Mind the Body

Verbal and Non-verbal Signs of Choice Awareness

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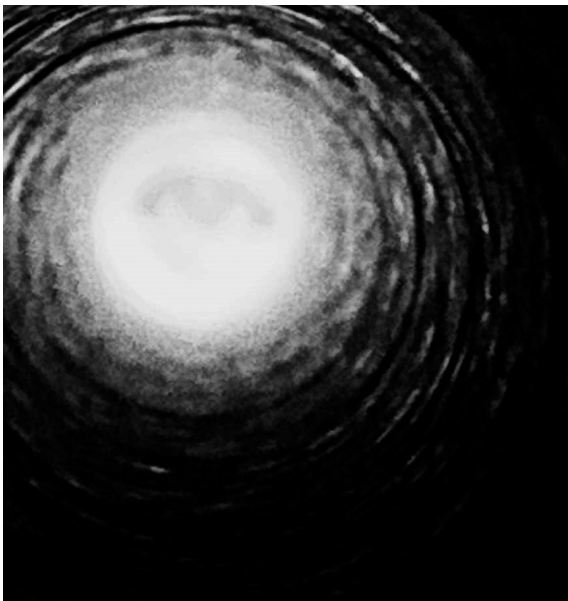
ALEXANDRA MOURATIDOU
COGNITIVE SEMIOTICS | CENTER FOR LANGUAGES AND LITERATURE | LUND UNIVERSITY



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Have you ever swiped right on a dating app, only to meet someone who doesn't quite match the profile you chose – yet you go along with it and even justify why this person was your preference all along? This scenario captures how people experience and express their choices when manipulation is involved and touches upon the central concern of this thesis: how awareness of choice manifests across different levels of consciousness and within diverse semiotic systems.

Framed within the discipline of cognitive semiotics, this work combines experimental studies with phenomenological philosophy to examine both verbal and non-verbal expressions during choice justification. In doing so, it reveals the complexity of conscious experience and offers a fresh perspective on the subtle relations between choice making, expression, and awareness.

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Alexandra Mouratidou

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DOCTORAL DISSERTATION

Doctoral dissertation for the degree of Doctor of Philosophy (PhD) at the Faculty of Humanities and Theology at Lund University to be publicly defended on date of October 25, 2025, at 10.00 in Auditorium Hall, Centre of Languages and Literature, Helgonabacken 12, Lund, Sweden

Faculty opponent
Shaun Gallagher
Lillian and Morrie Moss Professor of Excellence, Department of Philosophy at University of Memphis, Memphis (USA) and Professorial Fellow in Philosophy, SOLA at University of Wollongong (Australia).

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Title and subtitle: Mind the Body: Verbal and Non-verbal Signs of Choice Awareness.

Abstract:

This doctoral thesis explores the phenomenon of choice awareness through an interdisciplinary framework grounded in cognitive semiotics. Combining phenomenological philosophy with empirical investigations, the thesis examines how awareness of choice manifests across different levels of consciousness and within diverse semiotic systems.

Papers 1 to 3 present experimental studies using choice manipulation tasks, analysing participants' verbal justifications, bodily expressions, and deictic gestures. The findings reveal differences in choice investment, as expressed in language, between manipulated and non-manipulated choices, and between detected and non-detected manipulations. Even when manipulations go verbally undetected, participants often display signs of pre-reflective awareness, such as longer response times, a wider variety and increased frequency of bodily movements, and affectively marked gestures. These results challenge the assumption that we are "blind" to our choices and that verbal detection is the only reliable indicator of awareness, supporting instead the idea that we are, at the core, aware of our choice making, even if this awareness manifests non-verbally and below the threshold of reflective articulation. Papers 4 and 5 elaborate one of the thesis' methodological foundations and key principles of cognitive semiotics: phenomenological triangulation which integrates first-, second- and third-person perspectives in the exploration of phenomena.

The thesis further develops the model known as the Semiotic Hierarchy (of intentionality and meaning making), linking different types of choice making to varying levels of consciousness and sign use. Expressions of choice awareness, ranging from articulated verbal justifications to spontaneous bodily adaptors, can be interpreted as signs by the analyst, whether participants recognize them as such.

In sum, the thesis offers a richer account of choice awareness than traditional approaches in cognitive science, emphasizing the complexity of conscious experience and advocating a polysemiotic approach on how we make, experience, and express our choices.

Key words: cognitive semiotics, choice making, meaning making, phenomenology, pre-reflective, reflective, consciousness, intentionality, operative, categorial, self-awareness, semiotic hierarchy, phenomenological triangulation, life world, non-human subjects, construal, bodily expressions, signals, adaptors, deictic gestures, facial expressions, torso, head, hand, movements, tactility, affectivity, valence, preference, blindness, manipulation, deception, confabulation.

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To Michael

Look what we've done!

Table of Contents

Abstract

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Acknowledgements

If I could turn back time and do this all over again, I would in an instant. This is largely thanks to the people I shared the past five years with.

My supervisor, Jordan Zlatev, who guided and supported me every step of the way. It is thanks to his genuine care, trust, and deep commitment that I have come this far. With such a generous supervisor by my side, I was able to grow both as a scholar and as a person – learning, among other things, to temper the brazenness in my rhetoric while defending my views with audacity. Beyond his pivotal role in my development, Jordan offered me something rarer still: an academic family, an environment where I felt I belonged and was accepted for who I was, spontaneously and without pretence. This was the fuel that kept me going – not only in my studies, but also in making Sweden my new home. I could not have become the person I am without him.

Patience is a remarkable trait – one I cannot claim to possess – but, thankfully, Joost van de Weijer has it in abundance. As my second supervisor, Joost patiently guided me through the wondrous yet bewildering world of statistics. While this world still manages to confound me, I greatly valued the time we worked together. I have learned from him not only about methods and analysis, but also about persistence in the face of complexity. For all these years of support, I am deeply grateful.

When I defended my Master's thesis in 2019, I was intimidated by the idea that Göran Sonesson would be the examiner. Without wanting to brag – too much – I can say that Göran showed a genuine interest in my work ever since, until his untimely passing in 2023. I was fortunate to have the opportunity to discuss various topics with him during seminars, to socialize at our frequent post-seminar gatherings, and on his recommendation to serve as a plenary speaker at the 13th Conference of the International Association for Visual Semiotics in 2023, after he refused to take *no* for an answer when I hesitated to accept the invitation. Above all, I want to thank Göran, because he gave us the past we always turn to in order to find our way into the future.

Mats Andrén, the co-author of one of the papers in this thesis, was someone I approached without having met before. I proposed collaborating on a paper, knowing that the chances of a positive reply were slim. To my delight, Mats accepted, leading to the smoothest collaboration I could have hoped for. Every

meeting was both fruitful, joyful, and rewarding, filling me with strength and energy. Though a seasoned scholar, Mats was always open to hearing me out and exploring ways to develop our paper together. I am deeply thankful for the opportunity to get to know him and to work alongside him.

I would also like to thank Todd Oakley and Sandra Meza. Todd served as my mock opponent, and his careful reading, probing questions, and constructive critique provided me with invaluable preparation for the defence, helping me to see my work from new perspectives. Sandra warmly hosted me at the University of Chile and at the Pontifical Catholic University of Chile during my Erasmus visit. And when I say hosted, I mean *φιλοξενία* in the true Greek sense. Without knowing me at all, she made the impossible possible: she gathered participants for my pilot study, arranged meetings with anyone she thought our research interests might align with, helped me find accommodation, showed me Santiago by night… and all this without me speaking Spanish and her speaking English. Her generosity, kindness, and openness made me feel at home in a new country, and the experiences I gained there remain invaluable. I am truly grateful for her hospitality.

Lund University has provided the resources, academic environment, and supportive community that made this research possible. I am indebted to the many individuals who, in various roles, provided invaluable assistance – particularly during the final stages of this thesis, from formatting to printing. Their contributions ensured that everything was completed in proper order and that the concluding process remained both efficient and manageable.

Another vital component of this thesis are the participants who generously took part in the studies. I am especially grateful to those who, during the sweltering summer in Greece, took the time to meet with me and allowed themselves to be (gently) misled about their choices. Without their willingness and good spirit, this research would not have been possible.

My thanks also to my colleagues and friends: Manuel Quezada, Vlad Zlov, and Johan Blomberg. Manuel kindly agreed to be my phenomenological "judge", sharing his expertise and devoting his time to reading my work and offering sincere, fair criticism – even when I did not always take it lightly. With Vlad, I have laughed and cried, stayed up until dawn on a New Year's Eve, completed our MA, and managed to stay in touch even during his time away. He is the kind of friend who offers help without being asked, generously giving his time and energy in any way he can. I am grateful to them both for their presence and help. I first met Johan when I was an MA student and he soon became one of my closest friends, playing many roles in my life ever since: patiently listening to me rehearse conference talks – often so many times that he must have known them by heart; offering thoughtful feedback on my writing; indulging my habit of concerning him at friendly gatherings to pick his mind or pester him with endless questions about phenomenology – a topic

eventually banned by others – and much more. Above all, he has reminded me of my abilities when I doubted myself and has attended, with most seriousness, to many imagined catastrophes I often conjured. His presence has eased the sense of existential loneliness, to which one is especially prone as a foreigner, and I count myself fortunate for his steadfast friendship.

There are a few other friends I consider my extended family, who have supported me in countless ways. My dear friend Maria Exarchou for her constant encouragement, faith, and the many stimulating conversations while walking – me through the streets of Malmö, and she through the streets of The Hague. My best friend, Eleni Athanasiou, who was instrumental in recruiting participants for the experiment in Paper 2: she took it upon herself to spread the word and went out of her way to help. Beyond this, she has always been present for me despite the geographical distance – listening patiently to my long phone calls, sharing my worries, and excusing my mistakes when I was too hard on myself. She is truly the kind of friend anyone would be fortunate to have.

Finally, I would like to thank my family. To my mom, Magda, without whom I could not have taken the steps that gradually led me here. She has always been supportive, even when she did not agree with my choices, and her love has been the one constant I know. To my kids, Triantafyllos and Philippos, for all the small sacrifices they made while I was away at conferences, working late, or absorbed in my computer even at home. I hope there is a silver lining to it: that they may learn to pursue what they find meaningful in life and to commit themselves fully, as I have done. Lastly, I wish to thank my partner, Michael, to whom this thesis is dedicated. While its academic content is my own, I regard the work as collaborative in every other sense, for it was his countless contributions – both seen and unseen – that made its completion possible. I am truly the luckiest to have such a supportive, attentive and giving partner. This achievement is as much his as it is mine.

Alexandra Mouratidou
Lund, September 8, 2025

PART I.
Introduction

1. All of Me

1.1. List of papers

This doctoral dissertation presents original research from five papers. Each of the papers is referenced in the thesis by its corresponding number.

Paper 1
Mouratidou, A., Zlatev, J., & van de Weijer, J. (2022). How much do we really care what we pick? Pre-verbal and verbal investment in choices concerning faces and figures. *Topoi 41*(4), 695–713. https://doi.org/10.1007/s11245-022-09807-z

Paper 2
Mouratidou, A., Zlatev, J., & van de Weijer, J. (2024). The body says it all: Non-verbal indicators of choice awareness. *Cognitive Semiotics 17*(2), 233–266. https://doi.org/10.1515/cogsem-2024-2012

Paper 3
Mouratidou, A. & Andrén, M. (Under review: revised and resubmitted). Deictic gestures beyond reference: Construal of affective valence in choice making. *Phenomenology and the Cognitive Sciences*.

Paper 4
Mouratidou, A. (In press). Investigating choice awareness through cognitive semiotics. A. Biglari (Ed.) *Open Semiotics*. Editions L'Harmattan.

Paper 5
Zlatev, J. & Mouratidou, A. (2024). Extending the life world: Phenomenological triangulation along two planes. *Biosemiotics 17*(2), 407–429. https://doi.org/10.1007/s12304-024-09576-9

Previous publication connected to this thesis:
Mouratidou, A. (2020). Choice awareness and manipulation blindness: A cognitive semiotic exploration of choice-making. *Public Journal of Semiotics 9*(1), 1–40. https://doi.org/10.37693/pjos.2019.9.21388

1.2. Summary of papers

Papers 1 to 3 explore choice awareness through choice manipulation experiments, focusing on (a) *factors* influencing participants' detection of manipulation, and (b) *manifestations* of participants' detection of manipulation in their verbal and non-verbal expressions. Based on the empirical findings, I make claims about participants' awareness of their choices. Papers 4 and 5 address *phenomenological triangulation*, the basic methodological principle of cognitive semiotics, and its application in the exploration of choice awareness (Paper 4), and beyond (Paper 5).

Paper 1 examines *investment* as a factor influencing choice awareness and manipulation detection. Choice investment is operationalized in terms of eleven linguistic markers. The study predicted that participants would show a higher degree of investment when justifying (a) their choices of faces over figures, (b) manipulated over non-manipulated trials, and (c) detected over undetected manipulations. These predictions were confirmed to varying degrees, suggesting that both pre-verbal and verbal justifications are linked to conscious awareness in choice making, revealing differences in the levels of investment and awareness involved in the process.

Paper 2 extends the investigation beyond verbal justifications to *non-verbal expressions* as signs of choice awareness. Participants' verbal justifications were categorized into non-manipulated, manipulated-detected and manipulated-undetected trials. The analysis included five categories of bodily expressions: Adaptors, Head, Torso, Face, and Hands. The results showed that even when participants did not verbally detect the manipulations, they took longer to assess their choices, used more bodily expressions, and engaged more body parts while justifying their choices. These findings suggest that participants had a level of pre-reflective awareness of the manipulation, evident in their non-verbal behaviour, challenging the assumption that a lack of verbal detection implies unawareness of choice.

Paper 3 investigates the role of *deictic gestures* in expressing affective valence and their potential to indicate awareness in choice making. Again, participants' reports were categorized into non-manipulated, manipulated-detected, and manipulated-undetected trials. The analysis included their verbal and deictic responses across seven dimensions: Deixis, Indicated Object, Hand Shape, Hand Use, Tactility, Utterance, and Valence. The results revealed differences in participants' deictic gestures between preferred and non-preferred alternatives across almost all dimensions. Additionally, when manipulation occurred, participants gesturally indicated their preferred choice, even when it was presented as the rejected alternative, in a manner similar to how they indicated their preferred option in the non-manipulated condition. These findings show that deictic gestures are not merely referential, but also convey affective construal, serving as implicit indicators of participants' awareness of choices.

Paper 4 describes the application of *phenomenological triangulation to the exploration of choice awareness*. By incorporating and analysing phenomena from first-, second-, and third-person perspectives, the paper provides a deeper understanding of choice awareness and its manifestation in verbal and non-verbal behaviour. Finally, the paper offers an alternative explanation of the phenomenon, challenging arguments that seem to undermine our reliability as conscious agents.

Paper 5 provides a reflection over, and *further explication of the principle of phenomenological triangulation*, elaborating on its conception and later development. The paper argues for the compatibility of phenomenology with scientific inquiry and asserts that the life world is not limited to human beings. Additionally, it describes the extension of the principle along two planes: the horizontal, which focuses on the interrelated dimensions of Self, Others, and Things as essential components of the life world; and the vertical, which addresses how phenomena are accessed from different perspectives: first-person (philosophical), second-person (qualitative empirical), and third-person (quantitative scientific).

1.3. Individual contributions to the papers

Paper 1 was written during the Covid-19 pandemic. Due to the challenging conditions at the time, we sought to make use of the data available from my MA thesis (Mouratidou, 2019). The idea of exploring choice investment as a factor influencing choice awareness and manipulation detection was originally mine; however, the concept was finalized in its current form through discussions among the three authors. Jordan Zlatev played a key role in operationalizing choice investment in terms of markers of investment, strengthening the theoretical framework, and revising parts of the paper for clarity. I coded the data, conducted the descriptive statistical analysis, and wrote the first full draft of the paper. Joost van de Weijer showed me how to conduct the statistical analysis, ensured the accuracy of the results, and advised on how to present the findings. The three of us worked on the final version of the paper, and I made the finishing touches.

For Paper 2, I ran the experiment, created the coding template, and wrote the first version of the text. Jordan Zlatev elaborated on and clarified theoretically the denotational vs. non-denotational distinction, as applied to bodily expressions, which was also part of the coding template. Joost van de Weijer conducted the inferential statistical analysis and contributed important clarifications to help understand the results. After receiving comments from anonymous reviewers, Joost van de Weijer addressed the feedback related to the statistics, while Jordan Zlatev and I revised the paper to its final form.

For Paper 3, the same data that I had gathered for Paper 2 was used but now looked upon from a different perspective. I developed a new coding template, carried out

the coding and descriptive statistical analysis, and drafted the initial version of the manuscript. At every stage, Mats Andrén offered essential guidance, provided critical feedback, and contributed his expertise in shaping the template, the analysis and framing the argument. All subsequent decisions were made collectively, and we worked closely together on producing the final version of the paper.

I was the single author of Paper 4. After writing the final draft, I received feedback from Jordan Zlatev with minor suggestions for improvements in terms of style and clarity.

In Paper 5, as a second author, I contributed on writing the section "Extending the Life World with a Second-Person Perspective". Jordan Zlatev wrote the first version of the rest of the paper. Thereafter, we both worked and made improvements on the text, in particular after receiving comments from the reviewers.

1.4. List of songs

The following songs are featured in this thesis, presented as section titles.

All of Me – Billie Holiday

Should I Stay or Should I Go – The Clash

A Matter of Choice – Bill Evans

The Uncertainty of Knowing – Bill Evans

Signs and Wonders – The Neville Brothers

It Don't Mean a Thing (If It Ain't Got That Swing) - Duke Ellington

It Ain't Necessarily So – Ella Fitzgerald

Pick a Card – Frank Sinatra

So What – Miles Davis

Don't Stop Thinking About Tomorrow – Fleetwood Mac

2. Should I Stay or Should I Go?

In 2013, I left Greece to move to Sweden, a country I had never visited before. Life in my homeland was not bad: I lived in a nice place by the beach, had a comfortable routine, and made a good living working at our family business. So why did I choose to leave? Throughout the years, I have given different reasons to justify my choice, depending on the context: I wanted to study a different major, secure a better future for my kid, pursue new opportunities. Others pointed to the economic crisis prevalent at the time, or the challenges of working with family. All these reasons are potentially true. Yet, I am still unsure if one of them outweighs the others or if combining them together provides a complete answer. Understanding and justifying our choices is not a black-and-white phenomenon; it involves varying degrees of awareness, some of which may be less transparent – even to ourselves. Yet, the choices we make carve our path and define who we are. For me, this road led to currently writing my dissertation on choice awareness, rather than, for instance, welcoming tourists during their summer vacations.

To explore the phenomenon of choice awareness, I use *cognitive semiotics,* which serves as the theoretical framework. This relatively new discipline studies the multiple dimensions of human and non-human meaning making (*semiosis*), combining concepts and methods from semiotics, cognitive science, linguistics, and phenomenology (Sonesson, 2015; Zlatev, 2015; Konderak, 2018). The philosophy and methodology of *phenomenology* was introduced by Edmund Husserl at the beginning of the previous century in his quest for a foundation of knowledge that is free from prevailing theoretical presuppositions. By starting from first-person experience, and by viewing human beings as self-determining agents embedded in a shared life world, phenomenology turned out to be one of the most influential philosophies of the 20th century, impacting disciplines such as psychology, sociology, and semiotics (see Section 5).

Using the potentials of the pluralistic discipline of cognitive semiotics, my work employs a combination of qualitative and quantitative methods, integrating a systematic methodology based on first-person (e.g., intuition-based), second-person (e.g., social interaction-based), and third-person (e.g., quantitative) perspectives, in line with *phenomenological triangulation* (e.g., Zlatev, 2009; Pielli and Zlatev, 2020; Zlatev and Mouratidou, 2024): one of the two core methodological principles of cognitive semiotics. Particularly, Paper 4 describes in detail how it has been

applied to the exploration of choice awareness, while Paper 5 gives an overview of its conception and development to its current form (see Section 6.2).

The second methodological principle of cognitive semiotics is that of the *conceptual-empirical loop* (e.g., Zlatev, 2015; Stampoulidis et al., 2019; Devylder and Zlatev, 2020; Mendoza-Collazos and Zlatev, 2022). Philosophical and empirical inquiries, shifting between the questions of "*what is choice awareness?*" and "*how does it show in the behaviour of the participants in the experiment?*", led to the development of theoretical concepts and their operationalizations through multiple loops of refinement. These iterations allow the understanding of the phenomenon to emerge from direct experience, rather than from pre-existing theories, assumptions, and biases, as elaborated in Section 6.1.

The phenomenon of choice making and its awareness has been explored in fields such as neuroscience and cognitive psychology. However, such approaches often emphasize automatic processes while overlooking the complexity of conscious experience in its diverse manifestations of meaning making (e.g., Libet, 1999; Wegner, 2002; Johansson et al., 2005; Soon et al., 2008; Haynes, 2011) (see Section 7 and 8). This shift toward mechanistic explanations of human behaviour has sparked important debates on topics such as the nature of agency, free will, and volitional action (e.g., Varela and Shear, 1999; Jack and Roepstor, 2004; Overgaard, 2006; Petitmengin, 2009, 2011). Given the prominence of these approaches, it becomes increasingly urgent to explore choice awareness through cognitive semiotics, with its emphasis on consciousness and polysemiosis (e.g., Zlatev et al., 2020; Cienki, 2020). *Polysemiosis,* as discussed in Paper 2, is a concept that captures an essential aspect of human communication: the combination of different semiotic systems in expression and interpretation. These include *sign systems* like language, gesture, and depiction, and *signal systems* such as bodily postures and spontaneous facial expressions. Such semiotic systems involve different degrees of awareness from both the producer's and the interpreter's side (see Section 5). Cognitive semiotics can, thus, offer a deeper understanding of choice awareness, one that transcends both traditional cognitive science and traditional semiotics (Konderak, 2018).

Particularly, by using a cognitive semiotic framework, the following questions are addressed in this thesis:

- *What is choice, what different kinds are there, and how do they relate to awareness?*
- *How do different factors influence participants' detection of the manipulation of their choice making?*
- *What kind of bodily signs and signals may serve as evidence for participants' choice awareness and how do these relate to different degrees of awareness?*

Before I proceed, let me also clarify what this thesis is *not* about. In the sections that follow, I do not directly engage with debates on consciousness, free will, or the validity of first-person reports. Further, the main goal of this thesis is not to challenge the paradigm of "choice blindness" (e.g., Johansson et al., 2005) in cognitive science, despite expressing occasional critical comments concerning its methodology and the theoretical interpretation of its findings. This thesis also does not aim to offer a detailed phenomenological account of volitional experience, action, or agency. Instead, as will become clear, my aim is to provide a comprehensive understanding of the context in which choice awareness – and its manifestation in both verbal and non-verbal expressions – is studied. Based on the empirical findings and theoretical interpretations presented, I aim to show the reader – whether or not they agree with my conclusions – the richness and complexity of choice making. In doing so, I hope to contribute to restoring our sense as reliable conscious agents, embedded within a shared life world and intersubjectively connected.

In the following sections, I present the context in which choice awareness is discussed and explain how this thesis contributes both theoretically and empirically to its understanding. Specifically, I propose a phenomenological and polysemiotic approach to the phenomenon, recognizing different degrees of awareness in relation to various semiotic systems. Throughout the sections, I highlight key ideas from the published papers and take the opportunity to delve deeper into the central arguments, clarifying certain points, and, when necessary, introducing a few new ideas.

This contextualizing part of the thesis is divided into five parts. Part I has provided introductory information about the papers comprising the thesis, as well as the topic of investigation, situated within the discipline of cognitive semiotics.

Part II explores the phenomenon of choice making by offering a theoretical account of different kinds of choices, followed by a discussion on choice manipulation and the detection of such manipulations. The focus lies on the distinction between pre-reflective and reflective consciousness, the intentionality of the body, and the hierarchy of intentionality and semiosis.

Part III elaborates on the cognitive semiotic approach to conscious awareness. It introduces semiotic concepts, such as the key semiotic notion of *sign*, and examines their relation to awareness, providing examples from the findings of the papers. It further presents the methodological framework applied throughout the papers.

Part IV turns to experimental approaches to choice making and awareness and discusses their findings in relation to those of this thesis. This discussion sets the stage for a detailed description of the forced-choice task, highlighting the differences between real-life and laboratory investigations of the phenomenon. Additionally, it proposes a phenomenological interpretation of "confabulatory"

reports, as well as a hierarchy of choice making and awareness with their corresponding verbal and non-verbal signs.

Finally, Part V concludes this *kappa* ('coat' in Swedish) of the thesis by summarising its contributions and offering suggestions for future studies.

PART II.
Choice making

3. A Matter of Choice

3.1. Kinds of choice making

In everyday life, we often express our choices by saying things like *I like this* or *I want this*. However, these expressions can have different meanings depending on the action taken and the kind of choice making we refer to. Likewise, our motivations for them can be accompanied by varying degrees of awareness. Following Sokolowski (2017), I distinguish between three kinds of choice making: a *chosen*, a *voluntary*, and a *preferred* action. Overall, an action can be understood as a bodily performance that is (i) initiated by the agent, (ii) under the agent's control and (iii) aimed at an end (Drummond, 2021, p.376).

Chosen actions are characterized by three components: *purpose, replaceability*, and *concatenation*: I do X in view of Y; an alternative option Z could have been selected to reach Y; and each chosen action X has to be seen in the context of the other chosen Z's that must also be made. Voluntary actions, on the other hand, are direct and spontaneous, done for the sake of nothing beyond themselves.[1] Chosen actions, thus, differ from voluntary ones in that they not only aim at an end, but are undertaken in the light of that end. As Sokolowski (2017) argues, "everything chosen is voluntary, but not everything voluntary is chosen" (p.11). One difference between chosen and voluntary actions lies in their *categorial* nature, since the former involves deliberation, and to that extent, a degree of reflection (Drummond, 2021), while the latter considerably less, if any, reflective engagement. For instance, choosing to walk through the park to clear my mind before a meeting is a chosen action, but if I suddenly pause mid-walk to watch a shifting cloud it is a voluntary one, as it is spontaneous, immediate, and not undertaken in view of anything beyond itself.

A third kind of choice making, which spans both voluntary and chosen actions, is one based on preference. The form of thinking in such choices fundamentally relies on the comparison of at least two alternatives, rather than on planning or strategizing to achieve an explicit goal. Sometimes, we assess the alternatives, weigh their various features and based on these, we choose the one preferred. "The preference

[1] The voluntary can be further distinguished into *simple* or *immediate* voluntary, which is the setting for choice; the *mediated*, which is that in view of which choices are made; and the *sedimented*, when choice is relaxed and in repose (Sokolowski, 2017, p.14)

for has been a selection against" (Sokolowski, 2017, p.19) and, in such cases, our categorial thinking is more pronounced. At other times, being under the influence of different factors (e.g., being captivated by one of the alternatives, such as the shifting cloud in the sky), we may perform a spontaneous voluntary act, rather than making an active choice. Again, in Sokolowski's terms, in this case "the situation is not really resolved into a choice. […] The thinking is not sustained and the performance, although still done by me, is less my own" (ibid, p.19).

Categorial is the kind of thinking and experience that builds upon simple perception and sensory experience to identify explicit features and make judgements about objects.[2] According to Husserl (1900/2001a), "categorial intuition is the fundamental mode of giving an object to consciousness, which allows us to recognize it in terms of its essential features" (p.133). Or as Sokolowski (2000, p.80) writes, through categorial intuition: "we move from sensibility to intellections, from mere experiencing to initial understanding". By means of categoriality, objects are intended as articulated, including relations between their constituent features or between different objects. At the same time, these are more fundamental than predications expressed in language or any other semiotic system:

> The object with these categorial forms is not merely referred to, as in the case where meanings function purely symbolically, but it is set before our very eyes in just these forms. In other words, it is not just thought of, but intuited or perceived. (Husserl, 2001b, p.280)

Categoriality can thus be a two-order achievement, consisting of the registration of the features of an object, as well as the subsequent articulation of those features in language, since "the syntax that defines language is grounded in the parts and wholes that are articulated in categorial consciousness" (Sokolowski, 2000, p.91). Sokolowski illustrates this with the example of seeing a car. At first, one may simply perceive the car (i.e., its colour, shape, etc.). However, upon closer inspection, one might notice a dent on the door. This shift from perception to the articulated judgement "this car is damaged" marks the transition from pre-categorial to categorial consciousness. Simple voluntary actions are often pre-categorial, while categoriality involves a degree of deliberation.

In my earlier work (Mouratidou, 2020), I introduced a two-level hierarchy of choice making corresponding to different types of consciousness (see also Section 4):

[2] According to Husserl (1900–1901/2001a, 1901/2001b), simple sensuous perception provides intuitive fulfillment for signifying elements not logically articulated (e.g., the terms "paper" and "white"). Categorial intentions (expressed verbally, for instance, by the copula "is" in the sentence "the paper is white") cannot be fulfilled by simple intuitions, as they are not sensible objects that can be immediately perceived, and require categorial intuitions (Sacrini, 2016; Zlatev and Blomberg, 2019).

- *Operative intentionality:* the (lower) level of pre-reflective consciousness that establishes "a natural, pre-predicative unity of our being in the world and of our life […] that appears in our desires, our evaluations, and our landscape more clearly than it does in objective knowledge" (Merleau-Ponty, 1945/2012, p.Ixxxii). It is the source of our more rapid and intuitive choices, or in Sokolowski's terms, our voluntary actions.
- *Categorial intuition:* the (higher) level of reflective consciousness that gives the basis for a predicative, but still pre-linguistic choice based on "our judgements and […] voluntary decisions" (ibid). It provides a foundation for thought, by allowing pre-linguistic judgements.

To these, a third level needs to be added to account for the more complex forms of deliberation that involve not only reflective awareness but also the capacity to engage in linguistic reasoning:

- *Reflective intentionality:* the (still higher) level of reflections, where remembering, imagining counterfactual scenarios and linguistic thinking is involved.

Thus, a chosen action requires *reflective* intentionality (e.g., deciding between job offers by weighing pros and cons), while a voluntary action arises from the operative level, such as avoiding an icy patch on the sidewalk. Categoriality serves as a bridge between the two, allowing us to move flexibly from spontaneous responses to deliberate choices (e.g., selecting a ripe fruit based on its colour, texture, or firmness).

The variety of the kinds of consciousness involved in choice making will become clearer with the assessment of the verbal justifications that participants provide to motivate their choices, as seen in Paper 1 and other parts of the thesis. Importantly, it cannot be assumed that a given type of situation always corresponds to a certain kind of choice making, since choices are contextualised and cannot be understood in isolation (Drummond, 2021). For example, drinking some water can be a simple voluntary action, involving operative intentionality when I am thirsty and water is at hand, or it can be a chosen action, involving reflective consciousness when it is done as part of a medication regimen.

Further, the categoriality of a choice driven by specific goals can eventually be habitual, and thus *sedimented* – in the "genetic" sense of the subject's temporal development and personal history rather than the "generative" that is collective and historical (Steinbock, 1995; Thompson, 2007) (see Section 3.2). Through this, the boundaries between what we explicitly decide and what we just do become less clear, and our reflective choices can be gradually transformed into simple voluntary actions. For instance, drinking a certain amount of water at specific times during some health treatment over a long period can become a habit, continuing long after

the treatment. But through categoriality, these habits can be interrupted, and lead to more reflective choices.

No matter the kind of choice making involved, our actions reflect who we are. This is especially apparent in our preferences and simple voluntary acts. When we choose with an explicit goal in mind, our choices are largely shaped by that goal, and the options we consider may sometimes seem like the only ways to achieve it. In the case of preference, however, we focus on the alternatives based on what we are immediately drawn to, revealing aspects of our sedimented choices. Such a revelation implies that our acts of choice making are more or less *public*: sometimes they appear as visible actions (e.g., I mow the lawn), while having a specific purpose in mind (e.g., to have a garden party), while at other times, our actions and purposes are stated in language, making it clear that we are on the third level of choice deliberateness: "this verbal supplement is a further public appropriation of what we have already appropriated by our deliberation and chosen action" (Sokolowski, 2008, p.257). This leads us to the topic of choice justification.

3.2. Justification of choice making

As seen above, different kinds of choice making involve different degrees of categoriality and thus enable us to justify them in different degrees of explicitness. As pointed out above, a chosen action can be articulated by breaking it down into three components: the goal we want to reach (*purpose*), the possibilities of substitution we considered (*replaceability*), and the intermediate steps taken to achieve it (*concatenation*) (Sokolowski, 2017). However, the choice making processes in simple voluntary actions can be much harder to articulate, as they lack the explicit categoriality of chosen actions. We may like jazz, find someone attractive, drink beer, without really knowing why. Something in our surroundings appears appealing and invites us to engage with it: the music is pleasant to listen to, the person seems interesting to get to know, the beer would feel refreshing to drink. Each of these is desired by itself and in its own right, without purpose, replaceability and concatenation, as there is when we make more deliberate choices. In the case of preference, it could be either more like a voluntary, or a chosen action, depending on the situation, as explained earlier.

Our verbal and non-verbal expressions are also shaped by choice-making processes. In language, we can draw from an inexhaustible repository to express ourselves. However, the things we say may not always be chosen deliberately – selecting each word with care to craft exactly what we aim to communicate. They can also be simple voluntary actions: spontaneous expressions, such as the curses we might utter when reacting to someone cutting us off while driving, or sedimented fixed responses, like *hey* or *good morning*, when briefly greeting a neighbour as we rush

off to work in the morning. Of course, we can always stop and reflect on these actions and adapt them, but as our minds may be directed elsewhere, we often do not.

Further, when we talk, we usually employ our whole body: we may shrug, frown, point, etc. Some of these bodily expressions are chosen to communicate something specific to our interlocutor, like using the thumbs-up gesture to show that everything is okay. Others are performed without us being reflectively aware of them and without aiming to convey anything, as some of our facial expressions when we are caught off guard, blushing when embarrassed, or adaptors (i.e., movements directed towards our body, such as scratching our head, or towards an object, such as rubbing a pen with our thumb). This distinction is further clarified in Section 5 and in Paper 2.

In addition, our choice of verbal and non-verbal expressions reflects how we frame a particular situation – our *construal* of it. "Construal" is an ambiguous term that has been used in cognitive linguistics to refer both to how we mentally take in a situation (such as in terms of *specificity, perspective*, and *valence)* and how we express it in language (Langacker, 2006). This concept is highly relevant for cognitive semiotics, and for the topic of this thesis. The continuity – though not identity – between pre-verbal experience and language implied by the notion of construal may be viewed as suggestive of a parallel with the phenomenological distinction between categorial and reflective intentionality when expressed in language or otherwise. While stemming from different theoretical traditions, this possible convergence suggests a productive point of contact between Langackerian semantic analysis and phenomenology (Möttonen, 2016). A shared observation is that intentional objects are not apprehended in a neutral manner but are always construed through particular dimensions or perspectives (see also Section 4).

Construal can, thus, be: (a) *subjective* (psychological), involving individual interpretations of a situation, which may vary from person to person; (b) *interpersonal* (pragmatic), pertaining to joint interpretations shaped by social interactions; and (c) *conventional* (semantic), reflecting interpretations encoded in particular words or non-verbal signs (Zlatev, 2016; Timm, 2022; Zlatev and Möttönen, 2022). Once again, these different kinds of construal demonstrate both continuity and discontinuity between pre-verbal experience and language. Purely experiential construal of the intentional object cannot be determinative of linguistic meaning since language always takes place in one communicative situation or another. For example, one's choice of which verbal expression to use will be a pragmatic, communicative process, arising from the experiences of individual speakers and hearers (Möttonen, 2016). Construal is further subject to "generative" sedimentation, whereby, over time and through numerous individual acts of meaning making, the relatively stable, intersubjectively shared senses of words and constructions emerge (Zlatev, 2016). In sum, construal operations in pre-verbal and verbal intentional acts are related but distinct (Zlatev and Möttonen, 2022).

With respect to the topic of the thesis, all three kinds of construal are relevant: how participants construe picture pairs, how this construal is shaped within the communicative setting between the participant and the experimenter during the justification task, and, ultimately, how participants' utterances and gestures reflect these interpretations. In Paper 1, we discuss this by analysing participants' verbal reports to assess their investment in the choice-making task. In Paper 2 we do so by looking at their bodily expressions as signs of different degrees of choice awareness, and in Paper 3 by examining participants' deictic gestures to assess their construal of the affective valence of the choice alternatives.

4. The Uncertainty of Knowing

4.1. Choice manipulation

Imagine you are using a dating app. You scroll past several pictures of people that do not appeal to you, until you finally select someone you like. You exchange a few brief messages and agree to meet. You arrive at the meeting point; someone approaches… but wait – this person does not look like the profile you thought you liked. Is this really the same person? The manipulations in the experiments described in Papers 1-4, inspired by the methodology used in "choice blindness" experiments (Johansson et al., 2005) and examined in this thesis (see Sections 7 and 8), are somewhat like this. Participants are typically asked to choose which of the two pictures they prefer, but when they are later presented with the chosen alternative, they are sometimes tricked. In certain trials, they are shown the rejected choice and asked to motivate why they had chosen it. The aim is to see whether participants will contest the manipulated option as their choice or accept it as such and based on their responses to make further claims about their choice awareness.

Using the dating app example, there are several ways the situation could unfold. With everything happening so quickly, you might not notice any difference and simply proceed to dinner. You might notice an inconsistency but attribute it to photographic filters, opting either to overlook it or to comment on it. Or being certain that it was not the person you had agreed to meet, you might excuse yourself and leave. Likewise, participants' responses to manipulated choices vary. Some explicitly detect the manipulation, while others do not; some express uncertainty about what was presented to them, while others are categorical about their initial choice. Notably, these responses are not only expressed verbally, but also *bodily*, as shown in Papers 2 and 3.

In my earlier work (Mouratidou, 2020), I explored *memory, affectivity*, and *consequence* as factors influencing participants' detection rate of manipulation (see also Paper 4). The assessment of participants' verbal justifications allowed me to identify several patterns in their responses, which I categorized into three levels of detection: *Clear, Possible*, and *No Detection*. Each level corresponded to different response types: *Categorical* and *Conciliatory* when the manipulation was explicitly detected; *Uncertainty* when participants either questioned or did not justify the manipulated choice presented as theirs; and *Ignorance, Indifference*, and *Acceptance* when the manipulation went undetected. In Paper 1, *choice investment*

was explored as a factor influencing manipulation detection, using these three levels of detection to analyse participants' response patterns.

Likewise, in Paper 2, where the focus this time is on participants' non-verbal expressions during the justification task, the same levels were used. Notably, at each level, participants exhibited different patterns in their bodily expressions. For example, there was a greater use of adaptors and a wider variety of body parts when participants justified a choice they had not previously made (i.e., Acceptance of manipulation), compared to when they justified a choice they actually made.

This is an important finding, as it shows that even when participants verbally justified the manipulated choice, their bodily behaviour differed from when they justified non-manipulated choices. Thus, adaptors could be seen as *signs* (see Section 5 for a definition) of participants' implicit awareness of the choice making, even when the manipulation was not explicitly detected and expressed in language. Additionally, when participants' verbal responses were coded as Possible – indicating uncertainty about what was presented to them as their choice – facial expressions were more frequent than in trials without manipulation. This suggests that facial expressions may serve as signs of implicit choice awareness. Such differences in participants' bodily expressions between non-manipulated cases and those involving undetected manipulations contradict claims about our "blindness", or complete unawareness of choice, further discussed in Section 7.1. Even when a preference is grounded on operative intentionality and is a voluntary rather than an explicitly chosen action – using the terminology of Section 3 – it still involves some level of awareness on the part of the subject. Further, the basic argument for claims about "choice blindness" rests on the assumed homogeneity of participants' verbal reports between non-manipulated trials and undetected manipulations (Johansson et al., 2005), elaborated further in Section 7. But as we saw, verbal expression is not the only possible realisation – or sign – of choice awareness.

4.2. Self-consciousness

The exploration of choice awareness, based on participants' verbal and non-verbal expressions, implies there is a distinction between the *experience* of making a choice and the *expression* of the experience, in language or gesture. The former provides the foundation upon which the latter is built, however, without necessarily implying a direct alignment between them (see Paper 1). As pointed out, categorial intentions underlie linguistic intentions (see also Table 1 below) but do not always align with them, as they stem from a prelinguistic and pre-predicative encounter with the world, which is more fundamental than language (Hua 19/281–282 as cited in Zahavi, 2003).

Subjective experience is characterized by self-acquaintance, but such familiarity does not guarantee full self-transparency or comprehension (Gallagher and Zahavi, 2021). As argued by Husserl (1931/1991, p.123), "consciousness is necessarily consciousness in each of its phases" understood in the broadest sense to embrace all aspects of our mental life (i.e., both the explicit and implicit phenomena of our awareness). Thus, in Husserl's view "self-consciousness cannot be restricted to the narrow scope of attentive or alert awareness, but must include in itself equally all background, obscure conscious experiences" (ibid, p.115).

The acquaintance with our experience is due to our pre-reflective and non-observational self-consciousness: it is I myself who stress over the future and imagine summer holidays. It is I myself who live through these experiences. However, *pre-reflective* self-consciousness does not amount to first-person knowledge. To reach the latter, we need to engage in reflection, involving *reflective* self-consciousness. Thus, while the former provides an implicit sense of self at the basic level, the latter enables explicit, intensified and thematic awareness, often involving signitive (i.e., sign based) intentionality, linguistic or otherwise. This is also reflected in the Semiotic Hierarchy of meaning making (e.g., Zlatev, 2018), as developed within cognitive semiotics, and presented below.

In Paper 3, I briefly discuss the split that reflection creates, as the reflecting self adopts a different attitude and temporal perspective from the self being reflected upon. This suggests that reflection does not merely replicate the original experience but, to a degree, transforms it. However, as Moran (2005, p.204) points out, there remains a "unity or coincidence" between the reflecting and the reflected selves, since what is grasped in reflection must already have been experienced. For reflection to occur, the object of reflection must already be (unthematically) present in experience, motivating the act of reflection. In Hua 4/217, Husserl remarks that to be motivated is to be affected by something, and then to respond to it (as cited in Zahavi, 2003, p.89):

> Whenever I reflect, I find myself in relation to something as affected or active. That to which I am related is experientially conscious – it is already there for me as a 'lived-experience' in order for me to be able to relate myself to it.

The relationship between the pre-reflective and reflective self-consciousness becomes apparent in the variation of justifications that participants provide to support the choices they made. The pre-reflective self-consciousness of the experience grants a subject (e.g., a participant in the studies) the resources to confirm or disconfirm the reflective interpretation (e.g., detect the manipulation). A misreading of experience, such as in the case of a hallucination, can be corrected through further experience and renewed reflection (e.g., retrospective detection of the manipulation).

Moreover, for scientific purposes, we can supplement reflective accounts in different ways, such as by investigating correlations between first-person reports and behavioural or physiological measurements, or more generally, by using phenomenological triangulation, as explained in Papers 4 and 5, as well as in Section 6. There will always be aspects of our experiences that will be challenging to reflect upon. Yet, these aspects are not equivalent to the "cognitive unconscious" in the sense of Lakoff and Johnson (1999) or to "the subpersonal" in the sense of Dennett (1991), which are not only inaccessible to consciousness, but also assumed to constitute the level at which cognitive processes take place. As pointed out above, we need a broad notion of consciousness, including all aspects of subjective experience, and, thus, of intentionality and semiosis.

4.3. Intentionality and semiosis

Intentionality, as understood within phenomenology, is a core feature of consciousness, its directedness beyond itself, or, more generally, our "openness to the world" (Merleau-Ponty, 1945/2012). I imagine summer holidays; I feel nervous about the upcoming defence of my dissertation; I judge this thesis to be almost complete. All these types of intentionality involve an *intentional act* that consists, according to Husserl's analysis of three parts: (a) the intentional *quality* (e.g., the type of intentionality: perceiving, imagining, signifying), (b) the intentional *object* to which this act is directed at, and (c) the intentional *matter*, the way this object is conceptualized (Husserl, 2001b, p.119-20).[3] The way I intend an object through various intentional acts (e.g., perceiving, judging or imagining a warm cup of coffee) can then be conveyed in our verbal and non-verbal expressions; in other words, our construal of it, as discussed in Section 3.2.

In short, our intentional acts are the unbreakable bridge between us and the world, where our acts of consciousness reach outside of themselves to intend (non-signitively) or refer (signitively) to transcendent (real or not) extramental objects. Thus, intentional acts do not merely depend on the existence of an object (e.g., in perception or hallucination) but are instead an intrinsic feature of consciousness. As Husserl put it: "all that is needed for intentionality to occur is the existence of an experience with the appropriate internal structure of object-directedness" (Hua 19/386, 427 as cited in Zahavi, 2003, p.21).

[3] The latter corresponds to the cognitive semiotic notion of *construal*, discussed earlier. Husserl later distinguished between *Bedeutung* (meaning) as linguistic meaning and *Sinn* (sense), conceived of as a more comprehensive notion that also encompasses pre-predicative and perceptual meaning (Hua 3/285 as cited in Zahavi, 2003, p.149).

This is in line with a general insight from cognitive semiotics, namely that intentionality and semiosis (understood as meaning making in general) are co-extensional and reciprocal phenomena, with intentionality corresponding to the "outward" directedness of consciousness towards the life world, and semiosis to "inward" direction, back to the subject(s) of experience (Zlatev and Konderak, 2023). The correlated insight is that the two should be understood as hierarchically layered, as formulated in various versions of the Semiotic Hierarchy, such as that shown in Table 1.

Table 1. The Semiotic Hierarchy (Zlatev, in press) with processes intertwined with sedimented structures.

Levels	Type of semiosis and intentionality	Processes	Structures
5	Linguistic	Languaging	Compositionality Grammar Complex texts
4	Signitive	Non-linguistic sign use	Signs Simple narratives
3	Reflective re-presentational	Remembering, Anticipating, Imagining	Mental imagery Time schemas
2	Reflective presentational	Categorial perception	Categorial objects
1	Pre-reflective presentational	Enactive perception	Affordances Body schema Habits

As argued by Merleau-Ponty (1945/2012), and reflected in Level 1 of the Semiotic Hierarchy, the most basic form of intentionality is operative intentionality. This corresponds to the "pre-reflective presentational" in Table 1. The experiential body possesses its own mode of intending, involving pre-reflective consciousness. This type of bodily intentionality is expressed through moods, sensuous drives, instincts, and impulses involving bodily and kinaesthetic sensations with varying degrees of conscious awareness. It grants the body a non-predicative form of awareness, both of itself and of the world encountered. The relevance of this foundational level is evident in the findings discussed in Papers 2 and 3, which suggest that participants possess an implicit awareness of their choices, which goes beyond – and can often contradict – verbal expressions, as these are typically used to respond to social demands.

Thus, semiosis and intentionality should be understood as involving a hierarchy of levels, some being direct in the sense of not mediated by signs, like in (enactive) perception, categorial perception and re-presentation (else, presentification)[4] as in

[4] "Re-presentation" (Thompson, 2007), or "pre-sentifying" (Zlatev, 2018) are English translations of Husserl's term *Vergegenwärtigung*.

imagination (Levels 1-3); while others being sign-mediated, such in the cases of signitive and linguistic intentionality (Levels 4-5).

There is also a correspondence between these levels with the ones of the choice-making hierarchy presented in Section 3.1: operative (Level 1), categorial (Level 2) and reflective intentionality (Levels 3-5). Thus, on the lowest level, there is operative intentionality, as manifested in basic enactive perception of affordances, sedimented along with habits and a largely pre-reflective body schema (Gallagher, 2005). On the second level, the subject is more clearly reflective of what they are perceiving, and able to perform basic judgements, thus, the degree of categoriality is heightened, albeit without predication. It is on the third level that we shift from presentational perception (here and now) to presentification involving making present something that is given in a different mode than in perception, like in remembering or imagining. Finally, Levels 4 and 5 involve the mediation of different signs, such as gestures and pictures, as well as language. The Semiotic Hierarchy is further adapted, and presented in the next section, in regard to choice awareness in verbally undetected manipulations.

PART III.
Cognitive semiotics

5. Signs and Wonders

5.1. What is a sign?

The participant scratched her head, leaned over the presented picture card depicting a male face and raised her eyebrows. While inspecting the card, her mouth formed a downward movement, as if in confusion or disapproval. Finally, she pointed with her finger at the card and said: *Ε…μου φάνηκε κάπως χαριτωμένος* ('E...mou fánike kápos charitoménos' / 'Well...I thought he looked kind of cute').

These verbal and non-verbal expressions can be understood as different signs of participants' choice awareness during the justification task, both for me as an analyst and, potentially, for the participant producing them, as elaborated below. Of course, this depends on how we define the concept of *sign*, arguably one of the most contested issues in semiotics. Without aiming at exhaustiveness, as this is not the main topic of this thesis, there are two polar positions concerning this in semiotics. On the one hand, scholars influenced by the seminal writings of Charles Sanders Peirce (1958) understand all forms of meaning making – from perception to verbal communication – as processes involving sign use, characterized by a triadic relation between Representamen, Object, and Interpretant (e.g., Paolucci, 2024). On the other hand, the other influential tradition, stemming from Saussure's structural linguistics (1916), treats the linguistic sign – defined by a dyadic relation between signifier and signified – as the primary model, considering other semiotic systems, such as gestures or images, as either identical to or derivative of it (e.g., Chandler, 2002).

Cognitive semiotics, as developed in the tradition stemming from Göran Sonesson, represents a middle ground in this long-lasting debate, by offering a more constrained understanding of signs than Peircean semiotics, yet a more general one than that of structuralist semiotics. Such an understanding has been shaped by the strong influence of phenomenology (e.g., Sonesson, 2015). Particularly, Sonesson's concept of the sign is understood through the phenomenological notion of *appresentation*, as well as ideas of the developmental psychologist Jean Piaget (see below). Notably, the integration of phenomenology and semiotics has been advocated for decades by Sonesson (1989, 2010, 2012), along with a few others (e.g., Stjernfelt, 2007).

Before delving deeper in the sign as a basic concept in cognitive semiotics, let us first take a step back to consider how it was originally conceived. Perhaps unsurprisingly, even in Antiquity, there was no single understanding of the term. On the one hand, there was the Aristotelian's view, according to which words (*ὀνόματα* / 'onomata') stand for objects in the world, and, on the other hand, that of the Stoics proposing a different notion: if something is the case (e.g., red spots on the body), then something else is also the case (e.g., measles) (*σημεῖα* / 'sēmeia'). A combination of both understandings was later achieved by Augustine, often hailed as the first semiotician, understanding the sign as "something which, on being perceived, brings into awareness another besides itself" (see Sonesson, 1989). It was Pedro da Fonseca who later generalized this to anything that serves to bring into awareness something different from itself, whether or not the sign itself becomes subject to awareness in the process (Deely, 1982, p.52ff), distinguishing between an *instrumental* or *formal* sign based on whether the mediating "something" must first be perceived (instrumental), or not (formal).

The cognitive semiotics notion of the sign stems from the claim of denying that the "formal sign" is a sign at all, since this corresponds to non-mediated intentionality (as in the first three layers of the Semiotic Hierarchy), in contrast to the "instrumental sign" where *the sign is perceived as something that re-directs intentionality toward something else*. Thus, as argued by Sonesson (2017) if perception is a case of intentionality, then the sign entails a form of "double intentionality", an indirect intentionality, which penetrates the expression to the referent, construing this with the help of the content. For example, when someone points toward a chair, the gesture is not simply perceived as a bodily movement; rather, it directs the observer's attention through the expressive act (i.e., the pointing) to the intended object (i.e., the chair), under a given construal (e.g., indicating where to sit).

As mentioned, Sonesson's definition of the sign (e.g., Sonesson, 2010) combines Husserl's insights on appresentation and Piaget's on *differentiation*. Appresentation is the experience of necessarily perceiving an object from a specific viewpoint – such as a particular side – while simultaneously experiencing it as a complete whole (see also Section 8). As Moran and Cohen (2012, p.40) put it: "every perception simultaneously presents and appresents. It appresents the empty horizons around the direct perception". Appresentation with focus on the occluded ("hidden") sides of objects thus provides Sonesson with one of the conditions for the sign, that of *double asymmetry*: what is more directly perceived is less thematic, while what is less directly perceived is more thematic. However, double asymmetry is insufficient for something to function as a sign: its "other side" is not just the back side of a perceived object, but something substantially different: the intentional object that it represents. Thus, Sonesson adds Piaget's notion of *semiotic function*: the differentiation between the two parts, understood as non-continuity and belonging to different categories. Such capacity develops gradually in children after the first

year of life and is arguably absent – or in some cases present to a limited extent (see Paper 5) – in non-human animals (e.g., Piaget, 1951; Donald, 1991).

Further, drawing on Peirce's notion of *ground,* Sonesson (2006) analyses the relations between expression and content/object as *iconic, indexical* or *symbolic*. Without the sign, as defined above, the ground is not sufficient for performing a sign function, since double asymmetry and differentiation are needed as well.

> The foot touching the earth is an indexicality; the traces left on the soil is an indexical sign for the observer following the trace. The branch of the tree which is still part of the tree is an indexicality; in the theatre, however, where it is cut off from the tree, it may well be an indexical sign for it (Sonesson, 2006, p.46)

The relationship between semiotic grounds and signs is shown in Table 2. On the horizontal level of the table, there are the relations of *Similarity, Contiguity* and *Conventionality*, corresponding to how the Peircean categories are usefully interpreted (e.g., Keller, 1998).

Table 2. The relationship between semiotic grounds and signs, based on Sonesson (2012), but without using the Peircean categories, and treating "iconicity" as identical with "iconic ground".

	Similarity	Contiguity	Conventionality
Ground	Iconicity = iconic ground	Indexicality = indexical ground	Symbolicity = symbolic ground
Sign	Iconic sign (icon)	Indexical sign (index)	Symbolic sign (symbol)

5.2. Signs and signals

Consistent with Sonesson's concept of the sign, but more concise, is the definition proposed by Zlatev, Zywiczynski, and Wacewicz (2020, p.160), which is adopted in this thesis as it allows distinguishing between signs and signals:

> A sign <E, O> is used (produced or understood) by a subject S, if and only if (a) S is made aware of an intentional object O by means of expression E, which can be perceived by the senses, and (b) S is (or at least can be) aware of (a).

If only condition (a) is present, E functions as a signal, while (b) is required for genuine signs, corresponding to the "instrumental sign" of Fonseca, as explained above. According to this definition, a sign consists of the relation between an Expression (E) and an Intentional object (O), while "content" is the way in which E is used to construe O. According to this definition, sign use necessarily involves a *reflective* subject, either as producer or interpreter of the relation. Note that this implies that anything can serve as E in sign use, including natural phenomena such

as the configurations of stars, implying that something does not need to be produced as a sign to be understood as one.

Returning to the example provided at the beginning of this section, the participant's verbal and non-verbal expressions are interpreted by myself, as analyst, as signs of her awareness of choice, no matter if she used them as signs or not. For example, I recognize that her verbal justification and deictic gesture indicate the picture card as the chosen one. Or I analyse her "unconscious" adaptors as a sign of nervousness or perplexity, as (a) and (b) are fulfilled, for me, even if they are not for her.

But are such expressions experienced as signs by the participant producing them? To demonstrate this, evidence for condition (b) in the definition is needed, not on our, but on their part. We can do so easier if we combine this with the notion of *communicative intent*. In every interaction involving at least two interlocuters, there is an underlying intent on the part of the addresser that the addressee will recognize their intent to produce a particular response in them (Grice, 1957). What this implies is that the addresser purposefully conveys a message, which is aimed at guiding the addressee to interpret the message in a particular way. The addresser, thus, has the intent not only to communicate a specific idea but also to make sure that the addressee recognizes this intent and uses it to derive meaning from the communication.

Adapting from Sonesson's (2012) discussion on the Gricean model of "speaker meaning" – which comes into being only if someone has the second-order communicative intent to make their first-order informative intent clear to the audience – to the interactions between participants and experimenter in the experiments of this thesis, implies that:

- A bodily expression, for example, finger pointing is perceived to be an instance of deixis: a gesture that belongs to the broader category of deictic gestures.
- Based on our cultural knowledge, we understand that such gestures are usually produced with a (more or less clearly articulated) purpose, namely, to direct someone's attention.
- There must be a subject (i.e., the participant producing it) having a communicative intent.
- The typical purpose of producing such a gesture is to convey a specific message (i.e., I refer to this card) from the subject producing it to another subject interpreting it (i.e., the addressee/analyst), whether specified or not.
- Unless there is a clear indication to the contrary (e.g., an earthquake moved the table, causing the card to slide in front of the participant's finger), we have reasons to suppose that the gesture has been produced with the intent of conveying a message from one subject to another.

Based on this, we assessed participants' polysemiotic responses in Paper 2 as either signs or signals according to condition (b) of the definition (i.e., being reflectively aware of the E-O relation). We used evidence such as that stated above to ascertain communicative intent.

An attempt to present a synthetic conception of the sign, consistent with cognitive semiotics and the discussion above, as well as used in the empirical studies of this thesis, and elaborated throughout this section, is shown in Figure 1.

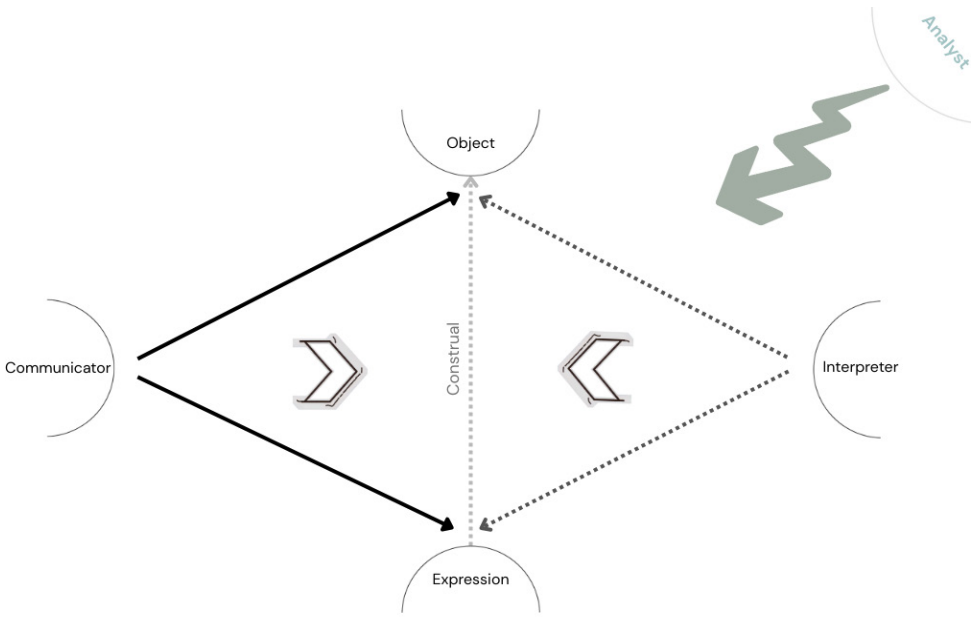

Figure 1. The synthetic representation of the sign, distinguishing between signs produced with communicative intent by the communicator (the left hand side, which should be seen as optional), and the more general notion of a sign for an interpreter or an analyst, which only requires a reflective interpreter, acknowledging the double asymmetry between expression and intentional object.

If there is a communicative situation, as in the studies of this thesis, the Communicator, directed toward an intentional Object, produces an Expression under a particular Construal (see Section 3.2). This Expression in the communicative setting is aimed at an Interpreter who also perceives it and co-construes the Object, (if the communication is successful). In addition to the primary Interpreter, there is also the Analyst (who could be the same person, as in the studies of this thesis), who analyses these expressions as signs (e.g., of choice awareness) retrospectively.

Thus, as analysts we could treat all participant expressions as potential signs of their choice-making process. However, in Papers 2 and 3 we assessed participants' expressions from the communicator's perspective (i.e., aiming to reassure whether

the participant was aware of the E-O relation when producing a bodily expression) by applying criteria of communicative intent and *denotational meaning* in our evaluation. Thus, for an expression to possess denotational meaning, it necessarily had to be categorized according to the predominant (though not exclusive) type of semiotic ground, as discussed above: iconic (resembling the object), indexical (drawing attention to the object), or symbolic (denoting the object based on a socially shared convention), and to be used with apparent communicative intent.

By contrast, unintentional signals of emotion and other bodily movements (e.g., scratching, yawning, etc.) that do not denote specific meanings were categorized as *signals*. Unlike signs, signals are not intended to communicate a message and are generally performed without focal awareness (Ekman and Friesen, 1969, p.84). That is why signals like adaptors (see Section 3.2) have been extensively studied in the literature as indicators of deception "leakage": the unintentional betrayal of truth through demeanour, or more broadly, of high emotional or cognitive load (Ekman, 2009).

In sum, gestures that usually involve different parts of the body (e.g., a shrug) can be regarded as both denotational, based on the semiotic ground of conventionality, and, thus, on their form and meaning remaining relatively fixed in different contexts and for different speakers (i.e., "I don't know"), as well as non-denotational, reflecting participants' attitude (e.g., ignorance, surprise, etc.). Other bodily expressions, which can have relatively stable meaning but also differ in form across contexts and speakers, have only non-denotational meaning (e.g., puckering lips when saying *hmmm,* titling the head to the side, narrowing the eyes, etc.). Finally, simple movements usually performed without speech (e.g., participants licking their lips, stretching their legs, blinking, etc.) lack both denotational and non-denotational meaning. Thus, signs (for the producer) always have denotational and sometimes also non-denotational meaning. Signals can at most have non-denotational meaning, even if some of these expressions can have some degree of conventionality. Finally, adaptors and purely practical actions serve practical aims rather than purposes of communicative expressions. This way of assessing non-verbal expressions aligns with the sign-versus-signal distinction in Zlatev et al.'s (2020) definition, cited above, which holds that signs require reflective consciousness of the denotational relationship between the expression and its intentional object – criteria (a) and (b) – whereas signals do not – criterion (a) only.

Importantly for the present thesis, by highlighting the reflective awareness of the directed relation between expression and object helps situate sign use within the Semiotic Hierarchy of semiosis and intentionality, as elaborated in the previous section and summarised in Section 8.3. This, in turn, provides the basis for further claims regarding participants' awareness of their choices, as illustrated by the example of undetected manipulation, presented in Table 3.

Table 3. Adopting the Semiotic Hierarchy (Zlatev, in press) to the study of choice awareness during the justification of undetected manipulations.

Levels	Type of semiosis and intentionality	Processes	Participants' expressions and their semiotic status
5	Linguistic	Languaging	**Justification response: verbal sign**
4	Signitive	Non-linguistic sign use	**Pointing, shrugging: gestural signs**
3	Reflective Re-presentational	Remembering, Anticipating, Imagining	**Hesitation, pause, face expressions: intermediary status**
2	Reflective presentational	Categorial perception	**Adaptors: bodily signal**
1	Pre-reflective presentational	Enactive perception	

The examples of participants' expression used in Table 3 reflect instances produced during undetected manipulations. This implies that participants verbally justified the manipulated picture as their choice, while producing various bodily signs and signals. For demonstration purposes, we may align these with the different types of semiosis.

For example, at the lower Levels (1-2), the production of bodily signals such as adaptors suggests that participants may have been aware that something was "wrong" with the picture card presented as their choice, or with the situation they found themselves in, despite verbally justifying the manipulated picture as their choice. Notably, this claim is supported by comparisons with cases in which no manipulation was involved or in which manipulation was verbally detected, where such bodily signals were significantly less frequent (see Paper 2).

The next, reflective re-presentational Level (3) can be linked with facial expressions and, potentially, pauses and hesitations. Again, participants verbally justified a choice they did not make as their own; however, their responses were significantly longer in duration (e.g., by trying to imagine or remember why they could have made that choice) than in the other two conditions (i.e., non-manipulated and manipulated-detected trials), demonstrating a higher rate of facial expressions (see Paper 2).

The highest two Levels (4-5), which involve signitive and linguistic intentionality, correspond to participants' gestural signs (e.g., pointing at the picture card) and verbal justifications (e.g., saying "I liked him more"), respectively.

5.3. Semiotic systems and polysemiosis

The participants' expressions that were analysed are, as noted, polysemiotic. The concept of polysemiosis, i.e., the combination of different sign and signal systems (see Section 2), requires principles according to which to distinguish between different semiotic systems. Following Zlatev et al. (2023, p.84), this can be accomplished on the basis of the following six criteria:

1. *Production*: the way by which the physical form of the sign is created, such as bodily movements, sound waves, etc., corresponding to the expression pole of the sign or signal.
2. *Modality*: the primary sensory channel through which the expression is perceived, such as vision for bodily expressions, hearing for speech, etc.
3. *Degree of permanence*: limitations on the duration over which signs can be perceived and interpreted.
4. *Double articulation*: some signs can be formed by systematically combining elements that are meaningless on their own, such as phonemes in spoken languages.
5. *Semiotic ground dominance*: given that one or more semiotic grounds are a precondition for any sign (see Table 2), the question arises as to which ground tends to dominate (e.g., symbolicity in words, indexicality in natural symptoms, iconicity in photographs). However, these three types of grounds are not mutually exclusive and typically co-exist in any sign.
6. *Syntagmatic relations*: the combination of signs in larger units, such as phrases and texts, are described in structuralist linguistics and semiotics through "horizontal" (linear) relations, complemented by "vertical" (paradigmatic) relations with alternative signs that could replace them. However, since these relations cannot be easily applied to other sign systems outside of language, they should be seen as variable, distinguishing between more or less compositional systems, where the meanings of component signs combine in systematic ways.

On this basis, when comparing, for example, the semiotic systems of gesture and language, the former can be broken down into smaller sign units and nuclei (Kendon, 2004; Green, 2014), as it does not consist of minimal distinctive elements such as phonemes or graphemes and lacks the double articulation of language. Additionally, gestures do not have the systematic structure seen in language for organizing sequences of signs, making it arguably more challenging to convey complex messages such as narratives (Donald, 1991; Ryan, 2017). In terms of modality, vision is the primary one but can also involve hearing or haptic sense.

Since gestures involve the body and do not leave a lasting trace, they differ in terms of permanence from other semiotic systems, such as depiction.

To summarise, the intrinsic relationship of conscious awareness and sign use, as well as the interplay of different semiotic systems, allows to examine participants' polysemiotic expressions and make claims about their awareness of choice making. Returning to the example at the beginning of this section, it becomes apparent that depending on the social context and the situation at hand, there may be incongruence between what we communicate through one semiotic system, such as language, and what we communicate through another, such as bodily expressions. One such example is the experimental setting where participants made a series of preference-based choices and were asked to justify them, as described in Section 8.

6. It Don't Mean a Thing (If It Ain't Got That Swing)

6.1. The conceptual-empirical loop

The two methodological principles of cognitive semiotics employed in this thesis were briefly introduced in Section 2 and are developed across the five papers. In this section, I seek to further clarify their conceptual structure and demonstrate their relevance for the study of conscious awareness.

Starting with the *conceptual-empirical loop*, the principle suggests a dynamic interplay between conceptual (phenomenological) analysis and empirical research. This process allows for conceptual development to emerge in dialogue with empirical studies, rather than preceding them, in the form of fixed hypotheses or theoretical assumptions. The starting point is often the experiential reflection on the phenomenon (e.g., choice awareness), formulating preliminary insights without strict adherence to established theories that pre-determine the formulation of operational questions and experimental design. The empirical investigation serves to either support, challenge, or reshape these understandings. The ultimate goal of this cyclical process is to achieve, as systematically as possible, an experiential understanding of the phenomenon and its subsequent operationalizations, which in turn inform further iterations, as illustrated in Figure 2 with respect to the phenomena that this thesis focuses on.

The dynamicity of the conceptual-empirical loop, as illustrated in Figure 2, visually captures the iterative relationship between conceptual questioning and empirical exploration. On the conceptual side, reflection is guided by questions such as *What is choice?* and *What is choice awareness?* These questions form the initial ground for inquiry. On the empirical side, the investigation focuses on *How is choice manifested empirically?* and *How is choice awareness manifest in non-verbal expressions?* These questions shaped the design and interpretation of the empirical studies presented in Papers 1-3. The continuous movement between these sides of the loop allowed to trace implicit forms of participants' awareness. Thus, the loop was instrumental in identifying and allowing pre-reflective, bodily expressions to be brought into dialogue with theoretical insights, which could have been overlooked in a purely top-down or bottom-up approach. In short, the loop helped

expanding the notion of choice awareness across levels of intentionality and semiosis.

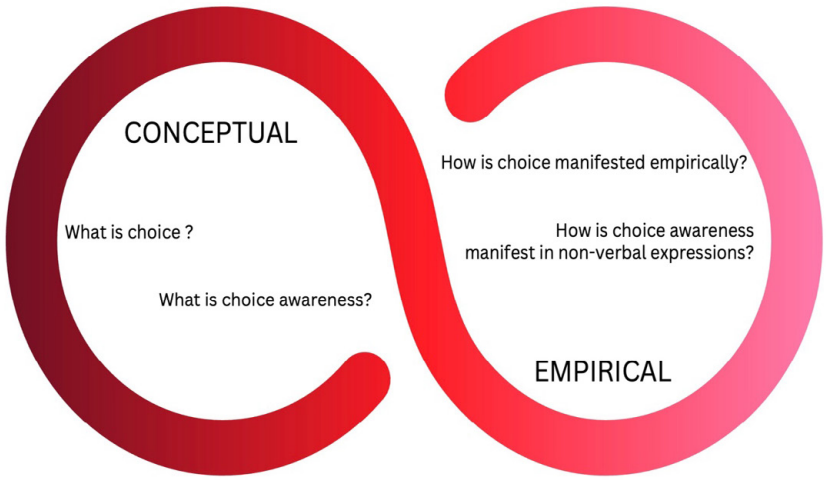

Figure 2. The conceptual-empirical loop of cognitive semiotics as applied in this thesis.

The conceptual-empirical loop advocates for at least a degree of liberation from pre-existing theories or paradigms, so that the questions posed may explore the phenomena as experientially given, in line with phenomenology. For example, the exploration of choice investment as a factor influencing participants' detection of manipulation was not a starting assumption, but rather crystallized through patterns identified in verbal justification, exemplifying how conceptual clarity is enriched by empirical insight, and vice versa (see Paper 1).

The presuppositionless exploration of phenomena, as Husserl advocates, "should not be understood as a nonconceptual and atheoretical account, but rather as a description that is determined by the things themselves rather than by various extraneous concerns that might simply obscure or distort that which is to be analysed" (Zahavi, 2003, p.94). The findings of such a process do not present themselves as revelations given in a single instance, but emerge through repeated inquiry, allowing for the attainment of reliable results. As Husserl (2001a) states:

> [I]t is impossible to understand what thinking [...] is in the specific sense in order to be able to be expressed by language and universal words and in order to provide a science, a theory, if we do not go back prior to this thinking, back to those acts and accomplishments that make up the most expansive part of our life. (p.32)

The commitment is, thus, not to pre-established theories or models, but to the phenomena as given in first-person experience.[5] Based on such givenness, clear and carefully crafted definitions are provided – as with the notions of signs and signals in the previous section. And if the empirical study needs to identify instances of the phenomena, including their sub-types, especially for quantitative analysis, it is necessary that operationalizations are developed.

Notably, the criteria guiding operationalizations are not always made explicit, particularly in some areas of psychology, raising questions about their *translation validity*: the degree to which a study's theoretical constructs align with their operationalization (Krathwohl, 2009; Zlatev and Moskaluk, 2023). Such concerns may complicate the evaluation of its validity and pose challenges for assessing the broader validity of theories (Slife et al., 2016). The iterative process of the conceptual-empirical loop can be seen as a safeguard against such pitfalls, since our task in using it is to clarify our concepts and the corresponding terms, avoiding conceptual ambiguities that can lead to empirical confusions.

6.2. Phenomenological triangulation

The influence of phenomenology becomes even more evident with the second methodological principle: *phenomenological triangulation*. While triangulation in many research contexts often implies the integration of diverse methodological approaches (such as combining qualitative and quantitative methods; Hussein, 2009), the notion of phenomenological triangulation combines three kinds of perspectives that correspond to how a phenomenon is accessed by the researcher, and three ontological dimensions (i.e., Self, Others and Things), as shown in Table 4. This is an important distinction, not made clear in earlier versions of the principle (e.g. Zlatev, 2009), which led to ambiguities, as we discuss in Paper 5.

Table 4. Phenomenological triangulation along the ontological (horizontal) and epistemological (vertical) planes.

Dimensions	*Self*	*Others*	*Things*
Perspectives			
First-person	Reflection	Empathy	Phenomenological reduction
Second-person	Psychotherapy	Interview	Intersubjective validation
Third-person	Self-observation	Experiment	Causal explanation

[5] *Grounded theory* is another qualitative method that develops theory from data rather than starting with pre-existing frameworks (e.g., Glaser and Strauss, 1967). However, unlike the conceptual–empirical loop, which prioritizes direct engagement with phenomena and the gradual formation of concepts through reflective analysis, grounded theory presupposes that patterns in data can yield theory without first clarifying the underlying phenomena, thus favoring data-driven abstraction over conscious reflection, such as the quest for essences in phenomenology.

Phenomenological triangulation, thus, implies that the phenomenon is given in three ways: (i) in direct givenness to the researcher, representing a *first-person perspective*; (ii) in dialogue between the researcher and others, representing a *second-person perspective*; and (iii) abstracted from these, as accessible to an impersonal community, representing a *third-person perspective*. Thus, regardless of the ontological status of the phenomenon, whether it is the self, the other, or things, phenomenological triangulation implies that third-person methods are always preceded by the first- and second-person perspectives, even if these are backgrounded. This aligns with the phenomenological principle of the primacy of consciousness, through which everything is given to us, including scientific knowledge (e.g., Husserl, 1913/2014; Merleau-Ponty, 1945/2012; Romdenh-Romluc, 2018; Gallagher and Zahavi, 2021).

Each of these perspectives corresponds to different kinds of methods, as shown in Table 4 (see also Paper 4), understanding methods in its etymological, and arguably most appropriate sense (e.g. Polio et al., 1997):

> […] the original meaning of the word "method", a meaning that combines *hodos*, a path or way, with the word meta, across or beyond. Under this rendering, method is not an algorithmic procedure to be followed mechanically if useful results are to be achieved; rather, a method is a way or path toward understanding that is as sensitive to its phenomenon as to its own orderly and self-correcting aspects. (p. 28)

For example, empathy, from the first-person perspective, as seen in Table 4, refers to our inherent experience of relating to others in the intersubjective world – an ontological foundation for human sociality and interaction (e.g., Stein, 1917/1989; Husserl, 1936/1970). From the second-person perspective, however, as shown in Table 5 below, empathy involves our grasping of another subject's experience (e.g., that of participants). It entails a direct, non-objectifying engagement with the other, where we attempt to enter their world and understand their experience.

Thus, exploring a phenomenon from a first-person perspective involves reflecting on its nature by attending to the acts of consciousnesses and their corresponding noemata. For the exploration of choice awareness, this analysis helped, for example, to identify different kinds of choices, potential factors influencing the detection of manipulation and a shift of focus on non-verbal expressions as possible indicators of choice awareness, discussed in the previous sections and shown in Table 5.

The second-person perspective involves methods such as employing empathetic understanding when assessing participants' verbal and non-verbal reports (elaborated further in Section 8), as well as ensuring intersubjective validation of these assessments (e.g., through discussions with co-researchers and inter-rater reliability measures). Further, engaging with the work of other scholars, along with observing and categorizing participants' verbal and non-verbal expressions, is also an application of the second-person perspective.

Finally, the third-person perspective in the studies of this thesis involves operationalisations allowing identifications and coding, and the use of statistics based on collected data. This approach helps provide estimates of effect sizes, considering the strength of the effect and the sample size in which it was observed. In doing so, it supports the researcher in persuading their audience that the findings are unlikely to be due to chance, as demonstrated, for instance, in the analysis of adaptors as indicators of choice awareness.

Table 5. Application of phenomenological triangulation in the study of choice awareness and manipulation detection.

Perspective	Methods	Applications	Paper	Examples
First-person	Phenomenological analysis	Intuitive notions Conceptual systematicity	1-5	Kinds of choice Hierarchy of choice making Choice investment
Second-person	Empathetic understanding Intersubjective validations	Engagement with (the work of) other scholars Elicitation and assessment of verbal and non-verbal reports	1-3	Literature review Inter-rater reliability measures Categories of bodily expression Markers of choice investment
Third-person	Experiments Statistics	Collecting data Quantification	1-3	Adaptors as indicators of choice awareness based on statistical significance

In sum, both principles – while distinct – are interdependent. The conceptual-empirical loop provides dynamic inquiry, while phenomenological triangulation ensures that this inquiry remains grounded in lived experience, intersubjective validation, and empirical robustness. Thus, both principles are interlinked and conceived as methodological principles adhering to the idea that theoretical thinking is rooted in pre-theoretical experience and that scientific research is a potentially infinite chain of ever-new interpretations all directed to a goal that may never be completely attained. As Husserl (1913/2014, §36, p.106) pointed out, "phenomenological analysis is an endless task. Each clarification brings to light new problems; every determination opens new horizons of inquiry".

PART IV.
Choice awareness

7. It Ain't Necessarily So

7.1. Choice blindness

Let us revisit the example of the dating app from Section 4, where – unknown to you – a different person than the one you were supposed to meet introduces themselves as your date. If you proceed to dinner without commenting on the discrepancy between the person you chose to go out with and the one you met, it would be considered as a case of "choice blindness" by the researchers who established this notion two decades ago. Inspired by "change blindness" experiments (Rensink et al.,1997), in which participants fail to detect visual changes in a scene when their attention is diverted, the research paradigm of "choice blindness" (Johansson et al., 2005) in cognitive science shifted the focus on choice and preference.

In an initial experiment (Johansson et al., 2005), participants were asked to choose the more attractive face from a set of 15 pairs of female faces, while three of these trials were manipulated (i.e., the chosen face was replaced with the non-chosen one). Participants then had to justify their choices for three manipulated trials and three non-manipulated ones. Factors such as deliberation time (in three conditions: 2s, 5s, and free deliberation time) and the similarity of the face-pairs in two conditions (high similarity and low similarity) were considered, but no significant effects were found. The results showed that participants: (a) often failed to notice the switch from their actual choice to the presented one (74% did not notice), (b) "confabulated" justifications to support choices they had never made, and (c) exhibited the same (high) degree of homogeneity in their verbal reports for both manipulated and non-manipulated choices.[6]

"Choice blindness" experiments have thereafter been applied across various domains, reporting relatively high rates of "blindness" for different types of preferences (e.g., political, moral, decision making) and across various modalities

[6] According to Nisbett and Wilson (1977), "confabulation" is used to refer to the explanation participants' gave for their behaviours with reference to factors known by the experimenters to be insignificant or irrelevant, while failing to report factors that were essential: "such reports are often based on a priori theories about behaviour – were they cultural, personal, or both – drawing the conclusion that people do not have actual introspective awareness" (p.233). Section 8.2 offers an alternative understanding of the phenomenon.

(e.g., vision, voice, taste, and smell, etc.) (e.g., Hall et al., 2010; Sauerland et al., 2013a). The research focus has also expanded to include areas such as memory, particularly in the context of eyewitness identification (e.g., Sagana et al. 2013; Cochran et al. 2016; Stille et al. 2017), neurocognitive mechanisms and physiological measures (Pärnamets et al., 2023). Additionally, studies have explored "choice blindness" in varied groups of individuals (e.g., autistic vs. non-autistic, younger vs. older children), consumer behaviour, and phenomena like preference reversal (e.g., Johansson et al., 2014; Loth et al., 2023).

Based on three (more or less) recurrent observations: (a) low detection rates of manipulation, (b) (presumed) confabulatory reports, and (c) similarity between non-manipulated and undetected manipulations reports, "choice blindness" has been presented as a robust phenomenon that serves as a general research tool for studying decision making, intentional action, and introspection (Johansson et al., 2008). Based on these findings, some authors conclude that our sense of agency and awareness of choice are illusory:

> Choice blindness reveals that not only are our choices often more constrained than we think, but our sense of agency in decision making can be a farce in which we are the first to deceive ourselves. (Martinez-Conde and Macknik, 2017, para. 6)

Such conclusions, however, appear to equate the actual cognitive processes involved in the process of choice making with neural processes in the brain, as expressed in the claim: "in the end, humans are nothing more than extremely complex physical systems" (Johansson, 2006, p.9). Thus, one possible explanation as to why the participants did not detect the mismatch between their actual choice and the one presented to them under manipulation is that:

> [P]rior intentions […] do not exist. Intentions are not well specified concrete entities; they are abstractions we use to make sense of behavior. There are processes in the brain that are responsible for the evaluation that led to the action, but there is no well specified internal description of what participants intended to do in addition. (Johansson, 2006, p.12)

Explanations of this kind seem to reflect presuppositions of certain trends in cognitive science regarding the nature of human cognition, centred on notions of causality and neurodeterminism (Tallis, 2011) (see Paper 4). The former posits that human beings are products of the laws of nature – laws deemed unbreakable – and, as such, our future actions are constrained by them. From this perspective, we are not the originators of the events in our lives; rather, causally embedded within our environment, we function as mere conduits through which events unfold:

> Given that brains are material objects, subject to the laws of physics, chemistry, and biology, and that we are our brains, we must be likewise subject to those laws. The prison of the universe is personalized in the prison of the brain (Tallis, 2021, p.15).

Indicative of this trend are two neuroscientific experiments in which subjects are asked to perform simple actions – such as moving a hand (Libet et al., 1983) or pressing a button at a time of their choosing (Soon et al., 2008). While participants' brain activity is monitored, participants are instructed to note the moment they feel the intention to carry out the movement. In brief, the key observation is that the brain's preparation for voluntary movement occurs *before* the subject becomes consciously aware of having made the decision to move. The conclusion drawn is that even when we believe we are voluntarily choosing to act, we are in fact responding to our brain's bidding, which is the one that has decided what we are going to do and when we are going to do it. Our actions are, thus, seen to be initiated by unconscious processes before we consciously determine them, and our intentions have nothing to do with them. Ultimately, our sense of control over our actions is considered illusory, and the things we say about them, the justifications we offer for choosing one option over another are regarded as merely "confabulatory" attempts at self-justification.

The methodological and philosophical problems of such experiments lie beyond the scope of this thesis. However, one point is crucial to highlight, further elaborated below and in Section 8. The study of the biological components alone cannot reveal the nature of meaningful action, as meaning is constituted by a person who stands supraordinate to their parts (Yalom, 1980, p.22), within the context of an intersubjectively shared life world.

7.2. Manipulation blindness

In my earlier work (Mouratidou, 2020), I provided a critical discussion of "choice blindness" in relation to the three recurrent observations. Regarding (a), the low detection rates, the diversity of results reported – even within studies conducted by the same researchers – suggests that methodological factors (e.g., type of decision, manner of manipulation, and methods of measuring detection) may influence the outcomes (see also Paper 4). For instance, when Sauerland et al. (2013b) examined participants' individual memories of norm violations using a questionnaire – where some of the answers were manipulated – they found that in 90% of cases, participants detected the manipulation. This suggests that different cognitive processes yield varying degrees of conscious awareness, and for memories drawn from personal and meaningful experiences, participants are rarely susceptible to manipulation. Additionally, when Pettimengin et al. (2013) used an "elicitation interview" to heighten participants' awareness by directing attention toward the

implicit aspects of experience that often go unnoticed, they reported that 80% of the manipulations were detected.[7]

Regarding (b), the "confabulatory" reports, I provided an alternative interpretation based on the openness of possibility that intentionality provides, which is further elaborated in the next section, as well as in Papers 1 to 4.

Perhaps the weakest part of the argumentation in my earlier work concerned (c), the assumed similarity between verbal reports given for non-manipulated and undetected manipulation trials, stating that it "does not necessarily indicate that differences could not still exist, since, as is well known, the absence of evidence is not evidence of absence" (Rees, 1973 as cited in Mouratidou, 2020, p.8). Accordingly, the work presented in this thesis – particularly Papers 2 and 3 – has primarily focused on exploring potential differences between the two types of reports. The motivation was not to engage in a cross-disciplinary debate with "choice blindness", given the different epistemological and methodological grounds that our respective traditions rest upon. Still, what I question for the most part here are the underlying assumptions reflected in the following:

> It can be argued that the problem of finding differences between manipulated and non-manipulated reports are due to the fact that they are both confabulatory. No difference that makes a difference. (Johansson, 2006, p.8)

Thus, what the similarity of the two kinds of reports is taken to imply is that even in the *absence* of manipulation, we construct unreliable versions of what we believe or think we have experienced.

To explore this counterintuitive assumption, I shifted the focus to our bodily expressions, since our thoughts and experiences are not solely expressed through language but through our entire bodily conduct. In Paper 2, we assessed participants non-verbal expressions in three conditions: *non-manipulated, manipulated-detected,* and *manipulated-undetected trials*. Particularly, when compared between the non-verbal production of non-manipulated and undetected choice manipulations, we found statistically significant differences in: (a) duration, (b) rates of occurrence of the Categories of Bodily Expression (CBEs) (i.e., Head, Torso, Face, Hands, and Adaptors), and (c) variety of CBE's. This implies that when participants' verbally justified choices that they had not made, they took longer to assess their choices, displayed more bodily expressions, and engaged more parts of their body than when they justified their non-manipulated choices. Further, in Paper 3, we explored participants' affective construal of the preferred and non-preferred

[7] According to the researchers: "This interview method aims at helping a subject to leave the level of representations and beliefs in order to become aware of the way he really carries out a given cognitive process and describe it with precision" (Pettitmengin and Lachaux, 2013, p.6). The "elicitation interview" method was later developed into the *micro-phenomenological interview*.

picture alternative by assessing their verbal and deictic expressions in the same three conditions. Using seven dimensions (i.e., Deixis, indicated Object, hand Shape, use of Hand, Tactility, Utterance, and Valence) to compare between non-manipulated, undetected and detected manipulations, we found that participants gesturally indicated their initially preferred option in undetected manipulations in a manner similar to how they indicated the preferred option when there was no manipulation, uninfluenced by the presentation of the card as the rejected alternative.

Put simply, if the argument regarding the similarity (if not identity, see the quotation above) between non-manipulated choices and undetected manipulations holds, then participants' bodily expressions (CBEs) in terms of duration, rates of occurrence, and variety should also be similar across both conditions. Likewise, the dimensions of bodily deixis for the preferred and non-preferred alternatives in undetected manipulations should be reversed compared to those in non-manipulated trials. That is, (a) participants should treat the originally preferred option in the manipulated trials as they treated the rejected option in non-manipulated trials, since it was presented as such, and (b) treat the non-preferred option in the manipulated trials as they treated the preferred one in non-manipulated trials. But, as reported, this was not the case.

Based on these observations, we may challenge the argument that a lack of verbally reported detection necessarily implies unawareness of choice. Instead, our findings emphasize the embodied nature of preference, where signs of pre-reflective consciousness and the operative role of the body (see Section 3 and 4) offer evidence supporting participants' awareness of their choice. Consequently, the terminological revision I proposed in my earlier work – from "choice blindness" to "manipulation blindness" – is more adequate. This shift in terminology suggests that participants are not "blind" when making their original choice, but rather they may fail to notice, or at least object to, the substitution of an alternative for that choice. Based on the findings of this thesis, it is thus argued that it is not the choice that is subject to "blindness", but the manipulation itself, as we have evidence to suggest that, at a bodily level, the participants in the study were reacting to what was presented to them and thus were aware of their choice.

The mismatches between verbal and non-verbal expression can be further illuminated through Varela's (1999) framework of cognitive time scales. Varela distinguishes three levels at which cognition unfolds. At the *microscopic* scale, processes occur within milliseconds to a few seconds, corresponding to the continuous, embodied flow of sensorimotor activity. At the *mesoscopic* scale, spanning seconds to minutes, experience is integrated into discursive or narrative episodes that we can articulate and reflect upon. Finally, at the *macroscopic* scale, which ranges from hours to years, cognition is embedded within historical, social, and biographical contexts, drawing on cultural sedimentations and long-term habits. Taken together, these scales highlight the layered and temporally differentiated nature of choice making and our awareness of it. Viewed from this perspective, the divergences observed gain additional clarity. Bodily expressions, such as adaptors,

align with the microscopic scale of pre-reflective awareness, where embodied processes operate more quickly and immediately than reflection. Verbal justifications, by contrast, occur at the mesoscopic scale, where experience is organized into coherent narratives. The macroscopic scale frames both of these scales, providing the cultural expectations about what kinds of explanations count as plausible or convincing. The fact that participants' sometimes non-verbally expressed discomfort or doubt while their verbal justifications conformed to the manipulated choice can thus be understood as a temporal as well as a semiotic mismatch: different forms of awareness manifest at different temporal scales.[8]

Further, the findings of this thesis align with a recent "choice blindness" study (Pärnamets et al, 2023), which has shifted the focus from verbal reports to the assessment of manipulation detection via physiological measures. These included response times, pupil dilation, and eye movements. The findings revealed significant differences between non-manipulated, detected, and undetected manipulation trials. While for undetected manipulations, participants exhibited eye-movement patterns similar to those of non-manipulated trials, the research reports: (a) longer response times, and (b) increased pupil responses, possibly indicating effortful rationalization and underlying cognitive conflict. However, what is striking is that despite the reported differences in how the bodies of participants reacted to choice manipulations when these were verbally undetected, compared to the non-manipulated trials, the conclusion drawn by the authors was that the patterns of results allow to reject notions that participants are aware of, but fail to report, the manipulations during accepted manipulated trials.

While at first glance, the gap between cognitive semiotic interpretations and those of "choice blindness" regarding choice awareness appears insurmountable, the empirical findings from both disciplines seem to be not that different. In choice manipulation experiments, some participants verbally react to the manipulation of their choice, while others do not. Those who do not react often provide justifications to support a choice they did not actually make. On a linguistic level, participants' reports in non-manipulated and undetected manipulation trials may not differ significantly. However, on a bodily level, such as in bodily expressions, deictic hand gestures, and physiological responses, clear differences are noted. Thus, it appears that the two approaches do *not* differ fundamentally in terms of their empirical observations. Rather, the more substantial differences lie at the epistemological level – that is, in how each approach conceptualizes and interprets the nature of conscious awareness and the role of embodiment in cognitive processes. While many cognitive science paradigms prioritize observable actions and overlook subjective experience, the approach of cognitive semiotics offers a more integrated account of choice making and awareness. The next section elaborates on this.

[8] I wish to thank Todd Oakley who initially pointed out this parallel.

8. Pick a Card

8.1. Forced-choice task

Eleni woke up to the alarm she had set the night before. She quickly grabbed a cup of coffee and followed Google Maps, driving 20 kilometres to the place her friend suggested the experiment would be conducted. Upon arrival, parking was impossible. When she finally found a spot, Eleni realised she was late and regretted arranging this right before going to work.

Eleni was one of the participants who made this thesis possible. After making their individual arrangements to take part in the study, participants were further required to understand the purpose of the research (i.e., a study on choice awareness), the general instructions (e.g., switching off their mobile phones), and the specific task instructions: being presented with 20 pairs of images, choosing the one they prefer, and then being presented with half of the image pairs again and needing to justify their choice. Participants had to further accept reassurances that their participation would be conducted ethically and to consent to be recorded on video by two cameras.

The crucial expression of the participants' choice making is thus more evident in their larger-scale commitment to take part in the experiment, something that has to be sustained over a longer period, and less so in their momentary selection between two picture alternatives. The commitment and motivations for their participation (e.g., help a friend conducting the experiment, receive a 15€ gift-card to buy a new t-shirt) is where the long-term chosen action lies, as elaborated in Section 3, since "a choice is an action; […] It is an intervention, and it creases the world in a way that exhibits rational articulation" (Sokolowski, 2008, p.257).

Thus, the kinds of choice making involved in the experiments discussed in this thesis, as well as in numerous other experiments on choice making, are at least two: (a) the explicit choice to participate in the experiment, involving purpose, replaceability, and concatenation (see Section 3.1), and (b) the experimental forced-choices based on preference, which are only a part of the participants' overarching choice to engage in the study. Two chains of participant motivation are implied here: one external and one internal to the action taken (Sokolowski, 2008). The first, external, chain fulfils the personal purpose the participants have in mind as they act, for example, helping a friend or buying a new t-shirt. The second, internal, chain

pertains to the series of experimental choices made during the study. These are linked to how the action relates to its end goal, such as completing the task by preferring one picture over another and justifying that preference.

Let us now look closer at the internal actions taken, the participants' choices based on preference, and see the extent to which a forced-choice task truly allows to treat them as such. Participants were instructed to choose the face they found more attractive or the figure they found more aesthetically pleasing – and they did. Driven by their individual motivations to participate in the experiment, they made a series of preferences, because the experimenter told them to do so. In certain situations, surely, they found the depicted faces attractive, leading them to make a preference based on that attraction. In others, however, they may have acted in opposition to their own inclinations, opinions, and preferences, being forced to necessarily prefer one of the two pictures, even if none of them appeared appealing to them. Such differences in their appraisals are made explicit in their subsequent justifications of choices, e.g., *I didn't like either of them and I just said this one* (Mouratidou, 2020, p.17). This kind of preference is quite different than being spontaneously drawn to an object and choosing it among others – like, for instance, when we have a soft spot for cakes and cannot decide which one to buy while standing in front of the bakery counter.

Thus, the choices that arise in the experiment are defined and laid out for the participants by an assumed expert who is in control and dictates what the situation requires. This implies that such choices cannot be fully regarded as independent, autonomous actions, since they occur through (at least) two agents, with one acting on behalf or for the sake of another (Sokolowski, 2017). Participants still actualize their choices, displaying their agency through their preferences and voluntary actions; yet, the responsibility for these decisions is shared. This dynamic can be further understood through the notion of *intersubjectivity*: the shared, interrelated nature of subjective experience with others, as explored in cognitive semiotics (Zlatev et al., 2008; Foolen et al., 2012; Zlatev and Blomberg, 2016) and phenomenology (e.g., Husserl, 1931/1991; Merleau-Ponty, 1945/2012; Levinas, 1969/1961).

In particular, Levinas (1961/1969) highlights face-to-face interaction as an ethical relation and a fundamental component of subjectivity, understood as an openness to the other beyond oneself. In his words, "before the Other, the I is infinitely responsible" (Levinas, 1996, p.18), suggesting that the mere presence of another person commands a form of responsibility from our side, with them acting as "authority without force" (Levinas, 1988, p.169), or else "a gentle force that obligates" (Filipovic, 2011, p.67). The shared sense of responsibility for the situation is evidenced in participants' responses to the question *why did you choose this one*, such as: *No reason, I think. I don't remember. You know better*; or, *I might have thought I wanted to say this one [preferred card], but I eventually said that one [manipulated card]* (Mouratidou, 2020). The purposes of both the experimenter

and the participants are thus intertwined, emerging through the interaction and embodied in the participants' carrying out the action and making choices on behalf of the researcher.

Additionally, the responsibility participants take is not only manifested in their justifications, expressing their evaluations, opinions, and thoughts, but also with their bodily involvement in the action of having indicated a card. Their reasoning is already expressed in the bodily activity they performed, as much as in their justifications. This is apparent even in the cases when participants are tricked about what is presented to them: the justification provided appropriates and ratifies not just an opinion or an appraisal, which might be mistaken, but also the physical conduct, something being done: they have indicated one of two options (see also Section 8.2).

As previously noted, the divergence between the present and the "choice blindness" approaches is not primarily empirical, but epistemological. Specifically, I wish to make the following interrelated claims:

- Choice making encompasses a range of kinds of choice making, from voluntary to reflective, with preferences manifesting at various points along this scale.
- It also involves varying degrees of awareness that correspond to different forms of intentionality (i.e., operative, categorical, and reflective, as discussed in Section 3).
- Choice awareness is expressed polysemiotically – not only through language, but also via non-verbal bodily signs and signals.
- All of the above are best understood within a public, intersubjective communicative context, rather than in isolation.

Accordingly, my aim in examining the specifics of the experimental task in this section is not to undermine the scientific validity of this thesis or other experimental studies. Rather, it is to foreground the nature of meaningful action, where choices gain significance and are justified by what we value in our everyday life. This distinction is vital, as the conclusions drawn from experimental studies – such as whether we are aware of or blind to our choices (e.g., Johansson et al., 2005), or whether we intend our actions or merely believe we do so (e.g., Wegner, 2002) – profoundly shape our understanding of human nature (see Section 7). To reduce participants' awareness of choice to the mere selection of one card over another in a forced-choice experimental task is analogous to viewing a "much-trailed handshake between two national leaders as just an arm movement" (Tallis, 2021, p.18). Actions derive their meaning from a network of shared purposes: "no action is an island. Nor is any agent. Voluntary actions are integrated with one another in our individual and communal […] lives" (ibid, p.86). Seeing actions as

interconnected (Gallagher, 2020) can also help account for the participants' justifications of choices they did *not* make, as elaborated below.

8.2. "Confabulation"

As discussed in the previous section, justifications of choices that were not initially made are understood in "choice blindness" experiments as inaccurate explanations that are misaligned with participants' reasoning during choice making. Thus, "confabulation" is taken as evidence for post hoc constructions in reasoning, implying that our explanations for choices are often narrative-driven rather than reflective of actual cognitive processes that led to make a choice:

> If we are supposed to know our own minds from the inside, we should know why we do what we do. And when asked to describe why we chose a face we in reality did not prefer, we are not supposed to just fabricate reasons (at least not without knowing that this is what we are doing). In our experiments, it is evident that the participants do not have perfect access to their underlying cognitive machinery. (Johansson, 2018, p.20)

Rejecting access to our choices and actions suggests that our brain acts first and then we catch up by constructing a story to make sense of that action. As a result, phenomena such as authenticity and agency are called into question, if not mocked altogether as naive. But given the context in which these forced choices are made, and the artificiality of the experimental task – as described in this section and throughout this thesis – is it not an oversimplification, to say the least, to conceive the phenomenon of choice awareness in such fixed terms? Does not such approach overlook the very conditions under which the experiments are constructed, neglecting intersubjective meaning-making elements of choice making that can explain why one deviated from what was in fact predetermined as the expected, adequate response – while overgeneralizing the claim of our unawareness of choice far beyond study participants?

What I argue for in this thesis is that participants' verbal responses to undetected manipulations reveal the effort of a subject, or a group of subjects in this context, to actively pursue certain outcomes (i.e., to offer justifications as dictated by the experimenter), thereby realising their choice to participate in the experiment. Knowing why one is doing something (even if one's self-knowledge is limited) is inherently connected to the action itself. As Tallis (2021, p.91) argues our intentions are necessarily available to us as agents, even prior to more self-conscious aspects of action such as setting priorities or engaging in higher-order reflection. Thus, the justification of choice entails, as previously discussed in Section 3, the interplay of operative, categorial, and reflective levels of intentionality during the act of

choosing, as well as the specifics of the intersubjective network within which such choices are embedded. The availability of our intentions to ourselves is further expressed in our ability to entertain possibilities that transcend the actual (Hua 6/161 as cited in Zahavi, 2003, p.96) and discussed in Paper 3.

Justifying a (manipulated) choice can thus be understood in some cases as an act of sense making, regardless of whether it was previously chosen or not. It is an intentional reconstitution of meaning, an act of re-making the choice in the present, not a faulty retrieval of a past mental act. The participant is asked to experience the presented alternative as given and, on this basis, they reconstitute it through a different intentional act (see Section 4). Thus, at least some of the participants can be expected to respond not to what they did choose, but to what they are now asked to treat as their choice – which is ultimately what they need to do to carry out the action and reach the purpose of their participation in the experiment. They envisage possibilities that are relevant to their needs and plans, as formed by the situation at hand, supplementing the actual present of what *is* to what *might be*.

Can such justifications be treated as signs of participants' "introspective access" to their choice-making process? The answer is affirmative. As discussed in Section 3, choices based on preference can involve varying degrees of categoriality, depending on whether they are realised as a chosen action or simply a voluntary action. In the latter case, they can be harder to articulate due to the lower level of categoriality involved, as well as the sedimented layers of experience that may be difficult to access. In both types of reports, participants draw on their own sedimented history of values, preferences, and perceptual associations. Thus, such responses remain truthful – not necessarily in a factual-historical sense – but in terms of what might have been the case. A plausible explanation of what cognitive scientists might label as a "confabulated" justification is that, in some cases, such justifications are the outcome of a re-activation of sedimented meanings: participants are not fabricating reasons from nowhere; rather, they are accessing affective and perceptual experiences (e.g., a genuine preference for smiling faces, or associations between certain aesthetics and qualities such as safety, beauty, or confidence), even if their original act of choosing that face did not take place because the other picture alternative prevailed.

As discussed in Section 5, our perception of an object is always accompanied by intending its absent profiles. As Zahavi (2003, p.96) states, "were we only directed toward the given, no perceptual consciousness of the very object would be possible". This is further explained by Husserl in the following terms:

> Every spatiotemporal perception (ordinarily termed 'external perception') can be deceptive, although it is a perception, that according to its own meaning, is a direct apprehension of the thing itself. According to its own meaning it is anticipatory—the anticipation [*Vorgriff*] concerns something cointended—and, in such a radical fashion, that even in the content of that which is perceptually given as itself, there is,

> on closer inspection, an element of anticipation. In fact, nothing in perception is purely and adequately perceived (Hua 8/45; cf.9/486 as cited in Zahavi, 2003, p.96).

What this implies is that whenever we perceive an object, there is always more to it than what is seen, touched, heard, etc. The object has other sides, and possible parts beyond those presently visible and properties that could be further uncovered. What we anticipate exceeds what is currently presented to us, and there is no guarantee that any of the possibilities we envisage correspond to actuality, although they most often do. The well-founded intuition that there is more to things than what we apprehend at any given moment underpins the sense of an infinitely expandable horizon of possibility surrounding what is actual and present (see also Paper 3). Accordingly, in some cases, the manipulated picture is explored anew by the participant who focuses on those aspects that were previously unattended, aligning those with their past experiences, values, and perceptual associations. Because our directedness toward objects always involves a transcendence of the given, an openness to what is not yet perceived but still anticipated, participants' reasoning reflects their engagement with the object as a meaningful possibility, rather than a static fact. In this sense, the space of possibility invoked in their justifications is not self-deceptive or "confabulatory", or at least not necessarily so, but indicative of the very conditions that make perception and understanding possible in the first place.[9]

The anticipatory nature of perception is closely linked to different modes of fulfilment. When an object is not fully present in experience (e.g., when I think about my friend Eleni's upcoming visit to Sweden), I am directed toward something which remains empty of intuitive content. In contrast, when the object becomes intuitively given (e.g., when I greet her at the airport), the perceptual experience fulfils the earlier empty intention. As Zahavi (2003) explains, such a situation illustrates "the ideal of a perfect synthesis of fulfilment where a signitive existence-positing intention (typically a claim) is adequately fulfilled by a corresponding perception, thus providing us with the very self-givenness of the object" (p.32).

Let me illustrate this with another relevant example. A participant chooses picture A from a pair of alternatives, A and B. In the second step of the study, the experimenter highlights picture A as the participant's choice (i.e., a non-manipulated trial). Here, the participant's intention that she initially chose picture A is fulfilled by a corresponding intuition, in which the object is presented as it was intended: picture A is perceptually given as her choice, thus actualising intention and fulfilment.

[9] Moreover, a more detailed analysis might further consider how the temporal structure of intentionality, known in the phenomenological literature as "time consciousness" – its interplay of retention, primal impression, and protention – shapes participants' engagement with the manipulated object, influencing not only their current sense making but also the continuity of their experiential horizon.

However, Husserl, being concerned more with the possibility of knowledge than with factual knowledge, argues that "a claim is true as long as it can be intuitively fulfilled and not only when it is actually fulfilled" (Zahavi, 2003, p.32), stressing that the private opinions of a subject are never immune, but rather intersubjectively validated. This implies that error and defeasibility are also part of experience, without, however, annulling its validity, since "the only thing that can defeat a particular evidence is a new and stronger evidence" (Hua 17/164 as cited in Zahavi, 2003, p.32).

Let us now try to apply this reasoning to manipulated trials. A participant initially choses picture A – whether as a reflected-upon chosen action or a more immediate voluntary action with corresponding degrees of categoriality – but is then presented with picture B as her supposed choice. Factors such as her degree of investment in the choice-making process (see Paper 1), the memorability of the depicted faces, the kind of choice making involved will influence her initial evaluation of the pair and level of certainty in having chosen A over B. This is reflected in the participants' verbal categories of detection: Clear, Possible and None, as outlined in Section 3.

If the participant is relatively certain about her choice, she is likely to notice the manipulation and respond accordingly (e.g., *I chose A*). However, in cases of uncertainty (e.g., *I think I chose the younger one, so maybe A*) or indeterminacy (e.g., *I know I chose someone*), the presentation of Picture B functions in two ways: first, as evidence that a choice was made (i.e., one of the two options was indeed selected); and second, as a stronger, intersubjectively reinformed form of evidence, namely, that picture B was the chosen one, gaining further weight through its presentation by the experimenter, who is implicitly regarded as having expertise within the experimental context.

Thus, the presented picture card B fulfils different kinds of prior intentions: (a) *I picked A not B* (Clear detection), (b) *I picked the youngest*, *so probably A* (Possible detection), (c) *I picked someone* (No detection). In the latter case, where detection is not verbally expressed, the participant's empty intention (i.e., *I know I chose someone*) is fulfilled when picture B is presented and experienced anew as chosen. Awareness of choice, in this sense, is not a static relation between intention and intuition but a dynamic process, and fulfilment is not absolute: it can vary in degree, range, and clarity, with each case representing a different kind of intention and level of fulfilment.

In sum, justifications to manipulated choices may reveal participants' reconstitution of meaning, with awareness evolving through the interplay of intention and fulfilment. The way these layers of awareness connect to signification and the Semiotic Hierarchy, as applied to choice making, is presented below.

8.3. Verbal and non-verbal signs of choice awareness

Before turning to the final section of this *kappa*, I wish to present a modified version of the Semiotic Hierarchy (Table 6), which summarises and illustrates what has been described in detail throughout the previous sections regarding the relationship between experience and signification in the context of choice making and awareness.

The (horizontal) rows, Levels 1 to 3, correspond to different layers of experiential choice making and awareness. The remaining two Levels of the hierarchy, that of signitive and linguistic semiosis and intentionality, are illustrated with participants' non-verbal and verbal expressions, on the (vertical) columns. The last column corresponds to different kinds of choices. However, as elaborated in Section 3, choices can only be understood in context, thus, the examples used here are schematic.

Table 6. Verbal and non-verbal signs of choice awareness.

Levels	Type of semiosis and intentionality	Category of verbal detection	Type of verbal response to manipulation	Pattern of verbal response	Signs of non-verbal expression of awareness	Kinds of choice making in preference
3-5	Reflective	Clear	Denial	Reject NP picture & justify P	Deictic hand gestures, Head expressions	Chosen action
2	Categorial	Possible	Uncertainty	Question NP & justify Preferred (P) or NP Justify/Do not justify NP & state preference for P	Face expressions, Longer temporal duration	Intermediate
1	Pre-reflective	None	Ignorance Indifference Acceptance	Cannot justify Non-Preferred (NP), or justify it reluctantly Justify both as equal Justify NP	Adaptors, Physiological evidence, Longer temporal duration	Voluntary action

PART V.
Conclusions

9. So What?

9.1. Contributions

This thesis contributes to the study of conscious awareness in choice making by proposing and empirically substantiating a cognitive semiotic approach. It applies the two methodological principles of cognitive semiotics: the *conceptual-empirical loop* and *phenomenological triangulation*. The former enables the iterative development of operational concepts rooted in experiential givenness, while the latter integrates first-, second-, and third-person perspectives in the study of the phenomenon. Paper 4 and 5 explicitly demonstrate how the latter is applied in the thesis, and more generally, framing the empirical contributions of this work and ensuring that theoretical insights remain anchored in lived experience.

Guided by the three overarching questions, as stated in Section 2, the contributions can be briefly summarised as follows.

To address the first question, *What is choice, what different kinds are there, and how do they relate to awareness?,* I conceptually distinguished between *chosen* and *voluntary*, and, orthogonal to these kinds, *preferred* actions. These different kinds of choice making are interlinked with different levels of intentionality in the Semiotic Hierarchy (i.e., *operative, categorial, reflective*) and corresponding forms of semiosis. Empirically, this distinction was supported through the analysis of participants' polysemiotic reports during choice justifications, and by examining potential factors influencing their detection of manipulations.

Regarding the second question, *How do different factors influence participants' detection of manipulation in choice making?*, two such factors were identified: *choice investment* and *affective construal*. Paper 1 demonstrated that greater investment in the choice-making process correlated with higher detection rates, while Paper 3 showed that affective construal, expressed in participants' deictic gestures, oriented toward their originally preferred alternative even when this was presented as rejected under manipulation. Together, these findings refine the understanding of manipulation detection – and, by extension, of choice awareness – as contextually modulated rather than uniformly absent.

The third question asked, *What kinds of bodily signs and signals may serve as evidence for participants' choice awareness, and how do these relate to different degrees of awareness?* The findings highlight that awareness is not binary

but gradated, emerging across multiple semiotic systems. Paper 2 showed that, even in verbally undetected manipulations, participants exhibited longer response durations, more frequent and increased variety of bodily expressions, indicating a level of pre-reflective awareness of their choices. Paper 3, likewise, demonstrated that deictic gestures are not merely referential but also convey affective construal, serving as implicit indicators of awareness.

Based on these findings, the thesis further offers an alternative account of so-called *confabulation*. Rather than treating participants' justifications of manipulated choices as mere errors or fabrications, such responses can be seen to reflect an intentional reconstitution of meaning: participants may, at least in some cases, re-engage with the presented alternative and intend it as a plausible choice in the present. In this sense, what has been called "confabulation" can be understood as evidence of sense making grounded in sedimented preferences and values, rather than as a mere failure of introspection.

Building on this, the thesis also makes several broader contributions: *Terminologically*, it proposes "manipulation blindness" as a better term to reframe the phenomenon in a way that acknowledges participants' implicit awareness of choice. *Methodologically*, it demonstrates the application of phenomenological triangulation to experimental data and develops it to its current form that includes non-human subjects. *Theoretically,* it extends the Semiotic Hierarchy by explicitly linking kinds of choice making to levels of intentionality and clarifies the concept of the *sign*. *Interdisciplinary*, it exemplifies the way phenomenology can be integrated into empirical research through cognitive semiotics. *Philosophically,* it contributes to the rehabilitation of agency by defending the reliability of conscious experience and emphasizing the embodied, intersubjective nature of choice awareness.

To summarise, the thesis provides detailed experimental investigations into how participants verbally and non-verbally detect manipulations, and how these expressions relate to their awareness of choice. In particular, the findings demonstrate that bodily signs and signals can serve as evidence of choice awareness. Even when verbal reports fail to indicate detection of manipulation, bodily expressions such as adaptors, facial expressions, and deictic gestures reveal *signs of pre-reflective awareness*. This shows that non-verbal signs are not peripheral but central to understanding conscious experience, supporting the claim that choice awareness is embodied and context dependent. These empirical results provide support for a broader notion of conscious awareness, encompassing both the explicit and implicit expressions of our embodied, intersubjective nature. By combining phenomenological analysis with empirical evidence, this thesis contributes to restoring a richer view of human agency, emphasizing the complexity of conscious awareness and the polysemiotic ways in which it is expressed.

10. Don’t Stop Thinking About Tomorrow

10.1. Future studies

The topic of choice making and awareness is vast, as it underpins nearly every aspect of human conduct. This breadth allows for a variety of future approaches. Based on my own research preferences, four potential directions of exploration stand out: (a) cross-cultural comparisons of verbal and non-verbal signs of awareness with focus on adaptors, (b) “confabulation” and sense making, (c) the sociological implications of choice making in contexts such as habit and addiction, and (d) the role of awareness in creative expression. Each offers a distinct yet complementary lens through which to further understand the dynamic between awareness, choice making, and expression.

10.2. Cross-cultural comparison with focus on adaptors

A promising avenue lies in investigating how awareness and manipulation are expressed and detected across different social contexts. Such an approach would help identify potentially universal as well as culturally specific verbal and non-verbal signs of choice awareness – beyond the Greek population, which has been involved in the experiments of this thesis.

Four factors governing gestural variation across cultures have been identified in the literature (Kita, 2009), one of them being *culture-specific gestural pragmatics*. Latin American populations are of particular interest, as they are often characterized by high emotional expressivity and conviviality (Rychlowska et al., 2015; Campos and Kim, 2017). For example, a recent study by Salvador et al. (2023) across Chileans, Mexicans, European Americans, and Japanese found that Latin Americans tend to use emotional expressions to establish and nurture interdependent social relationships. Since communicative interaction between experimenter and participant is crucial for the expression of detection of choice manipulations, as discussed in Section 8, cultural differences in emotional expressivity are highly relevant for investigating verbal and non-verbal signs of choice awareness.

Motivated by these insights, I recently pursued a short *Erasmus* exchange in Chile at the Pontificia Universidad Católica de Chile, where I conducted a pilot study with Chilean participants. The data from this study could later be contrasted with the existing Greek dataset to examine both potential universals and cultural specificities in the manifestations of participants' detection of manipulation.

Related to this, while adaptors are frequently observed in communicative contexts, they have received comparatively less empirical attention than gesture (e.g., Lin et al., 2020; Sekine and Hotta, 2025). Similarly, although the influence of situational context (e.g., formal vs. informal, solitary vs. interactive, face-to-face vs. mediated interaction) has been noted (e.g., Burgoon et al., 2021), controlled comparative studies of adaptors across contexts remain relatively scarce (Matsumoto, 2006; Neuliep, 2020). The choice manipulation task employed in this thesis, therefore, offers a promising testing ground, as it allows systematic comparison between non-manipulated and manipulated trials across different cultural contexts, potentially revealing both universal and culture-specific patterns in adaptor use.

Following the findings of Paper 2, differences in adaptors were observed in three cases: (a) *frequency* of occurrence (i.e., more instances in manipulated-undetected than in detected and non-manipulated choice trials); (b) *form* (e.g., the vast majority for manipulated-detected and non-manipulated choice trials consisted of self-stimulation of *Hand to body* with only a few instances of *Hand to object*, while in manipulated-undetected cases, adaptors were roughly balanced between *Hand to body* and *Hand to hand*); and (c) *affect-related function* (e.g., *adjustive* adaptors were more frequent in detected cases than in undetected and non-manipulated trials, while *punitive* adaptors were more frequent in undetected choice trials, and the least when no manipulation was involved). Although these differences are relevant, since distinctions between the form of adaptors have been associated with differences in their function (Ekman and Friesen, 1969; Freedman, 1972), they open several important questions.

First, the issue of *gender* differences. This study did not examine potential differences between female and male participants. The existing literature likewise does not provide clarity, and it remains uncertain whether men and women differ systematically in the frequency, form, or function of adaptor use. Second, the *temporal* occurrence of adaptors. I did not analyse whether adaptors are produced before, during, or after the verbal justification, and existing literature offers limited insight. For example, one study notes that discrete adaptors are significantly more likely to occur near conversational turn transitions, suggesting that they may be temporally aligned with speech structure (Żywiczyński et al., 2017), however, beyond this example, systematic investigations of adaptor timing are rare. Third, the study of Paper 2, as with the vast majority of adaptor research, has focused on hand adaptors, with comparatively little attention paid to other articulators. There is some evidence of mouth-related adaptors (e.g., lip biting) and leg- or foot-related adaptors (e.g., leg crossing) (Ekman and Friesen, 1969; DePaulo et al., 2003; Burgoon et al.,

2016); however, systematic investigations of such behaviours remain scarce, with much of the existing work being conducted in the context of deception detection (e.g., Vrij, 2008; Vrij et al., 2019).

A systematic investigation of adaptors, building on the findings of this study to address commonly identified research gaps, could yield crucial insights into both their functional diversity and their broader role in human interaction and choice awareness. This is a direction of research that I plan to pursue in the near future.

10.3. "Confabulation" and sense making in choice making

Another line of inquiry involves the phenomenon – usually but possibly mistakenly – referred to as "confabulation". While the literature typically treats participants' justifications to manipulation as uniformly inaccurate, the alternative interpretation proposed in Section 8.2 suggests a more nuanced understanding. In a similar vein, Bortolotti (2021) distinguishes between *choice error* and *choice change*, the latter implying a form of intentional preference realignment rather than oblivious error. Similarly, Stammers (2020) argues that "confabulation" can serve as a socially resonant explanation, offered to make experience meaningful within a given context, rather than as mere fabrication. In line with this work, my analysis suggests that the phenomenon may reflect different processes: at times, participants may indeed produce superficial explanations, particularly when they are not invested in the task and merely wish to provide "something" in response. In other cases, however, what is labelled as "confabulation" may instead represent an intentional reconstitution of meaning: participants actively engage with the presented alternative and attempt to render it intelligible in light of their preferences, values, and the immediate context.

Empirically, these distinctions can be pursued further. During debriefing sessions, participants were shown the manipulated pairs again and invited to comment spontaneously on them. Some reported no recollection of the choice at all, while others recalled a sense of doubt or unease and the motivations of providing the justifications that they did. This may suggest that "confabulation" may come in degrees, ranging from minimal, non-invested responses to more elaborate sense-making efforts. Future research could therefore aim to differentiate these levels systematically. Such work would deepen our conceptual grasp of "confabulation" and offer a more detailed account of how people justify manipulated choices, rather than denying introspection altogether.

10.4. Sociological implications of choice making in addiction

Addiction offers a compelling context to study the tension between different kinds of choice making. In particular, the testimonies of individuals who have faced alcohol addiction and recovered provide a unique opportunity to examine the full range of choice making and the interplay between voluntary, habitual and reflective choices. Tracing how these processes unfold in real-life can deepen our understanding of choice awareness and the types of consciousness involved, as well as how these influence an individual's capacity to exercise agency. Such exploration also highlights how addiction reshapes self-awareness and self-regulation, with direct implications for treatment strategies aimed at enhancing reflection and supporting more deliberate choice making during recovery.

This context further underlines the intersubjective dimension of choice making. Recovery narratives often show that the decision to enter rehabilitation is rarely made in isolation but is instead motivated by the presence of others. Family members, friends, and broader social networks often provide the encouragement or external perspective that motivates a turning point. Empirical studies confirm that strong social support significantly improves both treatment initiation and abstinence outcomes (Havassy et al., 1991; Dobkin et al., 2002; Tracy and Wallace, 2016). Moreover, recovery is frequently sustained through the development of new social identities, moving from being defined as an "addict" toward being recognized, and recognizing oneself, as a "recovering person". Such identity shifts, often enabled through group membership and mutual-aid communities, have been shown to bolster self-efficacy and reduce relapse risk (Dingle et al., 2015; Best et al., 2016). In this sense, the role of the Other in choice making is not incidental but central.

Investigating choice making under such conditions could therefore provide valuable insights into how reflective awareness is compromised, diminished, or reconstituted. It could also inform therapeutic interventions that aim not only to restore individual agency, but also to recognize and cultivate the intersubjective dimensions of choice that are vital for recovery.

10.5. The role of awareness in creative expression

In the realm of creative expression, particularly poetry, the relationship between experience and language is illuminated through the process of navigating choices during the creative process and the impact of awareness on their creative output. This process involves series of choices to capture and express what has been prior experienced, involving different degrees of awareness. Drawing on Merleau-

Ponty's insights (1964, 1968, 1973), poetic creation cannot be seen as a direct translation of thought, but a form of expression that actualizes pre-verbal experience. The argument can be developed by discussing poetic expression in terms of the phenomenological method: the suspension of the habitual ways of conceiving the world (i.e., the natural attitude) to attend to the pre-given significations of experience (i.e., phenomenological reduction) and capture its invariant aspects (i.e., eidetic variation). This can be further explicated through the *Motivation & Sedimentation Model* (MSM) (Zlatev et al., 2021; Moskaluk et al., 2022), which outlines three interconnected levels of meaning making: *Embodied, Situated,* and *Sedimented.*

On the Embodied level, meaning is pre-signitive, that of primordial perception based on pan-human body-based capacities (e.g., empathy, analogy-making, rhythm). This is the source of poetic creation, the state of "vague fever" (Merleau-Ponty, 1969/1973, p.32) that comes before the artistic expression, motivating the poet to palpate it and make appropriate choices for it to be expressed in the Situated level. Here, the so far amorphous, indeterminate, mute meaning becomes "it". The pulsing potentialities and the contingencies of the life of the artist motivate the creative expression that aims to capture pre-verbal experience and speak of it "as the first man on earth" (ibid). However, while doing so, poets also rely upon already existing language and culture on the Sedimentation level, which itself arises on the basis of previous expressing acts on the Situated level. The sedimented norms (e.g., rhetorical tropes, rhyme, meter, punctuation) and previous literary works enable poetic expression, but, at the same time, restrict it: poets need to dig deeper, and go beneath cultural sedimentations, bend the resources of "already spoken" language (*langage parlé*) (Merleau-Ponty, 1964, 1968) to an unprecedented usage in order for meaning to become incarnated in a new act of expression. The experience of choice making involved in the process and transition of each of these levels, enabling poets to express themselves creatively, could thus be illuminated further.

Applying the levels to poetic expression implies that the poet begins in a vague, felt sense of experience, which is then shaped into articulated form through creative choices that are both enabled and constrained by cultural and linguistic sedimentation. Combining my roles as both a poet and an academic, I developed this idea in two recent conferences talks on creativity, presented at *Coseriana Linguistica* in Cluj, Romania, and at the *Nordic Association for Semiotic Studies* in Tallinn, Estonia.

References

Best, D., Beckwith, M., Haslam, C., Haslam, S. A., Jetten, J., Mawson, E., & Lubman, D. I. (2015). Overcoming alcohol and other drug addiction as a process of social identity transition: The Social Identity Model of Recovery (SIMOR). *Addiction Research & Theory, 24*(2), 111–123. https://doi.org/10.3109/16066359.2015.1075980

Bortolotti, L. (2009). *Delusions and other irrational beliefs*. Oxford University Press.

Burgoon, J. K., Guerrero, L. K., & Floyd, K. (2016). *Nonverbal communication* (2nd ed.). Routledge. https://doi.org/10.4324/9781315663425

Burgoon, J. K., Guerrero, L. K., & Floyd, K. (2021). Relational messages and interpersonal communication. *Frontiers in Psychology 12,* 600208.

Campos, B., & Kim, H. S. (2017). Incorporating the cultural diversity of family and close relationships into the study of health. *American Psychologist, 72*(6), 543–554. https://doi.org/10.1037/amp0000122

Chandler, D. (2002). *Semiotics: The basics*. Routledge.

Cienki, A. (2020, December 16). *Language as multimodal, or communication as variably polysemiotic?* [Lecture]. Lomonosov Moscow State University.

Cochran, K. J., Greenspan, R. L., Bogart, D. F., & Loftus, E. F. (2016). Memory blindness: Altered memory reports lead to distortion in eyewitness memory. *Memory & Cognition, 44*(5), 717–726. https://doi.org/10.3758/s13421-016-0594-y

Deely, J. (1982). *Introducing semiotics: Its history and doctrine.* Indiana University Press.

DePaulo, B. M., Lindsay, J. J., Malone, B. E., Muhlenbruck, L., Charlton, K., & Cooper, H. (2003). Cues to deception. *Psychological Bulletin, 129*(1), 74–118. https://doi.org/10.1037/0033-2909.129.1.74

Dennett, D. C. (1991). *Consciousness explained.* Little, Brown and Company.

Devylder, S., & Zlatev, J. (2020). Cutting and breaking metaphors of the self and the Motivation & Sedimentation Model. In A. Baicchi (Ed.), *Figurative meaning construction in thought and language* (pp. 253–282). John Benjamins Publishing Company. https://doi.org/10.1075/ftl.9.11dev

Dingle, G. A., Cruwys, T., & Frings, D. (2015). Social identities as pathways into and out of addiction. *Frontiers in Psychology, 6*, Article 1795. https://doi.org/10.3389/fpsyg.2015.01795

Dobkin, P. L., De Civita, M., Paraherakis, A., & Gill, K. (2002). The role of functional social support in treatment retention and outcomes among outpatient adult substance abusers. *Addiction, 97*(3), 347–356.

Donald, M. (1991). *Origins of the modern mind: Three stages in the evolution of culture and cognition.* Harvard University Press.

Drummond, J. J. (2021). Voluntary action, chosen action, and resolve. *Journal of the British Society for Phenomenology, 52*(3), 305–324. https://doi.org/10.1080/00071773.2021.1977092

Ekman, P. (2009). *Telling lies: Clues to deceit in the marketplace, politics, and marriage.* W. W. Norton & Company.

Ekman, P., & Friesen, W. V. (1969). Nonverbal leakage and clues to deception. *Psychiatry, 32*(1), 88–106. https://doi.org/10.1080/00332747.1969.11023575

Filipovic, Z. (2011, June 10). Introduction to Emmanuel Levinas: *'After you, sir!'. Moderna Språk, 105*(1), 58–73. https://doi.org/10.58221/mosp.v105i1.8287

Foolen, A., Lüdtke, U., Racine, T. P., & Zlatev, J. (Eds.). (2012). *Moving ourselves, moving others: Motion and emotion in intersubjectivity, consciousness and language.* John Benjamins. https://doi.org/10.1075/ceb.6

Freedman, Norbert. 1972. The analysis of movement behavior during the clinical interview. In Aron W. Siegman & Benjamin Pope (Eds.), *Studies in dyadic communication*. Pergamon Press.

Gallagher, S. (2005). *How the body shapes the mind.* Oxford University Press.

Gallagher, S. (2020). *Action and Interaction.* Oxford University Press. https://doi.org/10.1093/oso/9780198846345.001.0001

Gallagher, S., & Zahavi, D. (2021). *The phenomenological mind* (3rd ed.). Routledge.

Glaser, B. G., & Strauss, A. L. (1967). The discovery of grounded theory: Strategies for qualitative research. Aldine.

Green, J. (2014). *Drawn from the ground: Sound, sign and inscription in Central Australian sand stories.* Cambridge University Press.

Grice, H. P. (1957). Meaning. *The Philosophical Review, 66*(3), 377–388. https://doi.org/10.2307/2182440

Hall, L., Johansson, P., Tärning, B., Sikström, S., & Deutgen, T. (2010). Magic at the marketplace: Choice blindness for the taste of jam and the smell of tea. *Cognition, 117*(1), 54–61. https://doi.org/10.1016/j.cognition.2010.06.010

Havassy, B. E., Hall, S. M., & Wasserman, D. A. (1991). Social support and relapse: Commonalities among alcoholics, opiate users, and cigarette smokers. *Addictive Behaviors, 16*(5), 235–246. https://doi.org/10.1016/0306-4603(91)90016-B

Haynes, J. D. (2011). Beyond Libet: Long-term prediction of free choices from neuroimaging signals. In S. Dehaene & Y. Christen (Eds.), *Characterizing consciousness: From cognition to the clinic?* (pp. 161–174). Springer. https://doi.org/10.1007/978-3-642-18015-6_10

Hussein, A. (2009). The use of triangulation in social sciences research: Can qualitative and quantitative methods be combined? *Journal of Comparative Social Work, 4*(1), 106–117. https://doi.org/10.31265/jcsw.v4i1.48

Husserl, E. (1970). *The crisis of European sciences and transcendental phenomenology: An introduction to phenomenological philosophy* (D. Carr, Trans.). Northwestern University Press. (Original work published 1936).

Husserl, E. (1991). *Cartesian meditations: An introduction to phenomenology* (D. Cairns, Trans.). Kluwer Academic Publishers. (Original work published 1931).

Husserl, E. (2001a). *Logical investigations* (Vol. 1, J. N. Findlay, Trans.). Routledge. (Original work published 1900–1901).

Husserl, E**.** (2001b). *Logical investigations* (Vol. 2, J. N. Findlay, Trans.). Routledge. (Original work published 1901).

Husserl, E. (2014). *Ideas: General introduction to pure phenomenology* (W. R. B. Gibson, Trans.). Routledge. (Original work published 1913).

Jack, A. I., & Roepstorff, A. (2004). Trusting the subject – Part II. *Journal of Consciousness Studies, 11*(7–8), 1–14.

Johansson, P. (2006). *Choice Blindness: The Incongruence of Intention, Action and Introspection* [Doctoral thesis, Lund University Cognitive Studies, Vol. 130]. Lund University. Retrieved from https://lup.lub.lu.se/search/files/4436175/547323.pdf

Johansson, P., Hall, L., Sikström, S., & Olsson, A. (2008). Blindness to the consequences of one's own actions. *Science, 322*(5902), 1625. https://doi.org/10.1126/science.1166021

Johansson, P., Hall, L., Tärning, B., Sikström, S., & Chater, N. (2014). Choice blindness and preference change: You will like this paper better if you (believe you) chose to read it. *Journal of Behavioral Decision Making, 27*(3), 281–289. https://doi.org/10.1002/bdm.1807

Johansson, P.; Hall, L.; Sikström, S., & Olsson, A. (2005). Failure to Detect Mismatches Between Intention and Outcome in a Simple Decision Task. *Science, 310* (5745), 116–119. https://doi.org/10.1126/science.1111709

Keller, R. (1998). *A theory of linguistic signs.* Oxford University Press.

Kendon, A. (2004). *Gesture: Visible action as utterance.* Cambridge University Press.

Kita, S. (2009). Cross-cultural variation of speech-accompanying gesture: A review. *Language and Cognitive Processes, 24*(2), 145–167.

Koda, T., Ishioh, T., Watanabe, T., & Kubo, Y. (2016). Analysis of gender-specific self-adaptors and their effects on agent's impressions. In *Proceedings of the 8th International Conference on Agents and Artificial Intelligence (ICAART 2016), Volume 1* (pp. 19–26). SCITEPRESS – Science and Technology Publications. https://doi.org/10.5220/0005660800190026

Konderak, P. (2018). *Mind, cognition, semiosis: Ways to cognitive semiotics*. Maria Curie-Skłodowska University Press.

Krathwohl, D. R. (2009). *Methods of educational and social science research: The logic of methods* (3rd ed.). Waveland Press.

Lakoff, G., & Johnson, M. (1999). *Philosophy in the flesh: The embodied mind and its challenge to Western thought*. Basic Books.

Langacker, R. W. (2006). Subjectification, grammaticization, and conceptual archetypes. In A. Athanasiadou, C. Canakis, & B. Cornillie (Eds.), *Subjectification: Various paths to subjectivity* (pp. 17–40). Mouton de Gruyter.

Levinas, E. (1969). *Totality and infinity: An essay on exteriority* (A. Lingis, Trans.). Duquesne University Press. (Original work published 1961).

Levinas, E. (1988). *Collected philosophical papers* (A. Lingis, Trans.). Martinus Nijhoff Publishers.

Levinas, E. (1996). *Basic philosophical writings* (A. T. Peperzak, S. Critchley, & R. Bernasconi, Eds.). Indiana University Press.

Libet, B. (1999). Do we have free will?. *Journal of Consciousness Studies 6*, 8, pp. 47–57.

Libet, B., Gleason, C. A., Wright, E. W., & Pearl, D. K. (1983). Time of conscious intention to act in relation to onset of cerebral activity (readiness-potential). *Brain, 106*(3), 623–642. https://doi.org/10.1093/brain/106.3.623

Lin, W., Orton, I., Li, Q., Pavarini, G., & Mahmoud, M. (2020). *Looking at the body: Automatic analysis of body gestures and self-adaptors in psychological distress*. arXiv. https://arxiv.org/abs/2007.15815

Loth, E., Sideropoulos, V., Remington, A., Hall, L., & Johansson, P. (2023). Choice blindness in autistic and non-autistic people. *Journal of Cognitive Psychology, 35*(8), 893–905. https://doi.org/10.1080/20445911.2023.2235174

Martinez-Conde, S., & Macknik, S. L. (2017, January 1). When free choice is an illusion. Scientific American. Retrieved from https://www.scientificamerican.com/article/when-free-choice-is-an-illusion/

Matsumoto, D. (2006). Culture and nonverbal behavior. In V. Manusov & M. L. Patterson (Eds.), *The SAGE handbook of nonverbal communication* (pp. 219–235). SAGE Publications.

Mendoza-Collazos, J. & Zlatev, J. (2022). A cognitive-semiotic approach to agency: Assessing ideas from cognitive science and neuroscience. *Biosemiotics, 15*, 141–170. https://doi.org/10.1007/s12304-022-09473-z

Merleau-Ponty, M. (1964). *Signs.* (R. C. McCleary, Trans.). Northwestern University Press.

Merleau-Ponty, M. (1968). *The visible and the invisible* (A. Lingis, Trans.; C. Lefort, Ed.). Northwestern University Press.

Merleau-Ponty, M. (1973). *The prose of the world* (J. O'Neill, Trans.; C. Lefort, Ed.). Northwestern University Press. (Original work published 1969).

Merleau-Ponty, M. (2012). *Phenomenology of Perception* (D. A. Landes, Trans). Routledge. (Original work published 1945).

Moran, D. (2005). *Edmund Husserl: Founder of phenomenology.* Polity Press.

Moran, D., & Cohen, J. S. (2012). *The Husserl dictionary.* Continuum.

Moskaluk, K., Zlatev, J., & van de Weijer, J. (2022). "Dizziness of Freedom": Anxiety disorders and metaphorical meaning-making. *Metaphor and Symbol, 37*(4), 303–322. https://doi.org/10.1080/10926488.2021.2006045

Mouratidou, A. (2019). *Choice awareness and manipulation blindness: A cognitive semiotic exploration of choice-making and memory* [Master's thesis, Lund University]. Lund University Publications Student Papers (LUP-SP). https://lup.lub.lu.se/student-papers/record/8997565

Mouratidou, A. (2020). Choice awareness and manipulation blindness. *Public Journal of Semiotics, 9*(1), 1–40. https://doi.org/10.37693/pjos.2019.9.21388

Mouratidou, A. (In press). Investigating choice awareness through cognitive semiotics. In A. Biglari (Ed.) *Open Semiotics*. Editions L'Harmattan.

Mouratidou, A., & Andrén, M. (Under review). Deictic gestures beyond reference: Construal of affective valence in choice making. *Phenomenology and the Cognitive Sciences*.

Mouratidou, A., Jordan, Z., & van de Weijer, J. (2022). How much do we really care what we pick? Pre-verbal and verbal investment in choices concerning faces and figures. *Topoi, 41*(4), 695–713. https://doi.org/10.1007/s11245-022-09807-z

Mouratidou, A., Jordan, Z., & van de Weijer, J. (2024). The body says it all: Non-verbal indicators of choice awareness. *Cognitive Semiotics, 17*(2), 233–266. https://doi.org/10.1515/cogsem-2024-2012

Möttönen, T. (2016). Dependence of construal on linguistic and pre-linguistic intersubjectivity. *Nordic Journal of Linguistics, 39*(2), 209–229.

https://doi.org/10.1017/S0332586516000093

Neuliep, J. W. (2020). *Intercultural communication: A contextual approach* (9th ed.). SAGE Publications.

Nisbett, R. E., & Wilson, T. D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review, 84*(3), 231–259. https://doi.org/10.1037/0033-295X.84.3.231

Overgaard, M. (2006). Introspection in science. *Consciousness and Cognition 15*(4), 629–633. https://doi.org/10.1016/j.concog.2006.10.004

Paolucci, C. (2024). A semiotic lifeworld: Semiotics and phenomenology—Peirce, Husserl, Heidegger, Deleuze, and Merleau-Ponty. *Semiotica, 2024*(260), 25–43. https://doi.org/10.1515/sem-2024-0152

Peirce, C. S. (1958). *Collected papers of Charles Sanders Peirce* (C. Hartshorne, P. Weiss, & A. W. Burks, Eds.). Belknap Press of Harvard University Press.

Petitmengin, C. (2009). What is it like to sense? A study of the experience of sensing movements. *Journal of Consciousness Studies, 16*(3–4), 31–52.

Petitmengin, C. (2011). The validity of first-person descriptions as authenticity and coherence. *Journal of Consciousness Studies, 18*(2), 43–69.

Petitmengin, C., & Lachaux, J.-P. (2013). Microcognitive science: Bridging experiential and neuronal microdynamics. *Frontiers in Human Neuroscience, 7*, 617. https://doi.org/10.3389/fnhum.2013.00617

Piaget, J. (1951). *Play, dreams and imitation in childhood.* Routledge & Kegan Paul.

Pielli, L. and J. Zlatev (2020). The cyborg body: Potentials and limits of a body with prosthetic limbs. *Cognitive Semiotics, 13*(2), Article 20202033. https://doi.org/10.1515/cogsem-2020-2033

Pollio, H. R., Henley, T. B., & Thompson, C. J. (1997). *The phenomenology of everyday life: Empirical investigations of human experience.* Cambridge University Press. https://doi.org/10.1017/CBO9780511752919

Pärnamets, P., Johansson, P., Strandberg, T., Balkenius, C., & Hall, L. (2023). *Looking at choice blindness: Evidence from gaze patterns and pupil dilation* [Preprint]. PsyArXiv. https://doi.org/10.31234/osf.io/v85sz

Rensink, R. A., O'Regan, J. K., & Clark, J. J. (1997). To see or not to see: The need for attention to perceive changes in scenes. *Psychological Science, 8*(5), 368–373.

Romdenh-Romluc, K. (2018). Science in Merleau-Ponty's phenomenology: From the early work to the later philosophy. In D. Zahavi (Ed.), *The Oxford handbook of the history of phenomenology* (pp. 340–359). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780198755340.013.22

Ryan, R. M. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness.* Guilford Press.

Rychlowska, M., Miyamoto, Y., Matsumoto, D., Hess, U., Gilboa-Schechtman, E., Kamble, S., & Muluk, H. (2015). Heterogeneity of long-history migration explains cultural differences in reports of emotional expressivity and the functions of smiles. *Proceedings of the National Academy of Sciences of the United States of America, 112*(19), E2429–E2436. https://doi.org/10.1073/pnas.1413661112

Sadiki, A. (2020). Nonverbal communication barriers in cross-cultural communication: A review. *International Journal of Research in Economics and Social Sciences 10*(7), 40–47. https://www.indusedu.org/pdfs/IJREISS/IJREISS_3747_19148.pdf

Sacrini, M. (2016). Categorial intuition and passive synthesis in Husserl's phenomenology. *Horizon. Studies in Phenomenology,* 5(2), 248–270. https://doi.org/10.18199/2226-5260-2016-5-2-248-270

Sagana, A., Sauerland, M., & Merckelbach, H. (2013). Witnesses blind to their own memory: Choice blindness for eyewitness identification decisions. *Psychological Science, 24*(8), 1402–1407.

Salvador, C. E., et al. (2023). Emotionally expressive interdependence in Latin America: Triangulating through a comparison of three cultural zones. Emotion, Advance online publication. https://doi.org/10.1037/emo0001302

Sauerland, M., Sagana, A., & Otgaar, H. (2013a). Theoretical and legal issues related to choice blindness for voices. *Legal and Criminological Psychology, 18*(2), 371–381. https://doi.org/10.1111/j.2044-8333.2012.02049.x

Sauerland, M., Schell-Leugers, J., Collaris, J., & Merckelbach, H. (2013b). "Yes, I have sometimes stolen bikes": Blindness for norm-violating behaviors and implications for suspect interrogations. *Behavioral Sciences & the Law, 31*(2), 239–255. https://doi.org/10.1002/bsl.2063

Saussure, F. de. (2011). *Course in general linguistics* (C. Bally & A. Sechehaye, Eds.; R. Harris, Trans.). Columbia University Press. (Original work published 1916).

Sekine, K., & Hotta, H. (2025). The Role of Self-Adaptors in Lexical Retrieval. *Languages 10*(9), 209. https://doi.org/10.3390/languages10090209

Sokolowski, R. (2000). *Introduction to Phenomenology.* Cambridge University Press.

Sokolowski, R. (2008). *Phenomenology of the human person*. Cambridge University Press.

Sokolowski, R. (2017). *Moral action: A phenomenological study*. The Catholic University of America Press.

Sonesson, G. (1989). *Pictorial concepts: Inquiries into the semiotic heritage and its relevance for the analysis of the visual world.* Lund University Press.

Sonesson, G. (2006). The meaning of meaning in biology and cognitive science. *Sign Systems Studies, 34*(1), 135–214.

Sonesson, G. (2010). Semiotics and phenomenology. *The Semiotic Review of Books, 18*(3), 1–11.

Sonesson, G. (2012). The foundation of cognitive semiotics in the phenomenology of signs and meanings. *Intellectica*, *58* (2), 207-239.

Sonesson, G. (2015). Cognitive semiotics: From integrated methodology to interdisciplinary program. *Chinese Semiotic Studies*, *11*(2), 159–180. https://doi.org/10.1515/css-2015-0009

Sonesson, G. (2017). Beyond the "Tragedy of Culture." *American Journal of Semiotics, 33*(3–4), 141–180. https://doi.org/10.5840/ajs2017121227

Soon, C. S., Brass, M., Heinze, H.-J., & Haynes, J.-D. (2008). Unconscious determinants of free decisions in the human brain. *Nature Neuroscience, 11*(5), 543–545. https://doi.org/10.1038/nn.2112

Stammers, S. (2020). Confabulation, explanation, and the pursuit of resonant meaning. *Topoi, 39*(1), 177–187. https://doi.org/10.1007/s11245-018-9616-7

Stampoulidis, G., Bolognesi, M., & Zlatev, J. (2019). A cognitive semiotic exploration of metaphors in Greek street art. *Cognitive Semiotics, 12*(1), Article 20192008. https://doi.org/10.1515/cogsem-2019-2008

Stein, E. (1989). *On the problem of empathy* (W. Stein, Trans., 3rd rev. ed.). ICS Publications. (Original work published 1917).

Steinbock, A. (1995). *Home and beyond. Generative phenomenology after Husserl*. Northwestern University Press.

Stille, L., Norlander, T., & Sikström, S. (2017). Choice blindness in forensic contexts: A comparison of identification procedures. *Frontiers in Psychology, 8*, 2255. https://doi.org/10.3389/fpsyg.2017.02255

Stjernfelt, F. (2007). Diagrammatology: An investigation on the borderlines of phenomenology, *ontology, and semiotics.* Springer.

Tallis, R. (2011). *Aping mankind: Neuromania, Darwinitis and the misrepresentation of humanity.* Acumen.

Tallis, R. (2021). *Freedom: An impossible reality*. Agenda Publishing.

Thompson, E. (2007). *Mind in life: Biology, phenomenology, and the sciences of mind*. Harvard University Press.

Timm, L. R. D. (2022). *Construal of motion events and linguistic relativity: Comparing German and Spanish speakers* [Master's thesis, Lund University]. Lund University Publications Student Papers (LUP Student Papers). https://lup.lub.lu.se/student-papers/record/9082132

Tracy, K., & Wallace, S. P. (2016). Benefits of peer support groups in the treatment of addiction. *Substance Abuse and Rehabilitation, 7*, 143–154. https://doi.org/10.2147/SAR.S81535

Varela, F. J. (1999). The specious present: A neurophenomenology of time consciousness. In J. Petitot, F. J. Varela, B. Pachoud, & J.-M. Roy (Eds.), *Naturalizing phenomenology: Issues in contemporary phenomenology and cognitive science* (pp. 266–314). Stanford University Press.

Varela, F. J., & Shear, J. (1999). First-person methodologies: What, why, how? *Journal of Consciousness Studies, 6*(2–3), 1–14.

Vrij, A. (2008). *Detecting lies and deceit: Pitfalls and opportunities* (2nd ed.). John Wiley & Sons.

Vrij, A., Hartwig, M., & Granhag, P. A. (2019). Reading lies: Nonverbal communication and deception. *Annual Review of Psychology, 70*, 295–317. https://doi.org/10.1146/annurev-psych-010418-103135

Wegner, D. M. (2002). *The illusion of conscious will*. MIT Press.

Yalom, I. D. (1980). *Existential psychotherapy*. Basic Books.

Zahavi, D. (2003). *Husserl's phenomenology.* Stanford University Press.

Zlatev, J. (2009). The Semiotic Hierarchy: Life, consciousness, signs and language. *Cognitive Semiotics 5,* 169–200. https://doi.org/10.1515/cogsem.2009.4.spring2009.169

Zlatev, J. (2015). *Cognitive semiotics.* In P. Trifonas (Ed.), *International handbook of semiotics* (pp. 1043–1067). Springer. https://doi.org/10.1007/978-94-017-9404-6_47

Zlatev, J. (2016). Turning back to experience in Cognitive Linguistics via phenomenology. *Cognitive Linguistics, 27*(4), 559–572.

Zlatev, J. (2018). Meaning making from life to language: The Semiotic Hierarchy and phenomenology. *Cognitive Semiotics, 11*(1), Article 20180001. https://doi.org/10.1515/cogsem-2018-0001

Zlatev, J. (in press). Five pillars of cognitive semiotics. In A. Bilgari (Ed.), *Open Semiotics* (Vol. 5). Editions L'Harmattan.

Zlatev, J., & Blomberg, J. (2016). Embodied intersubjectivity, affectivity, and the caring function of language. *Pragmatics & Cognition, 23*(1), 156–183. https://doi.org/10.1075/pc.23.1.07zla

Zlatev, J., & Blomberg, J. (2019). *Norms of language: What kinds and where from? Insights from phenomenology.* In A. Mäkilähde, V. Leppänen, & E. Itkonen (Eds.), *Normativity in Language and Linguistics* (pp. 69–102). John Benjamins Publishing Company.

Zlatev, J., & Konderak, P. (2023). Consciousness and semiosis. In J. Pelkey (Ed.), *Bloomsbury Semiotics: Volume 1 – History and Semiotics* (pp. [insert page range]). Bloomsbury Academic.

Zlatev, J., & Moskaluk, K. (2022). Translation validity in metaphor theories: CMT, DMT and the Motivation & Sedimentation Model. In A. Bagasheva, B. Hristov, & N. Tincheva (Eds.), *Figurativity and human ecology* (pp. 123–148). John Benjamins. https://doi.org/10.1075/ftl.17.06zla

Zlatev, J., & Mouratidou, A. (2024). Extending the life world: Phenomenological triangulation along two planes. *Biosemiotics, 17*(2), 407–429. https://doi.org/10.1007/s12304-024-09576-9

Zlatev, J., & Möttönen, T. (2022). *Cognitive linguistics and semiotics.* In J. Pelkey (Ed.), *Bloomsbury Semiotics: Volume 4 – Semiotic Movements* (pp. 269–291). Bloomsbury.

Zlatev, J., Jacobsson, G., & Paju, L. (2021). *Desiderata for metaphor theory, the Motivation & Sedimentation Model and motion-emotion metaphoremes*. In A. S. de Silva (Ed.), *Figurative language: Intersubjectivity and usage* (pp. 41–74). John Benjamins Publishing Company.

Zlatev, J., Racine, T., Sinha, C., & Itkonen, E. (Eds.). (2008). *The Shared Mind: Perspectives on Intersubjectivity*. John Benjamins Publishing Company.

Zlatev, J., Sonesson, G., & Konderak, P. (2020). *Meaning making: A semiotic perspective on the cognitive sciences.* Springer.

Zlatev, J., Żywiczyński, P., & Wacewicz, S. (2020). Pantomime as the original human-specific communicative system. *Journal of Language Evolution, 5*(2), 156–174. https://doi.org/10.1093/jole/lzaa006

Żywiczyński, P., Wacewicz, S., & Orzechowski, S. (2017). Adaptors and the turn-taking mechanism: The distribution of adaptors relative to turn borders in dyadic conversation. *Interaction Studies, 18*(2), 276–298. https://doi.org/10.1075/is.18.2.07zyw

Paper 1

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How Much Do We Really Care What We Pick? Pre-verbal and Verbal Investment in Choices Concerning Faces and Figures

Alexandra Mouratidou[1] · **Jordan Zlatev**[1] · **Joost van de Weijer**[2]

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Abstract
Every day we make choices, but our degree of investment in them differs, both in terms of pre-verbal experience and verbal justification. In an earlier experimental study, participants were asked to pick the more attractive one among two human faces, and among two abstract figures, and later to provide verbal motivations for these choices. They did not know that in some of the cases their choices were manipulated (i.e., they were asked to motivate the item they had not chosen). Against claims about our unreliability as conscious agents (Nisbett et al. in Psychol Rev 84:231–259, 2013; Johansson et al. in Science 310:116–119, 2005), the study found that in about half the cases the manipulations were detected. In the present study, we investigated whether varying degrees of choice investment could be an explanatory factor for such findings. We analysed the verbal justifications of the participants along a set of semantic categories, based on theoretical ideas from phenomenology and cognitive linguistics, and formulated a matrix of eleven *markers of choice investment*. We predicted a greater degree of investment when motivating (a) choices of faces than figures, (b) manipulated than actual choices, and (c) detected than non-detected manipulations. These predictions were confirmed, but with various strength. This allows us to argue for both consilience and differences between pre-verbal choice investment and the corresponding verbal motivations of the choices made, and thus for (degrees of) conscious awareness of choice making.

Keywords Cognitive linguistics · Cognitive semiotics · Choice making · Construal · Consciousness · Phenomenology · First-person descriptions

The whole conduct of life consists of things done, which do other things in their turn, just so our behaviour and its fruits are essentially one and continuous and persistent and unquenchable, so the act has its way of abiding and showing and testifying, and so, among our innumerable acts are no arbitrary, senseless separations.
Henry James, The Golden Bowl

1 Introduction

According to the ancient Greek myth, Paris had to choose who among the goddesses Hera, Athena, or Aphrodite was the fairest. The choice became especially hard because each goddess attempted to bribe him with a gift. For the playwright Euripides, this myth concerns a choice between the values that each gift symbolizes, while more common interpretations take it as a choice based on the goddesses' beauty. Whichever his motive, Paris chose Aphrodite which subsequently led to his marriage with the future Helen of Troy, with well-known disastrous consequences.

Employing mythology to attempt to make sense of human experience is common in philosophical inquiries (e.g., Kierkegaard 1983; Derrida 1995), but choice making is also a pervasive feature of everyday life, as pointed out by Baierlé (2016, p. 7):

> Throughout our lives we have to make choices. After college we choose where and what to study. In a restaurant we choose what we want for dinner. When we

✉ Alexandra Mouratidou
alexandra.mouratidou@semiotik.lu.se

Jordan Zlatev
jordan.zlatev@ling.lu.se

Joost van de Weijer
joost.van_de_weijer@ling.lu.se

[1] Division for Cognitive Semiotics, Lund University, Lund, Sweden

[2] Humanities Laboratory, Lund University, Lund, Sweden

plan our holidays we choose between different alternatives. In some cases we need to choose the morally right thing to do. In other cases we need to choose whether we favour our self-interest over the interests of others. While some choices – like choosing the starter of one's dinner in a restaurant – are unlikely to have a big impact on one's life, others – like what and where to study after college – have an immense one. Sometimes different choices can lead us through different paths to the same place, other choices can lead us to completely different places. Ultimately, the person we become depends on our choices.

Every time we make a choice, we position ourselves in the present, evaluate the situation to the best of our abilities and commit ourselves to one particular future rather than another, under the motivational weight of the various alternatives (de Monticelli and Behr 2011). In other words, the degree to which a particular choice matters depends immensely on the nature of the situation we are in and the potential consequences of the choice. This experience of the "mattering" or meaningfulness of a choice is what we refer to as the (pre-verbal) *investment* in an act of choice making. The investment concerning the choice of meal at the restaurant will typically be lower than that concerning a career, or a partner in marriage. Sometimes we make the relevant choice silently, and the investment in question is purely experiential, or at least not overtly verbalized. But more often, we discuss our choices with others, or even only with ourselves, in dialogue, a basic function of language (Linell 2009). In such cases we have the methodological advantage of being able to compare choice investment in different situations. One of the major claims in this paper is that the notion of investment has been underestimated in choice making research, especially in experiments dealing with so-called "choice blindness" (e.g., Johansson et al. 2005).

Current approaches in cognitive science influenced by physicalism and/or computationalism (see e.g., Dennett 1991, 1996; Bargh and Fergunson 2000; Libet 2005; Wegner 2006, 2018; Johansson et al. 2014) share the premise of the illusory nature of conscious will, focusing their scientific inquiries into the mechanisms that underly our (false) experience as agents.[1] In such approaches, higher order mental phenomena, such as choice making, are usually studied in carefully controlled experiments. While these experiments are designed to secure *internal validity* (i.e., the degree to which we can confidently infer a causal relationship between variables, Jhangiani et al. 2019, p. 49), we may question their *translation validity*: the truthfulness of the operationalizations in relation to the phenomena studied (Slife et al. 2016). For example, in so-called "choice blindness" experiments (see Sect. 3), people are often tricked about the choices they are asked to make as part of the experimental task, sometimes ending up accepting and motivating choices they had not initially made. But can we on this basis conclude that participants lack awareness of their choices, and are in general unreliable as conscious agents, as proposed by Johansson et al. (2005)? If people make choices in an experiment with the primary motivation to complete the task at hand, are they not more or less subject to a "setting of indifference" (de Monticelli and Behr 2011, p. 14), which is qualitatively different from everyday life where choices are proclamations of who we are and who we wish to become?

Grounded in the discipline of cognitive semiotics, which itself is rooted in the philosophical tradition emanating from Husserl known as phenomenology (Sonesson 2009; Zlatev 2015, 2018), our aim in this article is to explore the notion of *choice investment* both theoretically and empirically. As we argue in Sect. 2, especially when enriched by many scholars from Merleau-Ponty (1962, 1968) to present days (Sokolowski 2000; Gallagher and Zahavi 2012; Zahavi 2010, 2014), phenomenology offers a rich palette of concepts and methods to study lived experience, including that of choice making. Phenomenology also teaches us to make a distinction between experience as such, and its expression in language. If our access to the former were not reliable, since intentionality is always subject to "attributions" dependent on language, phenomenological methods would be fatally flawed (e.g., Dennett 1991, 2007; Wegner 2018). Such a language-centred position is problematic for various reasons and antithetical to cognitive semiotics which emphasizes that language is just one, albeit important, *semiotic system*, and it does not hold any determining role over consciousness. Still, given that our empirical methodology is predicated on the analyses of verbal responses justifying different choice trials, it is necessary to start by arguing for correspondences—but not identity—between non-verbal and language-based intentionality, and thus between pre-verbal and verbal choice investment. Using concepts from phenomenology and cognitive linguistics we justify this approach in Sect. 2.

In Sect. 3, we discuss a recent study (Mouratidou 2020), involving a forced-choice manipulation experiment (see Fig. 1), where participants were shown pairs of pictures of faces or of abstract figures (A) and asked which was more attractive. The participant then made their choice (B). After that, the participant was shown one of the two items and

[1] Note the following representative citation: "The fact is, we find it enormously seductive to think of ourselves as having minds, and so we are drawn into an intuitive appreciation of our own conscious will. […]. Each of our actions is really the culmination of an intricate set of physical and mental processes, including psychological mechanisms that correspond to the traditional concept of will, in that they involve linkages between our thoughts and our actions. This is empirical will. However, we don't see this. Instead, we readily accept a far easier explanation of our behavior: We intended to do it, so we did it" (Wegner 2018, p. 24).

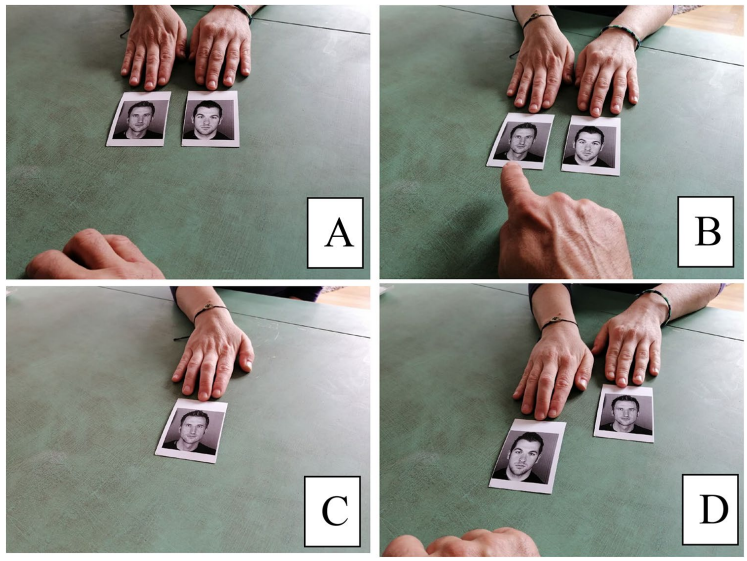

Fig. 1 The choice manipulation procedure. A participant is presented with two alternatives (**A**), asked to make a choice (**B**), asked if they had chosen it (**C**) and in a number of trials (manipulations) asked to justify the non-chosen alternative (**D**)

was asked if it was the preferred one (C). If the participant answered correctly, it was considered a Remembered item, and if not, a Misremembered item. Finally, the experimenter presented the chosen item (*actual* choice) or the non-chosen item (*manipulated* choice) and asked the participants to motivate their choice (D). Crucially, Mouratidou (2020) found that the manipulations for Remembered items were significantly more often detected (see Sect. 3) than in the case of Misremembered items. Further, the participants were more likely to notice and object to manipulations of Remembered faces than of Misremembered figures. This was sufficient for Mouratidou (2020) to argue that participants were not in any way "choice blind", but that they could be more or less "manipulation blind", influenced by factors such as memory and emotional valence. Why did these factors play such an important role? One possible answer is that the participants were more strongly invested in choices for faces compared to those for figures. In Sect. 3, we return to the results from the study, and describe how the verbal responses to manipulated choices differed from those to the actual (i.e., non-manipulated) choices.

For the present paper we further explored participants' verbal justifications for actual and manipulated choices concerning faces and figures to see if these indicate differences in investment. As pointed out above, we expected correspondences but not identity between pre-verbal and verbal choice investment. On the basis of operationalizations that we explain in Sect. 4, we tested the following general hypotheses, which we motivate as we go along:

- Justifications for choices concerning faces will be marked by a higher degree of investment than justifications for figures (H1)
- Justifications for manipulated choices will be marked by a higher degree of investment than justifications for actual choices (H2)
- Justifications for detected manipulations will be marked by a higher degree of investment than justifications for non-detected manipulations (H3)

In Sect. 5 we present the results for these hypotheses and discuss them in qualitative terms in Sect. 6 and summarize in Sect. 7. We conclude in Sect. 8 with some implications for the nature of choice making, face preferences, and the relation between pre-verbal and verbal choice investment.

2 Phenomenology of Experience and Language

Phenomenology focuses both on *what* is given in experience and on *how* this takes place, aiming to describe this in as much detail as possible (Sokolowski 2000; Zahavi 2003). The "what" of consciousness, in the broadest sense of the term, is the *intentional object*, again understanding this to be any phenomenon given to consciousness, such as the two faces represented in photographs shown in Fig. 1. The "how" of experience has many aspects, one of which is sometimes referred to as "quality" (e.g., Husserl 1900; Zahavi 2003),

but as this term is much too general, we may refer to it as *intentionality type*. Perceiving is one of the most basic kinds of intentionality, but there is also remembering, anticipating, imagining, dreaming, judging, and many others. Another aspect of the "how" is what has been called "intentional matter" (e.g., Zahavi 2003), but also goes under terms such as "aspectual shape" (Searle 1992), and "construal" (Zlatev 2016). The common point is that the intentional object is never intended neutrally, but under one or more *dimensions*.[2] To give a salient example, *valence* is a dimension in which "an object appears to be attractive or repulsive before it appears to be black or blue, circular or square" (Koffka 1928, p. 319). This dimension is particularly important, since it affects the most basic, *operative* level of intentionality which is based on pre-reflective bodily activity, and which influences how higher levels of intentionality, including perceptual, intersubjective, signitive (i.e., sign-based), and linguistic will manifest themselves (Merleau-Ponty 1962; Sokolowski 2000; Zlatev 2018).

To redirect experience back to the "how" of experience is known as the *phenomenological reduction*. This is a difficult process aiming to focus on *lived* experience as such. Using the metaphor proposed by Petitmengin and Bitbol (2009, p. 378), this is not like "switching the light to see what the room looks like, it's rather exploring it in the dark, by feel, a little as a blind person would do. It's not a matter of looking at one's experience, but of tasting it, or dwelling in it". From this pre-reflective, lived layer of experience, the phenomenological reduction gradually brings about a reflective layer, and in order to make this intersubjective it also leads to a verbal description of this layer. On the one hand, this implies that all verbal accounts we provide are never truly identical to the pre-reflective experiences themselves since "all recollections, descriptions, reflections, etc. are already transformations of those experiences" (van Manen 2014, p. 313). On the other hand, providing an account, or *logos* of our experience is what phenomenology is all about. Notably, the validity of phenomenological descriptions cannot be measured in terms of representative accurateness, but rather in terms of *authenticity*, becoming aware of different experiential dimensions and describing them with language that is *felt* to be truthful by the subject him or herself (Sokolowski 2000; Petitmengin and Bitbol 2009).

Of course, such a conception of language as a verbalization of experience is very distant from those of Chomskyan "generative linguistics", or from formal semantic analyses focusing on "truth-functions" based on mappings between sentences and "states of affairs" in reality, or "models" of these. But while the major phenomenologists were not preoccupied with language, such an experiential take on language is reflected in the first of Husserl's *Logical Investigations* (Bundgaard 2010), and has been "rediscovered" both in some recent schools of phenomenology (Sages and Lundsten 2009; Mörnerud 2016), and in some parts of *cognitive linguistics* (Langacker 1987, 2006; Zlatev 2010).

There is considerable, though largely implicit overlap between Langackarian semantic analyses and those of phenomenology (Möttonen 2016). For example, a central claim is that language, like pre-verbal experience, is characterized by a number of *dimensions of construal*. One of these is *specificity*: how much information is presented about the intentional object, or the "profile". As illustrated in (1), there is an increase in specificity in the description of Mona Lisa, as more and more attributes are being added:

(1) the woman < the sitting woman < the sitting woman with folded arms < the sitting woman with folded arms that is smiling < the sitting women with folded arms that is smiling enigmatically

Another dimension is *perspective,* which has to do with the degree to which the speaker is explicitly represented in the utterance or not. In the first instruction in (2) this is the case, but not in the second. We may characterize the perspective in the first case as one that displays *ego focus*, and in the last one having *object focus*.

(2) Sit on the opposite side from me. / Sit on the other side

While dimensions of linguistic construal like this are important for showing the continuity between pre-verbal experience and language, it is equally important to remember the differences between them (e.g., Blomberg and Zlatev 2014). Purely experiential construals of the intentional object cannot be determinative of linguistic meaning since language always takes place in one communicative situation or another (even if only in "communication with oneself", verbal thinking). For example, one's choice of which expression to use in (2) will be a pragmatic, communicative process, supervening on the experiences of individual speakers and hearers (Möttonen 2016). Construal is further subject to *sedimentation*, the process where, over historical time, through numerous individual acts of meaning-making, relatively stable intersubjectively shared structures emerge. As argued by Zlatev (2016), linguistic meanings (senses) can thus be understood as "conventionalized, socially shared construals of their intended referential objects" (ibid: 563). In sum, construal operations in non-signitive and signitive intentional acts are related but distinct (Zlatev and Möttönen

[2] The idea that intentional objects are given in (human) experience in particular ways has a long history in Western philosophy, but was developed in a novel and systematic way by Husserl and later phenomenologists by focusing on the relations between parts and wholes, between objects, sides and perspectives, and especially on the dynamic interplay of presence and absence (Sokolowski 2000).

2022). A further essential dimension, mentioned in Sect. 1, is that of *dialogicality* (Linell 2009): the degree to which language involves overt interaction of speaker or hearer, or is relatively one-sided or "monological".

More or less (in)direct correspondences between experience and language have been made by others, including Gendlin (1962) with respect to the so-called *experiencing scale* in psychotherapy. If the manner of the client's descriptions is high on this scale, a person can be seen as attending to the bodily felt sense of some situation and allowing words (and gestures) to emerge directly from that sense, as in (3). A description in the middle of the scale has more descriptive statements and narrations, with emotions briefly referred without internal elaboration, as in (4). Lowest on the scale were considered descriptions full of references to external events, expressed in a flat and self-evident manner, as in (5).

(3) It's almost like … it kind of feels like, sitting here looking through a photo album. And, like each picture of me in there is one of my achievements. It's like it feels right to me to say … that … I don't know quite how to say it … It's like the feeling is there, but I can't quite put words on it.

(4) We spent about two hours talking about his problem. I was very much disturbed by what he said because this was a very serious conversation, and it dealt with a decision he had to make regarding his work and his marriage.

(5) It was too late. She went into a coma, she lasted for about three or four months. We didn't know it had gone all the way back. There was no sign of it, nothing. (Hendricks 2009, pp. 132–133)

Interestingly, Gendlin and his colleagues established in a series of studies (Hendricks 2002, 2009; Goldman 2005) that the higher on the experiencing scale a clients' verbal descriptions were, the more likely it was for the therapy to have a positive outcome. In our terms, we could say that clients who expressed themselves higher on the experiencing scale were more invested in the therapy situation.

3 Language and Experience in Choice Making

In a study that questioned the assumptions that "we suffer from the most extreme form of inaccessibility to cognitive processes—literal lack of awareness that a process of any kind is occurring until the moment that the results appear" (Nisbett and Wilson 1977, p. 241), Mouratidou (2020) asked 43 Greek participants to choose from 20 pairs of photographs of human faces (male and female) the ones they found "most attractive", and from 20 pairs of abstract figures the ones they found most "aesthetically pleasing" (see Fig. 2). All verbal interactions took place in Greek, the native language of the first author, who also was the experiment leader in the study.

After that the participants were asked to confirm whether a face or figure was the one they had chosen. Finally, they were asked to justify their choice. These verbal responses often consisted of two parts: (A) a response comment to the presented picture, and (B) a justification motivating the picture as their choice, as illustrated in example (6).

(6) Did I choose this one? (A) Maybe because she is kind of smiling (B)

Without the participants' knowledge, four face trials and four abstract figure trials were manipulated by deliberately asking participants to justify their non-preferred choice (see Fig. 1D). These manipulated trials were formed by picking one picture card of each category created after the memory step: (a) Remembered as chosen; (b) Remembered as non-chosen; (c) Misremembered as chosen; and (d) Misremembered as non-chosen. The responses to the manipulated trials were categorized according to the type of detection and type of response, as shown in Table 1.

The figures in Table 1 show that approximately half of the responses to manipulated choices were either clearly or possibly detected. For the responses belonging to the "Clear detection" class, 75% were Remembered, and 25% Misremembered; for those to the "Possible detection", the rate was fairly equal for both Remembered (58%) and Misremembered (48%) choices, while for "No detection" these percentages were 37% and 63%, respectively.[3]

For the purpose of the present study, we examined a comparable number of verbal responses produced for *actual choices* (4 for faces, and 4 for figures per participant) and categorized them by the same criteria as those in Table 1, but in "mirror" form. For example, "Denial" implies rejecting the original choice, and expressing preference for the alternative in the final step of the procedure.

As can be seen from the right-most columns in Tables 1 and 2, the patterns were completely different. In the case of the responses given for the manipulated choices, it was equally frequent for participants to deny the manipulated choice, thereby detecting the manipulation, as it was for them to accept it as their choice. In contrast, in the responses given for the actual choices, very few participants (1%) denied their choice, and the vast majority (87%) motivated their choices confidently. The other types of responses (coded as "Uncertain", "Ignorant", and "Indifferent") were also much fewer when participants motivated their actual choices than the manipulated ones.

[3] Further, the study showed that the detection of manipulation for choices for faces was higher (64%) than for figures (43%), and even more so, when those choices were Remembered (48%) than Misremembered (32%).

Fig. 2 Sample of pairs of items to choose from for each kind of two conditions in the study of Mouratidou (2020)

Table 1 Participants' verbal response types for manipulated trials (manipulated choices (MC) and actual choices (AC))

Category	Type of response	Response pattern	Distribution
Clear detection	Denial	Reject MC and motivate the choice of the AC Question, reject MC and justify the choice of the AC	107 (34%)
Possible detection	Uncertainty	Question MC and motivate preference for AC Question MC and motivate MC Do not motivate MC and state preference for AC Motivate MC and state preference for AC	46 (15%)
No detection	Ignorance	Cannot motivate MC Cannot motivate MC spontaneously, only reluctantly	29 (9%)
	Indifference	Motivate both in similar ways	25 (8%)
	Acceptance	Motivate MC confidently	109 (34%)
Total *N*			316

These results may seem unsurprising or even commonsensical, but they are far from trivial as they contradict the strongest claims made by proponents of "choice blindness", according to whom all justifications are post-hoc rationalizations (Johansson et al. 2008, p. 20). However, the results of Mouratidou (2020) show that there is a considerable difference between participants' response patterns to actual and manipulated trials. Such findings can be seen as testaments to the correspondence between pre-verbal experience and verbal expression, and thus the reliability of first-person descriptions.

The relationship between pre-verbal choice making and verbal justification, however, is not always straightforward. For example, when participants were asked to justify their choices in the original encounter (B in Fig. 1) in what in effect is *a new choice situation* (D in Fig. 1), it is reasonable to expect that they had more conflicting experiences

Table 2 Participants' verbal response types for actual choices (AC)

Type of response	Response pattern	Distribution
Denial	Reject AC and shift to alternative	3 (1%)
Uncertainty	Question AC and motivate it Question AC and shift preference to alternative Question AC and either (clearly) motivate any of the two or not	24 (7%)
Ignorance	Cannot motivate AC Cannot motivate AC spontaneously, only reluctantly	5 (2%)
Indifference	Motivate both in similar ways	9 (3%)
Acceptance	Motivate AC confidently	286 (87%)
Total N		327

in the case where their original choice was manipulated (Table 1), than when this was not the case (Table 2). Thus, somewhat paradoxically, we can expect participants to be more invested in the situation when having to explain their choice when it was manipulated than when it was not. And within the category of manipulated trials, there should be more verbal markers of choice investment in the cases where manipulations were detected than when they were not detected. Thus, albeit indirectly, the language used in verbal responses when asked to justify choices can be expected to reflect the (degree of) investment in the making of the corresponding choices. Following this reasoning, we returned to the data from Mouratidou (2020), and analysed the verbal responses to be able to test the general hypotheses presented at the end of Sect. 1.

Concerning H1, the initial choice manipulation experiment involved choices concerning different perceptual objects and task instructions (i.e., the formulations of the choices to be made: "Who of these do you find more attractive?" and "Which figure do you find more aesthetically pleasing?"). The particular selection of objects was motivated by their different status in terms of *affectivity*, with faces expected to be more affect-arousing than abstract figures. These differences can be expected to impact on participants' cognitive and affective predispositions (e.g., Bartlett 1932) and, thus, on their differential investment during the choice making. This assumption was also supported by the results of the initial study (Mouratidou 2020), where it was found that choices for faces were more memorable, and their manipulations more detectable (see footnote 3). Thus, it is reasonable to assume that the degree of choice investment manifested in participants' verbal motivations will differ for faces and figures. The motivations for the other two hypotheses were given above.

4 Methodology

One of the methodological principles of cognitive semiotics is the *conceptual-empirical loop* (Zlatev 2015; Stampoulidis et al. 2019; Devylder and Zlatev 2020), which implies cross-fertilization between philosophical "what" and empirical "how" questions. Investigations begin not with "prior theories", but rather with meticulous reflection on the phenomenon, in general, and with various concrete manifestations of it in everyday life or in experimental settings, in particular. After a number of iterations of the loop, theoretical constructs are formulated, and further operationalized as appropriate for the empirical study in question. Experimental hypotheses may be stated and explanatory theories proposed, but only in subsequent steps. The ambition is in this way to obtain high degrees of *translation validity* (see Sect. 1), where theoretical constructs and their operationalizations remain true to the original phenomena, and even serve to elucidate them further. Thus, in the spirit of all phenomenology-based research, "under this rendering, method is not an algorithmic procedure to be followed mechanically of useful results are to be achieved; rather, a method is a way or path toward understanding that is as sensitive to its phenomenon as to its own orderly and self-correcting aspects" (Pollio et al. 1997, p. 28).

Using such an approach, we operationalized verbal choice investment in the following way. Starting from the conceptual side, we formulated a number of dimensions of construal in a way that was as intuitive as possible (see Sect. 2) and further adapted them to fit the situation at hand, resulting in a number of *categories.* Then, we tested their applications to the verbal responses of the participants, and adapted them further to be able to more accurately capture all relevant aspects. This was done in several iterations before settling on eleven categories. We grouped these categories further into three structural layers: *Ground, Frame,* and *Veneer* to indicate logical relations of the categories both within and between layers.

The layer Ground is presupposed by the other two layers and comprises the categories of *Interaction*, *Justification, Prominence* and *Preference* (see Table 3). Once again, there was a logical order between these categories. Interaction, which could be either *dialogical* or *monological,* between the experimenter and participant is a precondition for the response to be elicited. A given response could include a justification for the choice ("yes"), not include a justification ("no"), or else it could not be determined.[4] However, once a justification is provided, then prominence has to be given to the *target*, the *alternative,* or both (when they are assessed in comparison), implying that, inevitably, one of the two would be stated as the preferred one, as in (7).[5] Thus, these four categories indicate the justification formation and serve as a basis for determining the remaining layers and categories.

(7) I liked neither, he just seemed to me…I don't know, slightly better.
Equal prominence on Target and Alternative — Preference on Target

The layer Frame consists of the categories *Intentionality type, Time, Perspective,* and *Reference* (see Table 4). These categories are essential parts of the justification. First, the

[4] *Nil* was used to indicate "no value", in cases where one could not be assigned since the response was vague or self-contradictory in the given respect.

[5] All examples are English translations of original Greek responses.

Table 3 *Ground* categories and values of verbal choice investment, with corresponding operational criteria and examples in English

Category	Value	Criterion	Example
Interaction	Dialogical	Explicit or implicit references of the participant addressing the experimenter	*He looks nerdy,* ***doesn't he****?* *It was better. I hope this helps* ***you***
	Monological	Monological responses without references to the experimenter	*I like her face more*
Justification	Yes	The participant motivates one of the pictures as her choice	*She looks kind*
	No	The participant does not motivate any of the pictures as her choice or treats it as a random or forced choice	*Just because* *I don't know why* *Because I had to choose one of them*
	NIL	The participant provides a vague, unclear, or self-contradictory justification	*For the same reason* *I liked it more. Wait, no, I've made a mistake choosing it*
Prominence	Target	The focus of the justification is placed on the target picture	*I liked* ***him***
	Alternative	The focus of the justification is placed on the alternative picture	*I didn't like* ***the other one***
Preference	Yes	Explicit or implicit remarks that indicate preference for one of the pictures	*Because it seems a bit clearer*
	No	Explicit or implicit remarks that indicate dis-preference for one of the pictures	*It's abstract, while the other one makes sense to me*

chosen item will need to be described as intended in terms of one or more of the intentionality types: *perception*, *imagination, remembering,* and *affection. Time* concerns whether the item is described as being in the *past, present,* or *both*, as expressed by linguistic tense or adverbials, as shown in (8).

(8) There *is* a face here and I *didn't like* it

As shown in Sect. 2, every verbal expression implies a certain *Perspective*: with *ego* focus, when the intentional agent is highlighted, and *object* focus, when the focus is on the picture as the object of perception; or *both*, when ego and object are combined. Finally, the justification could be more or less *personal*: when the participant used individualized *Reference*, revealing some specific feature of the intentional object, or when those were lacking. As pointed out above, we grouped these categories under Frame, since they are essential ingredients of choice justifications that need to be expressed in one way or another.

Finally, Veneer consists of the categories *Specificity, Valence* and *Modality*, all of which include an evaluative element (see Table 5). Thus, a justification would be coded as *detailed,* when including remarks about (one or more) features (e.g., a facial characteristic) or *generic,* when the assumed reasons are holistic characterizations, designating a general impression of what the picture depicts (such as, "slightly better" mentioned in (7)). It could be evaluated as *positive* or *negative*, and could reflect different levels of certainty: *certain,* when the intentional agent is explicitly emphatic about the choice; *possible*, when the picture is evaluated as a potential choice; or *uncertain,* when the agent appears unsure. When the respective values were lacking within the three categories, it was coded as *neutral*. The latter indicates that these categories are not essential components of the verbal choice justification, since a choice can be motivated without containing anything but "neutral" values for any of them, and this motivated grouping and labelling them as Veneer. At the same time, these categories can be considered quite indicative of choice investment given their explicitly evaluative character.

On the basis of the conceptual and empirical considerations, and the linguistic manifestations of experiential choice investment just described (Tables 3–5), we formulated the operationalization of verbal choice investment in terms of the set of *markers of choice investment* (MCI) shown in Table 6. The more markers that are present in the responses of participants, the greater the verbal choice investment. This could be seen as the final layer of the process of operationalization, and step within the conceptual-empirical loop, exemplifying the relationship from the phenomenon in focus and corresponding concepts to its operational definition.

On this basis, we could operationalize the hypotheses presented at the end of Sect. 1 as follows. The degree of verbal choice investment will be greater:

- For choices concerning faces than for figures (H1)
- For manipulated than for actual choices (H2)
- For detected than for non-detected manipulations (H3)

Table 4 *Frame* categories and values of verbal choice investment, with corresponding operational criteria and examples in English

Category	Value	Criterion	Example
Intentionality type	Perception	Judgements, impressions, and descriptions of the picture	*He seemed troubled* *She looks like a housewife* *Better than her*
	Imagination	Hypothetical and imagined scenarios in both past and future	*He might (…) build us a spaceship* *She was a nerd in school* *I could be friends with him*
	Remembering	Backward references where the picture is intended as familiar or known	*He reminds me of Johnny Depp* *It made me think of a pair of headphones I once had*
	Affection	Affective response	*I like him*
	NIL	The justification includes a reference for the alternative picture, but without a further elaboration	*In comparison to this one*
Time	Past	References indicating that the justification was determined in the past. *Choose* was regarded as an integral element of the response answering the questions "why did you choose this one?" and was not coded	*I **liked** him* *I **thought** he is nice* *He **had** an odd nose*
	Present	References indicating that the justification of the picture is determined in the present as an ongoing choice making process	*He **seems** nice to me* *Because **she's smiling***
	Both	References which combine both past and present time	*There **is** a face here and I **didn't** like it*
	NIL	Not indicated because a verb or a time adverb is lacking	*Nicer than the other*
Perspective	Ego focus	The focus of the justification is placed on the participant perceiving the picture	***I** don't like his style* *He looks nice to **me***
	Object focus	The focus of the justification is placed on the picture as the object of perception	***This girl** is more attractive*
	Both	The focus of the justification is placed on both the participant as the perceiver and the picture as the object of perception	***I** like him. **He** is nice*
	NIL	The justification includes a reference for the alternative picture, but without any further elaboration	*In comparison to that one*
Reference	Personal	Explicit individualized remarks revealing something specific about the participant's selfhood (e.g., age, body, ethnicity, past history, etc.)	*He reminds me of **an ex*** *She looks like Megan Markle and this girl seems very nice to me* *Because he is in **my age***
	Impersonal	Lack of explicit individualised remarks	*I like her because she is smiling* *He looks like Johnny Depp*
	NIL	The justification includes a reference for the alternative picture, but without any further elaboration	*In comparison to that one*

5 Results

In this section we attest to what extent each of the three hypotheses, as operationalized above, are supported by the material. We present each of them following the logical order of the three structural layers (i.e., Ground, Frame, and Veneer), using only descriptive statistics since the central thrust of the analysis remains *qualitative*: to show patterns that can be made intuitive, and interpreted in a way that makes sense both for ourselves and the reader. For consistency, we defined a given MCI (see Table 6) to be present when the difference to the alternative was greater than 5%, but once again, we emphasise that there is no "objective" justification for this, only the need to provide clarity and a basis for further interpretation. In the spirit of qualitative research, the basic aim is for "a reader, adopting the same viewpoint as articulated by the researcher, can also see what the researcher saw, whether or not he agrees with it" (Giorgi 1975, p. 53). A summary of the outcome of the three hypotheses is presented in Sect. 6 and a discussion in Sect. 7.

5.1 Investment in Choices Concerning Faces vs. Figures (H1)

As shown in Fig. 3, within the Ground layer the marker of Interaction was slightly more often dialogical for faces (28%) than for figures (24%), albeit the difference between

Table 5 *Veneer* categories and values of verbal manifestations of choice investment, with corresponding operational criteria and examples in English

Category	Value	Criterion	Example
Specificity (perceptual attributes)	Detailed	Remarks indicating one or more specific characteristics depicted in the picture; sometimes combining them with an impression	*His **eyes*** *His **eyes seemed kinder** to me*
	Generic	Holistic characterizations indicating a general impression of the picture	*I liked him because **he's cute***
	Neutral	Lack of detailed or generic characterizations	*I liked her more*
Valence	Positive	Explicit remarks of positive value and positive characteristics, attributes, and descriptions	***I liked** him* *He is **nice*** *She seems **smart***
	Negative	Explicit remarks of negative value and negative characteristics, attributes, and descriptions	*He **scares** me* *He looks **boring*** *He looks at me **ironically***
	Neutral	Lack of explicit remarks of either positive or negative value	*It's **her hair***
Modality	Certain	Emphatic remarks and adverbs of affirmation or negation of the picture, such as "definitely, never, for sure," etc	***No way**, he is ugly* *I **remembe**r choosing her because I liked her lips*
	Possible	Adverbs, modal verbs and verbs that indicate possibility, such as "perhaps, probably, suppose"	***Probably** because he is smiling* *I **guess** because of her gaze*
	Uncertain	Remarks that indicate uncertainty about the justification of the picture, such as "no idea, it beats me"	*I **don't know** what I did, I **don't remember for sure**, **perhaps** because her arms are wide open*
	Neutral	Lack of remarks indicating certainty, possibility, or uncertainty	*She looks smart*

Table 6 Markers of choice investment (MCIs) and their explanations

MCI	Explanations
1. Greater dialogicality than monologicality	More experiential reactions, including more conflicting ones, and thus the need to share them
2. More expressed than absent justifications	More likely to justify somehow, rather than just "shrug"
3. More balanced target/alternative prominence: less difference between the two	Higher investment in the choice situation: both alternatives as possibilities for choice
4. More balanced preference: smaller difference between the two	Higher investment in the choice situation: both alternatives as possibilities for choice
5. More non-perceptual than perceptual intentionality	Not only speaking of the choices as directly present in perception, but also through other types of intentionality
6. More non-present than present time reference	Not only speaking of the choices as directly present in the here and now, but also as absent
7. More non-object than object perspective	Not only object focus, but a combination of ego and object focus
8. More personal than impersonal references	More personal associations
9. More detailed than generic and neutral specificity	More detailed references than generic and neutral
10. More non-neutral than neutral valence	More positive and negative remarks due to more experiential reactions for both choice alternatives
11. More non-neutral than neutral modality	More remarks indicating certainty, possibility, or uncertainty

them was less than 5%. The proportions for Justification were almost fully identical. However, Prominence was considerably more balanced between target and alternative for faces (54/46%) than figures (63/37%), and so was Preference, implying that participants were assessing both target and alternative picture as potential choices, possibly due to the differential affective status of the two kinds of perceptual objects.

Within the Frame layer, it was only the Reference marker that showed (somewhat) higher investment for faces than figures (5% difference), as predicted. On the other hand, the MCIs non-perceptual Intentionality, as well as non-present Time occurred more often for figures than for faces (with 17% and 24%, respectively), contrary to H1. Finally, non-object Perspective was used almost equally for the two kinds of intentional objects.

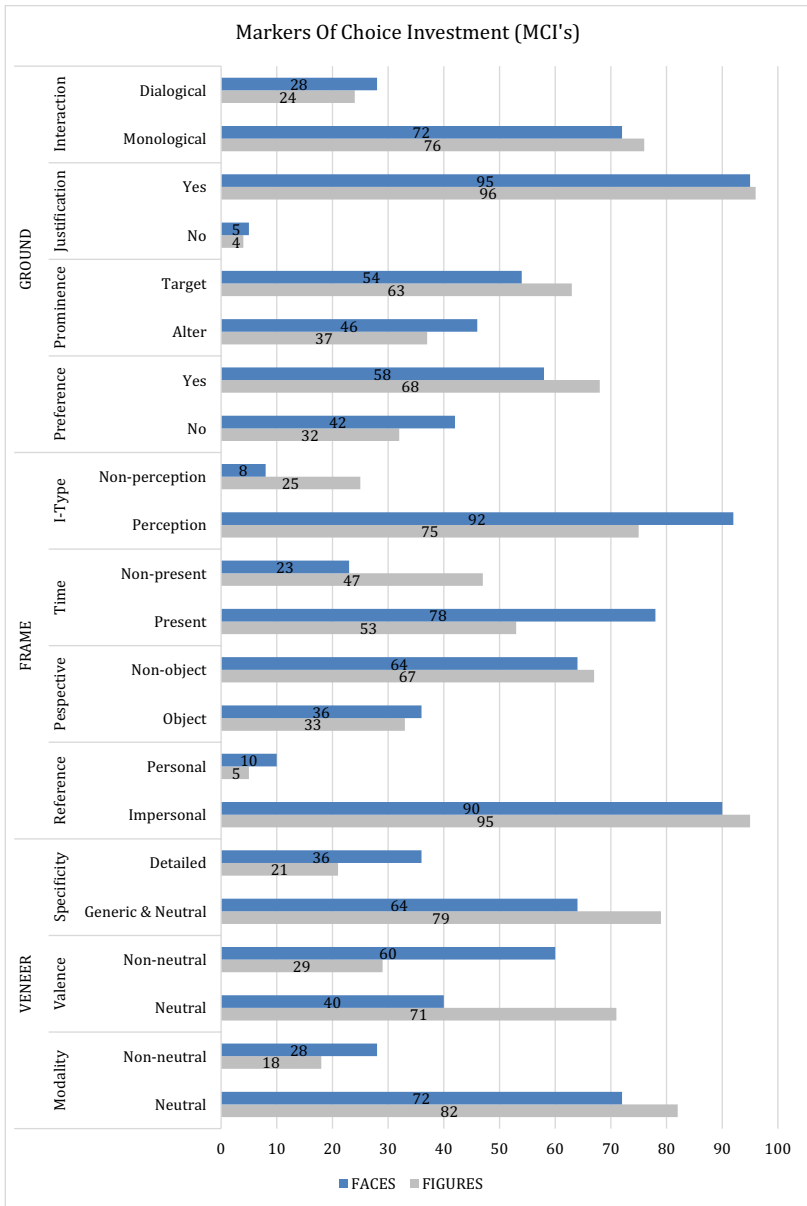

Fig. 3 MCIs of verbal manifestations for faces and figures

On the other hand, considering the Veneer layer, all the MCIs indicated higher investment for faces than figures: the justifications for faces were more detailed (15% difference), and had more non-neutral Valence (31% difference), while most occurrences were neutral for figures. Likewise, non-neutral occurrences indicating Modality were more for faces than figures (10% difference), as expected.

5.2 Investment in Choices Concerning Manipulated vs. Actual Choices (H2)

To remind, we predicted that when asked to justify their preference for an item that was not initially chosen, participants would in general be required to "work harder", and either imagine a situation in which they would make this preference, or else reason as to why they would maintain their original preference—a distinction that is the basis for H2. The results are shown in Fig. 4.

For the Ground layer, dialogical Interaction was much more common for the manipulated choices compared to the actual ones (25% difference) and Prominence was much more balanced between target and alternative picture for the manipulated choices (51/49%) than the actual (65/35%), as predicted. On other hand, Justifications for manipulated and actual choices were nearly identical, and Preference was nearly equally balanced between positive (yes) and negative (no) for both manipulated and actual choices.

For the Frame layer, non-object Perspective occurred more often for manipulated than for actual choices (10% difference), as expected. Non-present Time, contrarily to the prediction, occurred slightly more often for actual choices than manipulated (6% difference). There were no differences for Intentionality type and Reference between manipulated and actual choices.

Lastly, for the Veneer layer, for category Modality, non-neutral instances occurred much more for the manipulated choices (54% difference), as expected. For the other two categories there were no difference.

5.3 Investment in Choices Concerning Detected vs. Non-detected (H3)

Among the manipulated choices, the prediction was that there would be more markers of choice investment (MCIs) in the case of detected than non-detected manipulations, the reasoning being that the latter case would provide most conflicting experiences, requiring most effort from the participants.

Starting from the Ground layer again (see Fig. 5), Interaction was much more often dialogical for the detected manipulations (39% difference), as expected. Similarly, while for all detected manipulations (100%) there were justifications, in 8% of non-detected manipulations this was not the case, presumably because participants were unable to provide a justification that would not be experienced as a self-contradiction. Further, Prominence and Preference were much more balanced for detected than for non-detected manipulations.

Within the Frame layer, non-object Perspective justifications occurred more often for the detected manipulations (17% difference), as expected. Contrary to the predictions, non-present Time was almost twice as common for the non-detected manipulations (17% difference) and Reference was more often personal for the non-detected than the detected manipulations (6% difference). There were only minor differences for Intentionality type.

Finally, for the Veneer layer, the hypothesis was supported for Valence, given that there were more non-neutral occurrences when justifying detected choices than non-detected (8% difference) and for Modality, where the non-neutral justifications predominated for detected manipulations (14% difference). There were no differences for Specificity.

6 Summary

Table 7 summarises the quantitative results for each of the three hypotheses, in terms of the MCIs, our operationalizations of verbal choice investment, in terms of three logical possibilities:

a. cases where the maker was aligned with the respective hypothesis (A)
b. cases it was misaligned (MA), in the sense that it was stronger for the opposite kind of choice than then one predicted, and
c. neutral (−), where there was no difference between the two kinds of choices, i.e., less than 5% difference.

Given than for all three hypotheses the number of aligned markers clearly dominated over the misaligned: 6–2 (H1), 4–1 (H2) and 7–2 (H3), all three can be considered supported. But we need to immediately acknowledge that this support is conditional on the operationalizations used, and the choice to disregard the neutral markers. With this reservation, what generalizations can we make? First it is notable that balanced Prominence and non-neutral Modality were the two MCIs that were aligned for all three hypotheses. Dialogical Interaction, balanced Preference, non-object Perspective, and non-neutral Valence were supported for two of the three hypotheses, while personal Reference and detailed Specificity found support in one of the hypotheses. Finally, the MCI based on non-present Time did not find support in any of the hypotheses. As we discuss below, this suggests

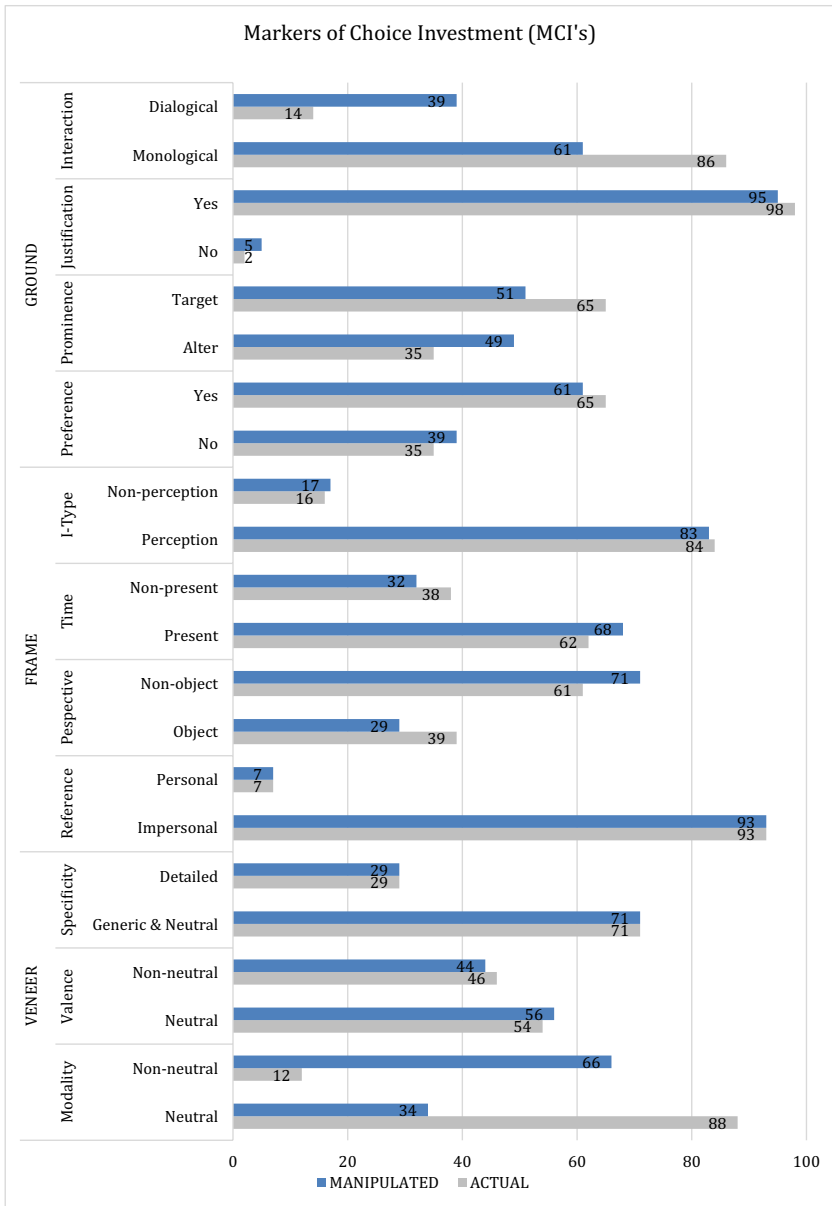

Fig. 4 MCI of verbal manifestations for manipulated and actual choices

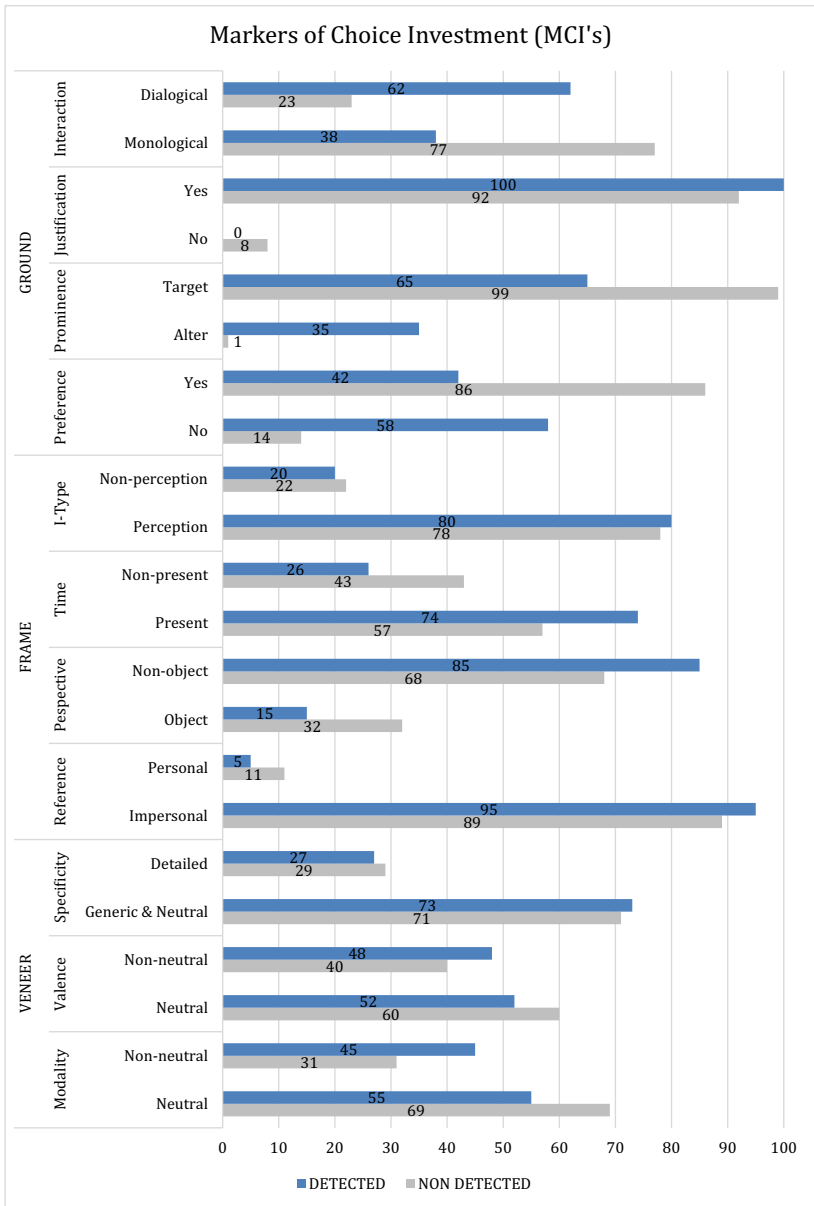

Fig. 5 MCIs of verbal manifestations for detected and non-detected manipulations

Table 7 Summary of MCIs across H1–H3 (A = aligned, MA = misaligned, – = neutral)

	MCI	H1	H2	H3
Ground	Dialogical interaction	–	A	A
	More justification	–	–	A
	Balanced prominence	A	A	A
	Balanced preference	A	–	A
Frame	Non-perceptual I-type	MA	–	–
	Non-present time	MA	MA	MA
	Non-object perspective	–	A	A
	Personal reference	A	–	MA
Veneer	Detailed specificity	A	–	–
	Non-neutral valence	A	–	A
	Non-neutral modality	A	A	A

that we need to reconsider the significance of Time reference as a marker of verbal choice investment.

Further, by looking at the occurrence of MCIs within the different layers, it can be observed that most aligned MCIs occurred for the Ground and Veneer layers, while all the misaligned ones occurred exclusively for the Frame layer. We discuss this and other possible generalizations in the following section.

7 Discussion

Cognitive semiotics employs not only the methodological principle of the conceptual-empirical loop, but also, that of pheno-methodological triangulation (Pielli and Zlatev 2020). This implies that it endorses the use of detached observation, quantification, and testable predictions, as in experimental psychology and cognitive science, as applied in the previous section. But cognitive semiotics emphasizes that such *third-person* methods are never sufficient on their own but must be preceded by, and complemented with, *first-person* methods such a phenomenological analysis, and *second-person* methods such as qualitative interaction analysis. The empirical findings reported in the previous section thus also require a qualitative interpretation of the findings, where we consider how the three choice situations, as well as the three layers of choice investment categories (Ground, Frame, Veneer) differ from one another. In other words, in this section we move back from the operationalizations to the phenomena themselves, assessing the translation validity of the study.

The first hypothesis concerned differences in choice investment between faces and figures, grounded in the differential affective status of the two kinds of perceptual objects. Many studies have attested that faces are a special kind of "stimuli" when it comes to perception, recognition and memory (e.g., Schupp et al. 2004; Kanwisher and Galit 2006; Tsao and Livingstone 2008; Öhman 2009) and this appears from the first days of life (e.g., Valenza et al. 1996). Thus, it can be safely assumed that the face items in the study were more affectively charged than the abstract figures. However, does this imply that participants are always more invested in choices concerning the former rather than the latter? The nature of the figures made their assessment more *effortful*, but this itself provoked particular manifestations of verbal investment. For example, participants had the tendency to "see into" the figures animate creatures (e.g., human and non-human animals) and use such interpretations in their justifications of their choices, as exemplified in (9–10).

(9) Because, I don't know, it's like I see two women, two faces (…)

(10) This one because I like the symmetry more it reminds me of birds

As pointed out by Bartlett (1932, p. 44, emphasis in original), given that the "task factor is always present it is fitting to speak of every human cognitive reaction, perceiving, imagining, remembering, thinking, and reasoning, as an *effort after meaning*". This effort is also reflected in the fact than even in cases where participants identified the *same* pattern, they varied the reasons for choosing one over the other, again potentially indicating an easier way (i.e., stating the apparent) to deal with a more demanding perceptual object, as exemplified in (11–12).

(11) It reminded me of wheel tracks, of a car, that's why I liked it more (…)

(12) It was a clear wheel track and it reminded me of snow

Faces, on the other hand, were mostly assessed based on attractiveness, (assumed) personality attribution, and familiarity (13–15).

(13) He is prettier than the other one

(14) Because she's more like introverted, angry, serious

(15) He looks like my brother, that's why

The more effortful assessment of figures when compared to faces is the likely reason why the MCIs Intentionality type and Time (see Table 6) showed greater choice investment for the figures rather than the faces, against the hypothesis. Thus, we find here a potential discrepancy between pre-verbal and verbally expressed choice investment. To put it simply, when choices are easier, then the language used to justify these also tends to be simpler:

> The more a person is in contact with her experience, the more the vocabulary becomes simpler, direct, concrete…The absence of abstract categories, of psychological concepts, is an indicator that the subject is

> not describing theoretical knowledge but is absorbed in his experienced, in contact with it. (Petitmengin and Bitbol 2009, p. 386)

The discrepancy between pre-verbal and verbal choice investment was even more strongly reflected in the second hypothesis (i.e., expected higher investment in manipulated than actual choices), which can account for why there were fewer aligned markers of choice investment here than for the other two hypotheses. This is not surprising, as this was the most complex choice situation in the study, both from the standpoint of the participants, and for us to make sense of theoretically. In cases where the manipulated item was justified as the preferred one, there were at least two distinct possibilities. The first is that the intentional object was not made fully *intuitive* (in the sense of clearly experienced, see Sokolowski 2000) in the participants' mind (e.g., they were less interested in the task, more distracted, assessed the object as more indifferent). In such cases, we would in fact have predicted lower verbal investment as well. But there is also the possibility, well-attested in the material, where the participants saw this as a *new* choice making situation, one that is more demanding, given that it required more effort to (a) assess the presented alternative as a potential choice, (b) provide reasons that resonate with their experiential life and (c) communicate them to the experimenter. Such cases of exploring the "false alternative" as a new choice should not be seen automatically as sterile fabrications of assumed reasons from participants' side, but at least potentially as acts of authentic choice making, an "originality as a result of an active doing of the I, on the basis of something or other given passively beforehand" (Husserl 1977, p. 160). The complexity of this experience is what we proposed to be reflected in higher rates of verbal choice investment, even if the manipulations were *not* detected. But even more so when they were explicitly or implicitly detected, and the original choice needed to be re-confirmed.

This leads naturally to the third hypothesis, where most markers of choice investment were aligned with the predictions. Testing the difference between detected and non-detected choice manipulations was indeed one of the initial motivations for the present study: to investigate whether varying degrees of choice investment could be an explanatory factor for manipulation detection and choice awareness. The high occurrence of markers of choice investment (7 out of 11) in accordance with the hypothesis can be seen as confirming our initial expectation that choices that mattered more for participants were those that the manipulations were more often detected. Thus, the outcome of this exploration validates the assumption about the relationship between choice awareness and investment, rendering this as one of the strongest contributions of the present study to the discussion of the reliability of first-person verbal descriptions, our trustworthiness as agents, and choice making research in general.

Another contribution is the list of 11 categories, divided into three layers, and operationalized as markers of choice investment (see Table 6), and as a useful tool for future research. But we need to consider why the categories within Ground and Veneer layer appeared to be more revealing for choice investment than those within the Frame layer, with the exception of non-object Perspective. One reason was pointed out above: the markers of the Frame layer concerned more effortful choices, which were not necessarily those where pre-verbal investment was highest. For example, the fact that non-present Time occurred more for figures than faces, as well as for the non-detected than detected manipulations, could imply that participants had to go back or further ahead in time to discuss the presented choices as valid, drawing from past memories or projecting to imagined situations. Likewise, Intentionality type was misaligned for the faces vs. figures hypothesis, and neutral for the other two hypotheses, suggesting that participants had to muster more complex types of intentionality to assess less transparent, and thus more demanding choices.

A different and not incompatible reason is that the Ground and Veneer layers can be said to be more *intersubjective*, vis-à-vis the encounter of the participant with the experimenter. The question that the experimenter posed ("Why did you choose this one?") required not only a personal justification of the choice, but a statement of these motives for the sake of the interlocutor, here the experimenter. The categories within the Ground and Veneers layer pointing more explicitly at the recipient, than those of the Frame: greater dialogical Interaction, more balanced Preference and Prominence, more detailed Specificity, and non-neutral Valence and Modality could be seen as more explicitly targeted towards the addressee for whom the justification is conveyed, more adequately satisfying her question. On the other hand, the categories Intentionality type, Time, and Reference can be seen as more general, and less dependent on the social context of choice situation. Still, we would not wish to dichotomise, as we agree with Sokolowski (2008) that verbal construal occurs first and foremost between interlocutors: being guided by the need to say something to someone and the imperative to communicate it brings the particular aspects of the object into manifestation: "Logical form arises not only between the mind and the object but also between two (or more) people who articulate the object in common" (ibid, p. 59).

In sum, choice investment cannot be understood without acknowledging the specifics of the choice situation, including the *nature* of the action taken, its *purpose* and its projected *consequences* (Sokolowski 2008). The first two of these elements are particularly relevant for understanding

choice making and investment in contexts such as that of the present study. The first concerns the fulfilment of participants' roles in partaking in the experiment. The second overlaps with this but is more specific: making choices and providing justifications that are as veridical and authentic as possible. The consequential component is less relevant in experimental settings than in everyday life, but even here we can suppose that participants aimed to make and justify choices that would not produce disruptions of the social interaction underway. As Sokolowski (2008) points out, these elements are activated as intentions in agents' choice making, while at the same time intersecting with those of other agents. It is this complex network that can be seen as ultimately determining participants' investment in the choice making act.

8 Conclusion

Grounded in phenomenology, cognitive semiotics allows a systematic way of studying meaning making in general, and choice making in particular (e.g., Sonesson 2009; Zlatev 2015; Mouratidou 2020). It does this by allowing us to move away from the positivist methodological tradition and to focus on the subjective and intersubjective character of human experience, involving a web of interconnections between body, mind, others, and the world. A phenomenon such as choice cannot be regarded as adequately explored by employing only an "objective" third-person methodology, since "experience is the raw data of all empirical, scientific knowledge and it is our task as to understand experiences from the vantage point of the people who live them" (Whitehead 2017, p. 8). Thus, the cognitive semiotic tools of the conceptual-empirical loop and pheno-methodological triangulation were instrumental for the present study of choice investment.

We began with first-person intuitions about the mattering of choice-making in everyday life and experimental settings. Then we used second-person methods to elicit and interpret the verbal material, *as well as* testable predictions and descriptive statistics. In this process, we moved from insights and concepts developed in cognitive linguistics and phenomenology to the dataset, the empirical side of the loop, and back again, in multiple iterations. The operationalizations of verbal choice investment that we provided were essential for formulating and testing three independent hypotheses, all of which were to various degrees supported. As shown in Sect. 7, however, both when these hypotheses were supported and when this was not the case were important for shedding light on the phenomenon under study: *choice investment*, the mattering of a particular choice, both in pre-verbal experience, and as expressed in language to an interlocutor. Some of the categories and their corresponding "markers" of choice investment appeared to be better aligned with the complexity, and thus the effort involved in *verbalizing* a choice, than the pre-verbal experience of choice itself.

This leads us to conclude that choice making and choice investment are complex phenomena. On the one hand, our choices are driven by forces that are more or less implicit, affected by "passive" forms of intentionality (e.g., Ricoeur 1966; Merleau-Ponty 1968). On the other hand, our verbal reports provide information about our motives and declare us as agents to our interlocutors. When we talk about our choices, we not only justify a previous action (i.e., the choice made), but in fact perform a new action: choices that are in play at the particular moment, choosing to provide a justification or not, particular words and expressions, ways of intending the intentional object, etc. This double activity indicates that choice making, and, inevitably, choice investment, is anything but a static phenomenon, since all meaning-making/intentionality is fundamentally dynamic, as pointed out by the founding father of phenomenology:

> I perceive attentively, I "consider" something, I am directed in memory toward the past, I grasp it, I exercise a contemplating representation, I explicate the object, I determine it as substrate of the properties belonging to it, I relate it to other objects, compare and distinguish them, I evaluate it as beautiful and ugly, I imagine it different and more beautiful, I wish that it were different. I "can" shape it differently, will it changed, and actualize the difference […] The I is not a dead pole of identity. (Husserl 1977, p. 160)

Thus, the verbal justifications of choice making that we analysed in the study should not be seen so much as expressions of the initial, pre-verbal choice investment, but as manifestations of choice investment in the particular context, involving faces or figures, actual or manipulated choices. Ultimately, it is through the combination of pre-verbal and verbal experience that we are fully manifested as active agents (Sokolowski 2008).

Such conclusions differ radically from the physicalist approaches in cognitive science that we mentioned in the introduction (e.g., Dennett 1991, 1996; Bargh and Fergunson 2000; Libet 2005; Wegner 2006, 2018), according to which choice making is viewed as a rather static and predictable phenomenon, and choice makers as blind concerning the forces that drive them. For example, if experimental participants fail to identify their initial choice and explain it, then "[they] are manifestly wrong about themselves" (Johansson 2006, p. 39), the argument being that:

> if we know our own minds from the inside, we should know why we do what we do… and when we are asked to describe why we chose a face we

in reality did not prefer, we are not supposed to just fabricate reasons. (Johansson et al. 2008, p. 20)

We hope that we have been able to show that this argument is problematic, not only due to its arrogance, but because it fails to acknowledge the many factors that guide our conduct, where experience is always more complicated and nuanced than what a single explanation can offer. "It is tempting", as Maslow (1966, pp. 15–16) famously puts it, "if the only tool you have is a hammer, to treat everything as if it were a nail" but if we want to *understand* a phenomenon, we should look at how things manifest themselves, using non-reductionist tools such as those of cognitive semiotics. This approach acknowledges that choice manipulation detection can be influenced by different factors and regards human beings as conscious agents with different degrees of choice awareness.

To conclude, our argument, based on previous and current empirical research combined with phenomenological insights, is that our choices arise in pre-verbal experience. But given that "no other human performance requires speech to the same extent as action" (Arendt 1958, p. 179), they are fully actualized in speech, and the dialogical encounter. Thus, it is legitimate to investigate this as reflecting choice investment: the degree to which we care about our choices. Further, and beyond the scope of the present article, are manifestations of choice making that go beyond language, into other semiotic systems such as gestures, postures, and facial expressions: the richness of bodily expression. This remains to be systematically studied in future choice making research.

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References

Arendt H (1958) The human condition. University of Chicago Press, Chicago

Baierlé E (2016) The phenomenology of choice. (PhD Dissertation), Université de Fribourg

Bargh JA, Fergunson MJ (2000) Beyond behaviourism: on the automaticity of higher mental processes. Psychol Bull 126:925–945

Barlett FC (1932) Remembering: a study in experimental and social psychology. Cambridge University Press, Cambridge

Blomberg J, Zlatev J (2014) Actual and non-actual motion: why experientialist semantics needs phenomenology (and vice versa). Phenomenol Cogn Sci 13(3):395–418

Bundgaard PF (2010) Husserl and language. In: Schmicking D, Gallagher S (eds) Handbook of phenomenology and cognitive science. Springer, Dordrcht, pp 368–399

De Monticelli R, Behr T (2011) What is a choice? Phenomenology and neurobiology. Annali D'italianistica 29:171–188

Dennett CD (1991) How to study human consciousness empirically or nothing comes to mind. Synthese 53(2):159–180

Dennett DC (1996) Kinds of minds: toward an understanding of consciousness. Basic Books, New York

Dennett CD (2007) Heterophenomenology reconceived. Phenom Cognit Sci 6:247–270

Derrida J (1995) The gift of death. The Universtiy of Chicago Press, Chicago

Devylder S, Zlatev J (2020) Cutting and breaking metaphors of the self and the motivation & sedimentation model. In: Baicchi A, Radden G (eds) Figurative meaning construction in thought and language. Benjamins, Amsterdam, pp 253–282

Gallagher S, Zahavi D (2012) The phenomenological mind. Routledge, London

Gendlin ET (1962) Experiencing and the creation of meaning: a philosophical and psychological approach to the subjective. Free Press, Glencoe

Giorgi A (1975) An application of phenomenological method in psychology. In: Giorgi A, Fischer C, Murray E (eds) Duquesne studies in phenomenological psychology. Duquesne University Press, Pittsburg, pp 82–103

Goldman A (2005) Reason internalism. Philos Phenomenol Res 71(3):505–533

Hendricks M (2002) Focusing-oriented/experiential psychotherapy: Research and practice. In: Cain D, Seeman J (eds) Humanistic psychotherapies: handbook of research and practice. American Psychological Association, Washington, DC, pp 221–252

Hendricks M (2009) Experiencing level: an instance of developing a variable from a first person process so it can be reliably measured and taught. J Conscious Stud 16(10–12):129–155

Henry J (1985) The golden bowl. Penguin, Harmondsworth

Husserl E [1900] (1970) *Logical investigations*. Routledge and Kegan Paul Ltd., Abington

Husserl E [1925] (1977) *Phenomenological psychology*. Martinus Nijhoff, The Hague

Jhangiani SR, Chiang AI, Cuttler C, Leighton CD (2019) Research methods in psychology, 4th edn. Kwantlen Polytechnic University, British Columbia

Johansson P, Hall L, Sikström S, Olsson A (2005) Failure to detect mismatches between intention and outcome in a simple decision task. Science 310(5745):116–119

Johansson P, Hall L, Sikström S (2008) From change blindness to choice blindness. Psychologia 51:142–155

Johansson P, Hall L, Tärning B, Sikström S, Chater N (2014) Choice blindness and preference change: you will like this paper better if you (believe you) chose to read it! J Behav Decis Mak 27(3):281–289

Johansson P (2006) *Choice blindness: The incongruence of intention, action and introspection.* (PhD Dissertation). Lund University
Kanwisher N, Galit Y (2006) The fusiform face area: a cortical region specialized for the perception of faces. Philos Trans R Soc B 361:2109–2128
Kierkegaard S (1983) Fear and trembling/repetition. Princeton University Press, Princeton
Koffka K (1928) *The growth of the mind.* (Tr. R.M. Ogden). Routledge & Kegan Paul, London
Langacker RW (1987) Foundations of cognitive grammar: Theoretical prerequisites, vol I. Stanford University Press, Stanford
Langacker RW (2006) Subjectification, grammaticization, and conceptual archetypes. In: Athansiadou A, Canakis C, Cornillie B (eds) Subjectification: various paths to subjectivity. de Gruyter, Berlin, pp 17–40
Libet B (2005) Mind time: the temporal factor in consciousness. Harvard UP, Cambridge
Linell P (2009) Rethinking language, mind, and world dialogically: interactional and contextual theories of human sense-making. Information Age Publishing, Charlotte
Malsow AH (1966) The psychology of science: a reconnaissance. Gateway, New York
Merleau-Ponty M (1962) Phenomenology of perception. Routledge, London
Merleau-Ponty M (1968) The visible and the invisible. Northwestern University Press, Evanston
Mörnerud J (2016) *University and culture. A phenomenological analysis of formal and informal discourse on education and research at universities in Sweden and China.* (PhD Dissertation), Lund University.
Möttonen T (2016) Construal in expression: intersubjective approach to cognitive grammar. University of Helsinki, Helsinki
Mouratidou A (2020) Choice awareness and manipulation blindness: a cognitive semiotic exploration of choice-making. Public J Semiot 9(1):1–40
Nisbett RE, Wilson TD (1977) Telling more than we can know: verbal reports on mental processes. Psychol Rev 84:231–259
Öhman A (2009) Of snakes and faces: An evolutionary perspective on the psychology of fear. Scand J Psychol 50(6):543–552
Petitmengin C, Bitbol M (2009) The validity of first-person descriptions as authenticity and coherence. Journal of Consciousness Studies 16(10–12):363–404
Pielli L, Zlatev J (2020) The cyborg body: potentials and limits of a body with prosthetic limbs. Cognit Semiot 13(2):2020–2033
Pollio HR, Henley TB, Thompson CJ (1997) The phenomenology of everyday life. Cambridge University Press, Cambridge
Ricoeur P 1966 (1950) *Freedom and nature: the voluntary and the involuntary*, trans. Erazim Kohak. Northwestern University Press, Evanston
Sages RB, Lundsten J (2009) Meaning Constitution Analysis: a phenomenological approach to research in human sciences. In G. Aikaterini & K. Mylonas (Eds.), *Quod Erat Demonstrandum: From Herodotus' ethnographic journeys to cross-cultural research: Proceedings from the 18th International Congress of the International Association for Cross-Cultural Psychology*. Pedio Books Publishing, Athens
Schupp HT, Öhman A, Junghöfer M, Weike AI, Stockburger J, Hamm AO (2004) The facilitated processing of threatening faces: an ERP analysis. Emotion 4(2):189–200
Searle JR (1992) The rediscovery of the mind. MIT Press, Cambridge
Slife BD, Wright CD, Yanchar SC (2016) Using operational definitions in research: a best-practices approach. J Mind Behav 37(2):119–139
Sokolowski R (2000) Introduction to phenomenology. Cambridge University Press, New York
Sokolowski R (2008) Phenomenology of the human person. Cambridge University Press, New York
Sonesson G (2009) View from Husserl's lectern. Cybern Hum Knowing 16(3–4):107–148
Stampoulidis G, Bolognesi M, Zlatev J (2019) A cognitive semiotic exploration of metaphors in Greek street art. Cognit Semiot 12(1):20192008
Tsao DY, Livingstone MS (2008) Mechanisms of face perception. Annu Rev Neurosci 31:411–437
Valenza E, Simion F, Cassia VM, Umiltà C (1996) Face preference at birth. J Exp Psychol Hum Percept Perform 22(4):892–903
van Manen M (2014) Phenomenology of practice. Routledge, London and New York
Wegner MD (2006) Who is the controller of controlled processes? In: Hassin R, Uleman JS, Bargh JA (eds) The new unconcious. Oxford University Press, New York
Wegner MD (2018) The illusion of consious will. MIT Press, Cambridge
Whitehead MP (2017) Psychologizing: a personal, practised-based approach to psychology. Rowman and Littlefield, Lanham
Zahavi D (2003) Husserl's phenomenolgy. Stanford University Press, Stanford
Zahavi D (2010) Naturalized phenomenology. In: Gallagher S, Schmicking D (eds) Handbook of phenomenology and cognitive science. Springer, Dordrecht, pp 2–19
Zahavi D (2014) Self and other: exploring subjectivity, empathy, and shame. OUP, Oxford
Zlatev J (2009) The semiotic hierarchy: life, consciousness, signs and language. Cognitive Semiot 4:169–200
Zlatev J (2010) Phenomenology and cognitive linguistics. In: Gallagher S, Schmicking D (eds) Handbook of phenomenology and cognitive science. Springer, Dordrecht, pp 415–443
Zlatev J (2015) Cognitive semiotics. In: Trifonas P (ed) International handbook of semiotics. Springer, Dordrecht, pp 1043–1067
Zlatev J (2016) Turning back to experience in Cognitive Linguistics via phenomenology. Cognit Ling 27(4):559–572
Zlatev J (2018) Meaning making from life to language: the semiotic hierarchy and phenomenology. Cognit Semiot 11(1):20180001
Zlatev J, Möttönen T (2022) Cognitive linguistics and semiotics. In: Pelkey J (ed) Bloomsbury semiotics, vol 4. Bloomsbury, London

Paper 2

Alexandra Mouratidou*, Jordan Zlatev and Joost van de Weijer

The body says it all: Non-verbal indicators of choice awareness

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Abstract: Recent cognitive science research suggests that occasional "blindness" to choice manipulations indicates a lack of awareness in choice making. This claim is based on participants' tendency not to detect choice manipulations and the similarity between their justifications for choices they made and those they were tricked into believing they made. Using a cognitive-semiotic framework, we argue that such conclusions underestimate the embodied, intersubjective nature of human meaning-making. We support this by investigating choice awareness beyond language to include non-verbal behavior. Forty-one participants were asked to choose from pairs of photographs of human faces the one they found most attractive and then to justify their choices, without knowing that for some of the trials they were asked to justify a choice that they had not made. Verbal responses were categorized as (i) non-manipulated, (ii) detected manipulated, and (iii) undetected manipulated trials. Bodily expressions, assessed using five different Categories of Bodily Expression (CBE): Adaptors, Torso, Head, Face and Hand expressions, revealed differences in: (a) duration, (b) rates of occurrence and (c) variety of the CBEs across trials. Thus, even when manipulations were not verbally detected, participants took longer to assess choices, showed increased bodily expressions, and engaged more body parts in undetected manipulations compared to non-manipulated choice trials. This suggests a degree of awareness to the choice manipulation, even if pre-reflective, manifested in participants' bodily expressions.

Keywords: adaptors; gestures; choice making; phenomenology; bodily expressions

1 Introduction

Research in cognitive science influenced by physicalism often shares the premise of the illusory nature of conscious will, focusing its scientific inquiries on the mechanisms

***Corresponding author: Alexandra Mouratidou**, Division for Cognitive Semiotics, Lund University, Lund, Sweden, E-mail: alexandra.mouratidou@semiotik.lu.se
Jordan Zlatev, Division for Cognitive Semiotics, Lund University, Lund, Sweden, E-mail: jordan.zlatev@ling.lu.se
Joost van de Weijer, Humanities Laboratory, Lund University, Lund, Sweden,
E-mail: joost.van_de_weijer@ling.lu.se

that underlie our purportedly false experiences of agency (Bargh and Ferguson 2000; Dennett 1991, 1996; Johansson et al. 2013; Libet 2005; Wegner 2018). For instance, our occasional tendency to justify a choice that we were tricked into believing we made has been treated in so-called *choice blindness* experiments (e.g., Johansson et al. 2005) as evidence of our unreliability as conscious agents. Such findings have been seen as supportive of a body of research, prevalent over the last half of the century, on the limits and fallibility of introspective reports and conscious experience. The reliability and use of first-person reports remains, however, a focal point of an ongoing debate within cognitive science (Jack and Roepstorff 2003, 2004; Overgaard 2006; Petitmengin 2009a, 2011; Varela and Shear 1999).

An alternative approach, based in cognitive semiotics, posed the question of whether it is justified to draw inferences about our lack of *choice awareness* just because participants in "choice blindness" experiments end up verbally justifying choices they had not made (Mouratidou 2020; Mouratidou et al. 2022). A different, and arguably more adequate term was proposed, *manipulation blindness*, since what such observations can at most show is unawareness concerning the switch of one item with another, not of the choice itself. Mouratidou (2020) explored potential factors influencing manipulation detection in a choice experiment, focusing on *memory*, *affectivity*, and *consequence*.[1] The first two of these factors had significant effects, as participants detected most of the choice manipulations when they remembered their original choice. In the experiment, 43 Greek participants were asked to choose from 20 pairs of photographs of human faces and from 20 pairs of abstract figures the ones they preferred (see Figure 1A and B). After going through all the pairs, they were asked to confirm whether a face or figure was the one they had chosen (C). Finally, they were asked to justify the choice they made in B. Without the participants' knowledge, four face trials and four abstract figure trials were manipulated by asking participants to justify why they had preferred an item which they actually had not (D).

Further analysis of the verbal justifications of both actual (i.e., non-manipulated choice trials) and manipulated choice trials showed differences in terms of *choice investment*: the "mattering" or meaningfulness of a choice in an act of choice making (Mouratidou et al. 2022: 606). Acknowledging the relationship between pre-verbal consciousness and language, a distinction was made between pre-verbal and verbal choice investment. Participants' verbal responses were analyzed along with a set of semantic categories, formulating a matrix of eleven markers of choice investment. A greater degree of investment was predicted when motivating (a) choices of faces

1 *Memory* was operationalized as the participants' ability to remember and recall their choices, *affectivity* as stimuli with different degrees of abstractness and presumed affective value (i.e., human faces vs. abstract figures), and *consequence* as different choice tasks assigned to the participants, assuming either more permanent effects (like getting a tattoo), or not.

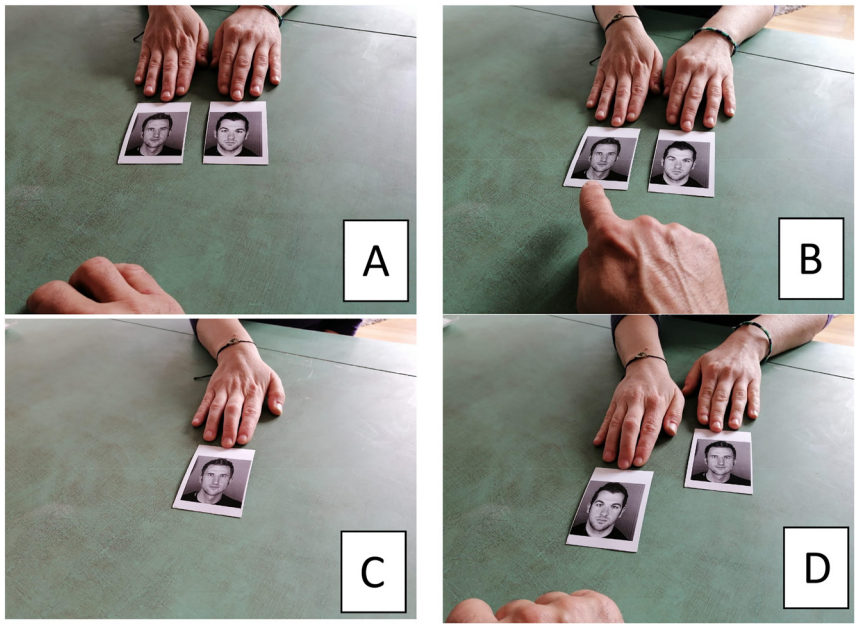

Figure 1: The choice manipulation procedure. (A) The participant is presented with two alternatives and, (B) asked to make a choice; (C) then asked if they had indeed chosen this, and (D) finally asked to justify their choices, where in a number of trials (manipulations) the non-chosen alternative in B was presented as their choice.

than figures, due to their different status in terms of affectivity; (b) manipulated than actual choices, since participants' conflicting experience in such choice trials would influence them to be more invested in explaining a choice that was not their own than when it was (e.g., by explaining the reasons for not making such a choice when the manipulation was detected, or by reconsidering it anew through a comparison of both alternatives); and (c) detected than non-detected manipulations, due to the assumption that choices that mattered more for participants would be more often detected than those that did not (see Section 3.3). These predictions were confirmed, but with various strengths, leading to conclusions for both consilience and differences between pre-verbal choice investment and the corresponding verbal motivations of the choices made, and thus for (degrees of) conscious awareness of choice making.[2]

2 In particular, more aligned markers of investment were found for (c), validating the assumption about the relationship between choice awareness and investment, while fewer markers of choice investment were found for (b), where the discrepancy between pre-verbal and verbal choice investment was more strongly reflected.

The discipline of *cognitive semiotics*, within which these investigations of choice making and manipulation detection have been carried out, acknowledges correspondences – but not identity between non-verbal experience and language, in line with research in phenomenology (Merleau-Ponty 1962; Sokolowski 2000). By integrating concepts and methods from linguistics, cognitive science and semiotics (Konderak 2018; Sonesson 2009; Zlatev 2015), cognitive semiotics focuses on the study of aspects of meaning and their interrelations, with consciousness (intentionality, in the broad phenomenological sense of the term) and meaning-making as two closely interrelated aspects of our interaction with the world and others (Zlatev 2018; Zlatev and Konderak 2022).

One of the principles of cognitive semiotics is that of *phenomenological triangulation* (e.g., Mendoza-Collazos 2022; Pielli and Zlatev 2020; Zlatev 2009; Zlatev and Mouratidou 2024), where any given phenomenon is methodologically approached by a plurality of perspectives. Starting with a first-person perspective and by reflecting on our own experiences on the matter, the phenomenon is then studied from an intersubjective, second-person perspective (e.g., through interviews, observations, etc.), and finally (and optionally) also through a more detached, third-person perspective (e.g., systematic coding, physiological measurements, etc.). What such phenomenological triangulation implies is that third-person methods are never sufficient on their own, nor, strictly speaking, necessary. Rather, they must be preceded by, and complemented with, first-person and second-person methods. Thus, no matter the ontological status of the phenomenon, the perspectives of the first and second-person are always at play, even if backgrounded, in line with the phenomenological dictum of the primacy of consciousness as the means through which everything is given to us, including scientific knowledge.

Another methodological principle of cognitive semiotics is that of the *conceptual-empirical loop* (e.g., Devylder and Zlatev 2020; Mendoza-Collazos 2022; Stampoulidis et al. 2019; Zlatev 2015), postulating the need to integrate philosophical and empirical investigations. The dialogue between "what" and "how" questions involves numerous iterations of the loop, where theoretical constructs are formulated, and further operationalized as appropriate for the empirical study in question (see Section 3.2). Thus, both of these tools are required for investigations that are committed to remain true to the original phenomenon and to elucidate it further.

One key concept of cognitive semiotics is that of *polysemiosis*: communicating by the simultaneous use of two or more semiotic systems, which could be sign systems like language, gesture and depiction, or signal systems like bodily postures and spontaneous facial expressions (Zlatev et al. 2020). Such semiotic systems involve different degrees of awareness both from the producer's and the interpreter's side. A gap in the studies mentioned above (i.e., Mouratidou 2020; Mouratidou et al. 2022) was that we did not consider any other semiotic system but language as indicative of choice awareness

and investment. To address this, we here propose a novel approach to the investigation of choice awareness and manipulation detection. In the present context, this implies the analysis of the polysemiotic utterances, consisting of both verbal, and bodily signs and signals. The objectives of the investigation are thus (a) to go beyond language into other bodily sign systems (e.g., hand gestures) and signal systems (e.g., adaptors, i.e., movements that satisfy personal needs and respond to environmental triggers) that involve different degrees of awareness both from the producer's and the interpreter's side, and (b) to expand our understanding of the interaction between different semiotic systems in two conditions: manipulated choices (when participants are asked to justify choices they did not make), and actual choices (when participants are asked to justify non-manipulated choices, i.e., the choices they actually made).

The structure of the remainder of the paper is as follows. Section 2 offers the theoretical background concerning polysemiotic communication, with focus on language, gestures and adaptors. Section 3 describes the methodology. The results and discussion are presented in Section 4, followed by the conclusions in Section 5.

2 Theoretical framework

Human communication is in most circumstances *polysemiotic,* relying on the interaction of different semiotic systems, as well as *multimodal*, relying on the combination of two or more sensory modalities like vision and hearing. These two dimensions are in fact orthogonal, even if they are often conflated in the literature (for a discussion, see Green 2014; Zlatev 2019; Zlatev et al. 2023). Semiotic systems can be either *sign systems,* including (most of) language, gesture and depiction or *signal systems* like postures and adaptors (see below). Both kinds consist of pairings of expression and meaning. However, only signs can denote things, properties or events, while the meanings of signals are not denotational (Zlatev et al. 2020). Thus, most (but not all) words and hand gestures qualify as signs. Various kinds of bodily movements (e.g., scratching, yawning, etc.) that do not denote, and in general are more constrained in what they can express, function as signals. Finally, other bodily expressions involving the head and face have somewhat intermediary status: if produced with communicative intent and/or denotational meaning they count as gestural signs (Andrén 2010; Kendon 2004). Else, they count as signals, as we explicate below.

The sign system of *language* is uniquely characterized by double articulation: phonemes or graphemes combine systematically to form meaningful morphemes, and by high degrees of conventionality (Clark 1996) and normativity (Itkonen 2003) of simple and complex linguistic signs (e.g., sentences). The syntactic relations are characterized by compositionality, where the meaning of a composite sign is built

up (at least in part) from the meanings of its constituent signs and the rules for combining these, though not in a mechanical "building block" manner, given the context-sensitivity of linguistic meaning (Goldberg 1995, 2006; Zlatev 1997).

When bodily expressions qualify as signs, they have denotational meaning. This can be categorized by the predominant, but not exclusive, type of *semiotic ground* (Sonesson 2010) between expression and denoted object (Zlatev et al. 2020): *iconic* (resembling the object), *indexical/deictic* (bringing the object to attention), and *symbolic* (denoting the object on the basis of a socially shared convention). In addition, such expressions may also have non-denotational meaning, expressing emphasis, modality (uncertainty, rejection, etc.), and affect (surprise, repulsion, etc.) (Ekman and Friesen 1969; Kendon 2004; Streeck 2009). In such cases the non-denotational meaning contains information about the speaker's *attitude*.

The ordinary language term "gesture" is highly ambiguous, but here we understand it in the sense of one of the pioneers of the field, Kendon (2004: 14), as denoting bodily "movements that (…) manifest deliberate expressiveness to an obvious degree". We can usefully complement this with the proposal of Andrén (2010) that the semiotic system of gesture can be distinguished from bodily signals and practical actions on the basis of one or both of the two criteria: sign function or overt communicative intent. The border between gestures and non-deliberate bodily signals is fluid, especially for articulators like the head, face, and body trunk.

An intermediary phenomenon with respect to conventionality are so-called *recurrent gestures:* a type of co-speech gestures that are to some extent conventional in the sense of commonly repeated, and thus to a degree socially shared. Although recurrent gestures are context dependent, they have relatively stable expression-object relations, albeit not as conventional as emblems or words (Bressem and Müller 2014; Kendon 2004; Ladewig 2014a; Muller 2017). While emblems (like the OK-gesture) are apt in replacing speech, recurrent gestures are usually part of a polysemiotic utterance and may have both denotational and non-denotational meaning. A good example is that of the *shrug*, which according to Debras (2017), qualifies as a recurrent gesture complex – although it has been customarily classified as an emblem (Kendon 1981; Efron and Van Veen 1972; Ekman and Friesen 1969, 1974; Ekman et al. 1976). What characterizes the shrug is a form of "compositionality" or in other terms: compound enactment (Streeck 2009), shrug complex (Morris 1994) or shrugging composite (Given 1977). The point is that the different bodily "components" of the gesture can be autonomous, but still interdependent.[3] This extends to other emblems, usually performed with a hand gesture and a facial expression (e.g., Calbris 1990; Poggi 2002, etc.).

3 For example, epistemic indetermination can be expressed with the face only (mouth shrug) and/or a body movement, while common ground can be expressed with a shoulder lift (Debras 2017), but also with a palm-up open hand gesture (Holler 2010). Note that this use of the term "compositionality" is

A class of sensory-motor movements that mostly fall on the signal side of the sign/signal divide are *affect displays*, expressing spontaneous information about the nature and the intensity of affect like surprise, indifference, or repulsion (Ekman and Friesen 1969). Another type of bodily signals are *adaptors*, which function as part of a total adaptive system (e.g., to satisfy bodily needs, manage emotions, learn instrumental activities, etc.). Unlike gestures, they are responses to environmental triggers that are not intended to communicate a message, and (generally) performed without (focal) awareness (Ekman and Friesen 1969: 84). Adaptors have been categorized differently according to their form and function (Ekman and Friesen 1969; Freedman 1972), but a major distinction is whether they are geared towards one's body (self-adaptors) or an external object. It has been claimed that in communicative settings where ambiguous, interfering, and conflicting cues are involved, "the speaker is likely to turn to soothing, grooming, rubbing, or scratching, as ways of confirming the boundaries of the self at the time when the sharing of thoughts is also required" (Freedman 1977: 114). Based on psychotherapy and forensic research (e.g., Ekman 1991, 1999, 2009; Ekman and Friesen 1969, 1976; Ekman et al. 1991), adaptors have been analyzed as indicators to deception "leakage" (i.e., the unintentional betrayal of the truth through demeanor) or more generally of high emotional and cognitive load (Ekman 2009).

Both affect displays and adaptors have been observed to be sometimes "discordant" with the message people explicitly convey - through speech and possibly also (some) gestures – in deception interactions. This is consistent with the sign versus signal distinction, given that signs require at least potential consciousness of the denotational relation between expression and intentional object, while signals do not (Zlatev et al. 2020).[4]

In sum, gestures that usually involve different parts of the body (such as a shrug or a nod) can be regarded as both denotational, since their form and meaning remain relatively fixed in different contexts and for different speakers, as well as non-denotational, reflecting participants' attitude (e.g., certainty, surprise, etc.). Other bodily expressions, which can have relatively stable meaning but also differ in form across contexts and speakers, have only non-denotational meaning (e.g., lips downwards and eyebrows lifted, puckering the lips when saying *hmmm)*. Finally, simple movements usually performed without speech (e.g., participants licking their lips) lack both denotational and non-denotational meaning. Thus, signs always have denotational and

different from that in semantics: that the meaning of the whole sentence is a function of the meaning of the parts, and their mode of combination (e.g., Partee 1984).

4 As reflected in the definition given by Zlatev et al. (2020: 160): "A sign <E, O> is used (produced or understood) by a subject S, if and only if: (a) S is made aware of an intentional object O by means of expression E, which can be perceived by the senses. (b) S is (or at least can be) aware of (a)", where signs required both (a) and (b) to be fulfilled, while for signals (a) is sufficient.

sometimes also non-denotational meaning. Signals can at most have non-denotational meaning, even if some of these expressions can have some degree of conventionality. Finally, adaptors and purely practical actions, mostly connected with the head and the upper body, serve practical aims rather than purposes of communicative expressions. These conceptual distinctions have been implemented in the coding system described in the following section.

3 Methods

3.1 Participants and procedure

To explore manifestations of choice awareness in different semiotic systems, we adapted the choice manipulation experiment used by Mouratidou (2020) that was briefly described in the introduction. 41 Greek participants (roughly balanced for gender) were shown 20 pairs of photographs of human faces (10 pairs depicting female faces, 10 pairs depicting male faces) and chose the person they found most attractive (see A and B in Figure 1). After that, the participants were presented with the initial pairs and were asked to justify their choice, without knowing that four trials were manipulated by deliberately asking them to justify their non-preferred choice (see D in Figure 1). The verbal responses to these manipulated trials were categorized according to the type of detection and type of response, following Mouratidou's (2020) categorization of participants' response patterns, into three levels of detection: (a) *clear*, when participants rejected the manipulated item as their own, (b) *possible,* when participants either questioned or did not justify the presented item as their choice but did so for its alternative (i.e., their actual choice), and (c) *none,* when they accepted the manipulated choice but without offering a justification, when they evaluated it as of equal weight with the alternative, or when they justified it as their own. Thus, each level of manipulation detection included one or more patterns that characterized participants' responses (i.e., *denial, uncertainty, ignorance, indifferenc*e, and *acceptance*) given for manipulated choices. All verbal interactions took place in Greek, the native language of the first author, who led the experiment.

3.2 Coding and analysis

Developing a coding system for polysemiotic communication is a complex methodological process. While the literature offers information about annotation schemes, detailed descriptions of the process of their development are lacking. As Stec (2015: 61) points out:

> Annotation work is treated as a final product rather than as a process which involves watching the data, creating and piloting an annotation scheme with multiple passes through one's data, improving that scheme as one makes new observations or encounters unexpected difficulties, implementing it and obtaining (if desired) measures of inter-rater reliability. However much we would like annotation schemes to be "objective" measures (…), they reflect theoretical choices and interpretations at every step of the way.

Our coding system concerns the semiotic systems described in Section 2, implemented in the ELAN video annotation software (Wittenburg et al. 2006). Methodologically, we used the conceptual-empirical loop (see Section 2): we began by distinguishing between different semiotic systems on the basis of phenomenologically grounded theoretical concepts, and established fine-tuned distinctions as we went along. On the empirical side of the conceptual-empirical loop, decisions on which semiotic systems were relevant for the analysis and further operationalizations relied on the specifics of the collected material. The coding system shown in Appendix A (Table A.1) is the result of several iterations of this loop. The collected video-recordings were watched multiple times throughout the coding process and the system was revised as a result of subsequent viewings of the data.

Schematically, the process can be summarized in four major plateaus, with multiple smaller steps in between. First, we developed a coding system based on the cognitive semiotic concepts defined in the previous sections as well as our observations of the data and then used it to code seven participants. Through this testing process, elements that needed to be revised or further considered and adapted became obvious. We noted them down during the coding of each participant and addressed them in subsequent meetings. At this stage, most changes were made with respect to (a) the form of all bodily expressions (see Table A.1), mainly adding or specifying values that were missing; and (b) the structure of the ELAN template. Second, a new template was created, which we used to code the rest of the material. Again, new observations and difficulties occurred and these were noted down. These concerned mostly cases where it was not clear where specific bodily expressions fall, implying that further decisions needed to be made (e.g., to distinguish between when an expression serves only a practical aim or reflects some kind of participant's attitude). When the first complete round of coding was made, we addressed these issues in multiple meetings among us. Third, we adapted the template accordingly and re-coded the material. Fourth, a final pass was made, checking for consistency across the coded files.

The polysemiotic utterances that were coded had been generated as responses to the question "why did you choose this picture card", while the participants were presented with the card they had chosen and the alternative they had rejected. Thus, a *polysemiotic utterance* corresponds to each choice trial that the participants were presented with and were asked to justify. When the presented picture card was the participant's actual choice (i.e., the non-manipulated one), it was coded as an *Actual*

choice trial; when the presented picture card was the alternative that the participant had initially rejected, it was coded as a *Manipulated choice* trial. Eight polysemiotic utterances (4 for Manipulated and an equal number of 4 for Actual choice trials) for each participant (in total 37 participants) were coded.[5] We, thus, labeled the first tier, *Trial,* as *Manipulated* or *Actual,* and the transition from one to the next as *Transition,* and transcribed speech in the next tier (i.e., *Speech*).

The remaining tiers were ordered as five different Categories of Bodily Expression (CBE) on the basis of a tentative cline from signals to signs (see Section 2): (A) Adaptors, (B) Torso expressions, (C) Head expressions, (D) Face expressions and (E) Hand expressions, explained below.

Each one of these was preceded in the ELAN template by a tier specifying (if possible) which picture was being focused on, using, besides the video, the speech as main evidence: *Chosen*, when they talked about the chosen item; *Non-chosen*, when they referred to the non-preferred item; *Pair*, when both cards were referred to as a pair, and *Other,* when participants provided generalized references irrelevant with the specific choice trial, or comments that were vague in regards to which item they referred to (such as *let's see, that's it*, etc.).

The category (A) Adaptors were treated as clear signals, involving movements of *Hand to hand*, *Hand to body*, and *Hand to object,* with no denotational meanings. Hence, their meanings were listed as three different affect-related functions (*Gentle self-ministration*, e.g., stroking, soothing, etc.; *Punitive self-ministration*, e.g., squeezing, scratching, biting, etc.; and *Adjustive*, e.g., adjusting one's glasses). The value *Unclear* was used when the quality of self-ministration could not be specified.

Categories (B-E) can, but need not, have sign status (see Section 2), and when they did have sign status, they always received a value for denotational meaning: *Deictic*, *Iconic*, *Symbolic*, or *Unclear* (when more than one value was possible). Additionally, they can also have non-denotational meaning *Attitude, Other* and *Movement.* Attitude was used for coding participants' expressions of emphasis, modality and affect, while other was used for spontaneous and idiosyncratic gestures (often produced when participants tried to come up with a specific word). Movement was used to code subtle physical movements in space rather than purposes of communicative expression.

For (B), Torso expressions, we coded *Forward, Back, Shrug* and *Other* (e.g., turning right and left in their chair). (C) involved Head turning from *Right/left*, *Down/up*, and *Forward/back* (and vice versa). Some of these expressions were combined into one (e.g., head tilted to the right while pushed forward), and in such cases, the expression that seemed to prevail more was coded. Category (D) included face expressions with the *Eyebrow(s)* (e.g., up/down), *Mouth* (e.g., lips downwards), *Both* (e.g., eyebrows up and mouth downwards, like in surprise), and *Other* (e.g., when the

5 The data from four participants were excluded due to malfunction of the camera.

whole face was involved in a particular expression; when the participant wrinkled their nose, like in repulsion, etc.). Finally, for category (E), Hand movements performed with one or more *Finger(s)* were coded; one *Hand* or *Both hands*; and *Move*, when participants moved one or both of the picture cards (e.g., pick up, push away, bring forward, etc.). To sum up, if categories (B-E) were judged to have signal status, then no value for denotational meaning was given, but they could still have non-denotational meaning. Thus, each instance of categories (B-E) could have values for both the denotational and non-denotational tiers, or for only one. Finally, the last two tiers were those of *Manipulation status,* specifying the type of detection and *Comments,* for any additional notes the annotator wished to make.

Since the goal of the study was to explore manifestations of choice awareness in the interaction of language with other semiotic systems, decisions on coding for the meaning of the bodily expressions relied to a great extent on how these appeared in coordination with speech. That was the case even for emblems, which, despite claims to the contrary (e.g., McNeill 2005), tend to co-occur with speech (Kendon 2008; Poyatos 1981). Likewise, headshakes and nodding, that can be more or less translatable into words (e.g., response particles like "no" and "yes"), most often interact polysemiotically with speech (e.g., Andrén 2014; Boholm and Allwood 2010).[6] Two independent raters coded 10 % of the data. The degree of interrater agreement was 90.2 %.

3.3 Hypotheses

Mouratidou et al. (2022) somewhat paradoxically argued that participants' verbal utterances for manipulated choices would be marked by a higher degree of *investment* than justifications for actual choices, especially so when manipulations were detected (and the original choice needed to be re-confirmed). The reasoning for that was that even when participants did not detect the manipulation, they would still treat these trials "as more demanding, and therefore would require more effort to (a) assess the presented alternative as a potential choice, (b) provide reasons that resonate with their experiential life and (c) communicate them to the experimenter" (ibid: 710). The higher degree of cognitive and experiential complexity of such trials was proposed to be reflected in higher rates of verbal choice investment. Here, we extend the claim made in regard to investment expressed in language to non-verbal production and hypothesize that since participants will in general be required to

6 The recurrent combinations of some gestures with particular words and expressions of spoken language are discussed by Andrén (2014) as "multimodal constructions" (148), or "polysemiotic constructions" in our framework, though we need to pay heed to not overusing the term "construction", which was originally defined as a "conventional, learned form-function pairings at varying levels of complexity and abstraction" (Goldberg 1995, 2006).

"work harder" and either imagine a situation in which they will make such preference, or else reason as to why they would maintain their original preference:

H1: Higher rates and a wider variety of bodily expressions will be present in the polysemiotic utterances produced for the manipulated than for the actual choice trials – at least for some of the semiotic systems.

Further, Mouratidou et al. (2022) hypothesized that the detected manipulations would provide the most conflicting experiences, requiring effort from the participants, which would be manifested in their verbal expressions. This implies that as the experiential complexity of the situation decreases from detected manipulations to non-detected and to actual choice trials, the language used to justify the choices would be simpler (ibid: 709). Again, extending this reasoning beyond language, participants' bodily expressions can be expected to be influenced by the complexity of the task: while in the detected manipulations the inconsistency between the presented manipulated item and the initially chosen one would be verbally and bodily expressed, in non-detected manipulations, the verbal expression of detection would be lacking, but the presented item (the manipulated choice) could still be perceived as odd, surprising, or confusing, albeit without these impressions being verbally communicated. In such cases, the manipulation would be considered as (verbally) non-detected, but there could still be indicators of participants' perplexity manifested in their bodily expressions. Thus, we formulated the following hypothesis:

H2: Higher rates and a wider variety of bodily expressions will be present in the polysemiotic utterances produced for (a) detected than non-detected manipulations and (b) non-detected manipulations than actual choice trials.

Finally, based on our theoretical framework and previous research on the sign versus signal distinction, we hypothesized that since signs require (reflective) consciousness of the denotational relation between expression and object, while signals do not, there will be differences in how the five different Categories of Bodily Expressions (CBEs) are used in manipulated and actual choice trials:

H3: Higher rates and a wider variety of signs will be present in the polysemiotic utterances produced for (a) detected than non-detected manipulations and (b) non-detected manipulations than actual choice trials. Inversely, a higher proportion and a wider variety of signals will be present in the polysemiotic utterances produced for (a) non-detected than detected manipulations and (b) detected manipulations than actual choice trials.

The motivation of the hypotheses reflects the methodological application of phenomenological triangulation, where the phenomenon under study is approached from first-person, second-person and, potentially also the detached third-person perspective (see Section 1). Thus, the claim of higher experiential complexity during manipulated trials rests first on our own experiences, thinking how puzzling it is when we face a choice we had not made (e.g., being served a different dish to the one we have ordered in a restaurant, opening the bag from the grocery store to find out a different kind of yogurt than the one we usually buy, etc.). And even more so, during a forced choice task, where someone of (assumed) authority is physically present and claims it to be ours, "forcing" us to defend our choice and restore the mistake, as opposed to situations where things progress smoothly without tensions or surprises (e.g., the non-manipulated trials).

In line with the second-person perspective, having conducted previous experiments on manipulation blindness, we have noticed differences in participants' behavior (verbal and non-verbal) when they were presented with manipulated choices as opposed to their own, motivating the shift of our focus of research to non-verbal expressions. We thus extend the claim of our previous work to bodily expressions, drawing from cognitive linguistics (e.g., Langacker 1987, 2006) and phenomenology, and supported by work on various fields involving people's verbalization of their experiences, such as psychotherapy and micro-phenomenological interviews (e.g., Goldman 2005; Hendricks 2002, 2009; Petitmengin and Bitbol 2009). These suggest correspondences between experience and language and that when there is congruence between them, the language used by the subjects tends to be simpler.

Finally, even third-person research on non-verbal behavior supports such claims: as stated in Section 2, adaptors have typically been considered as indicators of deception "leakage", and more generally of high emotional and cognitive load, predicting their occurrence in communicative settings where ambiguous, interfering, and conflicting cues are involved. Likewise, affect displays have been claimed to be "discordant" with the message people explicitly convey through speech and gestures in deception interactions. Hence, it is only natural to assume that during the manipulated trials, participants either being ambivalent between the two choice alternatives or detecting the manipulation would for example (a) use more pointing gestures to argue for "this picture" over "that picture"; (b) would produce more adaptors in this conflicting situation; and (c) express their surprise, puzzlement, etc. with their facial expressions.

In the following section, we present the results of the three hypotheses in a logical order that can be likened with a funnel. H1 focuses on the differences between the polysemiotic utterances produced for manipulated and actual choice trials. H2 concentrates on the differences between detected versus non-detected manipulations, and non-detected manipulations versus actual choice trials. Finally, the

H3 narrows down to explore potential differences between signs and signals in manipulated (both detected and non-detected) and actual choice trials. Our third-person method combined inferential and descriptive statistics. We used mixed effects regression models to compare the outcome variables between the manipulated and the actual choice trials, and then once again between the detected and non-detected manipulated trials and the actual trials. The analysis was performed in R version 4.4.0 (R core team 2024), using the package lme4 (Bates et al. 2015). However, in accordance with the lesser importance of third-person methods in cognitive semiotics than in cognitive science in line with phenomenological triangulation, we present and discuss the results of both kinds of statistics on an equal basis.

4 Results and discussion

4.1 General findings

There were 148 responses to actual choice trials, and 143 to manipulated choice trials. Participants' responses to the manipulated trials were almost equally divided between detected 52 % (Clear 41 %, Possible 11 %) (see Section 3.1), and non-detected 48 %. Table 1 shows the average numbers of the five CBEs and the average trial durations for the conditions which our hypotheses below compare: manipulated choice trials as a whole, with detected and non-detected subtypes, as well as actual choice trials.

Table 1 shows that manipulated choice trials were on average more than 5 s longer than actual choice trials. An intuitive way to interpret this is that in the manipulated choice trials participants took more time to either imagine a situation in

Table 1: Average numbers with standard deviations in parentheses of instances of each Category of Bodily Expressions (CBE) and trial duration for manipulated choice trials, detected manipulations, non-detected manipulations, and actual choice trials.

	Manipulated	Manipulated detected	Manipulated non-detected	Actual
CBE				
Adaptors	1.62 (1.95)	1.36 (2.01)	1.94 (1.84)	1.06 (1.41)
Torso	3.36 (3.28)	3.84 (3.58)	2.88 (2.84)	2.54 (2.46)
Head	8.99 (7.93)	10.17 (8.72)	7.79 (6.76)	7.05 (6.36)
Face	3.12 (2.77)	3.31 (2.74)	2.96 (2.79)	2.34 (2.36)
Hand	6.18 (4.67)	7.12 (5.36)	5.22 (3.49)	4.95 (4.11)
Trial duration (seconds)	24.79 (13.82)	27.34 (14.97)	22.16 (11.93)	18.66 (11.67)

which they would have made such a preference, or to elaborate on why they would maintain their original one. The detected manipulations were also significantly longer (see Table 2) than the non-detected, and so were the non-detected when compared with the actual choice trials. Thus, when participants' initial preference matched the presented item, the trials were shortest. In other words, even participants who did not (verbally) detect the manipulation still took more time to assess what was presented to them than when evaluating choices which they had initially made. Due to such differences, we included duration as a covariate in the analysis when comparing the different kinds of trials.

4.2 Manipulated versus Actual choice trials (H1)

The average numbers of CBEs in the manipulated and the actual choice trials are shown in Figure 2. As can be seen, the average numbers are higher in the manipulated choice trials than in the actual choice trials. The relative difference is largest in the Adaptors. In other words, when participants faced inconsistencies between the presented and the initially preferred item, and had to reconfirm their initial choice or explore anew the presented alternative, they more often engaged in body stimulation than when the presented item matched their actual preference. This is in line with previous findings, where adaptors act as a means of regulating sensory input (Freedman 1977: 117). Face expressions were also more often produced during manipulated trials, and so were Torso, Head and Hand expressions. In general, participants used their bodies more often to express themselves during manipulated trials than when they justified actual choices.

Further, we examined differences in the *variety* of bodily expressions between the two conditions by looking at how many of the five CBEs were present in each trial. As shown in Figure 3, a greater number of different CBEs occurred for the

Table 2: Mixed effects regression analysis of Categories of Bodily Expressions (CBE) and trial duration for manipulated and actual choice trials, with significant differences indicated in boldface.

	Estimate	Standard error	*t*	*p*
CBE				
Adaptors	**−0.570**	**0.173**	**−3.300**	**0.001**
Torso	**−0.888**	**0.267**	**−3.322**	**0.001**
Head	**−1.858**	**0.607**	**−3.059**	**0.002**
Face	**−0.751**	**0.260**	**−2.881**	**0.004**
Hand	**−1.222**	**0.461**	**−2.649**	**0.009**
Trial duration (seconds)	**−6.176**	**1.234**	**−5.005**	**0.000**

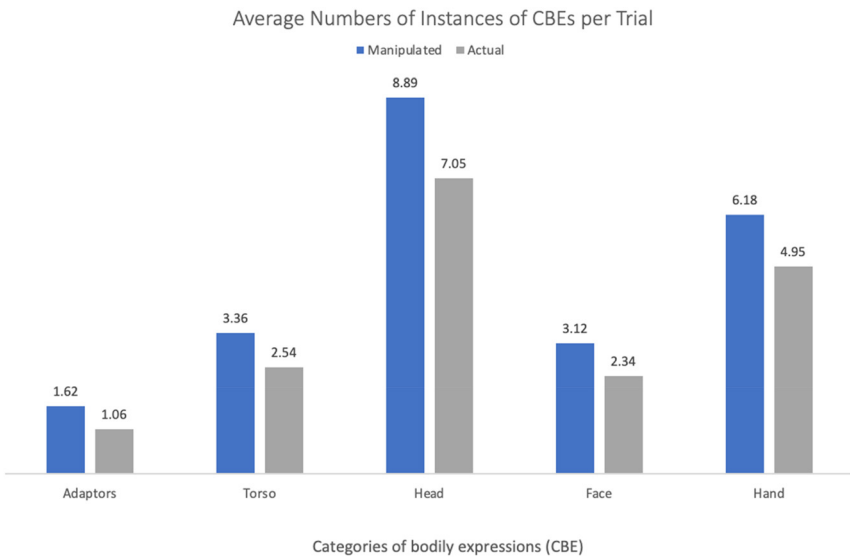

Figure 2: Average numbers of instances of Categories of Bodily Expressions (CBE) for manipulated and actual choice trials.

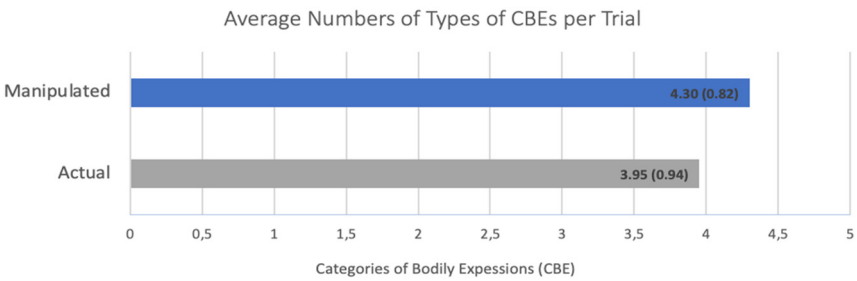

Figure 3: Average numbers with standard deviations in parentheses of types of Categories of Bodily Expressions (CBE) per trial.

manipulated trials. This suggests that the tension between participants' original choice and what was presented to them was manifested in their bodily expressions by engaging more semiotic systems to either refute or reconfirm the presented item as the preferred one.

The results of the mixed effects linear regression analyses of the five CBEs and trial duration for manipulated and actual choice trials, without controlling for the duration, showed that all differences for the five CBEs were statistically significant, as shown in

Table 2. To perform the analysis so is justified, given the considerable differences in length between manipulated and actual choice trials, as shown in Table 1. Even when controlling for duration, the differences between manipulated and actual trials in Adaptors (EST = 0.36, SE = 0.23, t = 1.97) and Variety (EST = 0.18, SE = 0.09, t = 2.04) were significant. In sum, the higher rates and the wider variety of the CBEs found in the polysemiotic utterances for the manipulated trials support the first hypothesis (H1).

4.3 Detected versus non-detected manipulations, and non-detected versus actual choice trials (H2)

As shown in Figure 4, Torso, Head, Face, and Hand expressions occurred on average more often in detected manipulations, followed by non-detected, and, finally, actual choice trials, as predicted by H2. The inferential statistics for detected versus non-detected, and non-detected versus actual choice trials are summarized in Table 3, with significant differences marked in bold. The table shows that differences between *detected and non-detected manipulation trials* were significant for only Head and Hand.

Adaptors, on the other hand, had on average more instances in *non-detected manipulated trials than in detected manipulated and actual choice trials*, and the difference between non-detected manipulated trials and actual was statistically

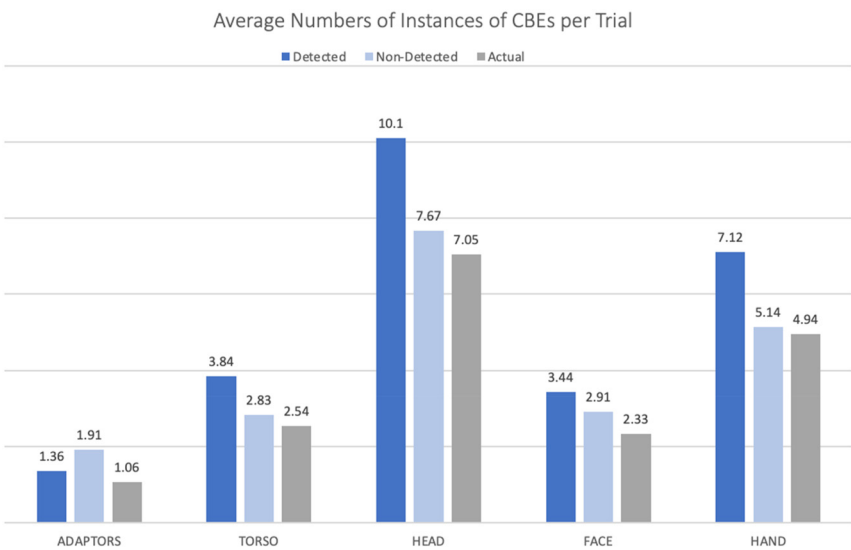

Figure 4: Average numbers of instances of Categories of Bodily Expression (CBE) for detected manipulated trials, non-detected manipulated trials, and actual choice trials.

Table 3: Mixed effects regression analysis of detected and non-detected manipulated trials, and non-detected manipulated trials and actual choice trials for the different Categories of Bodily Expression (CBE) and trial duration, with significant differences indicated in boldface.

	Detected vs. Non-detected manipulations				Non-detected manipulations vs. actual choices			
	EST	**SE**	***t***	***p***	**EST**	**SE**	***t***	***p***
CBE								
Adaptors	−0.211	0.269	−0.784	0.434	**−0.681**	**0.223**	**−3.046**	**0.003**
Torso	0.717	0.414	1.706	0.089	−0.512	0.346	−1.478	0.140
Head	**2.390**	**0.955**	**2.504**	**0.013**	−0.604	0.783	−0.771	0.441
Face	0.507	0.405	1.251	0.212	−0.485	0.336	−1.444	0.150
Hand	**2.031**	**0.703**	**2.889**	**0.004**	−0.156	0.586	−0.267	0.790
Trial duration (seconds)	**5.102**	**1.915**	**2.664**	**0.008**	**−3.500**	**1.581**	**−2.214**	**0.028**

significant (see Table 3). In other words, when participants were presented with the non-preferred alternative as their choice, and without verbally expressing anything that could indicate that they had noticed such inconsistency, they resorted to self or object-stimulation more often than when they detected the manipulation or justified their actual choices. This is consistent with the role of adaptors as "substitutive maneuvers for what is not verbalized" (Freedman 1972: 168), signaling a form of disengagement from a communicative setting (ibid, 174). Thus, the increased rate of Adaptors in the non-detected trials suggests that this category is a possible indicator of choice awareness, albeit of a marginal kind (e.g., Gurwitsch 1974; Koffka 1935).

As far as the *variety* of bodily expressions is concerned, there were on average more categories present in the polysemiotic utterances produced in *detected and non-detected manipulated trials rather than in the actual choice trials* as shown in Figure 5, where the difference between non-detected manipulated and actual choice trials was

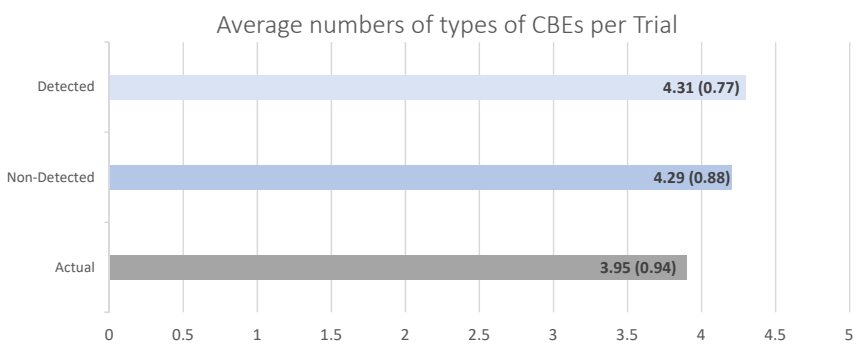

Figure 5: Average numbers with standard deviations in parentheses of types of Categories of Bodily Expression (CBE) per trial.

statistically significant (EST = –0.357, SE = 0.119, t = –3.008, p = 0.003). On the other hand, the average numbers of categories present in *detected and non-detected manipulated trials* were similar, with a non-significant difference (EST = 0.085, SE = 0.142, t = 0.599, p = 0.550). This similarity and the difference between non-detected manipulated and actual choice trials indicate that the mismatch between participants' preference with the presented item was manifested in the ways participants engaged their bodies during the subsequent choice justifications: equally many categories for detected and non-detected manipulations, and fewer in actual choice trials. Note that this holds independently of whether this difference was verbally expressed or not, showing once again the importance of looking for evidence for choice awareness beyond language.

In sum, there were overall more instances for four of the five CBEs and a higher variety in (a) detected than non-detected manipulated trials, and for all five CBEs and a higher variety in (b) non-detected manipulated than actual choice trials. For (a), differences in trial duration, as well as Head and Hand expressions were significant, while for (b), differences in trial duration, and the categories Adaptors and Variety. The findings reported above support the predictions of the second hypothesis (H2).

4.4 Signs and signals in detected versus non-detected, and non-detected versus actual choice trials (H3)

To address the more specific third hypothesis concerning differences between signs and signals, we looked at the values assigned for denotational (i.e., *Deictic, Iconic, Symbolic*) and non-denotational meaning (i.e., *Attitude, Other, Movement*) for all CBEs. Those that occurred less than five times were excluded from the analysis. We base the discussion below on the descriptive statistics.

Table 4 summarizes the average numbers of CBEs with denotational meaning. As can be seen, there were on average more signs in detected manipulated trials, followed by actual, and, finally, non-detected manipulated trials, which is only partly aligned with H3 (i.e., more sign use in detected manipulated trials, followed by non-detected manipulations and actual choice trials.). On the other hand, when looking at the highest rates in each column, the descriptive statistics are in line with the hypothesis.

Notably, *Deictic* hand expressions had higher rates in detected manipulated trials than in non-detected manipulated trials and nearly the same in non-detected manipulated and actual choice trials. This can be interpreted as showing that participants used deictic gestures to differentiate between the two alternative cards when arguing for their initial preference.

There were many more *Iconic* Hand and Face expressions for the non-detected manipulations than in detected manipulated and actual choice trials. For Hand, there

Table 4: Average numbers of different kinds of denotational meaning (deictic, iconic, symbolic) for the different Categories of Bodily Expression (CBE), with highest rates per category indicated in boldface.

Denotational meaning	CBE	Detected manipulated	Non-detected manipulated	Actual
Deictic	Hand	**3.32**	1.95	1.99
Iconic	Hand	0.21	**0.44**	0.20
	Face	0.05	**0.14**	0.09
Symbolic	Hand	0.17	**0.28**	0.20
	Face	**0.24**	0.19	0.09
	Head	**0.81**	0.64	0.60
	Torso	**0.23**	0.16	0.18
Total		**5.03**	3.08	3.35

was no difference between detected manipulations and actual choice trials, while for Face, there were higher rates in actual than non-detected manipulated choice trials. Notably, the differences of Iconic Hand expressions between detected and non-detected manipulations, as well as between non-detected and actual choice trials may indicate that participants used iconic gestures to help imagine reasons for supporting a choice they had not initially made. In the study's choice task, involving human faces assessed on attractiveness, *Iconic* Face expressions may suggest that participants adopted an affective stance expressing their verbal justification (e.g., *he looks mild*) with a matching, iconic face expression.

Symbolic Hand occurred more frequently in the non-detected manipulated trials, followed by actual choice trials and least often in the detected manipulated choice trials. As expected, Face (e.g., ignorance) and Head (e.g., nodding) expressions occurred more frequently in the detected manipulated trials, followed by non-detected manipulated and least often in the actual choice trials. This suggests that participants used such signs to express epistemic modality (uncertainty, rejection, etc.) for the detected and non-detected manipulated trials, and much less so when they justified their actual choices. Symbolic Torso expressions occurred more frequently in detected manipulated trials too, but, followed by actual choice trials and non-detected manipulations.

Turning to non-denotational meaning, Adaptors were the only of the five CBEs that always had *signal* status (i.e., non-denotational meaning). Table 5 shows the average numbers of Adaptors and their affect-related functions across trials.

As expected, there were more Adaptors during non-detected manipulations, followed by detected manipulations and actual choice trials. Looking at the affect-related functions, the majority, in the non-detected manipulated trials, was coded as *Unclear* due to the difficulty of deciding the force by which the expression was

Table 5: Average numbers of Adaptors for Detected, Non-detected and Actual choice trials, with highest rates per category indicated in boldface.

Function	Detected manipulated	Non-detected manipulated	Actual
Gentle	0.37	0.37	0.3
Punitive	0.33	**0.40**	0.24
Adjustive	**0.17**	0.10	0.11
Unclear	0.36	**0.84**	0.48
Total	1.23	**1.71**	1.13

conducted by solely looking at the video recordings (e.g., whether the participants were rubbing or squeezing their arms).

Gentle adaptors occurred roughly similarly in all choice trials, however, *Adjustive* adaptors were more frequent in detected cases than in non-detected and actual, while *Punitive* adaptors were more frequent in non-detected choice trials, and the least for actual. This could be interpreted as follows: when participants verbally detected the manipulation, they either "rewarded" themselves with a gentle self-stimulation or adjusted an object on their body, in a similar manner that they verbally "adjusted" what was presented to them with what they had actually chosen. On the contrary, the fact that most *Punitive* adaptors were performed in non-detected manipulation trials could be seen as an implicit form of participants "punishing" themselves for not verbalizing that something might be wrong with what has been presented to them, channeling the non-verbalised thought back to them with punitive self-stimulation. Consistent with the literature, self-stimulation can be viewed as providing feedback action that regulates the arousal created by the specific condition (e.g., interference, conflict, tension, etc.) (e.g., Freedman 1977; Grand et al. 1975) (see Section 4.4).

Finally, looking at the non-denotational meaning for the CBEs with signal status (see Table 6), against our prediction, there were on average more expressions reflecting *Attitude* (i.e., emphasis, modality, affect) in detected manipulated choice trials, followed by actual choice trials and, finally, non-detected manipulations. Torso and Head expressions were more frequent in detected manipulations, followed by actual choice trials and then non-detected manipulations, while for Face and Hand expressions, the reverse occurred: slightly more in non-detected manipulations, and then in actual choice trials. Similarly, expressions of Movement did not follow the prediction. Torso and Hand *Movement* rates were higher in detected trials, followed by non-detected and actual trials, while there were more Head *Movement*, following the detected choice trials, in the actual manipulations than in non-detected, and most Face *Movement* occurred in actual trials. However, the differences between these were minor.

Table 6: Average numbers of non-denotational meaning for Categories of Bodily Expression (CBE) for detected manipulated, non-detected manipulated and actual choice trials, with highest rates per category indicated in boldface.

Non-denotational meaning	CBE	Detected manipulated	Non-detected manipulated	Actual
Attitude	Torso	**0.63**	0.38	0.53
	Head	**2.01**	1.31	1.46
	Face	**2.00**	1.59	1.54
	Hand	**2.65**	2.04	1.89
Movement	Torso	**2.55**	2.13	2.04
	Head	**3.82**	3.26	3.71
	Face	0.50	0.58	**0.69**
	Hand	**0.24**	0.15	0.14
Other	Hand	0.29	0.47	**0.31**
Total		**14.69**	11.91	12.31

In regards to non-denotational meaning, *Other* expressions were almost double in non-detected manipulations: this category included participants idiosyncratic hand expressions performed when they were searching for a specific word (e.g., *he looks more*…*.more*…*.how to put it*…*sensitive*). The difference of such expressions between non-detected manipulated, detected manipulated and, even more so, actual choice trials could indicate that while for the latter, participants had easier access to their vocabulary to verbally express their choice justifications, in non-detected manipulations, they strove to find specific words and phrases manifested with an increased use of *Other* hand expressions. This trend could indicate an implicit form of manipulation awareness, or at least of experiencing something wrong with the presented choices, expressed with participants making more effort to articulate their thoughts due to the inconsistency between what they had chosen and what was presented to them.

We also looked at the form of the CBEs between different trials. In general, there were few differences apart from the following. For Adaptors, the vast majority for detected manipulated and actual choice trials consisted of self-stimulation of *Hand to*

Table 7: Adaptors form in detected manipulated, non-detected manipulated and actual choice trials, with highest rates per category indicated in boldface.

	Detected manipulated	Non-detected manipulated	Actual
Hand to body	**0.48**	0.30	0.27
Hand to hand	0.08	**0.27**	0.14
Hand to object	0.06	**0.13**	0.05

body, with only a few instances of *Hand to object*. However, for the non-detected manipulated cases, Adaptors were roughly balanced between *Hand to body* and *Hand to hand*, but there were only half as many Hand to object cases. However, Hand to object adaptors were still more than twice as common than in the other conditions (see Table 7).

This is relevant, since distinctions between the form of adaptors have been associated with differences in their function. Freedman (1972: 172) considered adaptors in dyadic communication as "body-focused movements", involving "a depletion of communicative effort and a splitting of the speaker's attention", and linked different adaptors to "different constellations of conflict between what remains unverbalized and is expressed only in motor form, and what is verbalized". Specifically, *Hand to body* adaptors were associated with withdrawal from the communicative interaction, functioning as direct need gratifiers; *Hand to hand* with acute discomfort; while, *Hand to object* with suppressed or repressed thought (when the thought is verbalized, the movements drop out), leading to exploratory and problem-solving behavior. Likewise, Mahl (1968) identified *Hand to object* adaptors as "anticipatory", associated with suppressed or repressed thoughts.

Further, *Hand to hand* adaptors were considered to involve activity which is non-gentle (e.g., squeezing, rubbing, scratching), while *Hand to body* to usually involve soothing, stroking, etc. This is in fact aligned with our findings on the affect-related function of adaptors, where most adaptors were coded as *Gentle* for the detected manipulated cases, rather than in non-detected manipulated and actual choice trials, and *Punitive* occurred more in non-detected manipulations, and the least often for actual choice trials. In sum, adaptors have been linked to different ways of relating to the listener and different levels of verbal articulation, since they entail different forms of resistance to articulation: some inhibiting, others facilitating verbal expressions (Freedman 1972).

Another CBE with difference in its form between detected manipulated, non-detected manipulated and actual choice trials was Face. One of the coded features were Eyebrows: when there was no evidence from speech that participants were expressing Attitude or acted as a component of another bodily expression, it was coded as Movement. On average, there were three times more expressions of this sort in non-detected manipulated cases (0.17), than in detected manipulated (0.05) and actual choice trials (0.06). This may indicate that participants without verbalizing affect of any kind, expressed their surprise by using their eyebrows (a typical facial feature expressing surprise). Thus, this could be regarded as a signal of participants' awareness of something being wrong with the choice that was presented to them as their own, when speech was lacking.

In sum, the third hypothesis (H3) found some support, but only in part. As expected, there were overall most signs (i.e., denotational meaning) in detected manipulated

choice trials. However, this rate was followed by the rate of sign use in actual choice trials and not by the non-detected manipulations as predicted, though the differences between these two conditions were mostly minimal. As for signals, when considering only adaptors (see Table 5), the rates of these were indeed highest in the non-detected manipulated trials, followed by detected manipulated and actual choice trials. However, when considering non-denotational meaning in CBEs in general (see Table 6), the rates were highest in detected manipulated choice trials, followed by actual choice trials and non-detected manipulations, against our prediction. In the discussion above, we suggested some possible reasons for why this could be the case.

4.5 Additional findings

Apart from the results concerning the three hypotheses, we made several relevant observations which we summarize here.

4.5.1 Types of detection: possible detection

For the sake of greater clarity, as the relatively low number of cases of Possible detection (16), this sub-condition was merged with that of Clear detection (59) for the main analysis (see Section 4.1). However, when considering Possible and Clear detection separately, there were some potentially interesting differences.

First, Possible detection trials were on average 12.7 s longer than Clear detection trials. This implies that participants took more time to make sense of the discrepancy between the presented and the preferred item, and/or elaborate on this conflicting experience than when this discrepancy was verbally expressed (Clear detection). Thus, in such cases, uncertainty was expressed with both speech and body.

When we considered Possible and Clear detection together, Face expressions occurred more for detected manipulations, followed by non-detected manipulations and actual choice trials. However, this order differs when we look at Possible and Clear detection separately: there were on average more Face expressions in non-detected manipulations (2.9), slightly less for detected manipulations (2.8) and the least for actual choice trials (2.3). This suggests that when participants were presented with the non-preferred alternative as their choice, they formed more facial expressions than when they detected the manipulation or justified their actual choices. The increased number of instances of Face expressions during non-detected trials implies that the CBE Face could be an indicator of (marginal) choice awareness similarly to Adaptors.

Table 8: Shrug and Symbolic Head shake in detected manipulated, non-detected manipulated and actual choice, with highest rates per category indicated in boldface.

	Detected manipulated	Non-detected manipulated	Actual
Shrug	**0.22**	0.16	0.18
Symbolic head shake	0.12	**0.14**	0.06

4.5.2 Shrug and head shake

We investigated two different bodily expressions expressing (different kinds of) negation: the Shrug and the Head shake (e.g., right to left). Although both could be used alongside participants' verbal expressions like "I don't know", we noticed a difference in the way they were actually used. In general, there was more shrugging in *detected* manipulations and least often in non-detected manipulations, while Head shake occurred slightly more in *non-detected* manipulations and the least in actual choice trials (see Table 8). This may indicate that Shrug, at least in this context, was used to convey participants' expression of *completing the assigned task* (e.g., "I have nothing more to say"), while the Head shake was used *to express genuine ignorance or denial*. The multiplicity of meaning of the shrug has been extensively discussed by Debras (2017: 27–28), taking on "dynamic meanings (e.g., incapacity, inaction), as well as affective (indifference, rejection) or epistemic ones (in the sense that the speaker has nothing new to add to what is already known)". On the other hand, the Head shake can be taken "as part of language in the traditional sense of language as a conventionalized system", as discussed by Andrén (2014: 141). The difference between Head shake in non-detected and actual choice trials (see Table 8) indicates that participants negated more *explicitly* when the choices were manipulated than when they were their own. Thus, this could be regarded as an indicator of choice investment, and potentially even awareness of the manipulation, without this being verbally expressed.

5 Conclusions

Addressing the phenomenon of choice making and manipulation detection from the perspective of cognitive semiotics implies the principle of phenomenological triangulation: systematic calibration of methods based on first-person (e.g. intuition-based), second-person (e.g. social interaction-based) and (optionally) third-person (e.g. quantitative) methods (Pielli and Zlatev 2020; Zlatev and

Mouratidou 2024). Using such an approach and following previous research (Mouratidou 2020; Mouratidou et al. 2022), we have tried to offer deeper insights into the phenomenon of manipulation detection in "choice blindness" experiments, and correlatively, into the phenomenon of choice awareness. When confronted with the situation of having to justify a choice that we have either made in the past or have not, we face a dynamic, more or less experientially complex situation manifested in our verbal expressions and, even further, in how we express this with our body, the ground for all human meaning making, as argued by Merleau-Ponty (1962; cf. Hass 2008).

We would suggest that claims that "we do not know as much of ourselves as we think we did" (Johansson 2006: 39) are based on rather constrained notions of (self) knowledge, underestimating the embodied and intersubjective character of our existence. While we must express our indebtedness to the scholars that initiated the field of "choice blindness" for providing the field with a controversial phenomenon that challenges everyday intuitions, we would argue that by going beyond the perspectives of traditional cognitive science, we can provide a more nuanced account of this phenomenon. After all, the general proposal for such an extension is not new, for example from "cognitivism" to "emergence" to "enaction", as suggested already by Varela et al. (1991), and more recently in phenomenological cognitive science (Gallagher and Zahavi 2012) and cognitive semiotics (Sonesson 2020; Zlatev 2015).

Such a perspective gives rise to the nuanced findings that we reported in this paper. And they, in turn, speak against one of the tenets of the discourse against our reliability as conscious agents: the homogeneity between participants' verbal reports justifying choices they made and choices they did not, with assumptions of "confabulation" even when choice manipulation is not involved. In contrast, we found notable differences in the participants' polysemiotic utterances justifying actual choices and non-detected manipulated choices. These differed in at least three aspects: (a) duration, (b) rates and (c) the variety of categories of bodily expressions (CBEs) used. Thus, whether or not the detection of the manipulation was verbally expressed, we could show that it was reflected in participants' longer time of assessing the assumed choices, increased rates of bodily expressions, and engagement of more parts of their bodies during the non-detected manipulation than the actual choice trials.

Based on such findings, we would argue for a degree of awareness of the manipulations, even in apparently "non-detected" manipulations, and even if this awareness is not focal, but a matter of pre-reflective, self-consciousness (Gallagher and Zahavi 2012), manifested in the use of participants bodily expressions, such as adaptors. This is consistent with the rich understanding of different kinds of consciousness in phenomenology (e.g., Sokowlowski 2000; Zahavi 2018), and cognitive semiotics (Zlatev 2018). In particular, it can be argued that bodily awareness of choice

manipulation manifests itself with signals, operating on the level of *operative intentionality*, while bodily signs imply *categorial intentionality*, while explicit verbal statements express *propositional intentionality*.[7]

Based on the semiotic distinction between signs and signals (Zlatev et al. 2020), we could explore their presence in different kinds of choice trials, corresponding methodologically to "conditions" or "independent variables". We found that signs were more often used by the participants when they were justifying detected manipulations, less so in actual choice trials, and the least in non-detected cases of manipulation. However, there were many variations in this pattern. Depending on the category of bodily expressions and their status as signs or signals (depending on whether they could be classified as *denotational* or not), we observed rate differences when comparing between non-detected manipulations and actual choices trials: more in the former, and the least in the latter. Further, signals in general were again mostly present in detected manipulations, followed by actual choice trials and non-detected manipulations. While contradicting our third hypothesis, this finding highlights even more the role of adaptors occurring mostly in non-detected manipulations, less so in detected and the least in actual choice trials.

Future studies on the topic could focus on differences between the form of bodily expressions, especially of adaptors and deictic gestures, to investigate whether the way an expression is formed reflects the affective status of participants towards a preferred or a non-preferred alternative, and thus provide further evidence of choice awareness expressed implicitly in bodily behavior.

Cognitive semiotics is a science which helps to widen our understanding of (human) meaning making and existence, by unifying first-person, second-person and third-person methodologies. In the paper, we hope to have shown its potential for offering a richer understanding of choice awareness and manipulated detection, reconfirming us as conscious agents with different degrees of awareness manifested both verbally and bodily.

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7 Operative intentionality corresponds to the "lowest" level of our pre-reflective interactions with the world, serving as a ground for "higher" levels of intentionality involving reflective consciousness, as categorial intentionality, and propositional intentionality, the latter based on language (cf. Sokolowski 2000; Zlatev 2018).

Appendix A: Table A.1. ELAN coding template for polysemiotic utterances produced for actual and Manipulated choice trials

Tier	Name	Controlled vocabulary
1	**Trial**	AC (actual choice trial)
		MC (manipulated choice trial)
		TR (transition)
2	**Speech**	Transcription
3	**Picture card**	C (chosen)
		NC (non-chosen)
		P (pair)
		O (other)
4	**(A) Adaptors**	HH (hand to hand)
	Form	HB (hand to body)
		HO (hand to object)
5	Meaning	Gentle self-ministration (stroke, sooth, etc.)
		Punitive self-ministration (squeeze, scratch, bite)
		Adjustive
		Unclear
6	**(B) Torso expressions**	F (forward)
	Form	B (back)
		S (shrug)
		O (other)
8	Denotational	Deictic
		Iconic
		Symbolic
		Unclear
9	Non-denotational	Attitude (epistemic, affective, etc.)
		Other
		Movement
10	Picture card	C (chosen)
		NC (non-chosen)
		P (pair)
		O (other)
11	**(C)Head expressions**	RL (right/left)
	Form	DU (down/up)
		FB (forward/back)
12	Denotational	Deictic
		Iconic
		Symbolic
		Unclear
13	Non-denotational	Attitude (epistemic, affective, etc.)
		Other
		Movement

(continued)

Tier	Name	Controlled vocabulary
14	Picture card	C (chosen)
		NC (non-chosen)
		P (pair)
		O (other)
15	**(D) Face expressions**	E (eyebrows up/down)
	Form	M (mouth)
		B (both)
		O (other)
16	Denotational	Deictic
		Iconic
		Symbolic
		Unclear
17	Non-denotational	Attitude (epistemic, affective, etc.)
		Other
		Movement
18	Picture card	C (chosen)
		NC (non-chosen)
		P (pair)
		O (other)
19	**(E) Hand expressions**	F (finger/s)
	Form	H (hand)
		B (both hands)
		M (move picture card: pick up, push away, bring forward, etc.)
20	Denotational	Deictic
		Iconic
		Symbolic
		Unclear
21	Non-denotational	Attitude (epistemic, affective, etc.)
		Other
		Movement
22	Picture card	C (chosen)
		NC (non-chosen)
		P (pair)
		O (other)
23	**Manipulation status**	C (clear)
		P (possible)
		N (none)
24	**Comments**	

References

Andrén, Mats. 2010. Children's Gestures from 18 to 30 months, In *Center for Languages and literature*. Lund: Lund University PhD Thesis.

Andrén, Mats. 2014. Multimodal constructions in children: Is the headshake part of language? *Gesture* 14(2). 141–170.

Bargh, John, A. & Melissa J. Ferguson. 2000. Beyond behaviorism: On the automaticity of higher mental processes. *Psychological Bulletin* 126(6). 925.

Bates, Douglas, Martin Maechler, Ben Bolker & Steve Walker. 2015. Fitting linear mixed-effects models using lme4. *Journal of Statistical Software* 67(1). 1–48.

Bressem, Jana & Cornelia Müller. 2014. A repertoire of German recurrent gestures with pragmatic functions. In Cornelia Müller, Alan Cienki, Ellen Fricke, Silva H. Ladewig, David McNeil & Jana Bressem (eds.), *Body – language – communication. An international Handbook on Multimodality in human interaction*, Vol. II, 1575–1592. Berlin: De Gruyter Mouton.

Boholm, Max & Jens Allwood. 2010. Repeated head movements, their function and relation to speech. In Michael Kipp, Jean-Claude Martin, Patrizia Paggio & Dirk Heylen (eds.), *Workshop on multimodal corpora: Advances in capturing, coding and analyzing multimodality*. LREC 2010. Valletta, Malta.

Calbris, Geneviève. 1990. *The semiotics of French gestures*. Bloomington, IN: Indiana University Press.

Clark, H. Herbert. 1996. *Using language*. Cambridge: Cambridge University Press.

Debras, Camille. 2017. The shrug: Forms and meanings of a compound enactment. *Gesture* 16(1). 1–34.

Dennett, Daniel. 1991. *Consciousness explained*. London: Penguin Books.

Dennett, Daniel. 1996. *Finds of minds: Towards an understanding of consciousness*. New York: Basic Books.

Devylder, Simon & Jordan Zlatev. 2020. Cutting and breaking metaphors of the self and the motivation & sedimentation model. *Figurative Meaning Construction in Thought and Language*. 253–282.

Efron, David & Stuyvesant Van Veen. 1972. *Gesture race and culture: A tentative study of the spatio-temporal and "linguistic" aspects of the gestural behavior of eastern jews and southern italians in new york city living under similar as well as different environmental conditions*. The Hague: Mouton.

Ekman, Paul. 1991. *Telling Lies: Clues to Deceit in the Market Place, Politics, and Marriage*. New York: W.W. Norton & Company..

Ekman, Paul. 1999. Emotional and conversational nonverbal signals. In Lynn S. Messing & Ruth Campbell (eds.), *Gesture, speech, and sign*, 45–55. Oxford: Oxford University Press.

Ekman, Paul. 2009. Lie catching and micro expressions. In Clancy Martin (ed.), *The Philosophy of deception*. Oxford: Oxford University Press.

Ekman, Paul & Wallace V. Friesen. 1969. Nonverbal leakage and cues to deception. Psychiatry. *Journal for the Study of Interpersonal Processes* 32(1). 88–106.

Ekman, Paul & Wallace V. Friesen. 1974. Nonverbal behavior and psychopathology. In R. J. Friedman & M. N. Katz (eds.), *The psychology of depression: Contemporary theory and research*, 203–232. Washington, D.C.: J. Winston.

Ekman, Paul & Wallace V. Friesen. 1976. Measuring facial movement. *Nonverbal Behavior* 1. 56–75.

Ekman, Paul, Wallace V. Friesen, Maureen O' Sullivan & Klaus Scherer. 1976. Body movement and voice pitch in deceptive interaction. *Semiotica* 16(1). 23–27.

Ekman, Paul, Maureen O'Sullivan, Wallace V. Friesen & Klaus Scherer. 1991. Invited article: Face, voice, and body in detecting deceit. *Journal of Nonverbal Behavior* 15(2). 125–135.

Freedman, Norbert. 1972. The analysis of movement behavior during the clinical interview. In Aron W. Siegman & Benjamin Pope (eds.), *Studies in dyadic communication*. New York: Pergamon Press.

Freedman, Norbert. 1977. Hands, words, and mind: On the structuralization of body movements during discourse and the capacity for verbal representation. In Norbert Freedman & Stanley Grand (eds.), *Communicative Structures and psychic structures*. New York: Springer Science and Business media.

Gallagher, Shaun & Dan Zahavi. 2012. *The phenomenological Mind*, 2nd edn. London: Routledge.

Givens, B. David. 1977. Shoulder shrugging: A densely communicative expressive behavior. *Semiotica* 19(1-2). 13–28.

Goldberg, E. Adele. 1995. *Constructions: A construction grammar approach to argument structure*. Chicago: University of Chicago Press.

Goldberg, E. Adele. 2006. *Constructions at work: The nature of generalization in language*. Oxford: Oxford University Press.

Goldman, Alan. 2005. Reason internalism. *Philosophy and Phenomenological Research* 71(3). 505–533.

Grand, Stanley, Norbert Freedman, Irving Steingart & Charles Butchwald. 1975. The relation of adaptive styles to kinetic and linguistic aspects of interview behavior. *Journal of Nervous and Mental Disease* 161. 293–306.

Green, Jenny. 2014. *Drawn from the ground: Sound, sign and inscription in Central Australian sand stories*. Cambridge: Cambridge University Press.

Gurwitsch, Aron. 1974. The field of consciousness. In *The Phenomenology of the Social World*, 67–88. Evanston, IL: USA: Northwestern University Press.

Hass, Lawrence. 2008. *Merleau-ponty's philosophy*. Bloomington: Indiana University Press.

Hendricks, M. 2002. Focusing-oriented/experiential psychotherapy: Research and practice. In D. Cain & J. Seeman (eds.), *Humanistic psychotherapies: Handbook of research and practice*, 221–252. Washington, DC: American Psychological Association.

Hendricks, Marion. 2009. Experiencing level: An instance of developing a variable from a first person process so it can be reliably measured and taught. *Journal of Consciousness Studies* 16(10–12). 129–155.

Holler, Judith. 2010. Speakers' use of interactive gestures as markers of common ground. In Stefan Kopp & Ipke Wachsmuth (eds.), *Revised selected papers from the 8th international gesture workshop, GW 2009*, Vol. 5934, 11–12. Berlin: Springer.

Itkonen, Esa. 2003. *What is language? A study in the philosophy of linguistics*, Vol. 8. Turku: University of Turku: Publications in General Linguistics.

Jack, I. Anthony & Andreas Roepstorff. 2003. Why trust the subject? *Journal of Consciousness Studies* 10(9-10). v–xx.

Jack, I. Anthony & Andreas Roepstorff. 2004. Trusting the subject? Part 2. *Journal of Consciousness Studies*. 11–17.

Johansson, Petter. 2006. *Choice blindness: The incongruence of intention, action and introspection*. Lund: Lund University, Cognitive Studies.

Johansson, Petter, Lars Hall, Sverker Sikström & Andreas Olsson. 2005. Failure to detect mismatches between intention and outcome in a simple decision task. *Science* 310(5745). 116–119.

Johansson, Petter, Lars Hall, Betty Tärning, Sverker Sikström & Nick Chater. 2013. Choice blindness and preference change: You will like this paper better if you (believe you) chose to read it. *Journal of Behavioral Decision Making* 27(3). https://doi.org/10.1002/bdm.1807.

Kendon, Adam. 1981. *Nonverbal communication: Interaction and gesture*. The Hague: Mouton Publisher.
Kendon, Adam. 2004. *Gesture: Visible action as utterance*. Cambridge: Cambridge University Press.
Kendon, Adam. 2008. Some reflections on the relationship between 'gesture' and 'sign. *Gesture* 8. 348–366.
Koffka, Kurt. 1935. *Principles of gestalt psychology*. London: Taylor & Francis.
Konderak, Piotr. 2018. *Mind, cognition, semiosis: Ways to cognitive semiotics*. Lublin: Maria Curie-Sklodowska University Press.
Ladewig, H. Silva. 2014a. Recurrent gestures. In Cornelia Müller, Alan Cienki, Ellen Fricke, Silva Ladewig, David McNeill & Sedinha Teβendorf. (eds), *Body-language-Communication*, Vol. 2, 1558–1574. Berlin: Walter de Gruyter.
Langacker, W. Ronald. 1987. *Foundations of cognitive grammar: Theoretical prerequisites*, Vol. I. Stanford: Stanford University Press.
Langacker, W. Ronald. 2006. Subjectification, grammaticization, and conceptual archetypes. In A. Athansiadou, C. Canakis & B. Cornillie (eds.), *Subjectification: Various paths to subjectivity*, 17–40. Berlin: de Gruyter.
Libet, Benjamin. 2005. *Mind time: The temporal factor in consciousness*. Harvard University Press.
McNeill, David. 2005. *Gesture and Thought*. Chicago: University of Chicago Press.
Mahl, F. George. 1968. Gestures and body movements in interviews. In John Shien (ed.), *Research in psychotherapy*, vol. III. Washington, D. C.: American Psychological Association.
Mendoza-Collazos, Juan. 2022. *Agency and artefacts: A cognitive semiotic exploration of design*. Lund: Lund University.
Merleau-Ponty, Maurice. 1962. *Phenomenology of perception*. London: Routledge.
Morris, Desmond. 1994. *Bodytalk: A worldguide to gesture*. London: Jonathan Cape.
Mouratidou, Alexandra. 2020. Choice awareness and manipulation blindness. *Public Journal of Semiotics* 9(1). 1–40.
Mouratidou, Alexandra, Jordan Zlatev & Joost van de Weijer. 2022. How much do we care what we pick? Pre-verbal and verbal investment in choices concerning faces and figures. *Topoi* 41. 695–713.
Müller, Cornelia. 2017. How recurrent gestures mean: Conventionalized contexts-of-use and embodied motivation. *Gesture* 16(2). 276–303.
Overgaard, Morten. 2006. Special issue on introspection. *Consciousness and Cognition* 15(4). 629–633.
Partee, H. Barbara. 1984. Compositionality. *Varieties of Formal Semantics* 3. 281–311.
Petitmengin, Claire. 2009a. Ten years of viewing from within. *Journal of Consciousness Studies* 16. 10–12.
Petitmengin, Claire. 2011. Describing the experience of describing? The blind spot of introspection. *Journal of Consciousness Studies* 18(1). 44–62.
Petitmengin, Claire & Michel Bitbol. 2009. The validity of first-person descriptions as authenticity and coherence. *Journal of Consciousness Studies* 16(10–12). 363–404.
Pielli, Laura & Jordan Zlatev. 2020. The cyborg body: Potentials and limits of a body with prosthetic limbs. *Cognitive Semiotics* 13(2). https://doi.org/10.1515/cogsem-2020-2033.
Poggi, Isabella. 2002. Symbolic gestures. The case of the Italian gestionary. *Gesture* 2(1). 71–98.
Poyatos, Fernando. 1981. Gesture inventories: Fieldwork methodology and problems. In Adam Kendon (ed.), *Nonverbal communication, interaction, and gesture. Selections from Semiotica*, 371–400. The Hague: Mouton.
R Core Team. 2024. *R: A Language and Environment for statistical computing*. Vienna, Austria: R Foundation for Statistical Computing. https://www.R-project.org/.

Stampoulidis, George, Marianna Bolognesi & Jordan Zlatev. 2019. A cognitive semiotic exploration of metaphors in Greek street art. *Cognitive Semiotics* 12(1). https://doi.org/10.1515/cogsem-2019-2008.
Stec, M. K. Kashmiri. 2015. *Visible quotation: The multimodal expression of viewpoint*. University of Groningen PhD Thesis.
Streeck, Jurgen. 2009. *Gesturecraft: The manu-facture of meaning*. Amsterdam: John Benjamins.
Sokolowski, Robert. 2000. *Introduction to phenomenology*. Cambridge: Cambridge University Press.
Sonesson, Göran. 2009. The view from husserl's lectern: Considerations on the role of phenomenology in cognitive semiotics. *Cybernetics and Human Knowing* 16(3-4). 107–148.
Sonesson, Göran. 2010. Rhetoric from the standpoint of the lifeworld. In Göran Sonesson & Maria Gulia Dondero (eds.), *Le Groupe Mu. Quarante ans de recherche collective*. Paris: Nouveaux actes sémiotiques.
Sonesson, Göran. 2020. That there is more to the medium than the message: Further considerations on the cognitive semiotics of lifeworld mediations. In Lars Grabbe, PatrickRupert- Kruse & Norbert Schmitz (eds.), *Bildgestalten: Topographien medialer visualität*, 39–56. Darmstadt: Büchner-Verlag eG.
Varela, J. Francisco & Jonathan Shear. 1999. *The View from Within. First-person approaches to the study of consciousness*. Darmstadt: Imprint Academic.
Varela, J. Francisco, Evan Thompson & Eleanor Rosch. 1991. *The embodied Mind: Cognitive Science and human experience*. Cambridge, MA: MIT Press.
Wegner, M. Daniel. 2018. *The Illusion of conscious will*. MA: MIT Press.
Wittenburg, Peter, Hennie Brugman, Albert Russel, Alex Klassmann & Sloetjes Han. 2006. Elan: A professional framework for multimodality research. In *Paper presented at the 5th international Conference on language Resources and evaluation (LREC 2006)*. Genoa, Italy: European Language Resources Association (ELRA).
Zahavi, Dan. 2018. *Phenomenology: The basics*. London: Routledge.
Zlatev, Jordan. 1997. *Situated embodiment: Studies in the emergence of spatial meaning*. Stockholm: Stockholm University PhD Thesis.
Zlatev, Jordan. 2009. The Semiotic Hierarchy: Life, consciousness, signs and language. *Cognitive Semiotics* 4. 169–200.
Zlatev, Jordan. 2015. The emergence of gestures. In Brian MacWhinney & William O'Grady (eds.), *The Handbook of language emergence*, 458–476. Malden, Mass: John Wiley & Sons.
Zlatev, Jordan. 2018. Meaning making from life to language: The Semiotic Hierarchy and phenomenology. *Cognitive Semiotics* 11(1). https://doi.org/10.1515/cogsem-2018-0001.
Zlatev, Jordan. 2019. Mimesis theory, learning and polysemiotic communication. In Michael A. Peters (ed.), *Encyclopedia of educational Philosophy and theory*. Cham: Springer.
Zlatev, Jordan, Przemyslaw Żywiczyński & Sławomir Wacewicz. 2020. Pantomime as the original human-specific communicative system. *Journal of Language Evolution*. 156–174. https://doi.org/10.1093/jole/lzaa006.
Zlatev, Jordan. & Piotr Konderak. 2022. Consciousness and semiosis. In Jamin Pelkey (ed.), *Handbook of semiotics*. London: Bloomsbury Press.
Zlatev, Jordan, Simon Devylder, Rebecca Defina, Kalina Moskaluk & Linea B. Andersen. 2023. Analyzing polysemiosis: Language, gesture, and depiction in two cultural practices with sand drawing. *Semiotica* 253. 81–116.
Zlatev, Jordan & Alexandra Mouratidou. 2024. Extending the life world: Phenomenological triangulation along two planes. *Biosemiotics*. 17(2). 407–429.

Bionotes

Alexandra Mouratidou
Division for Cognitive Semiotics, Lund University, Lund, Sweden
alexandra.mouratidou@semiotik.lu.se

Alexandra Mouratidou is a Doctoral Candidate in Cognitive Semiotics, Division for Cognitive Semiotics, Center for Languages and Literature at Lund University, Sweden. She was a public relations officer in the board of the International Association for Cognitive Semiotics (IACS), from 2022 to 2024, and a co-organiser of IACS-5. Her research interests lie in polysemiotic communication, especially when choice-making and choice manipulations are concerned, as well as in phenomenology and consciousness. She is assistant editor of *Public Journal of Semiotics*.

Jordan Zlatev
Division for Cognitive Semiotics, Lund University, Lund, Sweden
jordan.zlatev@ling.lu.se

Jordan Zlatev is Professor of General Linguistics and Director of Research for the Division of Cognitive Semiotics at Lund University, Sweden. He was the first president of the Swedish (currently: Scandinavian) Association for Language and Cognition (SALC), from 2006 to 2009, and of the International Association for Cognitive Semiotics (IACS), from 2013 to 2014, and he is currently a board member and IACS-5 organizer. He is the author of *Situated Embodiment: Studies in the Emergence of Spatial Meaning* (1997), and of over 100 articles in academic journals and anthologies. He co-edited *The Shared Mind: Perspective on Intersubjectivity (2008), Moving Ourselves, Moving Others: Motion and Emotion in Intersubjectivity, Consciousness, and Language* (2012) and *Meaning, Mind and Communication: Explorations in Cognitive Semiotics* (2016). His current research focuses on polysemiotic communication, and more generally on the nature of language in relation to other semiotic systems like gesture and depiction. His approach to cognitive semiotics is strongly influenced by phenomenology, the philosophy and methodology of lived experience. He is editor-in-chief of *Public Journal of Semiotics*.

Joost van de Weijer
Humanities Laboratory, Lund University, Lund, Sweden
joost.van_de_weijer@ling.lu.se

Joost van de Weijer is employed at Lund University Humanities Lab in Sweden. He collaborates with various researchers on the topics of animal communication, prosody and factivity, and motivation in highschool students to learn a foreign language. He teaches courses in psycholinguistics and in the statistical analysis of experimental data, provides methodological support for ongoing research projects within various areas of language and speech, and on psychophysiological measurement of behavioural and cognitive processes. He is editorial secretary for the journal *Studia Linguistica*, and is member of the editorial board of the journal *Bilingualism, Language and Cognition.*

Paper 3

Deictic gestures beyond reference:
Construal of affective valence in choice making

Alexandra Mouratidou and Mats Andrén

Abstract

What is the role of deictic gestures in expressing affective valence, and can such gestures serve as an indicator of awareness in choice making? To examine this, we analyzed participants' deictic gestures toward preferred and non-preferred picture alternatives in an experimental choice justification task. The task involved manipulation: in some trials, participants were presented with the rejected alternative as if that had been their choice and were asked to justify it.

Based on whether participants detected the manipulation or not (i.e., reacting to the presented picture card or accepting it as their choice), three types of choice trials were distinguished: (a) non-manipulated, (b) manipulated-undetected, and (c) manipulated-detected. We categorized the verbal and deictic responses of 29 Greek participants according to seven dimensions: Deixis, indicated Object, hand Shape, use of Hand, Tactility, Utterance, and Valence. We found differences in participants' deictic gestures between preferred and non-preferred choice alternatives across nearly all dimensions. Moreover, when manipulation was involved, participants gesturally indicated their preferred option, which was presented as their rejected alternative, in a manner similar to how they indicated the preferred picture card when there was no manipulation.

Based on these observations, we argue that deictic gestures are not merely referential but also carry affective and evaluative construals, serving as indicators of implicit awareness of choices. The study's findings offer insights into the embodied nature of preference, the way agency arises within a landscape of possibilities, and how pre-reflective consciousness and the operative nature of the body provides a window into participants' awareness in choice making.

1. Introduction

In everyday social interaction, we use different semiotic systems like language, gesture, postures, and facial expressions. *Deictic* gestures are one of the most basic ways we can convey referential information (Cooperrider, 2023, p. 44), a universal feature of both spoken and signed communication (Kendon, 2004; Kita, 2003a; Morgenstern, 2014; Pfau, 2011), and among the earliest types of communicative actions in childhood (Tomasello, 2008). *Pointing* is perhaps the most prototypical kind, but deictic gestures can also direct the addressee's attention to referents in other ways; for instance, by placing things in certain ways (Clark, 2003), or by holding an object towards an interlocutor to show it – often in coordination with speech (Andrén, 2010, 2014).

While deictic gestures serve referential functions, they may simultaneously also embody and reflect other aspects of meaning-making. For example, differences in the form of manual

deictic gestures (e.g., hand shape, rotation position of the forearm, etc.) have been "related to the way the object being referred to is presented in the speaker's discourse" (Kendon, 2003, p. 109). A similar point, made by Cooperrider (2011), suggests that the form of deictic gesture "embodies the speaker's construal of what is pointed to" (p. 82). However, the idea that the nature of deictic gestures might systematically vary in relation to various types of semantic distinctions has not been thoroughly examined, with a few exceptions (e.g., Birdwhistell, 1996; Eco, 1976; Calbris, 1990; de Jorio, 2000; Wilkins, 2003; DeLeon, 2023). In the present study we investigate aspects of deictic gestures that go beyond their referential function. In particular, we look at their construal of affective valence (see Section 2.2).

For this purpose, we analyze data from an experimental study where participants are (repeatedly) asked to make a choice between two picture cards laid out in front of them (see Figure 1a, Section 3.1). The pictures are photographs of human faces, and the participants are asked to choose the one they find most attractive. Some moments later, the participants are presented with the same pair of pictures. The experimenter asks the participant to justify their choice by pushing the preferred picture card a bit closer to them than the rejected alternative. This communicative context is likely to involve many deictic gestures, as participants may use them to indicate which of the two referents they are discussing. A previous study of the same kind of data (Mouratidou et al., 2024) showed that this was indeed the case. That study, however, did not look closer at the quality of those deictic gestures, which is the focus of the present study.

The experimental procedure includes a twist. In some trials, the experimenter manipulates the participants' choice by highlighting the picture card that they did not choose and presents it as if it had been the preferred one (see Figure 1b, Section 3.1). Based on whether such choice manipulation occurs, and if it is detected by participants, the choice trials are categorized into three distinct types: (a) non-manipulated trials, (b) manipulated trials *undetected* by the participants, and (c) manipulated trials *detected* by the participants. The experimental design is inspired by so-called "choice blindness" experiments (Johansson et al., 2005). Over the past two decades, such studies have shown that the majority of participants often fail to detect manipulations and tend to provide similar verbal justifications for both the choices they originally made and those they did not. Such observations lead to rather counter-intuitive conclusions – namely, that we are unaware of the sources of our actions, and that the justifications we provide to account for them are post-hoc constructions. This view contributes to a broader discourse questioning our reliability as conscious agents and the validity of first-person reports (Dennett, 1991, 1996; Bargh & Ferguson, 2000; Libet, 2005; Johansson et al., 2013; Wegner, 2018).

This experimental setting provides a compelling and novel context for examining affective valence in deictic gestures. On the one hand, the task contrasts a preferred choice alternative with a non-preferred one, enabling the observation of potential differences in participants' deictic gestures, such as hand shape, hand use, or tactile engagement (see Section 3.2). If, as commonly argued in phenomenology, affect is intrinsic even to our pre-reflective bodily activities (Merleau-Ponty, 1945; Husserl, 1928/1991; Sokolowski, 2000; Fuchs, 2013; Bower & Gallagher, 2013; see Section 2.1), then it can be expected to be manifested in participants' deictic gestures toward affectively charged alternatives. Thus, the first research question this study explores is whether participants' deictic gestures differ when indicating a preferred versus a non-preferred picture.

On the other hand, the manipulated trials offer an opportunity to examine whether participants' construal of affective valence manifests differently when justifying their originally preferred picture card (non-manipulated trials) versus the one presented *as* their preferred choice (manipulated trials). This exploration may illuminate how aspects of deictic gestures related to construal of affective valence could serve as indicators of participants' awareness of their choices (see Section 2.3).[1] Such awareness may not be explicitly verbalized or focal, but pre-reflective (e.g., Gallagher & Zahavi, 2012, p. 52, see Section 2.3). Thus, the second research question concerns how participants gesture toward the preferred and non-preferred alternatives when manipulation is involved (i.e., when the preferred picture is presented as rejected, and vice versa). Does the way participants deictically indicate the preferred and non-preferred alternatives change depending on how these are presented by the experimenter in the manipulated trials, or does it remain consistent with their gestures in non-manipulated trials?

The next section offers brief theoretical overviews of *cognitive semiotics*, which is the overall theoretical framework within which the present study is performed, relevant concepts of phenomenology, the construal of affective valence, and choice awareness. Section 3 describes the methodology, while Section 4 details the results. The discussion is presented in Section 5, and our conclusions in Section 6.

2. Theoretical Background

Cognitive semiotics is a relatively new discipline that studies the multiple dimensions of human and non-human meaning-making (semiosis), by combining concepts and methods from semiotics, cognitive science, linguistics, and phenomenology (e.g. Sonesson, 2009; Zlatev, 2015; Konderak, 2018). Holding a pluralistic conception of human nature, where consciousness and semiosis stand as two closely interrelated aspects of our interaction with the world, cognitive semiotics research utilizes *phenomenological triangulation* (e.g., Zlatev, 2009; Pielli & Zlatev, 2020; Mendoza-Collazos, 2022; Zlatev & Mouratidou, 2024, Mouratidou, in press-a, see Section 3.2). This methodological tool has been evolved over the past two decades from its early conception as "methodological triangulation" (Zlatev, 2009) to its current form. Notably, it does not merely involve combining qualitative and quantitative methods but integrates three epistemological perspectives for accessing a phenomenon: (a) direct givenness to the researcher (*first-person perspective*), (b) dialogical interaction between researcher and others (*second-person perspective*), and (c) observational analysis that abstracts from individual experience (*third-person perspective*). In parallel, it considers three ontological dimensions, referring to the nature of the phenomenon under study, whether it primarily pertains to the Self, Others, or Things (Zlatev & Mouratidou,

[1] In this study, "choice" refers specifically to preference-based selections between two picture alternatives. Following phenomenological distinctions (Sokolowski, 2017; Mouratidou, 2020; in press-b), we distinguish such preference-based choices (i.e., affectively guided actions that may not involve reflective deliberation) from fully reflective, purpose-driven choices. Accordingly, "choice awareness" here refers to a pre-reflective awareness of preferring one alternative over another.

2024).[2] For example, empathy, from the first-person perspective, refers to our inherent experience of relating to others in the intersubjective world – an ontological foundation for human sociality and interaction. From the second-person perspective, however, empathy involves our grasping of another subject's experience (e.g., that of experimental participants). It entails a direct, non-objectifying engagement with the other, where we attempt to enter their world and understand their experience.

Crucially, phenomenological triangulation foregrounds the first-person perspective as foundational, implying that third-person methods are always grounded in first- and second-person perspectives, even when these are backgrounded. This principle explicitly rejects the idea of a 'view from nowhere' and affirms that all third-person inquiry is ultimately dependent on an experiencing subject. In doing so, it promotes a way of accessing phenomena as lived, while simultaneously fostering epistemic transparency by clarifying how each perspective contributes to the understanding, rather than concealing this process behind a supposedly neutral method. This reflects the idea that theoretical thinking is rooted in pre-theoretical experience and aligns with the phenomenological dictum of the primacy of consciousness: that everything, including scientific knowledge, is ultimately given through experience (e.g., Husserl, 1913; Merleau-Ponty, 1945; Gallagher & Zahavi, 2012; Romdenh-Romluc, 2018). As Zahavi (2021) puts it, "phenomenology returns us to the experiential phenomena themselves, rather than making do with mere speculations and theories about their nature" (p.262). Thus, phenomenological triangulation builds on interdisciplinary efforts to develop non-reductionist approaches to science, ensuring that first-person experience is duly incorporated (e.g., Varela & Shear, 1999; Gallagher, 2003; Gallagher & Sørensen, 2006). Relying solely on the "objectivity" of third-person methods, by contrast, risks producing a distorted view of the human condition, one that reduces the complexity and richness of experience to overly simplistic or externalizable metrics. The present study is both theoretically and empirically informed by these principles, as will be demonstrated in the sections that follow.

2.1. Phenomenology and affect

The philosophy and methodology of phenomenology, as intended by Edmund Husserl, seeks to eliminate metaphysical claims and theoretical prejudices by focusing on phenomena as they are given in experience. Its aim is to attain a comprehensive understanding and description of the experiential structure of our embodied, intersubjective existence: "Rather than focusing on the objects of knowledge, we should describe and analyze the experiential dimension in detail in order to disclose the cognitive distribution of the knowing subject" (Husserl, 1900/2001, I, p. 170). This does not imply that phenomenology centers on purely subjective accounts alone; rather, it aims to provide a detailed account of the lifeworld as it is given to experience (Sokolowski, 2000; Gallagher & Zahavi, 2012).

A fundamental characteristic of conscious experience is *intentionality*, which grants our access to the world. As pointed out by Husserl (1900/2001, I, p. 275): "the objects that we are conscious of are not simply in consciousness as in a box, so that they can merely be

[2] Table B.1 provided in Appendix B shows the three kinds of perspectives of the vertical level, and the three kinds of ontological dimensions on the horizontal, with examples that are only prototypical and not exclusive for each cell.

found in it and snatched at in it, they are first constituted as being, what they are for us, and as what they count for us (...)". Intentionality, thus, captures the particularity of the relationship we have with an object (a cup, a picture, an idea for a research paper), indicating that our experience is always "of something", directed at a given (intentional) object, and of a specific kind (e.g., perceptual, signitive, imaginative, etc.). In other words, intentionality indicates how we are moved or compelled to treat something in a certain way, and how an object presents itself to us as inviting, salient, unsettling, or compelling (Merleau-Ponty, 1945). The way we engage with the world and the way things give themselves to us does not occur in an isolated manner, but within a horizon, both internal and external to the object. The former involves the state of indeterminacy that things inherently possess, the potential properties that are considered as deposits to the present act of perception. The latter is the possible relationships an object can have with other surrounding objects. To illustrate this, Husserl (1913/1983, p.70) provides an example:

> Every perception of a physical thing has, in this manner, a halo of *background-intuitions* (or background-seeings, in case one already includes in intuiting the advertedness to the really seen), and that is also a "*mental process of consciousness*" or, more briefly, "consciousness," and, more particularly, "of" all that which in fact lies in the objective "background" seen along with it. (emphasis in original)

What has been implicit in our brief description of phenomenology so far is the fundamental role of the body in experience, perception, and cognition. The dual nature of the body, experienced both as an object (*Körper*), a site to touch, and as a subject (*Leib*) is deeply implicated in our relation to the world and others, and is the most intimate expression of ourselves (Moran, 2005). We normally notice this duality when our habitual and smooth interaction with the world is disturbed (Zahavi, 2019), as reflected in the ancient Daoist formula of Zhuang Zi that "you forget your feet when the shoes are comfortable" (Watson, 1996, p. 128). The body possesses its own mode of intentionality, involving a pre-reflective or non-thematic consciousness that is directed towards objects without requiring explicit reflection or categorization. This kind of *drive* or *operative intentionality* (Merleau-Ponty, 1945, p. xviii) consists of sensuous drives, instincts, and impulses, mediating between bodily and kinesthetic sensations with different degrees of conscious awareness, and granting the body with a non-predicative form of knowledge, both of itself and of the world encountered:

> My body is primarily experienced as an instrument of my will, a "field of free will" (4: 310), it is the center of a series of "I can's", of my "being able to" *(Können)*, of "powers" or "capacities" (*Vermögen*). [...] But not every bodily movement involves an explicit act or *fiat* of the will (14: 447ff). I may move my hand "involuntarily" because its position was uncomfortable (4: 260), I involuntarily reach for a cigar (4: 258). When I play the piano, I don't "wilfully" move my fingers, but they do move voluntarily (14: 89). There are zones between the willed and the truly involuntary. Action and affection can be functionally interwoven (4:338-9). (Husserl 1952, cited in Moran, 2005, p. 211-212, emphasis in original).

Viewing semiosis as an embodied, active process implies the presence of an evaluative or appraising component, which exists even before the formation of propositional attitudes or even categorial objects (e.g., Fuchs, 2013; Bower & Gallagher, 2013; Zlatev, 2018). Patocka's (1988) concept of the body's intentionality as *e-motion* is indicative of the close

relationship between emotion and intentionality, both understood as forms of movement initiated by felt impressions and shaped by a continuous dynamic of attraction and repulsion (Thompson, 2007, p. 364). As Husserl (1900/2001) theorized, for something to stand out in perceptual experience, it must possess an *affective* appeal, a distinctive way in which the object draws our attention and become salient to consciousness. This appeal may involve tension, resolution, exertion, unease, satisfaction, or dissatisfaction, modulating our attention (Husserl, 1931/2004).

We experience such affective states – whether fleeting or enduring, objectless or directed toward specific objects – through a range of moods and feelings that attune our bodily engagement with the world. We anticipate receiving sensory information about the objects surrounding us, "given in the form of "if-then" sequences: if I move my head in this direction, then I will see the object in such and such a way. These movements have their own horizons of possibility (e.g., I can turn my head or I can turn my body with the head) and yield different series of appearances of the object" (Moran**,** 2005, p.214). Consider, for example, walking down the street and noticing a blooming flower in the heart of winter. You might slow your pace, stand still, your eyes widen. You may lean toward the flower, take a deep breath. Perhaps you stretch out your arm to gently touch its petals with your palm or fingers. These bodily expressions are moments of admiration, resonating with the experience and implicitly orienting the body toward possible further actions (Bower & Gallagher, 2013).

Thus, affect has a fundamental role in the generation of the flow of experience and action. We can be involuntarily affected while engaged in some activity (passive) or by responding to an affective influence by noticing or turning toward it (receptive) (Husserl, 1900/2001). Affect is also integral to time-consciousness, specifically to the future oriented aspect of *protention* and involves motivation, appraisal, affective tone and readiness for action and movement (Varela & Shear, 1999; Thompson, 2007).

One particular way the body interacts with the world, as illustrated in the earlier example, is through tactility, which offers a more immediate and direct form of engagement compared to vision. Tactility includes a s*patial* dimension, allowing the perception of surfaces, edges, and forms in three dimensions, and a *temporal* dimension, unfolding through movement and interaction over time (Katz, 1989). Active touching involves intentional exploration – such as running a hand over an object to discern its shape or texture – and is closely connected to movement and proprioception (ibid). In his foundational phenomenological study of tactile experience, Katz (1989) focuses on the hand, treating it as a unitary sense organ: "man's outer brain" (p. 5), rather than merely a collection of minute receptors or skin surfaces. Similarly, Gibson (1966) emphasizes the active nature of touch, remarking that the hand can engage in a variety of exploratory actions such as groping, palpating, prodding, pressing, rubbing, or lifting (p. 123). Extending this view, phenomenologists and enactivists alike have emphasized that perception is not a passive reception of information but an active, embodied process: we perceive by skillfully moving and engaging with the world (Merleau-Ponty, 1945; Varela et al., 1991; Noë, 2005), where we do not merely register passive sensations but actively explore our surroundings through physical contact. The sensorimotor coupling between perception and action enables a dynamic form of knowing that is both pre-reflective and affectively charged.

The fundamental role of the body and affect in perceptual experience is central to the present study. By drawing from such accounts, we can better understand participants' deictic gestures – often involving tactile engagement with the picture cards – as manifestations of their affective valence toward positively or negatively evaluated alternatives. Moreover, the pre-reflective and operative manner in which the body functions offer a window into participants' awareness of choice in a more implicit way than language. Such view is further supported by research on gesture-speech mismatches (Goldin-Meadow et al., 1993), showing that gestures can reveal implicit understandings or conflicts that are not accessible to verbal articulation. Particularly, Goldin-Meadow and colleagues (1993) argue that mismatches between gestures conveying different information than speech are often predictive of cognitive change.[3] In our experimental context, similar discrepancies between how participants gesturally indicate their preferred and non-preferred alternatives (across non-manipulative and manipulated trials) and what they verbally justify as their choice may indicate epistemic tension and implicit awareness of the manipulation. These expressive divergences reinforce our treatment of gesture and speech as layers of choice awareness.

2.2. Construal of affective valence

Construal is an ambiguous term that has been used in cognitive linguistics to refer both to how we frame a situation (such as in terms of specificity, perspective, or valence) and how we express it in language (Langacker, 2006) and gesture (e.g., Müller, 2008; Cienki, 2015). Three types of construal can be distinguished: *subjective* (psychological), involving individual interpretations of a situation, which may vary from person to person; *interpersonal* (pragmatic), pertaining to interpretations shaped by social interactions; and *conventional* (semantic), reflecting interpretations encoded in particular words or non-verbal signs (Zlatev, 2016; Zlatev & Möttönen, 2022; Timm, 2022). These different kinds of construal demonstrate both continuity and discontinuity (Zlatev & Möttönen, 2022; Mouratidou et al., 2022). With respect to the topic of the present study, all three kinds of construal are relevant: how participants affectively construe the presented picture pairs, how this construal is shaped within the communicative setting between the experimenter and the participant during the justification task, and, ultimately, how participants' utterances and gestures reflect these interpretations.

Affect is typically associated with facial expressions and less commonly with articulators like the hands, which are primarily involved in conventional gestures (e.g., emblems such as the thumbs-up or OK gesture) and adaptors (i.e., bodily expressions involving self- or object-touching that help manage emotions, regulate internal states, or adjust to the environment rather than convey a message) (Efron, 1941; Ekman & Friesen, 1969; Kendon, 1983). Some links between the use of the hand (right or left) and affect (positive or negative) have been made (McNeill, 1992; Casasanto, 2009; Müller, 2013; Bressem & Müller, 2017), rooting them in lateralization of brain function, as well as in cultural and gestural conventions. However, many of the findings of gesture research in terms of associations of

[3] Goldin-Meadow et al. (1993) found that children who produced gestures that conveyed different information than their speech (i.e., gesture-speech mismatches) were more likely to learn new problem-solving strategies after instruction. This suggested that gestures could reflect implicit knowledge not yet accessible in verbal form.

hand use and affect have been somewhat contradictory. Overall, the role of the hands in expressing and grasping emotional meaning has been largely overlooked, particularly in the context of deictic gestures.

As noted in the introduction, deictic gestures are often examined exclusively in terms of their referential function, despite evidence that they also convey aspects of meaning related to how an object is construed (Kendon, 2004; Cooperrider, 2011). For instance, Birdwhistell (1966) observed that deictic gestures (or "kinesic markers") associated with stress pronomials varied depending on factors such as proximity, singularity, and plurality. Similarly, Eco (1976) made similar claims about variations in finger pointing, which marked closeness and distance. Kendon (2004), after examining seven different hand shapes and hand shape/forearm rotation configurations, concluded that "the form of the pointing gesture is not a matter of idiosyncratic choice or variation unrelated to the other things the speaker is doing. It seems, rather, that the hand configuration a speaker uses in pointing is a patterned component of the utterance ensemble" (p. 223). Thus, by focusing on the embodied and enacted expression of affective valence in deictic gestures, we aim to offer new insights into this relatively underexplored domain.

2.3. Choice awareness and manipulation detection

The design of the current experiment is inspired by the "choice blindness" method (see Section 1), which has been applied across various domains and modalities (e.g., aesthetic, moral, and political preferences in modalities like vision, voice, and taste). "Choice blindness" is often discussed in relation to the broader phenomenon of the "introspection illusion" (e.g., Pronin, 2009), where it is claimed that we mistakenly believe we have direct insight into our mental states. Thus, participants' failure to notice inconsistencies between their chosen option and the one they were presented with, combined with the similarity between their "confabulatory" justifications for the rejected alternative and those for their preferred choice, is seen as evidence supporting this view. Else, as one of the initiators of the research paradigm has put it: "if there are no differences between a real choice and manipulated choice, perhaps we make things up all the time" (Johansson, 2016: 6:30).

However, previous research has yielded diverse findings regarding the detection rates of manipulations, suggesting that participants' failure to notice manipulated choices varies across contexts (Haggard et al., 2002; Sauerland et al., 2013; Scherer et al., 2013; Petitmengin et al., 2013; Stahl et al., 2016; Lachaud et al., 2023). This variability implies that different levels of choice awareness are influenced by various factors, including experimental conditions (e.g., autobiographical versus task-assigned experiences), the type of decision (e.g., preference-based versus goal-oriented choices), and the method of manipulation (e.g., face-to-face interaction versus automated computer programs). Moreover, measuring detection through explicit verbal comments has faced criticism (e.g., Fazio & Olson, 2003; Cochran et al., 2016), as such measures can be influenced by factors like social desirability, participants' willingness to express themselves freely, and varying levels of self-awareness. This has led to a shift in focus toward more implicit methods of measuring detection, including reaction times, physical measurements, and nonverbal expressions, which can reveal detection even when participants are less aware of it or reluctant to verbalize their experiences.

Some studies have addressed these concerns, challenging previous claims of our unawareness of choices. Their findings suggest that manipulation detection is influenced by factors like *memory*, *affectivity*, and to various degrees by participants' *investment* in the experimental task (Mouratidou, 2020; Mouratidou et al., 2022). Particularly relevant in the present context is the fact that when the investigation extended beyond verbal reports to include non-verbal behavior as an indicator of manipulation detection, significant differences were observed (Mouratidou et al., 2024). Specifically, participants' responses to non-manipulated and undetected manipulation trials differed in (a) duration, (b) frequency of bodily expressions across five categories, and (c) the variety of bodily expressions used.[4] Thus, even when manipulation detection was not verbally expressed, it was evident in participants' longer assessment times, increased bodily expression rates, and greater engagement of body parts during undetected manipulated trials compared to non-manipulated trials.

These findings go against strong claims about our unreliability as conscious agents, and especially the idea that participants' responses when justifying their choices are homogeneous, whether they are describing choices they actually made or did not make (e.g., Johansson, 2006). In contrast, Mouratidou et al. (2024) argue for a degree of awareness of the manipulations, even in cases of verbally undetected manipulations. As already mentioned in previous sections and further elaborated below, operative intentionality refers to the embodied level of consciousness. Thus, this awareness may not be focal but rather pre-reflective, manifesting in participants' bodily expressions, such as adaptors. Extending this to the current investigation, where our focus is again on preference-based choices that may or may not entail reflective awareness, we expect that participants' deictic gestures will offer similar insights about their awareness of choice. These embodied expressions suggest that even when participants do not explicitly report the manipulation, their bodily expressions toward the choice alternatives retain traces of their initial affective construal of them, indicating a more nuanced form of choice awareness than verbal reports alone might reveal aligned with this form of intentionality.

As commonly argued in phenomenology, experience is characterized by self-acquaintance and familiarity: "To be a subject is to be in the mode of *being aware of oneself*" (Husserl, 1973a, cited in Gallagher & Zahavi, 2012, p. 52, my emphasis). However, as also discussed in Section 2.1, this awareness can take different forms and degrees and does not necessarily imply self-transparency, complete self-comprehension, or infallibility (Gallagher & Zahavi, 2012). Rather, it underlines the intrinsic link between experiential phenomena and first-person givenness. Everything we experience is experienced consciously, involving some form of awareness or acquaintance with the experience, while, at the same time, some aspects of experience may remain unnoticed or unattended. Based on this distinction, two forms of consciousness can be identified: *pre-reflective* and *reflective*. The former provides an implicit sense of self at the experiential level, whereas the latter enables an explicit, conceptual, and objectifying awareness, often involving articulation, through which we turn to our experience and make it thematic (ibid, p. 61). The act of reflection creates a split, as the reflecting self adopts a different attitude and temporal perspective from the self being reflected upon, implying that reflection does not replicate the original experience but, to

[4] The five categories that were included in the analysis were: Adaptors, Head, Torso, Face and Hands.

some degree, transforms it. However, "there is (...) unity or coincidence" (Moran, 2005, p. 204) between the reflected and the reflecting self, since something was already experienced prior to the act of grasping it in reflection. As Husserl states: "even asserting that the "I" who reflects is the same "I" being reflected upon involves a certain equivocation; yet within this "I", there exists both identity and difference" (ibid).

These phenomenological insights are highly relevant to the present study, as they help us understand the relationship between participants' verbal and non-verbal expressions in relation to varying degrees of awareness of their choices. On its part, the study provides inroads to additional insights into the interplay between these forms of consciousness in choice making and manipulation detection. As already mentioned in Section 1, "choice blindness" experiments challenge our reliability as conscious agents by claiming that participants often provide *similar* verbal justifications for the choices they genuinely made and those they were misled into believing they made. Extending this claim to gestures suggests that participants' deictic expressions toward the preferred and non-preferred alternatives in non-manipulated and undetected manipulation trials would also be similar. The reasoning is that in the absence of any verbal indication of manipulation detection, participants would treat the manipulated option as their initially preferred choice and its alternative as the rejected one. As should be clear by now, we aim to challenge such claims. Although some of the dimensions of deictic gestures toward the presumably preferred picture card in undetected manipulations may indeed mirror those directed at the preferred card in non-manipulated trials (e.g., participants may point more at the presented alternative, regardless of it not being their actual preference, since they are asked to verbally justify it), we expect that overall participants will gesture toward their preferred picture card in undetected manipulations in some ways similar to how they gesture toward the preferred card in non-manipulated trials. This will occur *even though the preferred card is presented as the rejected option*. Such findings can help support claims of non-verbal expressions serving as indicators of choice awareness and in fact reinforce claims on our reliability as conscious agents.

3. Method

3.1. Participants and procedure

To examine participants' deictic gestures, we used the data of the choice manipulation experiment presented in Section 1. In that experiment, 41 Greek participants (20 female, 21 male) were shown 20 pairs of photographs of human faces (10 pairs depicting female faces, 10 pairs depicting male faces) and asked to choose the person they found most attractive (see Figure 1a). After that, the participants were presented with the initial pairs and were asked to justify their choice, without knowing that four trials were manipulated by deliberately asking participants to justify their non-preferred alternative (see Figure 1b).

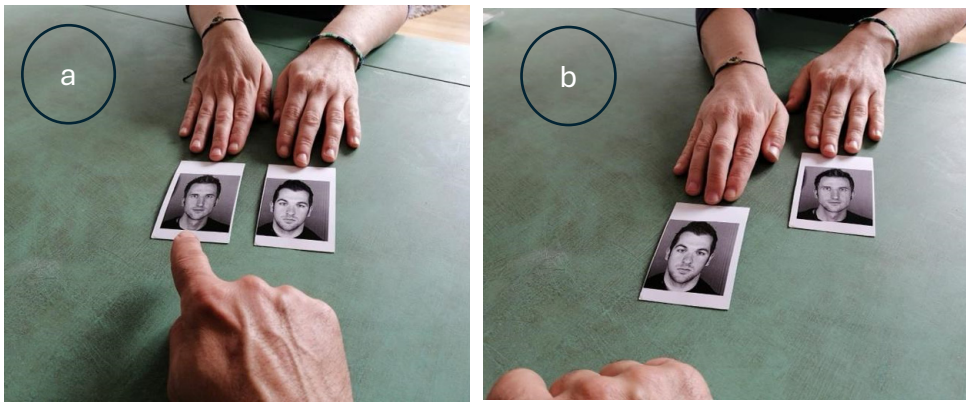

Figure 1. The choice manipulation procedure. (a) The participant is presented with two alternatives and asked to make a choice; (b) then asked to justify their choices, where in a number of trials (manipulations) the non-chosen alternative was presented as if it was their choice.

For the current study, we selected the participants who had at least one undetected manipulation in their responses, in order to allow the comparison of their deictic gestures towards the preferred and non-preferred alternative in the three conditions (non-manipulated, manipulated-undetected and manipulated-detected trials). Thus, 29 Greek participants were included in the study, coding four of their justification responses for non-manipulated choices and four for manipulated choices (including detected and undetected manipulations).

3.2. Coding and analysis

Following the principle of phenomenological triangulation (Section 2.1), we explored the phenomenon from three perspectives, as shown in Table 1.

Table 1. Application of phenomenological triangulation in the current study.

Perspectives	Methods	Applications	Examples
First-person	Phenomenological analysis	Intuitive identification of key notions	Deictic gestures as indicator of choice awareness Affective construal
Second-person	Empathetic understanding Intersubjective validation	Interactional assessment of verbal and non-verbal reports	Literature review Dimensions of affective construal Inter-rater reliability measures
Third-person	Experimental design Statistics	Collecting data Quantification	Descriptive statistics Pattern identification

We began by exploring choice awareness, its relation to affective construal and expression in deictic gestures. This involved our first-person reflection on how the phenomenon is given in experience, specifically, how bodily expressions of preference are manifested through

verbal and non-verbal deixis. These reflections helped us identify dimensions of affective valence that became candidates for inclusion in our coding system. For instance, we considered how proximity or tactility might differ depending on whether an object is construed as preferred or non-preferred (i.e., we typically approach and touch what attracts us more readily than what repels us). However, deciding which dimensions to include required moving to the second-person perspective. This involved dialogical refinement of our initial intuitions through interaction with co-researchers and engagement with participants' verbal and non-verbal expressions. In this context, empathetic understanding and intersubjective validation, such as repeated viewings, collaborative coding, and gesture interpretation were central. We also considered how the relevant literature frames deixis beyond referential function (see Section 2) and adapted those insights to our analysis. During this process, the coding dimensions were iteratively revised.[5] As part of this second-person perspective, we employed an inter-rater reliability check with an expert gesture coder, who independently annotated 10% of the data, resulting in 96.5% agreement. Finally, in line with cognitive semiotic methodology, we turned to the third-person perspective. This involved formal operationalization of the coding scheme, annotation of participants' gesture data, and the use of descriptive statistics to identify patterns across the three trial types (non-manipulated, manipulated-undetected and manipulated-detected). This multi-layered process aligns with Zahavi's (2009) call for methodological transparency in phenomenologically informed studies, ensuring that empirical inquiry remains rooted in lived experience and shaped by intersubjective engagement. Phenomenological triangulation thus enables us to preserve the richness of embodied meaning-making while offering empirical robustness.

Our coding system includes seven dimensions of deictic gestures, implemented in the ELAN video annotation software (Wittenburg et al., 2006). The coding template is presented in Appendix A, Table A.1. We began by coding participants' verbal and gestural deictic expressions generated during the justification part (after the choice had been made). The experimenter presented the picture pair, pushing one of the picture cards forward. The card was always presented on the participant's right side. For non-manipulated trials, this card was the preferred one, while for the manipulated trials, it was the initially rejected, non-preferred alternative. While presenting the picture card, the experimenter posed the question: "why did you choose this one?" Participants responded by providing their justification. Based on their verbal responses and trial type, we distinguished between Non-manipulated, Manipulated-undetected and Manipulated-detected choice trials. Responses to *manipulated* trials were further categorized according to the type of detection, following Mouratidou's (2020) categorization for participants' response patterns, into three levels of detection: (a) *Clear* detection, when participants explicitly rejected the manipulated item as their own (e.g., "I chose that one [pointing to the preferred option], because he's cute"), (b) *Possible* detection, when participants questioned the choice or failed to justify the presented item but did offer a justification for the alternative (e.g., "This is the one I chose, right? [pointing to the non-preferred option]. I don't know….The other looks nicer. Perhaps I would choose the other one now"), and (c) *No* detection, when participants accepted the manipulated choice without justification, evaluated both options as equal, or justified the manipulated option as

[5] For example, the variation of the location where the task took place did not allow for the dimension of proximity to be included, since chairs and tables had different height and length varying the distance of the participant to the picture cards.

their own (e.g., "This one... [pointing to the non-preferred option) I didn't like either of them and I just said this one"). Each detection level included one or more response patterns, such as denial, uncertainty, ignorance, indifference, or acceptance, reflecting participants' attitude toward the manipulated choice. We further coded each verbal response based on whether participants' justification was focused on the preferred or non-preferred option of the presented picture pair (i.e., *Picture card* type). Finally, when a deictic gesture was produced, we coded the accompanying verbal expression (i.e., *Utterance*), if any, and assessed the *Valence* expressed based on the presence (or absence) of evaluative markers (see dimension (7) below). Note that the *Utterance* coded was restricted to what was synchronically expressed while the deictic gesture was conducted.

Participants' gestures were coded along seven different dimensions: (1) Deixis, (2) Object, (3) Hand shape, (4) Hand, (5) Tactility, (6) Utterance, and (7) Valence, with the following values. Dimension (1) specified whether the participant had produced a deictic gesture, differentiating between *Pointing* and *Other.*[6] If a deictic gesture was coded, then the indicated Object (2) was specified as *Preferred, Non-preferred, Pair*, or *Other* (i.e., when participants showed something other than the picture cards). Dimension (3) specified the hand Shape of the gesture, including *Finger/s*, *Palm*, and *Other* (i.e., when the gesture combined both fingers and palm in a way that both of them were equally prevalent, making it difficult to decide one over the other). Dimension (4) specified the Hand that participants used to perform the gesture, *Right, Left,* or *Both*. Tactility (5) included different ways of participants' tactile engaging with the picture cards, such as *Touch, Tap, Tap multiple*, and *Rearrange*. The latter included only cases where the participant moved the card as part of a pointing gesture, not standalone actions. When the deictic gesture was simultaneously accompanied by speech, then this was coded under dimension (6), and was further specified for its Valence under (7), as *Positive, Negative,* or *Neutral*. We considered only characteristics, attributes, and descriptions that conveyed explicitly positive or negative valence (e.g., "He is handsome," "I really don't like her hair," "He looks boring") to avoid overinterpreting ambiguous expressions that could plausibly carry either valence depending on context, such as "He looks wild," which may be interpreted as either attractive or off-putting.

While some of these dimensions (e.g., Hand and hand Shape) capture formal properties of gestures, other dimensions (e.g., Object and Valence) have referential and evaluative functions. However, all of them are dimensions of deixis, part of the polysemiotic utterance (i.e., combining language and gesture) provided by the participants to justify their choices. Taken together, these dimensions allow us to analyze deictic gestures as embodied expressions of participants' affective construal.

4. Results

4.1. General findings

[6] The distinction was made based on the features of *indexicality* (i.e., contiguity in time and space), *directedness* (i.e., a vectorial movement towards between expression and referent), and/or *coordination of attention* (i.e., other-orientedness relative to their context of use) in social interactions (Andrén, 2010).

Overall, there were 116 responses to non-manipulated choice trials and 111 responses to manipulated choice trials.[7] Among the manipulated trials, 68 manipulations went undetected, while 43 were detected. As noted in Section 3.1, each of the 29 participants provided justification responses for four non-manipulated choices and four manipulated choices, including both detected and undetected manipulations.

We present the results for each dimension of Deixis across the three conditions: (a) non-manipulated, (b) manipulated-undetected, and (c) manipulated-detected choice trials, using descriptive statistics. Specifically, we examined differences between preferred and non-preferred picture alternatives within and across these conditions, and identified indicative patterns. Given the multi-dimensional structure of our coding system, which included multiple gesture dimensions and fine-grained categorical values across three trial types, the patterns are reported as descriptive percentages in the sections that follow.[8]

4.2. Dimensions of Deixis

4.2.1. Deixis

Figure 2 shows the proportions of Deixis directed toward the preferred, non-preferred, and pair of pictures across the three trials. Given the infrequent occurrence of Other deixis, we treat Deixis as a homogeneous dimension, consisting almost exclusively of pointing gestures.

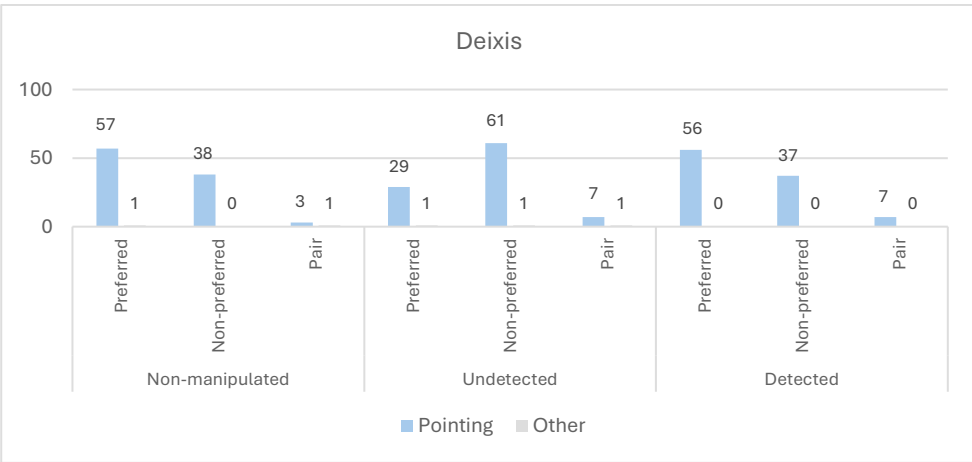

Figure 2. Proportions of Deixis for the preferred, non-preferred, and pair of picture cards for non-manipulated, manipulated-undetected and manipulated-detected trials.

[7] The data of four participants to manipulated trials were excluded due to malfunction of the camera.

[8] We did not include inferential statistics, as doing so would have required substantial simplification of our multi-dimensional coding system for the results to be reportable. While preliminary inferential analyses were conducted and some comparisons yielded statistically significant results, we ultimately chose not to report them, since it would have complicated the presentation and shifted the emphasis away from the study's exploratory and qualitative aims. For these reasons, we frame the findings as hypothesis-generating, offering a foundation for future studies employing more targeted and statistically driven designs.

In non-manipulated and manipulated-detected trials participants most frequently used Deixis to indicate the preferred card, whereas in undetected manipulations they used it mainly to indicate the non-preferred card (presented on the right-hand side, as if it were their preferred one). The picture pair as a whole (as opposed to one card or the other) was indicated more often during undetected and detected manipulation trials (8% vs 7%, respectively) than in the non-manipulated (4%).

Two patterns may be observed: first, in non-manipulated and manipulated-detected trials, the non-preferred alternative was indicated more often than in undetected manipulations (38% and 37% vs. 30%). This suggests that in the former cases, participants justified their preference in comparison, often referring to the non-preferred option as part of explaining their choice (e.g., "I liked this guy more than the other one"). In manipulated-undetected trials, however, participants focused more on the originally non-preferred picture card, now presented as preferred, likely attempting to reevaluate it in order to justify it as their choice. Referring to the "rejected" card would not support their response in the same way it did when the presentation of the picture cards aligned with their initial preference.

Second, in manipulated trials, participants pointed more frequently at the picture pair, evaluating it as a whole (e.g., "I didn't really like any of them"). This suggests that in such cases, participants may have downplayed the differences between the picture alternatives, adopting a more indifferent attitude toward selecting one over the other. In contrast, the picture pair was rarely pointed at during non-manipulated trials, where such an attitude was rather unnecessary, since their preference aligned with the presented chosen card requested to be justified.

4.2.2. Hand Shape

As shown in Figure 3, participants used their *Finger/s* to point at the picture cards more often than their *Palm*. This is not surprising since pointing gestures, which were the majority, prototypically involve the index finger. *Other* (i.e., gestures where *Finger/s* and *Palm* were combined in a way that both were equally prominent) were used the least.

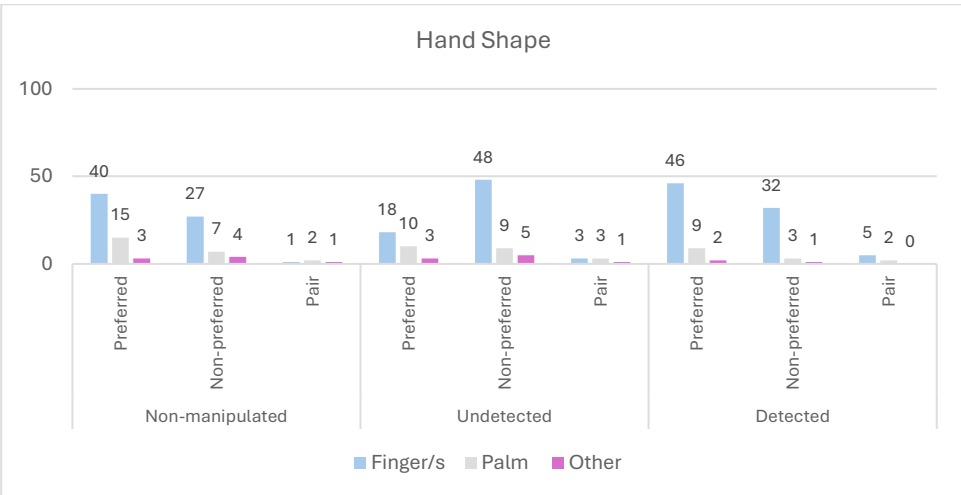

Figure 3. Proportions of hand Shape for the preferred, non-preferred, and pair of picture cards for non-manipulated, manipulated-undetected and manipulated-detected trials.

Comparing the hand Shape of the gestures across the three types of trials, we observe similar patterns. Participants most frequently used their *Finger/s* to indicate the preferred picture card in non-manipulated and manipulated-detected trials, and the non-preferred one in manipulated-undetected trials. When using their *Palm*, participants most often indicated the preferred card rather than the rejected alternative both in non-manipulated (15% vs. 7%) and detected manipulation trials (9% vs. 3%). However, the reverse pattern was observed during undetected manipulations: participants used their *Palm* slightly more frequently to indicate their originally preferred picture card (10%), even though it was presented as the rejected alternative.

The use of the palm has been widely discussed in gesture studies as signaling openness, presentation, or inclusion (e.g., Müller, 2004; Calbris, 2011). In our data, this is reflected in the higher frequency of palm gestures when participants indicated the preferred option compared to the non-preferred one, nearly twice as often in non-manipulated trials and almost three times as often in manipulated-detected trials, suggesting affiliation or endorsement. Extending this pattern to undetected manipulation trials, where participants used the palm slightly more often to indicate their originally preferred image (10% vs. 9%), we interpret this as consistent with an affiliative stance: the gesture signals inclusion or acceptance of the preferred item, even when it is misrepresented as the rejected one. Taken together, the form of the gesture, its orientation toward the preferred object, and its recurrence across trial types support such interpretation. Additionally, it can be observed that the difference between *Finger/s* pointing for preferred and non-preferred alternatives in non-manipulated (40% vs 27%) and manipulated-detected (46% vs 32%) is smaller than between preferred and non-preferred alternatives in undetected manipulations (18% vs 48%). Again, this may further support the claim that participants in the former cases assessed the alternatives in comparison, while when the manipulation was verbally undetected, they focused more on the presented picture card, in an attempt to reevaluate it.

4.2.3. Hand

Overall, participants used their *Right* hand more often than their *Left*, while *Both* hands were rarely used, as shown in Figure 4. However, their hand-use varied depending on the object indicated across the three conditions.

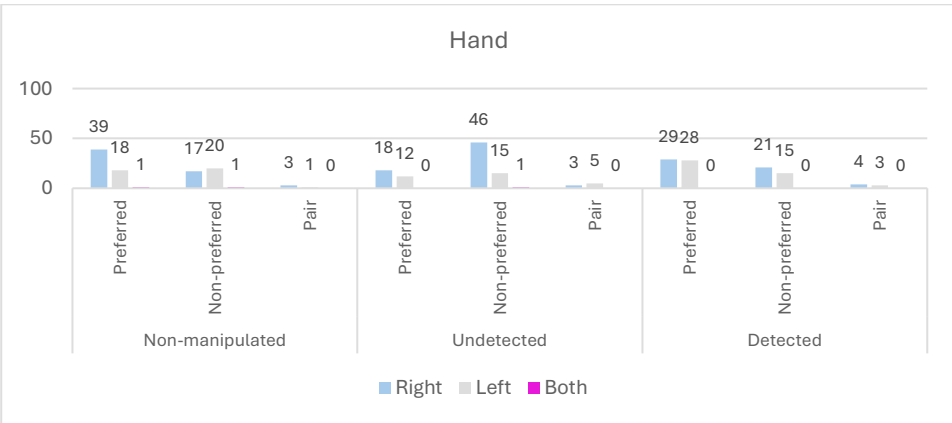

Figure 4. Proportions of Hand for the preferred, non-preferred, and pair of picture cards for non-manipulated, manipulated-undetected and manipulated-detected trials.

In non-manipulated trials, participants predominantly used their *Right* hand to indicate the preferred picture and their *Left* for the non-preferred one (39% vs 20%, respectively). At first glance, this pattern may appear to support research linking right-hand use with positive affect, particularly in right-handed individuals (Casasanto, 2009). However, while findings in gesture research on hand use and affective valence are theoretically suggestive, they remain empirically inconsistent (see Section 2.3). Some studies support an association between handedness and valence, while others emphasize the influence of cultural norms and task demands (e.g., Proctor & Cho, 2006; de la Vega et. al, 2012). This lack of consensus is further complicated in our study by the fact that we did not record participants' handedness. Nevertheless, our within-participant, trial-type comparison design allowed us to observe shifts in hand use relative to each participant's own behavior, rather than relying on fixed assumptions about handedness or valence mapping. This implies that even if a participant were left-handed and associated positive valence with the left hand, we would expect them to use that hand consistently, unless the manipulation disrupted this pattern. The observed shifts in hand use, particularly when comparing non-manipulated with manipulated trials, suggest that these gestures responded to affective or epistemic tension rather than reflecting stable motor preferences. While this does not eliminate the concern, it helps mitigate it.

In manipulated-detected and manipulated-undetected trials, participants predominantly used their *Right* hand to point to both the preferred and the non-preferred picture cards, contrary to the pattern observed in non-manipulated trials (i.e., *Right* hand for the preferred, *Left* for the non-preferred object). Treating the latter trial type as a baseline and extending the association of right-hand use with preference and left-hand use with rejection, the increased use of the *Right* hand in manipulated trials may reflect a process of reevaluating the presented choice as potentially preferable, for example, identifying positive features that might justify the selection. This interpretation is grounded in a comparative pattern observed across trial types: the difference between *Right* and *Left* hand use when indicating the preferred picture card is largest in non-manipulated trials (39% vs. 18%), and markedly smaller in manipulated-undetected (18% vs. 12%) and manipulated-detected trials (29% vs. 28%). This narrowing suggests that, when participants faced inconsistencies between their actual preference and the presented choice, they may have engaged in a compensatory comparison of the two options. In some cases, this process was reflected in participants' verbal justifications (e.g., "I didn't like his hair, but his eyes were kind and that's why I chose him"), revealing an effort to reconcile preference with presentation. In contrast, when no manipulation occurred and the presented image matched their original choice, no such compensatory reasoning was necessary, possibly explaining the clearer distinction in hand use. While exploratory, this interpretation is grounded in the dimensions of deixis, their interactional context, and their consistency across trial types, aligning with the theoretical framework outlined in Section 2.

4.2.4. Tactility

As shown in Figure 5, tactile interactions varied across the three choice trials.

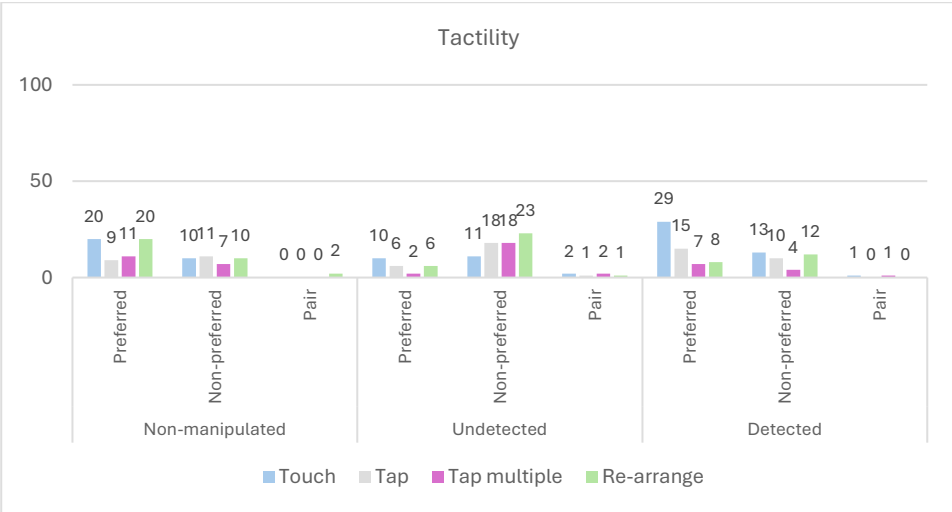

Figure 5. Proportions of Tactility for the preferred, non-preferred and pair of picture cards for non-manipulated, manipulated-undetected and manipulated-detected trials.

While participants in non-manipulated trials most often touched and rearranged (20% each) the preferred picture card, the non-preferred alternative was most often tapped (11%). These modes of tactile engagement are qualitatively different: the former involves prolonged contact with the object and greater use of the hand surface, whereas the latter is characterized by brief tapping, typically involving only the fingertip. As mentioned earlier, tactile information complements visual perception by providing a more immediate and embodied sense of objects (see Section 2.1). In this case, the differences between touching the preferred choice and tapping the non-preferred may align with participants' affective construal of them (i.e., we tend to have more prolonged contact with things we like than with things we do not).

In the manipulated trials, participants exhibited different ways of tactile interaction with the two picture cards, depending on whether the manipulation was detected or not. In the manipulated-detected trials, participants primarily touched both their preferred option (29%), even when it was presented as the rejected one, and their non-preferred option (13%). In contrast, during the undetected manipulated trials, they most frequently rearranged the manipulated card presented as preferred, while touching it the least (23% vs. 11%). Rearranging the position of the presented card may reflect participants' attempt to survey what is shown to them, possibly repositioning it in relation to their own body or the alternative picture card. This tactile engagement with the rejected picture card, highlighted as the preferred one, can be seen as participants' way of expressing confusion or puzzlement about the inconsistency between their choice and what is presented to them. By rearranging

it in space, they may be attempting to understand or rectify the discrepancy (see Section 5).[9] Comparing such cases with detected manipulations, the pattern may suggest that, in defending their choices against the manipulation, participants reevaluated the presented card, exploring or surveying it as a potential choice by either touching or repositioning it. However, the instances of tactility overall and the differences in values are small, making it difficult to draw generalizations.

4.2.5. Valence

As shown in Figure 6, *Neutral* valence was the most frequent across the three kinds of trials. Instances of *Positive* and *Negative* valence were most frequent in non-manipulated choice trials, followed by detected and undetected manipulations.

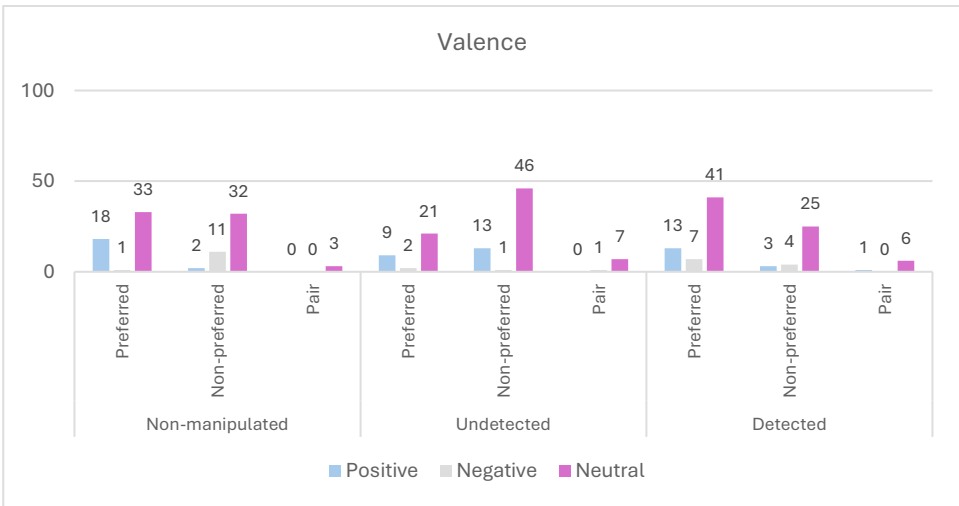

Figure 6. Proportions of Hand for the preferred, the non-preferred and pair of pictures for non-manipulated, manipulated-undetected and manipulated-detected trials.

Apart from the instances of *Neutral* valence, participants most often attributed *Positive* characteristics to the preferred picture card and *Negative* to the non-preferred one, both in non-manipulated trials and detected manipulations. This is not surprising. However, this pattern breaks down when the manipulation was not detected: participants tended to pair *Positive* attributes with their deictic gestures toward *both* the non-preferred picture (presented as chosen) and their initially preferred choice despite it being framed as the one they had rejected. Further, in these trials, negative attributes were nearly nonexistent for both the preferred and non-preferred pictures (2% and 1%, respectively), representing the lowest percentage across the three conditions. This may suggest that in non-manipulated and manipulated-detected trials (as previously claimed based on the instances of deixis), participants assessed the picture alternatives comparatively. Apparently, that was not the

[9] Finer distinctions within the *Rearrange* category (e.g., pushing away vs. pulling closer) may reveal nuanced affective differences, however, our current coding scheme prioritized interpretability given the limited instances and exploratory scope. Future studies with larger samples may profitably explore such subcategories.

case in undetected manipulations, where participants seemed to focus more on the presented picture card, mustering their resources to reevaluate it in order to justify it as their choice.

5. Discussion

The discussion of the results is presented in two subsections, corresponding to the research questions, as presented in the introduction and further elaborated in the subsequent sections of the paper. To facilitate the discussion, Table 2 summarizes the qualitative differences between preferred and non-preferred picture cards based on the highest proportions for each dimension.[10]

Table 2. Qualitative differences between preferred and nonpreferred picture cards for each dimension, based on the highest proportion for non-manipulated, manipulated-undetected and manipulated-detected trials, marking with bold those values that differed across the three kinds of choice trials.

Dimensions	***Non-manipulated***		***Undetected***		***Detected***	
Object	*Preferred*	*Non-preferred*	*Preferred*	*Non-preferred*	*Preferred*	*Non-preferred*
Deixis	More	Less	Less	More	More	Less
Hand shape	Finger/s	Finger/s	Finger/s	Finger/s	Finger/s	Finger/s
Hand	Right	**Left**	Right	**Right**	Right	**Right**
Tactility	Touch/rearrange	**Tap**	Touch	**Rearrange**	Touch	**Touch**
Valence	Positive	**Negative**	Positive	**Positive**	Positive	**Negative**

5.1. Affective valence in deictic gestures

One of the aims of the study was to explore deictic gestures beyond their referential function. Drawing on the phenomenological insight of an irreducible affective component in all forms of intentionality that imply embodied interactions with the environment, we examined participants' construal of preferred and non-preferred picture alternatives. Specifically, we explored whether participants' deictic gestures differed when indicating a preferred versus a non-preferred picture, and in what ways.

Among the three conditions, the non-manipulated trials offer the clearest view of the differences between preferred and non-preferred alternatives. In these trials, the highlighted picture (pushed forward by the experimenter as the chosen one) aligns with participants' preferences. Moreover, the communicative setting is simpler than in manipulated trials, where participants may feel confused about their choices or pressured to negotiate their initial selection, influencing their expressions. Thus, we may treat this condition as the typical, default case and use it as a baseline for comparison with the other two choice trials.

The first two dimensions, Object and Deixis, primarily reflect the communicative demands of the experimental setting rather than participants' affective construal. Participants are required to justify the specific picture card presented to them, making it the focus of their justification (Object). Subsequently, they directed their gestures (Deixis) predominantly

[10] The dimension *Utterance* is not included, since it is indicated by the dimension of *Valence*.

toward it, except for when the manipulation was detected and their target object shifted from the presented one to their initially preferred.

In regards to participants' hand Shape, they primarily used their fingers to gesture at both alternatives across all three types of trials. However, in non-manipulated trials, they typically pointed to the preferred card with their right hand and to the non-preferred card with their left, consistent with findings linking the right hand to positive evaluations and the left to negative ones (see Section 2.2). When tactility was involved, participants mostly touched or rearranged the preferred card, while the non-preferred card was mainly tapped. This indicates brief tactile engagement with the non-preferred card (a single tap) and more prolonged interaction with the preferred card (touching or moving it). Finally, when the gestures were accompanied by verbal expressions, aside from the predominant neutral ones, positive attributes were associated with the preferred picture and negative ones with the non-preferred. In the absence of manipulation, *participants' deictic gestures differed when indicating a preferred versus a non-preferred picture.* Thus, it is not any one dimension that provides evidence of affective construal, but rather the pattern of co-occurrence across dimensions and trial types.

This pattern is further reinforced when examining the preferred option across the manipulated trials: participants consistently pointed with their right hand, touched the preferred picture card, and made positive remarks about it. Notably, *this occurred even when the manipulation was verbally undetected, and the preferred card was presented as the rejected one*. However, what differed from the non-manipulated trials was how participants indicated the initially rejected alternative (which was presented as their preferred choice). Some gestural dimensions for these picture cards resembled those of the preferred option in non-manipulated trials, while others varied depending on whether the manipulation was detected. In both manipulated conditions, participants predominantly used their fingers and right hands. However, when the manipulation was detected, they more frequently *touched* the rejected alternative and made *negative* remarks about it. In contrast, when the manipulation was undetected, participants mostly *rearranged* the highlighted card and commented on it *positively*.

One of the most compelling patterns supporting the claim that deictic gestures express affective stance is the consistent use of *Touch* when participants referred to their preferred option. This tactile engagement was not only more frequent but also qualitatively distinct, characterized by prolonged, purposeful contact that contrasts with the brief, less invested gestures (such as tapping) observed for non-preferred alternatives. The recurrence of this form across non-manipulated and manipulated-detected trials suggests that participants' bodily engagement with the preferred image reflects an affiliative or positively valenced orientation toward it. Rather than functioning solely to locate or indicate a referent, such observations support our broader claim that deictic gestures can convey more than spatial reference: they can function as subtle but consistent markers of affective construal.

Further, the similarities in the deictic dimensions of the non-preferred picture card with the preferred one, when manipulation was involved, could indicate participants' reevaluation of it as a potential choice. Such a process entails a dynamic gestalt or figure-ground structure: "something becomes noticeable (...) emerging with affective prominence, salience, or clarity. In contrast, something else remains unnoticed because of its weaker appeal" (Husserl, 1900/2001, p. 211) – in this case, motivated by the demands of the communicative

interaction and the experimenter's instruction to justify it. "Every receptive action presupposes a prior affection" (ibid, p. 127), however, the interplay between passivity and activity, affection and receptivity is dynamic, "depending on the nature and force of the allure, as well as one's motivations, (...)" (in Thompson, 2007, p. 374). Most importantly, this "allure" does not refer to a causal stimulus-response relation, but to an intentional relation of motivation implying flexibility, change and dynamism.

To summarize, clear differences were observed in participants' gestures for preferred and non-preferred alternatives when no manipulation was involved. This supports the argument that deictic gestures not only direct attention to a target but also characterize it (e.g., Kendon & Versante, 2003), in the present case, in terms of affective construal. When manipulation was involved, participants' deictic gestures towards their preferred choice resembled those in non-manipulated trials, regardless of whether the manipulation was detected. However, the similarities between the rejected alternatives and the preferred ones in undetected manipulations suggest that, influenced by the communicative setting and demands of the task, participants may have been reevaluating the rejected alternative as a potential choice.

5.2. Affective valence and choice awareness

The second aim of the study was to explore choice awareness and whether participants' construal of affective valence, expressed through deictic gestures, could serve as an indicator of awareness, even when the manipulation was not verbally detected. Specifically, we aimed to examine whether the way participants pointed to the preferred and non-preferred options in the manipulated trials differed from or remained consistent with their gestures in the non-manipulated trials, and based on these observations, to draw conclusions about their implicit awareness of choice.

To put it simply, if the arguments of homogeneity between non-manipulated and undetected manipulations of "choice blindness" would stand, then the dimensions of deixis for *both* the preferred and non-preferred alternatives in undetected manipulations should be the *reverse* of those in non-manipulated trials: treating (a) the originally preferred option as the rejected in non-manipulated trials, and (b) the non-preferred alternative as the preferred in non-manipulated trials. Was this the case? Starting the cross-comparison with (a), we observed that participants did not treat the presumably rejected alternative in the same way as the rejected picture card in non-manipulated trials. On the contrary, the deictic gestures were similar to those of their preferred option in the non-manipulated trials. Based on the observation that participants' construal of the affective valence of the preferred choice *remained consistent across the three kinds of trials, unaffected by the manipulation*, we can argue that it serves as an indicator of participants' implicit awareness of their choices. Despite verbally endorsing a choice of the picture card they did not prefer, the qualitative properties of their deictic gestures suggest that, at least on a bodily level, they were aware of their preference.

To continue with the cross comparison for (b), the dimensions of deixis of the non-preferred alternative were indeed similar with those of the preferred in non-manipulated trials. However, this similarity can be understood by rooting agency in the sense of possibility, and as already discussed (see Section 5.1), by reevaluating the object as potentially preferred. Every act of the ego, as pointed out by Husserl, is surrounded by an entire range of potential

actions (Moran, 2005, p. 211). The object's horizon and the intertwined basic acts of consciousness (see Section 2.1) may have provided the flexibility of a fuller perception of both the intended object and the perceiver's identity that were developed together, allowing participants to discover new ways of experiencing both things and themselves (Mouratidou, 2020, p. 28). This feature of intentionality is described eloquently by Tallis (2021, p. 96):

> Intentionality opens up a landscape dappled with possibilities that may or may not be actualized. Seeing those possibilities, I am ahead of myself and of the present state of the world. I envisage even more remote possibilities that are relevant to my needs, wishes, plans, and dreams. The explicit future envisaged by agents, supplementing the actual present is informed by a remembered or implicit past. Possibilities are not free floating: they take their rise from our experience of actuality. But they are not part of, or even less confined to, that actuality.

Moreover, the specific experimental task involved self-referentiality: participants were instructed to justify their choices based on their self-knowledge. Beyond the inherent difficulty of explaining the reasons behind preference-based choices, participants were required to reflect on their own choice-making process. This suggests, as discussed in Section 2.3, that the relationship between the pre-reflective and reflective intentionalities may involve variations in the motivations guiding participants to choose one picture over another, as well as the motivations influencing how they later perceive and justify the selected picture as their own (e.g., under the influence of experimental instructions or researcher authority). However, the differentiation that reflection entails also implies unity: the justifications participants provide are expressions of their identity, rooted in and motivated by their experiential life – they are not mutually contradictory but rather complementary (see Section 2.3). To quote Husserl once again:

> When I say "I", I grasp myself in a simple reflection. But this self-experience [*Selbst-erfahrung*] is like every experience [Erfahrung], and in particular every perception, a mere directing myself towards something that was already there for me, that was already conscious, but not thematically experienced, not noticed (Husserl, 1973b, cited in Gallagher & Zahavi, 2012, p. 70).

To summarize, the findings suggest that participants were pre-reflectively aware of their preferences, grounded on operative intentionality. While this does not amount to verbal articulation of manipulation detection, it nonetheless demonstrates a consistent affective orientation that is bodily expressed. Our findings align with that of other studies assessing manipulation detection via bodily expressions, as well as physiological measures. For example, in a previous study (Mouratidou et al., 2024, see Section 2.), participants exhibited significantly more adaptors (e.g., self-touching) during verbally undetected manipulations. Such bodily expressed reactions to the incongruence between participants' preference and the presented alternatives suggest a form of "knowing" operating below the level of reflective awareness. Similarly, working within the "choice blindness" paradigm, Pärnamets et al. (2023) reported significant physiological differences, such as increased pupil dilation and longer response times during undetected manipulations, arguing that such indications are indicative of effortful rationalization and underlying cognitive conflict. Whereas the authors (strikingly) concluded that the reported findings *do not support* participants' detection of the manipulation - and, thus, awareness choice – we, consistent with the phenomenological tradition and a richer understanding of the phenomenon, argue that

embodied responses often precede and condition reflective access. As Gallagher (2005, p. 45) states, "pre-reflective bodily awareness is not a matter of conceptual or propositional knowledge. It is a form of non-objectifying, operative self-awareness that functions as a condition for the possibility of higher-order cognition". Thus, taken these findings together, we hold that such bodily expressions provide evidence of pre-reflective awareness of choice: "The body is our general medium for having a world" (Merleau-Ponty, 1945, p. 169), and in this case, it is precisely through the body that the original orientation of the choice expresses itself and remains accessible.

6. Conclusion

In this study we investigated the role of deictic gestures in expressing affective valence and its relation to choice awareness. By examining participants' gestures toward preferred and non-preferred picture cards across non-manipulated and manipulated trials, we identified a number of clear differences. These suggest that (a) deictic gestures are not merely referential but carry affective and evaluative dimensions, and (b) the affective valence manifested in deictic gestures serves as an indicator of participants' implicit awareness of their choice making.

In non-manipulated trials, participants primarily used their right hand, engaged in prolonged tactile interactions, and made positive verbal expressions to indicate their preferred choices, in contrast with the gestures they used for non-preferred alternatives. In manipulated trials, this pattern persisted for the preferred option, even when the manipulation went undetected. This suggests that participants retained an implicit awareness of their original preferences, despite verbally endorsing the manipulated choice. Even when the manipulations were verbally undetected, participants indicated the manipulated picture card with gestures similar to those used when no manipulation was involved.

Regarding participants' gestures toward the non-preferred alternative, presented as their own, a reevaluation process was evident. This was reflected in the similarities between the deictic gestures directed at the non-preferred alternative and those directed toward the preferred choice in non-manipulated trials. Such reevaluation, shaped by the communicative demands of the experimental task, suggests the dynamic interplay between agency, intentionality, and affective construal in choice-making contexts.

Grounded in phenomenological and cognitive semiotic concepts, the study provides further insights. Participants' gestures and verbal justifications aligned with the perspective that affective salience in perception guides action and that agency emerges within a landscape of possibilities. Furthermore, the dynamic relationship between bodily expressions and affective valence suggests that participants were pre-reflectively, on the level of operative intentionality, aware of their choices, regardless of whether they verbally endorsed a choice they did not initially prefer.

Future research could explore the generalizability of these findings to higher-stakes choices and other communicative contexts, furthering our understanding of the interaction between affect, embodiment, and cognition. A revised experimental design could address certain factors that might have influenced the results. For example, the extent to which participants affectively construed the presented pictures may vary depending on stimuli characteristics, such as the monochrome nature of the images. Additionally, the degree of investment in the choice task likely varied among participants. Some may have evaluated the pairs

superficially, making random or less-engaged choices, limiting the extent to which their subsequent justifications and deictic gestures reflected their affective construal.

In conclusion, deictic gestures are not merely referential; they also carry affective and evaluative dimensions. These gestures offer a window into implicit choice awareness, revealing the affective foundations of choice making, even in manipulated experimental settings. The study's findings have implications for our understanding of pre-reflective and reflective processes in expressing our preferences and how choice awareness may be bodily manifested, contributing to a more pluralistic understanding of human agency and consciousness.

References

Andrén, M. (2010). *Children's gestures from 18 to 30 months* [Doctoral dissertation, Lund University].

Andrén, M. (2014). Multimodal constructions in children: Is the headshake part of language? *Gesture, 14*(2), 141-170. https://doi.org/10.1075/gest.14.2.02

Bargh, J. A., & Ferguson, M. J. (2000). *The automaticity of everyday life*. In R. S. Wyer Jr. (Ed.), *Rethinking the role of conscious experience in social cognition* (pp. 55-77). Psychology Press.

Birdwhistell, R. L. (1966). Some relationships between American kinesics and spoken American English. In A. G. Smith, (Ed.). *Communication and Culture* (pp. 182-189). Holt, Rinehart & Winston.

Bressem, J. & Müller, C. (2014). A repertoire of German recurrent gestures with pragmatic functions. In C. Müller, A. Cienki, E. Fricke, S. H. Ladewig, D. McNeil & J. Bressem (Eds.), *Body – language – communication. An International Handbook on Multimodality in Human Interaction* (Vol. II, pp.1575-1592). De Gruyter Mouton.

Bower, M., & Gallagher, S. (2013). *Affect, cognition, and the embodied mind*. *Phenomenology and the Cognitive Sciences, 12*(2), 221-241. https://doi.org/10.1007/s11097-012-9264-3

Calbris, G. (1990). *The semiotics of French gestures*. Indiana University Press.

Calbris, G. (2011). *Elements of meaning in gesture*. John Benjamins Publishing Company.

Casasanto, D. (2009). *Embodiment and abstract thought*. *Current Directions in Psychological Science, 18*(4), 198-202. https://doi.org/10.1111/j.1467-8721.2009.01637.x

Cienki, A. J. (2015). Spoken language usage events. *Language and Cognition, 7*(4), 499-514. https://doi.org/10.1017/langcog.2015.20

Clark, H. H. (2003). Pointing and placing. In S. Kita (Ed.), *Pointing: Where Language, Culture, and Cognition Meet* (pp. 243-268). Lawrence Erlbaum Associates.

Cochran, J. K.; Greenspan, R. L.; Bogard, D. F.; & Loftus, E. F. (2016). "Memory Blindness: Altered memory reports lead to distortion in eyewitness memory". *Mem Cogn 44*(5), 717-726.

Cooperrider, K. (2011). *Reference in action: Links between pointing and language* [Doctoral dissertation, University of California]. eScholarship. https://escholarship.org

Cooperrider, K. (2023). Fifteen ways of looking at a pointing gesture. *Public Journal of Semiotics 10* (2), 40-84.

De Jorio, A. (2000). *Gestures in Naples and Gestures in Classical Antiquity. A translation of La mimica degli antichi investigata nel gestire napoletano*. Fibreno.

De la Vega, I., de Filippis, M., Lachmair, M., Dudschig, C., & Kaup, B. (2012). Keep your hands crossed: The valence-by-left/right interaction is related to hand, not side, in an incongruent hand–response key assignment. *Acta Psychologica* 142(3), 273-277. https://doi.org/10.1016/j.actpsy.2012.12.011

DeLeon, C. (2023). Pointing to communicate: the discourse function and semantics of rich demonstration. *Linguist and Philos 46*, 839-870. https://doi.org/10.1007/s10988-022-09363-0

Dennett, D. C. (1991). *Consciousness explained*. Little, Brown & Company.

Dennett D. C. (1996). *Kinds of minds: toward an understanding of consciousness.* Basic Books.

Eco, U. (1976). *A Theory of Semiotics*. Indiana University Press.
Efron, D. (1941). *Gesture and Environment*. King's Crown Press.
Ekman, P. & Friesen, W. F. (1969). Nonverbal leakage and cues to deception. *Psychiatry: Journal for the study of interpersonal processes 32* (1), 88-106.
Fuchs, T. (2013). The phenomenology of the body. In D. Zahavi (Ed.), *The Oxford handbook of contemporary phenomenology* (pp. 256-271). Oxford University Press.
Gallagher, S. (2003). Phenomenology and embodiment. In D. Zahavi (Ed.), *Handbook of phenomenology and cognitive science* (pp. 233-253). Springer.
Gallagher, S. (2005). *How the body shapes the mind*. Oxford University Press.
Gallagher, S. & Zahavi, D. (2012). *The phenomenological mind*. Routledge.
Gallagher, S., & Sørensen, J. (2006). The body in phenomenology and cognitive science. In S. Gallagher & D. Zahavi (Eds.), *The phenomenological mind* (pp. 91-114). Routledge.
Gibson, J. J. (1966). *The senses considered as perceptual systems*. Houghton Mifflin.
Goldin-Meadow, S., Alibali, M. W., & Church, R. B. (1993). Transitions in concept acquisition: Using the hand to read the mind. *Psychological Review*, 100(2), 279-297. https://doi.org/10.1037/0033-295X.100.2.279
Fazio, R. H. & Olson, M. A. (2003). Implicit measures in social cognition research: Their meaning and use. *Annual Review of Psychology 54* (1), pp. 297-327.
Haggard, P., & Witton, C. (2002). The feeling of doing: Volition and the sense of agency. *Consciousness and cognition, 11*(3), 541-551. https://doi.org/10.1016/S1053-8100(02)00011-8.
Husserl, E. [1900-1901] (2001). Logical investigations (Vol. 1, J. N. Findlay, Trans.). Routledge.
Husserl, E. [1913] (1983). *Ideas pertaining to a pure phenomenology and to a phenomenological philosophy: First book* (F. Kersten, Trans.). Martinus Nijhoff Publishers.
Husserl, E. [1928] (1991). *On the phenomenology of the consciousness of internal time* (J. B. Brough, Trans.). Springer.
Husserl, E. [1936] (2004). *The crisis of European sciences and transcendental phenomenology* (D. Carr, Trans.). Northwestern University Press.
Johansson, P. (2006). *Choice blindness: The incongruence of intention, action and introspection* [Doctoral dissertation, Lund University].
Johansson, P. (2016, November). *Do you really know why you do what you do?* [Video]. TED Conferences.
Johansson, P., Hall, L., Sikström, S. & Olsson, A. (2005). Failure to Detect Mismatches Between Intention and Outcome in a Simple Decision Task. *Science 310* (5745), 116-119.
Johansson, P., Hall, L., Tärning, B., Sikström, S., & Chater, N. (2013). Choice blindness and preference change: You will like this paper better if you (believe you) chose to read it. *Journal of Behavioral Decision Making 27*(3).
Katz, D. (1989). *The world of touch*. Lawrence Erlbaum Associates.
Kendon, A. (1983). Gesture and speech: how they interact. In J. M. Wieman & R. P. Harrison (Eds) *Nonverbal Interaction (*pp. 13-45). Sage Publications.
Kendon, A. (2000). Language and gesture: Unity or duality? In S. C. Levinson & N. J. Enfield (Eds.), *Manuals: The perspective of gesture and sign* (pp. 335-354). Cambridge University Press.
Kendon, A. (2003). Gesture and the nature of language. In D. McNeill (Ed.), *Language and gesture* (pp. 46–63). Cambridge University Press.
Kendon, A. (2004). *Gesture: Visible action as utterance*. Cambridge University Press.
Kendon, A., & Versante, L. (2003). Pointing by hand in 'Neapolitan'. In Sotaro Kita (Ed). *Pointing: Where Language, Culture and Cognition Meet* (pp. 109-137). Lawrence Erlbaum.
Kita, S. (2003a). Pointing: A critical review. In S. Kita (Ed.), *Pointing: Where language, culture, and cognition meet* (pp. 1-32). Lawrence Erlbaum.
Konderak, P. (2018). *Mind, Cognition, Semiosis: Ways to Cognitive Semiotics*. Maria Curie-Sklodowska University Press.
Lachaud, L., Jacquet, B., & Baratgin J. (2022). Reducing Choice-Blindness? An Experimental Study Comparing Experienced Meditators to Non-Meditators. *Eur J Investig Health Psychol Educ 12*, (11), 1607-1620.

Langacker R. W. (2006). Subjectification, grammaticization, and conceptual archetypes. In Athanasiadou A, Canakis C, Cornillie B (Eds), *Subjectification: various paths to subjectivity (*pp. 17-40). De Gruyter.
Libet, B. (2005). Reflections on the role of consciousness in cognitive neuroscience. *Consciousness and cognition, 14*(2), 404-417. https://doi.org/10.1016/j.concog.2005.01.002
McNeil, D. (1992). *Hand and Mind.* University of Chicago Press.
Mendoza-Collazos, J. (2022). *Agency and artefacts: A cognitive semiotic exploration of design.* Lund University.
Merleau-Ponty, M. [1945] 2008. *Phenomenology of Perception* (D. A. Landes, Trans). Routledge.
Moran, D. (2005). *Husserl Founder of Phenomenology.* Polity Press.
Morgenstern, L. (2014). *Gesture and signed language: Embodiment and the relationship between spoken and signed communication*. *Phenomenology and the Cognitive Sciences, 13*(4), 725-743. https://doi.org/10.1007/s11097-014-9383-1
Mouratidou, A. (2020). Choice awareness and manipulation blindness. *Public Journal of Semiotics, 9*(1), 1-40. https://doi.org/10.37693/pjos.2019.9.21388
Mouratidou, A. (In press-a). Investigating choice awareness through cognitive semiotics. In A. Biglari (Ed.) *Open Semiotics*. Editions L'Harmattan.
Mouratidou, A. (In press-b). *Mind the Body: Verbal and Non-verbal signs of choice awareness*. [Doctoral dissertation, Lund University].
Mouratidou, A., Jordan, Z., & van de Weijer, J. (2022). How much do we really care what we pick? Pre-verbal and verbal investment in choices concerning faces and figures. *Topoi, 41*(4), 695-713. https://doi.org/10.1007/s11245-022-09807-z
Mouratidou, A., Jordan, Z., & van de Weijer, J. (2024). The body says it all: Non-verbal indicators of choice awareness. *Cognitive Semiotics, 17*(2), 233-266.
Müller, C. (2004). Forms and uses of the palm up open hand: A case of a gesture family? In C. Müller & R. Posner (Eds.), *The semantics and pragmatics of everyday gestures* (pp. 233–256). Weidler.
Müller, C. (2008). What gestures reveal about the nature of metaphor. In A. Cienki & C. Müller, C (Eds.), *Metaphor and gesture* (pp. 219-245). Johan Benjamins.
Müller, C. (2013). *The study of gestures in the context of language and communication*. In S. C. Levinson & N. J. Enfield (Eds.), *The handbook of language and gesture* (pp. 117–135). Oxford University Press.
Noë, A. (2005). *Action in perception*. MIT Press.
Patočka, J. (1998). *Body, Community, Language, World* (trans. E. Kohák). Open Court.
Petitmengin, C., Remillieux A., Cahour, B. & Carter-Thomas, S. (2013). A gap in Nisbett and Wilson's findings? A first-person access to our cognitive processes. *Consciousness and Cognition 22* (2), 654-669.
Pfau, R. (2011). Sign language and gesture: The relation between signed languages and gestural communication. In S. C. Levinson & N. J. Enfield (Eds.), *Manuals: The perspective of gesture and sign* (pp. 335-354). Cambridge University Press.
Pielli, L. & Zlatev, J. (2020). The cyborg body: Potentials and limits of a body with prosthetic limbs. *Cognitive Semiotics 13*(2), 78-94.
Proctor, R. W., & Cho, Y. S. (2006). Polarity correspondence: A general principle for performance of speeded binary classification tasks. *Psychological Bulletin 132*(3), 416-442.
Pronin, E. (2009). *The introspection illusion*. *Consciousness and cognition, 18*(1), 1-13. https://doi.org/10.1016/j.concog.2008.11.007
Pärnamets, P., Johansson, P., Strandberg, T., Balkenius, C., & Hall, L. (2023). *Looking at choice blindness: Evidence from gaze patterns and pupil dilation* [Preprint]. PsyArXiv.
Romdenh-Romluc, K. (2018). Science in Merleau-Ponty's phenomenology: From the early work to the later philosophy. In D. Zahavi (Ed.), *The Oxford handbook of the history of phenomenology* (pp. 340–359). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780198755340.013.22

Sauerland, M., Kiefer, M. & Kuhlmann, J. (2013). Choice blindness and the reliability of autobiographical memories. *Journal of Experimental Psychology: Learning, Memory, and Cognition 39* (3), 965-975.

Scherer, L. D., Windschitl, P. D. & Smith, A. R. (2013). Choice blindness in decision making: The failure to detect mismatches between intention and outcome. *Journal of Experimental Psychology: General 142* (1), 1-15.

Sokolowski, R. (2000). *Introduction to Phenomenology*. Cambridge University Press.

Sokolowski, R. (2017). *Moral action: A phenomenological study*. CUA Press.

Sonesson, G. (2009). The view from Husserl's lectern: Considerations on the role of phenomenology in cognitive semiotics, *Cybernetics and Human Knowing, 16* (3-4), 107-148.

Stahl, C., Skewes, J. & Roepstorff, A. (2016). Choice blindness and introspection: A study on the limits of self-knowledge. *Consciousness and Cognition 44* (1), 66-77.

Tallis, R. (2021). *Freedom: An Impossible Reality*. Agenda Publishing.

Thompson, E. (2007). *Mind in life: Biology, phenomenology and the sciences of mind*. Harvard University Press.

Timm, L. (2022). *Construal of motion events and linguistic relativity: Comparing German and Spanish speakers* [Master's thesis, Lund University]. Lund University Publications. https://lup.lub.lu.se/student-papers/search/publication/9082132

Tomasello, M. (2008). *Origins of Human Communication.* The MIT Press.

Varela, F. J., Thompson, E., & Rosch, E. (1991). *The embodied mind: Cognitive science and human experience*. MIT Press.

Valera, F. J. & Shear, J. (1999). First-person methodologies: what, why, how? *Journal of consciousness studies 3* (4), 330-349.

Watson, B. (1996). *Chuang Tzu: Basic writings*. Columbia University Press.

Wegner, D. (2018). *The illusion of conscious Will*. The MIT Press.

Wilkins, D. (2003). Why pointing with the index finger is not a universal (in sociocultural and semiotic terms). In S. Kita (Ed). *Pointing: Where Language, Culture and Cognition meet* (pp. 171-215), Lawrence Erlbaum.

Wittenburg, P., Brugman H., Russel, A., Klassmann, A., & Sloetjes H. (2006). Elan: A professional framework for multimodality research. In Paper presented at the 5th international Conference on language Resources and evaluation (LREC 2006). Genoa, Italy: European Language Resources Association (ELRA).

Zahavi, D. (2009). *Phenomenology: The basics*. Routledge.

Zahavi, D. (2021). Applied phenomenology: why it is safe to ignore the epoché. *Cont Philos Rev 54,* 259-273. https://doi.org/10.1007/s11007-019-09463-y

Zlatev, J. (2009). The semiotic hierarchy: Life, consciousness, signs and language. *Cognitive Semiotics 4* (2), 170-201.

Zlatev, J. (2015). Cognitive Semiotics. In P. G. Trifonas (Ed.). *International Handbook of Semiotics* (pp.1043-1067). Springer.

Zlatev. J. (2016). Turning back to experience in Cognitive Linguistics via phenomenology. *Cognitive Linguistics 27*(4), 559-572.

Zlatev, J. (2018). Meaning making from life to language: The semiotic hierarchy and phenomenology. *Phenomenology and the Cognitive Sciences, 17*(2), 131-157. https://doi.org/10.1007/s11097-017-9547-5

Zlatev, J., & Mouratidou, A. (2024). Extending the life world: Phenomenological triangulation along two planes. *Biosemiotics, 17*(2), 407-429. https://doi.org/10.1007/s12304-024-09576-9

Zlatev, J. & Möttönen, T. (2022). In Pelkey J (Ed), *Cognitive linguistics and semiotics.* Bloomsbury semiotics (vol 4).

Appendix A.

Table A.1. ELAN coding template for deictic gestures for Non-manipulated choice trials, Detected and Undetected manipulations.

TIER	NAME	CONTROLLED VOCABULARY
1	Trial	Non-manipulated (3) Manipulated (4) Manipulated (8) Non-manipulated (9) Non-manipulated (11) Manipulated (12) Manipulated (16) Non-manipulated (17)
2	Manipulation status	Detected Undetected
3	Transcription	
4	Picture card	P (preferred) NP (non-preferred) P (pair) O (other)
5	Deixis	Pointing Other
6	Object	Preferred Unpreferred Pair Other
7	Hand shape	Finger/s Palm Other
8	Hand	Right Left Both hands
9	Tactility	Touch Tap Tap multiple Rearrange
10	Utterance	
11	Valence	Positive Negative Neutral

Appendix B.

Table B.1. Phenomenological triangulation along the ontological (horizontal) and epistemological (vertical) planes (Zlatev & Mouratidou, 2024).

Dimensions Perspectives	Self	Others	Things
First-person	Reflection	Empathy	Phenomenological reduction
Second-person	Psychotherapy	Interview	Intersubjective validation
Third-person	Self-observation	Experiment	Causal explanation

Paper 4

Investigating choice awareness through cognitive semiotics

Alexandra Mouratidou

Abstract

Physicalist approaches to cognition view behavior as driven by neural mechanisms and automatic processes, often neglecting the complexity of human experience. Cognitive semiotics, rooted in phenomenology, emphasizes consciousness and meaning-making. Central to this is *phenomenological triangulation*, exploring phenomena through first-, second-, and third-person perspectives. This chapter applies this principle in choice making, validating awareness and our reliability as conscious agents.

1.Laying the background after looking in the wrong place

The everlasting topic of free will, taken up in every period of Western philosophy by philosophers like Plato, Descartes, and Kant, may seem outdated to many. Modern neuroscience has currently taken the lead in deciphering human nature by portraying cognition as brain processes and/or computations (e.g., Dennett, 1991) and the feeling of consciously willing our actions as an illusion (e.g., Wegner, 2003). Natural scientists, determinist philosophers, and even the general public increasingly credit the brain (and environment) as the dictator of our actions, subscribing to the idea that "you can do what you decide to do—but you cannot decide what you will decide to do" (Harris, 2012: 38).

The idea of the impossibility of free will directly relates to the scope of this chapter on choice making and awareness, with respect to the following claims: (a) human actions are governed by unbreakable natural laws (i.e., causality imprisons the agent in her past, while law-governed nature predestines her future); and, (b) agency is reducible to neurological processes, which are explicable according to the laws of physics, chemistry, and biology. In short, "causal ancestry" (Tallis, 2021: 80) and brain activity seem to have more to say about our choices than conscious subjects themselves. Such conclusions are allegedly supported by the numerous studies on free will (e.g., Libet, 1983, 1985, 1999; Soon et al., 2008; Haynes, 2011) and choice making (e.g., Johansson et al., 2005, 2008, 2018; Hall et al. 2010, 2012), with most findings interpreted within the same explanatory vein: not our will, but Brain's will. Our choices are claimed to be initiated by unconscious processes before we determine what we are going to do and when we are going to do it. As for our sense of agency, it is "like that of the child moving the plastic toy steering wheel next to the real thing held by its parent, unaware that its voluntary actions are

causally inert or epiphenomenal" (Dennett, 2003: 225). Certainly, we can reason with as much sophistication as we want about the nature and motivation of our actions, but that amounts to nothing more than retrospectively constructed verbalizations, or "confabulations" (e.g., Nisbett and Wilson, 1977; Wegner, 2003; Johansson et al., 2005). [1]

The implications of such views extend beyond the scientific context, and into the core of our humanity. In fact, such positivistic approaches to human nature are by no means recent, advanced by current technological developments, like neuroimaging and AI. And neither is the question of whether natural sciences are sufficient to account for human existence, as pointed out by Husserl nearly a century ago:

> The total world-view of the modern man, in the second half of the nineteenth century, let itself be determined by the positive sciences and be blinded by the "prosperity" they produced, meant an indifferent turning-away from the questions which are decisive for a genuine humanity. […] It excludes in principle precisely the questions which man […] finds the most burning: questions of the meaning or meaninglessness of the whole of this human existence. (1936: 5)

In quest of a foundation of knowledge free from prevailing theoretical presuppositions, such as metaphysical realism and naturalism, and able to attain "things" in their essence, Edmund Husserl introduced the philosophy and methodology of *phenomenology* at the beginning of the last century. By starting from what he considered to be the only given—first-person experience—and by viewing human beings as self-determining agents embedded in a shared life-world, phenomenology turned out to be one of the most influential philosophies of the 20th century, impacting also disciplines such as psychology, sociology, and semiotics. In his final work published during his lifetime, *"The Crisis of European Sciences and Transcendental Phenomenology"*, Husserl brings forth what is, more than ever, topical in these days where "mind" and "brain" are considered by many as synonymous: "But can the world, and human existence in it, truthfully have a meaning if the sciences recognize as true only what is objectively established in this fashion […]? Can we console ourselves with that?" (1936: 7).

The failure of natural-scientific rationality to accommodate the human subject in its totality and complexity has resulted in reductionist approaches to cognition, captured in a well-known quote by Daniel Dennett: "In short, the mind is the brain… We can (in principle!) account for every mental phenomenon using the same physical principles, laws, and raw materials that suffice to explain radioactivity,

[1] As Nisbett and Wilson claim: "such reports are often based on a priori theories about behaviour–were they cultural, personal, or both–drawing the conclusion that people do not have actual introspective awareness" (1977: 233).

continental drift, photosynthesis, reproduction, nutrition, and growth" (1991: 33). Such reductionist approaches leave the experiential aspect, with the significance it carries, out of the picture. The researcher, in their pursuit to understand human beings (or other animals), uses the corresponding "appropriate" methods for studying them as physical entities among others. These methods are deemed not only adequate, but most valid. We could thus rely exclusively on measurements of participants' heart rates, brain activity, or skin conductance to understand, for example, choice making in an experimental task, rather than participants' first-person reports, if at all. Subsequently, scientific objectivity, in the sense outlined by Dennett, implies that the researcher's subjectivity is, at best, redundant, reduced to the reliability that third-person ("external") measurements can provide. Thus, scientific robustness amounts to the (assumed) elimination of subjectivity from the equation. In short, as Husserl put it: "Someone who is raised on natural science takes it for granted that everything merely subjective must be excluded and that the natural-scientific method […] determines objectively" (1936: 53).

However, in fixating on this sort of objectivity—a detached, presumably perspectiveless, pursuit—science loses sight of its own purpose, as "[m]easuring rods and clocks have been taken to be theoretically self-sufficient entities" (Tallis, 2021: 45), while the researcher, in the best case, remains merely mediatory. However, is it not the observer, belonging to a community of minds, who "transforms straight rods into rulers and periodic events into clocks" (ibid)? To quote Husserl once again:

> This objectivism, or this psychophysical world-view, in spite of its apparent obviousness, is naïvely one-sided and has constantly failed to be understood as such. The reality of the spirit as a supposed real annex to bodies, its supposed spatiotemporal being with nature, is an absurdity. […] [N]o objective science can do justice to the very subjectivity which accomplishes science. (1936: 294-5)

Strongly influenced theoretically and methodologically by phenomenology, *cognitive semiotics* focuses on the study of different aspects of meaning, holding a pluralistic conception of human nature, where consciousness and meaning-making stand as two closely interrelated aspects of our interaction with the world. Cognitive semiotic research rests upon two methodological principles: (a) *the conceptual-empirical loop* (e.g., Zlatev, 2015; Stampoulidis et al., 2019; Devylder and Zlatev, 2020; Mendoza-Collazos, 2022) and (b) *phenomenological triangulation* (e.g., Zlatev, 2009; Pielli and Zlatev, 2020; Zlatev and Mouratidou, 2024). Philosophical and empirical investigations, oscillating their focus between "what" is the phenomenon and "how" it manifests itself, generate theoretical constructs and subsequent operationalizations through numerous iterations of the conceptual-empirical loop. These iterations ensure the unbiased reflection on the phenomenon under study, as it is experientially given, freed from prior theories, assumptions, etc.

They further involve accessing the phenomenon from three different perspectives and their corresponding methods: (a) in direct givenness to the researcher, a *first-person* (philosophical) perspective; (b) in dialogue between the researcher and others, a *second-person* (empirical in a qualitative sense) perspective; and (c) abstracted from these, as accessed by an impersonal community, a *third-person* (scientific in a quantitative sense) perspective. Such triangulation implies that no matter the ontological status of the phenomenon (i.e., Self, Others, or Things), third-person methods are always preceded by the perspectives of the first and second person, even if backgrounded, in line with the phenomenological dictum of the primacy of consciousness as the means through which everything is given to us, including scientific knowledge.

Conscious awareness in choice making is one of the topics that has been recently explored within cognitive semiotics (Mouratidou, 2020; Mouratidou et al., 2022; Mouratidou et al., 2024; Mouratidou and Andrén, under review). The following sections describe and exemplify the application of the abovementioned principles to the study of choice awareness when manipulation is involved, offering evidence for varying levels of awareness, as reflected in participants' verbal and non-verbal responses. This evidence challenges claims associated with what is known in the literature as "choice blindness" (e.g., Johansson et al., 2005, 2008, 2018; Hall et al., 2010, 2012; McLaughlin and Somerville, 2013*;* Sagana et al., 2013; Cochran et al., 2016; Stille et al., 2017).

2. What kind of "blindness" are we talking about?

"If you go to an ice cream store, order a chocolate cone, and then accept a strawberry cone without noticing, that is choice blindness" (https://courses.lumenlearning.com/waymaker-psychology/chapter/psych-in-real-life-choice-blindness/). This example describes the phenomenon of not noticing that you have been misled about a choice you made. Aiming to overcome "the problem of taking the verbal reports of experimental subjects at face value" (Johansson et al., 2005: 4) when reflecting on their choices, a group of cognitive scientists developed an experimental method based on a "card-magic trick" to manipulate what participants chose and what was presented to them as their choice (ibid). Applied in various domains and modalities (e.g., aesthetic, moral, and political preferences in modalities like vision, voice and taste), choice blindness experiments over the past two decades have reported that the majority of participants not only fail to notice the inconsistency between what they chose and what they were presented with, but also verbally justify choices that they never actually made. Additionally, when these "confabulatory" reports were compared with reports that participants generated for their non-manipulated choices, no differences were found (ibid). Such observations led to conclusions reflected in a quote by one of the initiators of this experimental paradigm:

> […] our experimental results clearly support an anti-introspectionist view. If we are supposed to know our own minds from the inside, we should know why we do what we do. And when asked to describe why we chose a face we did not actually prefer, we are not supposed to fabricate reasons (at least not without knowing that this is what we are doing). In our experiments, it is evident that the participants do not have perfect access to their underlying cognitive machinery. (Johansson et al., 2008: 20)

As creative and impressive as choice blindness may be, it has spread across different disciplines as a "research tool to study decision-making, intentional action, and introspection" (Johansson et al., 2018: 151) and is now established as a research paradigm (Johansson et al., 2005), leaving us baffled by the implications of its findings, as reflected in the following statements: "our free will may in fact be limited" (Gärdenfors, 2023: 19); "the self is […] a fiction created by the mind to make sense of its own fragments" (McGrail, 2015: 6); "it challenges the very conception of what an attitude amounts to and how you can measure it" (Hall, 2012: 251); "perhaps we make things up all the time" (Johansson, 2016: 6:30´´). In other words, implications that challenge the ideas of ourselves as reliable agents, the validity of introspection as a research method, and the scope of our self-awareness in choice making.

But before we blindly accept such claims to "blindness," let us consider some factors that seem to be neglected: (a) diverse findings regarding detection rates of manipulation in previous choice-blindness research (e.g., Haggard et al., 2002; Sauerland et al., 2013; Scherer et al., 2013; Pettitmengin et al., 2013; Stahl et al., 2016; Lachaud et al., 2023) imply that the phenomenon of participants not noticing that their choices have been manipulated is subject to variation, urging further investigation into whether different degrees of choice awareness can be attributed to various factors (e.g., experimental conditions, type of decision, method of manipulation, etc.); (b) observations of homogeneity between the verbal justifications for manipulated and non-manipulated choices do not necessarily indicate that differences could not still exist; and (c) the practice of measuring detection through explicit verbal comments is acknowledged to be problematic (e.g., Fazio and Olson, 2003; Cochran et al., 2016), necessitating inquiry into alternative methods for assessment.

These issues have been addressed in a series of cognitive semiotics studies challenging prior claims regarding our unawareness of choice (Mouratidou, 2020; Mouratidou et al., 2022; Mouratidou et al., 2024; Mouratidou and Andrén, in prep), presented in Section 4. These studies rest on choice-manipulation experiments based on preference, inspired by the choice-blindness experimental design. In short, participants are first asked to choose between two picture alternatives, selecting the one they prefer. They are then presented with the initial pairs and asked to justify their choice. However, for some of the trials, they are presented with the non-preferred alternative as their choice, as shown in Figure 1.

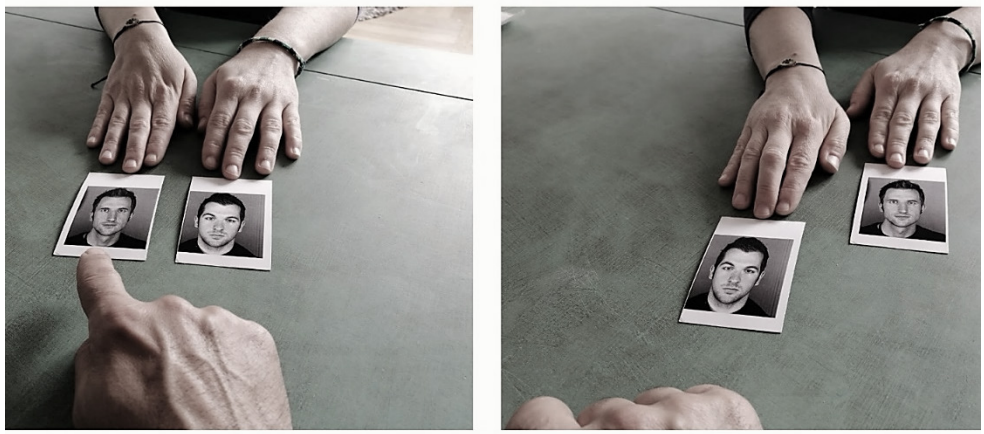

Figure 1. The choice manipulation procedure. (1) The participant is presented with two alternatives and asked to make a choice; (2) then asked to justify their choice, where in a number of trials (manipulations) the non-chosen alternative was presented as their choice.

3. Phenomenological triangulation

Over the last two decades, cognitive semiotics has developed what was initially called "methodological triangulation" (Zlatev, 2012), which involves a triangulation of methods from three different perspectives: 'subjective,' 'intersubjective,' and 'objective' methods (Zlatev, 2009). This was later refined into "pheno-methodological triangulation" (Pielli and Zlatev, 2020), as the triangulation did not merely refer to the combination of qualitative and quantitative methods, which is the usual understanding of methodological triangulation, but rather to the perspective the researcher takes to access the phenomenon. Recently, it has been further evolved, both terminologically to its current term, "phenomenological triangulation" (Mendoza-Collazos, 2022), and conceptually along two planes (Zlatev and Mouratidou, 2024): the *epistemological* plane, corresponding to the ways the phenomenon is accessed by the researcher, and the *ontological* plane, referring to the part of the interconnected life-world that is in focus: Self, Others, and Things (Table 1). These dimensions are interwoven into an ontological whole (i.e., the life-world) and should not be seen as strict divisions; however, one can still focus more on one aspect than another (Zlatev and Mouratidou, 2024).

Dimension	*Self*	*Others*	*Things*
Perspective			
First person	Reflection	Empathy	Phenomenological reduction
Second person	Psychotherapeutic dialogue	Interview	Intersubjective validation
Third person	"Third-person data" analysis	Psychological experiment	Causal explanation

Table 1. Extended phenomenological triangulation along two planes: the three kinds of perspectives of the vertical level, and the three kinds of ontological dimensions on the horizontal, with examples that are only prototypical and not exclusive for each cell (Zlatev and Mouratidou, 2024).

In approaching any given phenomenon, we necessarily start with the *first-person* perspective: the
openness of consciousness to something other than itself (i.e., the intentional object) on the one hand, and the "givenness" of the object to consciousness on the other. The *intentionality* of consciousness describes its directedness, being necessarily *of* something—things, ideas, relations, etc.—which are experienced as already meaningful. At the same time, this process is intersubjectively constituted with other subjects. The correlative relationship of consciousness reflects that human beings are "meaning-apprehenders and meaning-bestowers in a world that is encountered as already laden with significances that [we] both uncover and, in a certain sense, invent" (Moran, 2016: 2). Thus, we begin exploring the phenomenon through our intuition of it, informed by the insights we gain from how it is experientially given and our reflections on this givenness, which necessarily includes aspects of intersubjectivity (Others) as well.

From there, we open our way of accessing the phenomenon to explicitly include the perspectives of others (e.g., participants, the research community, etc.). We thus expand our understanding by considering the *second-person* perspective. This can involve methods like interviews, observing participants in fieldwork, studying different scholars, collaborating with other scientists, etc. This exploration can then lead to the *third-person* perspective, which includes formalizations and quantitative analysis (e.g., statistical tests, physiological measurements, etc.), "giving the impression that we are [now] dealing with perspectiveless 'facts'" (Zlatev and Mouratidou, 2024: 9).

Phenomenological triangulation does not only dictate how research is to be conducted within cognitive semiotics; rather, it also describes what researchers usually do, regardless of their theoretical and methodological preferences. However, by explicitly adhering to this approach, we not only accomplish robust scientific investigations, but also restore objectivity on its real basis: that of the experiencing subject making observations, taking decisions, interpreting patterns, inventing terminology, etc. in interaction with other researchers. Additionally, phenomenological triangulation provides an ethos for scientific endeavors that includes yet exceeds formal institutional requirements (e.g., consent forms, ethical applications, etc.): the ethos of scientific honesty, encompassing the transparency

and modesty about what it means to conduct research—not from a free-floating "objective" eye surveying the world that exists over there, but from an embodied eye standing at a certain spot in this world that is right here for me, you, and them.

4. Conscious awareness in choice making

The central motivation for applying phenomenological triangulation in the study of choice awareness can be summarized by the question: *Do low detection rates of manipulation, combined with the similarity between participants' verbal reports for both non-manipulated and undetected manipulations, indicate a lack of choice awareness?* To explore this, we conducted a series of studies based on choice-manipulation experiments, comparing participants' (verbal and non-verbal) responses in three distinct conditions: (a) Non-manipulated choice trials, (b) Undetected manipulation trials, and (c) Detected manipulation trials. By examining differences between conditions (a) and (b), we aimed to challenge the assumption that participants are unaware of their choices. In other words, any detectable differences in expressions between non-manipulated and undetected manipulation trials would suggest that participants may not be as unaware of their choices as previously assumed.

4.1. First-person perspective: "I"

What would it be like going to an ice cream store, ordering a chocolate cone, and then accepting a strawberry one without saying anything about it? Would this suggest that I am unaware of my preference for chocolate over strawberry, or could it indicate that I quickly chose one flavor over another without caring too much which one I would get? In other words, failing to verbally express (which as noted above is usually taken as not noticing) the inconsistency between what I chose and what I got, should not necessarily imply that I do not know what I preferred in the first place. Rather, it may suggest that, for whatever reason, I did not recognize the substitution or the inconsistency between the two options. Consequently, a terminological revision has been proposed: *manipulation blindness* (Mouratidou, 2020), which posits that participants are not "blind" when making their original choice (i.e., they are not unaware of their preferences), but rather may fail to notice (or at least object to) the substitution of an alternative for their original choice.

But what reasons might influence me to not notice such a switch? Features such as *memory, consequence, affectivity*, and *investment* in the choice-making process could be potential factors influencing the detection of manipulation. These factors were explored by Mouratidou (2020) and Mouratidou et al. (2022) where they were operationalized as follows: *memory* as the participants' ability to remember and recall their choices; *affectivity* as stimuli with varying degrees of abstractness and presumed affective value (e.g., human faces versus abstract figures); *consequence* as different choice tasks assigned to the participants, which

may have either more permanent effects (such as getting a tattoo) or temporary ones; and *choice investment* as a set of semantic categories that formulate a matrix of eleven markers of investment. Thus, if I remembered ordering chocolate flavor, felt strongly about it (e.g., it were my favorite), recognized that the consequences of not getting what I ordered were significant (e.g., being allergic to strawberry), or the choice mattered to me (e.g., keeping a promise made to my child on her birthday), I would more likely notice and object to what was handed to me as my choice.

Further, my reflection as practicing researcher indicates that certain dynamics are at play in communicative experimental settings: the relationship between the researcher and the participant is asymmetrical, with the former assigning tasks and the latter responding to them to the best of her ability. The researcher possesses a certain assumed authority, as the one who knows what she is doing and how, that the participant trusts and relies upon. Consequently, if I feel ambivalent about what I chose (e.g., if I do not remember it well or if it does not matter to me that much), when the researcher asserts that I had chosen "this" over "that," I am likely to entertain the idea that perhaps I did so, rather than attribute the inconsistency on her, as her mistake. Thus, even if I verbally justified something I did not choose in order to adequately respond to the assigned task, there should be other ways through which my ambivalence, surprise, hesitation, and so forth could be expressed, testifying as indicators of choice awareness. In Mouratidou et al. (2024) and Mouratidou and Andrén (under review), we describe how we extended the investigation of choice awareness and manipulation detection beyond language to include non-verbal expressions. This inquiry into other semiotic systems and their interrelations aimed to enhance our methods of "measuring" detection.

In sum, having explored the phenomenon from a first-person perspective, we have identified (a) a distinction between at least two types of choices: a fast, unreflective choice (e.g., I just wanted an ice cream and quickly picked one flavor over another) and a slow, reflective choice (e.g., having my first treat after a long period of fasting and taking time to decide which one it would be); [2] (b) several factors that may influence the detection of manipulation; and (c), non-verbal expressions as possible indicators of choice awareness.

[2]The former is based on *operative intentionality*: the (lower) level of pre-reflective consciousness that establishes "a natural, pre-predicative unity of our being in the world and of our life […] that appears in our desires, our evaluations, and our landscape" (Merleau-Ponty, 2012: xxxii). The source of our more rapid and intuitive choices. The latter on *categorial intuition*: the (higher) level of reflective consciousness that gives the basis for a predicative, but still pre-linguistic choice based on "our judgments and […] voluntary decisions" (ibid). It provides the foundation of reason and thought, while generating our slower and more deliberate intentional acts. The choices we make are products of the combination of both levels: in the former, our attention is somewhat diffused, while in the latter it is directed and focused towards specific features (Mouratidou, 2020: 6).

4.2. Second-person perspective: "You"

Building on the previous insights, we extend the investigation into the second-person perspective. We begin by reviewing relevant literature in relation to the aforementioned points. Due to space constraints, I will only briefly highlight some of the key theoretical considerations that informed the studies.

Based on interactions with and "debriefing" of the participants in the studies, an alternative interpretation of "confabulation" was offered, as the actualization of possibilities that intentionality provides, motivating justifications that are not fabricated, but truthful, in line with participants' experiential life. As pointed out by a prominent interdisciplinary scholar:

> Intentionality opens up a landscape dappled with possibilities that may or may not be actualized. Seeing those possibilities, I am ahead of myself and of the present state of the world. I envisage even more remote possibilities that are relevant to my needs, wishes, plans, and dreams. The explicit future envisaged by agents, supplementing the actual present is informed by a remembered or implicit past. Possibilities are not flee floating: they take their rise from our experience of actuality. But they are not part of, or even less confined to, that actuality. (Tallis, 2021: 96)

In our earlier work (Mouratidou, 2020; Mouratidou et al., 2022), we examined whether the factors identified above (i.e., memory, consequence, affectivity, and choice investment) had been explored in previous choice blindness research and, if so, in what manner. Additionally, for Mouratidou et al. (2024), we reviewed studies on non-verbal behavior that have been conducted in psychotherapy and forensic research as indicators of deception "leakage" (i.e., the involuntary revelation of truth through non-verbal cues; e.g., Ekman et al., 1969, 1991, 1999, 2009). Engaging with the work of other scholars informed our methodological decisions, such as the bodily expressions to include in our investigation of choice awareness, and the semantic categories to consider as relevant markers of choice investment. Following this, we turned to the participants themselves to observe their experiences of choice manipulation.

In the first study (Mouratidou, 2020), examining memory, consequence, and affectivity, 43 participants were assigned a forced-choice task involving manipulation. Participants' verbal justifications were analyzed, distinguishing between those detecting the manipulation and those that did not. Based on the observation of participants' distinct response patterns, a 10-category scale was developed (Table 2), which enabled the classification of specific types of responses. The results were then assessed accordingly. [3]

[3] The responses were almost equally divided between Detection, when including Clear and Possible Detection (49%), and No Detection (51%). The detections consisted predominantly of Categorical

TYPE OF DETECTION	TYPE OF RESPONSE	RESPONSE PATTERN
Clear	Categorical	Reject M.C. and justify the choice of the P.C. (1)
	Conciliatory	Question, reject M.C. and justify the choice of the P.C. (2)
Possible	Uncertainty	Question M.C. and state preference for P.C. (3) Question M.C. and justify M.C. (4) Do not motivate M.C. and state preference for P.C. (5) Motivate M.C. and state preference for P.C. (6)
None	Ignorance	Do not justify M.C. (7) Cannot justify M.C. spontaneously, but does so reluctantly. (8)
	Indifference	Evaluate choices as of equal weight. (9)
	Acceptance	Justify M.C. (10)

Table 2. Type of detection, type of response, and patterns of responses. MC=manipulated card, PC=preferred card (Mouratidou, 2020)

Thus far, we have explored how the second-person perspective encompasses the engagement with the work of other scholars and the observation and categorization of participants' (verbal and non-verbal) expressions. However, in the studies referenced above, the second-person perspective also involved the use of inter-rater reliability measures. In Mouratidou et al. (2024), where bodily expressions were assessed as potential indicators of choice awareness, two independent raters coded 10% of the data, achieving a high degree of agreement, with an inter-rater reliability score of 90.2%.

4.3. Third-person perspective: "They"

Having identified the phenomenon, distinguished between different ways of investigation, and conducted the experimental tasks, we could turn to the third-person perspective, which for these studies takes the form of descriptive and inferential statistics. Such analysis can assist in providing estimates of effect sizes, given the strength of the effect and the size of the sample in which the effect is found, and thus, help the researcher convince their audience that the observed effects are likely not a matter of chance (van de Weijer, 2024).

In Mouratidou et al. (2024), we describe how we examined participants' bodily expressions across five Categories of Bodily Expression (CBE): Adaptors, Torso,

responses (21%). Amongst the No Detection responses, the majority were categorized as cases of Acceptance; however, a third (33%) of the total No Detection responses belonged to the categories of Ignorance and Indifference. This rather mixed stance towards No Detection may be argued to indicate a degree of manipulation awareness, expressed implicitly either by participants' ignorance in acknowledging and justifying the manipulated choice as their own, or by treating both alternatives as indifferently "equal", as part of a forced choice task.

Head, Face, and Hand Expressions evaluated in terms of their rates of occurrence and variety (i.e., the engagement of different CBEs). Participants' bodily expressions were analyzed using statistical tests, specifically mixed-effects regression models, to compare the outcome variables between manipulated and non-manipulated choice trials, and then again between detected and undetected manipulated trials, as well as non-manipulated trials.

Table 3 shows the mixed effects regression analysis between (a) detected and undetected manipulation trials, as well as (b) undetected and non-manipulated choice trials for the five Categories of Bodily Expression and trial duration. There were overall more instances for four of the five CBEs in (a) detected than undetected manipulated trials, and for all five CBEs in (b) undetected manipulated than non-manipulated choice trials. For (a), differences in *trial duration*, as well as *Head* and *Hand* expressions were significant, while for (b), differences in *trial duration*, and the categories *Adaptors,* as well as *Variety* (EST = -0.357, SE = 0.119, t = -3.008, p = 0.003). These findings suggest that, regardless of whether the manipulation was verbally detected, it was reflected in participants' longer evaluation times, increased rates of bodily expressions, and engagement of more body parts (i.e., variety) during undetected manipulated trials compared to non-manipulated.

	DETECTED VS. NON-DETECTED MANIPULATIONS				NON-DETECTED MANIPULATIONS VS. ACTUAL CHOICES			
	EST	SE	*t*	*p*	EST	SE	*t*	*p*
CBE								
Adaptors	-0.211	0.269	-0.784	0.434	**-0.681**	**0.223**	**-3.046**	**0.003**
Torso	0.717	0.414	1.706	0.089	-0.512	0.346	-1478	0.140
Head	**2.390**	**0.955**	**2.504**	**0.013**	-0.604	0.783	-0.771	0.441
Face	0.507	0.405	1.251	0.212	-0.485	0.336	-1.444	0.150
Hand	**2.031**	**0.703**	**2.889**	**0.004**	-0.156	0.586	-0.267	0.790
Trial duration (seconds)	**5.102**	**1.915**	**2.664**	**0.008**	**-3.500**	**1.581**	**-2.214**	**0.028**

Table 3. Mixed effects regression analysis of detected and non-detected manipulated trials, and non-detected manipulated trials and actual (non-manipulated) choice trials for the different Categories of Bodily Expression (CBE) and trial duration.

To give another example, Mouratidou (2020) found that *memory* and *affectivity* significantly predicted manipulation detection, while consequence did not. The positive values of estimated effects reflected that the likelihood of detecting manipulation increased when the stimulus was remembered. P-values indicated statistical significance for memory and affectivity predictors, but not for consequence.

Thus, third-person methods can complement first- and second-person approaches, helping to achieve a more comprehensive understanding of the phenomenon.

5. Conclusions

In this chapter I started by presenting a brief overview of current physicalist approaches to cognition, particularly in regards to willing our actions and choices, and argued that they are limited in scope. To offer an alternative, I proceeded by theoretically describing the cognitive semiotic principle of phenomenological triangulation and illustrated its application on the study of choice awareness when manipulation is involved, across different studies on the matter.

Summarizing the insights gained from the integration of the philosophical and empirical aspects of the conceptual-empirical loop (see Section 1), as well as of the multiperspectival access to the phenomenon of choice making, I concluded that the phenomenon of "manipulation blindness" can be interpreted in ways that do not undermine choice awareness. In particular, the detection of choice manipulations is found to be influenced by various factors (i.e., memory, affectivity, and investment), while choice awareness is often evident in more implicit forms than speech, such as bodily behavior. Thus, I have argued for different degrees of awareness, even in cases of apparently undetected manipulations, which may not be focal, but rather a matter of pre-reflective self-consciousness (Gallagher and Zahavi, 2012).[4]

Rather than beginning with theoretical presuppositions (e.g., that experience can be reduced to a single causal factor, cognitive processes have fixed characteristics, or only empirical data derived experimentally is valuable) guiding subsequent methodological choices (e.g., by-passing participants' first-person accounts as unreliable), cognitive semiotic investigations start with experience and balance between first-, second- and third-person perspectives. The pluralism of this combination safeguards that operationalizations remain truthful to the phenomenon (i.e., translation validity, see Zlatev and Moskaluk, 2022), and is driven by the phenomenological dictum that "what is given or accepted as evidence must be actually experienceable within the limits of and related to the human experiencer" (Ihde, 2012: 9). The conclusions of the studies on choice awareness reflect that in order to account for human cognition, we cannot and should not deprive the investigation from the first- and second-perspectives. Relying solely on the "objectivity" of third-person methods is likely to lead to a distorted view of the human condition, reducing the complexity and richness of human experience to overly simplistic metrics. As stated once again by Husserl:

[4] Pre-reflective self-consciousness refers to the non-observational and non-objectifying feature of primary experience (52); however, "my pervasive pre-reflective self-consciousness is not to be understood as complete self-comprehension. Thus, one should distinguish between the claim that consciousness as such involves an implicit self-consciousness and the claim that consciousness is characterized by total self-transparency. One can easily accept the first and reject the latter" (Ricoeur, 1966 in Gallagher and Zahavi, 2012: 61).

> Only a radical inquiry back into subjectivity—and specifically the subjectivity that ultimately brings about all world-validity, with its content and in all its prescientific and scientific models—can make the objective truth comprehensible […]. (1936: 69)

References

Cochran, Jane K.; Greenspan, Richard L.; Bogard, David F.; Loftus, Elizabeth F. (2016). "Memory Blindness: Altered memory reports lead to distortion in eyewitness memory". *Mem Cogn* 44, 5, pp. 717-726.

Dennett, Daniel (1991). *Consciousness explained*. London: Penguin Books.

Dennett, Daniel (2003). *Freedom Evolves*. New York: Viking Press.

Devylder, Simon; Zlatev, Jordan (2020). "Cutting and Breaking Metaphors of the Self and the Motivation and Sedimentation Model". *In* Alessandro Baicchi and Klaus Radden (eds). *Figurative Meaning Construction in Thought and Language.* Amsterdam: Benjamins, pp. 253-281.

Ekman, Paul; Friesen, Wallace F. (1969). "Nonverbal leakage and cues to deception". *Psychiatry: Journal for the study of interpersonal processes* 32*,* 1, pp.88-106.

Ekman, Paul; O'Sullivan, Maureen; Friesen, Wallace V.; Scherer, Klaus R. (1991). "Face, Voice, and Body in Detecting Deceit". *Journal of Nonverbal Behavior* 15, 2, pp. 125-135.

Ekman, Paul (1999). "Emotional and Conversational Nonverbal Signals". *In* Lynne S. Messing and Raymond W. Campbell (eds.). *Gesture, Speech, and Sign*. New York, NY: Oxford University Press, pp. 45-55.

Ekman, Paul (2009). "Lie Catching and Micro Expressions". *In* Martin Clancy (ed.). *The Philosophy of Deception*. New York, NY: Oxford University Press.

Fazio, Russell H.; Olson, Michael A. (2003). "Implicit measures in social cognition research: Their meaning and use". *Annual Review of Psychology* 54, 1, pp. 297-327.

Gallagher, Shaun; Zahavi, Dan (2012). *The phenomenological mind*. London: Routledge.

Gärdenfors, Peter (2023). *The limited nature of our free will*. Cambridge: MIT Press.

Haggard, Patrick; Clark, Scott; Kalogeras, John (2002). "Voluntary action and conscious awareness". *Nature Neuroscience* 5, 4, pp. 382-385.

Hall, Lars (2012). LiveScience. Charles Choi (19 September 2012). Opinions Easily Flip-Flop, Researchers Find. https://www.yahoo.com/news/opinions-easily-flip-flop-researchers-210444844.html

Hall, Lars; Johansson, Peter; Tärning, Beth; Sikström, Sven; Deutgen, Tanja (2010). "Magic at the marketplace: Choice blindness for the taste of jam and the smell of tea". *Cognition* 117, 1, pp. 54-61.

Hall, Lars; Johansson, Peter; Strandberg, Thomas (2012). "Lifting the veil of morality: Choice blindness and attitude reversals on a self-transforming survey". *PLoS One* 7, 9, e45457.

Harris, Sam (2012). *Free Will*. New York: Free Press.

Haynes, John Dylan (2011). "Beyond Libet: Long-term prediction of free choices from neuroimaging signals". *In* Walter Sinnott-Armstrong and Lila Nadel (eds.). *The Boundaries of Consciousness: Neurobiology and Neuropathology*. Amsterdam: Elsevier, pp. 85-96.

Husserl, Edmund (1970) [1936]. *The Crisis of European Sciences and Transcendental Phenomenology: An Introduction to Phenomenological Philosophy*, trans. D. Carr. Evanston, IL: Northwestern University Press.

Ihde, Don (2012). *Experimental Phenomenology: Multistabilities*. Albany: State University of New York Press.

Johansson, Peter (2016, November). *Do you really know why you do what you do?* [Video]. TED Conferences.

Johansson, Peter; Hall, Lars; Sikström, Sven; Olsson, Andreas (2005). "Failure to Detect Mismatches Between Intention and Outcome in a Simple Decision Task". *Science* 310, 5745, pp.116-119.

Johansson, Peter; Hall, Lars; Sikström, Sven. (2008). "From Change Blindness to Choice Blindness". *Psychologia* 51, 2, pp.142-155.

Johansson, Peter; Hall, Lars; Sikström, Sven (2018). "Research tool to study decision-making, intentional action, and introspection". *In* Jonathan W. Clegg (ed.). *The psychology of decision making*. Thousand Oaks, CA: Sage Publications, pp. 150-162.

Lachaud, Lucie; Jacquet, Bertrand; Baratgin, Jean (2022). "Reducing Choice-Blindness? An Experimental Study Comparing Experienced Meditators to Non-Meditators". *Eur J Investig Health Psychol Educ* 12, 11, pp.1607-1620.

Libet, Benjamin; Gleason, Catherine A; Wright, Edward W; Pearl, David K. (1983). "Time of conscious intention to act in relation to onset of cerebral activity (readiness-potential). The unconscious initiation of a freely voluntary act". *Brain* 8, 4, pp. 623-42.

Libet, Benjamin (1985). "Unconscious cerebral initiative and the role of conscious will in voluntary action". *Behavioral and Brain Sciences* 8, 4, pp.529-66.

Libet, Benjamin (1999). "Do we have free will?". *Journal of Consciousness Studies* 6, 8, pp. 47-57.

Lumen Learning. (n.d.). *Psych in real life: Choice blindness*. Lumen Learning. https://courses.lumenlearning.com/waymaker-psychology/chapter/psych-in-real-life-choice-blindness/

Nisbett, Richard E.; Wilson, Timothy D. (1977). "Telling more than we can know: Verbal reports on
mental processes". *Psychological Review* 84, 3, pp. 231-259.

McGrail, John (2015). *The Synthesis Effect: Your Direct Path to Personal Power and Transformation*. Newburyport, MA: Red Wheel/Weiser.

McLaughlin, Owen; Somerville, Jason (2013). "Choice blindness and choice confidence in financial decision making". *Judgment and Decision Making*, 8, 5, pp. 577-588.

Mendoza-Collazos, Juan; Zlatev, Jordan (2022). "A cognitive-semiotic Approach to Agency: Assessing ideas from Cognitive Science and Neuroscience". *Biosemiotics*, 15, 1, 141-170.

Merleau-Ponty, Maurice [1962] 2012. *Phenomenology of Perception* (D. A. Landes, Trans). London: Routledge.

Moran, Dermot (2016). "Husserl on Human Subjects as Sense-Givers and Sense-Apprehenders in a World of Significance". *Discipline Filosofiche* 2, XXV, pp. 9-33.

Mouratidou, Alexandra (2020). "Choice awareness and manipulation blindness". *Public Journal of Semiotics* 9*,* 1, pp.1-40.

Mouratidou, Alexandra; Zlatev, Jordan; van de Weijer, Joost (2022). "How Much Do We Really Care What We Pick? Pre-verbal and Verbal Investment in Choices Concerning Faces and Figures". *Topoi* 41,4, pp. 695-713.

Mouratidou, Alexandra; Zlatev, Jordan; van de Weijer, Joost. (2024). "The body says it all: Non-verbal indicators of choice awareness". *Cognitive Semiotics* 2, 18, pp. 18-39

Mouratidou, Alexandra; Andrén, Mats (under review). "Deictic gestures beyond reference: Construal of affective valence in choice making". *Phenomenology and the Cognitive Sciences.*

Petitmengin, Claire; Remillieux, Agnés; Cahour, Béatrice; Carter-Thomas, Stéphane (2013). "A gap in Nisbett and Wilson's findings? A first-person access to our cognitive processes". *Consciousness and Cognition* 22, 2, pp. 654-669.

Pielli, Laura; Zlatev, Jordan (2020). "The cyborg body: Potentials and limits of a body with prosthetic limbs". *Cognitive Semiotics* 13, 2, pp. 78-94

Sagana, Anna; Sauerland, Markus; Merckelbach, Herman (2014). "Memory impairment is not sufficient for choice blindness to occur". *Frontiers in Psychology* 5, 5, pp. 449.

Sauerland, Markus; Kiefer, Michael; Kuhlmann, Jan (2013). "Choice blindness and the reliability of autobiographical memories". *Journal of Experimental Psychology: Learning, Memory, and Cognition* 39, 3, pp. 965-975.

Scherer, Laura D.; Windschitl, Paul D.; Smith, Andrew R. (2013). "Choice blindness in decision making: The failure to detect mismatches between intention and outcome". *Journal of Experimental Psychology: General* 142, 1, pp. 1-15.

Soon, Chun S.; Brass Markus; Heinze, Hans-Jochen; Haynes, John-Dylan (2008). "Unconscious determinants of free decisions in the human brain". *Nature Neuroscience* 11, 5, pp. 543-545.

Stahl, Christoph; Skewes, Joshua; Roepstorff, Andreas (2016). "Choice blindness and introspection: A study on the limits of self-knowledge". *Consciousness and Cognition* 44, 1, pp. 66-77.

Stampoulidis, George; Bolognesi, Marianna; Zlatev, Jordan (2019). "A cognitive semiotic exploration of metaphors in Greek street art". *Cognitive Semiotics* 12, 1, pp. 63-81.

Stille, Lotta; Norin, Emelie; Sikström, Sverker (2017). "Self-delivered misinformation - Merging the choice blindness and misinformation effect paradigms". *PLoS ONE*, 12, 3, e0173606.

Tallis, Raymond (2021). *Freedom: An Impossible Reality*. Newcastle upon Tyne: Agenda Publishing.

Wegner, Daniel (2018). *The Illusion of Conscious Will*. Cambridge, MA: MIT Press.

Van de Weijer, Joost (2024, October 17). *Statistics for cognitive semiotics.* Cognitive Semiotics Seminar. Lund University, Lund.

Zlatev, Jordan (2009). "The semiotic hierarchy: Life, consciousness, signs and language". *Cognitive Semiotics* 4, 2, pp. 170–201.

Zlatev, Jordan (2012). "Cognitive Semiotics: An emerging field for the transdisciplinary study of meaning". *The Public Journal of Semiotics* IV, 1, pp. 2-24.

Zlatev, Jordan (2015). "Cognitive Semiotics". *In* Peter G. Trifonas (ed.). *International Handbook of Semiotics*. Dordrecht: Springer, pp.1043-1067.

Zlatev, Jordan; Moskaluk, Kalina (2022). "Translation validity in metaphor theories CMT, DMT, and the Motivation & Sedimentation Model". *In* Antoaneta Bagasheva, Bojan Hristov and Nadezhda Tincheva (eds.). *Figurativity and Human Ecology*. Amsterdam: John Benjamins Publishing Company, pp. 123-148.

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RESEARCH

Extending the Life World: Phenomenological Triangulation Along Two Planes

Jordan Zlatev[1] **· Alexandra Mouratidou**[1]

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Abstract

Phenomenology is often mistakenly understood as both introspectionist and anthropocentric and thus as incapable of providing us with objective knowledge. While clearly wrong, such critiques force us to spell out how the *life world* that is given in human experience is in fact not anthropocentric and not incompatible with science. In this article we address this by adapting a recent proposal to extend the key methodological principle of cognitive semiotics, *phenomenological triangulation*, along two planes. The first is horizontal and concerns the dimensions of Self, Others and Things, as irreducibly interrelated dimensions of the life world. The second is vertical, and deals with the way phenomena are accessed: from a first-person (philosophical), second-person (empirical in a qualitative sense) and third-person (scientific in a quantitative sense) perspective. With each perspective, the life world becomes correspondingly extended beyond direct experience. It is thus neither static nor confining. We exemplify each step with corresponding research, also providing examples of how non-human animals and not only human beings may serve as Others, thus addressing the critique of anthropocentrism. We conclude by pointing out how, despite some theoretical differences, the focus on subjectivity and the explicit or implicit adoption of the principle of phenomenological triangulation can serve as common ground for cognitive semiotics and biosemiotics.

Keywords Cognitive semiotics · Phenomenology · Intersubjectivity · Constitution · Non-human subjects

✉ Alexandra Mouratidou
alexandra.mouratidou@semiotik.lu.se

Jordan Zlatev
jordan.zlatev@semiotik.lu.se

[1] Division for Cognitive Semiotics, Lund University, Lund, Sweden

Introduction

While mind-body dualism is claimed to be outdated, it is amazing how persistent, at least in Western culture, is the view that every one of us is trapped in our individual "mental bubbles". This is also often complemented with an equally depressing assumption of a "purely objective" reality, located somewhere beyond human perception, and perhaps ultimately unknowable. Given this situation, one of the most liberating contributions of the school of thought inaugurated by Husserl (2001 [1900-1901]) known as *phenomenology* is that it frees us from what Sokolowski (2000: 9) calls the "egocentric predicament" that we can only know our own minds. While commonly misunderstood by detractors like Dennett (2001) to be an anti-scientific "philosophy of consciousness", phenomenology in fact offers an alternative to both subjectivism and objectivism (Merleau-Ponty, 1962). It urges us to return "to the things themselves", in the famous Husserlian dictum: from priorly held assumptions, prejudices, theories, beliefs – to an unbiased reflection upon our experience of the world as it is given to us. In doing so, we find that it is groundless to claim that what we experience are only "appearances", and that reality is somehow hidden behind this. Rather, we are led to embrace our inextricable embeddedness in the *life world*,[1] the one and only reality that we are both part of and can fully know. In the words of Sokolowski (2000: 14): "The way things appear is part of the being of things; things appear as they are, and they are as they appear." Against various claims that we only have access to "representations" or "signs", phenomenologists have always insisted that as the fundamental kind of intentionality, perception gives us direct access to the world; other intentionalities like remembering, anticipation and imagination complement this, by directing consciousness beyond the here and now. Yet, even they do not operate with "mental images" but with what Husserl called *Vergegenwäritung*, variously translated as "re-presentation" (Thompson, 2007) or "presentifying" (Zlatev, 2018), and may be best characterized as a kind of vicarious perception. Only on top of this come signs like words and images which do represent both concrete and abstract phenomena, but only for beings with reflective consciousness like ourselves (Zlatev et al., 2020), capable of grasping indirect, *signitive* (i.e. sign-based) intentionalities.

All these feats of human consciousness are fascinating to study, but what is even more important is once again that they open us for the multi-faceted, and multi-layered life world. Or as stated cogently by Zahavi (2019: 30):

> The reason for the phenomenological interest in intentionality is not primarily due to the narrow concern with and interest in subjective experiences per se. The argument is rather that if we really wish to understand the status of physical objects, mathematical models, chemical processes, social relations, cultural products, etc., then we need to understand how they can appear as what they are, and with the meaning they have.

[1] In the literature, this rendition of Husserl's term *Lebenswelt* is found, alongside *lifeworld, life-world* and *Lifeworld*. We prefer it, as it makes its referent appear more normal and natural, as should be the case.

There is a problem, however. Even disregarding culture-specific aspects of the life world – the different "home worlds" in terms of generative phenomenology (Steinbock, 2003) – and focusing on the universal, pan-human level of the life world – where the sun goes up in the morning and goes down in the evening, where objects tend to fall to the ground, where we are born, grow older and die, *etcetera* – is there not a risk of anthropocentrism? Even if we acknowledge the "intertwining" between the subject and the world, emphasized so much by Merleau-Ponty, does phenomenology not limit us to a world that is constituted, or even projected by *human* consciousness? For example, the following famous quotation uses the problematic terminology of "projection", which is at least on the face of it vulnerable to accusations of anthropomorphism (cf. Hverven & Netland, 2021).

> The world is inseparable from the subject, but from a subject which is nothing but a project of the world, and the subject is inseparable from the world, but from a world which the subject itself *projects*. The subject is a being-in-the-world [*être au monde*], and the world remains "subjective", since its texture and its articulations are sketched out by the subject's movement of transcendence. (Merleau-Ponty, 1962: 499–500, our emphasis)

Our aim here is to tackle such objections of anthropocentrism and anthropomorphism with a three-pronged argument. The first response is that the "constitution" of the life world is in fact a *co-constitution*, and not only between a single subject and the world as suggested by the quotation above, but by a plurality of subjects, in *intersubjectivity*. In section "Triangulating Ontologically from a First-Person Perspective" we elaborate on what this implies, enriching the argumentation by including encounters with non-human subjects, that is, other sentient creatures, most easily illustrated with domestic animals. This offers a first kind of "extension" of the life world, as alluded to in the title.

The second life world extension is more methodological: we encounter ourselves, others and things not only from a first-person perspective, but also from a second-person perspective, which involves an Other that is different from ourselves. This brings in an irreducible ethical dimension, as shown by Levinas (1969), but also an epistemological one, allowing us to move towards more "applied" forms of phenomenology in fields like psychotherapy and phenomenological psychology. We address this in section "Extending the life World with a Second-Person Perspective", and as with the first response, we also illustrate with examples involving non-human animals.

The third extension of the life world is in the direction of an even more detached, third-person ("they") perspective, as in natural science. Husserl (1970 [1936]) originally proposed the notion of the *Lebenswelt* in contrast to this, but there is no inherent contradiction between phenomenology and a scientific "world view" – as long as this is precisely understood as *a view*, of someone and from somewhere, rather than the proverbial and self-contradictory "view from nowhere" (Nagel, 1986; Zahavi, 2010; Gallagher, 2018).[2] Thus, we can turn towards ourselves, other subjects and physical

[2] A somewhat analogous critique of metaphysical conceptions of "objective reality" may be found within more philosophical-oriented studies in semiotics (e.g. Deely, 2009), as pointed out by an anonymous reviewer.

phenomena with the help of the instruments and methods of natural science, including genetics, neuroscience, etc. to better understand causal processes that as such are not accessible to phenomenology (Mendoza-Collazos & Zlatev, 2022). However, we do so not independently from the previous two perspectives, but by *triangulating* with them. This is perhaps how we can understand the statement in one of the final, unfinished works of Merleau-Ponty, who more than any other of the classical phenomenologists strived for extending the scope of the life world, both epistemologically and ontologically:

> The ultimate task of phenomenology as philosophy of consciousness is to understand its relationship to non-phenomenology. What resists phenomenology within us—natural being, the 'barbarous' source Schelling spoke of—cannot remain outside of phenomenology and should have its place within it. (Merleau-Ponty, 1964: 178)

Before we start, however, in the following section we wish to situate our approach within *cognitive semiotics*: a relatively new discipline that combines concepts and methods from semiotics, linguistics and cognitive science, and aligns these with the help of phenomenology (Zlatev, 2012; Konderak, 2018; Sonesson, 2022). We show how each of the three steps of the argument corresponds to adding an extra layer to the cognitive-semiotic principle of *phenomenological triangulation*. In doing so, we adapt a proposal made by Sonesson (2022) to complement the essentially epistemological "vertical" plane with an ontological "horizontal" plane. This extension, and the inclusion of examples of non-human animals, is also inspired by recent proposals within biosemiotics (Tønnessen, 2023), and we conclude with some suggestions for how phenomenology can help establish a common ground for cognitive semiotics and biosemiotics.

Cognitive Semiotics and *Extended* Phenomenological Triangulation

Cognitive semiotics is indebted to the philosophy of phenomenology in many respects, such as the understanding of perception not as based on "mental pictures" or any other kinds of representations (signs) but rather on enactive processes, such as those proposed in ecological psychology (Gibson, 1979). Correlative to this are narrower definitions of sign use (signification) than is customary in Peircean semiotics, namely as a derivative form of intentionality, presupposing reflective consciousness to be able to grasp the representational relation between expressions (representamina) and intentional objects (Sonesson, 2010; Zlatev et al., 2020). A further insight, as stated in the introduction, is to view imagination and remembering as rather intermediary between these kinds of intentionality: like perception, being directed to the intentional objects, and not to representations; but like signitive intentionality, involving a type of bifurcation of consciousness into a "here and now" and "there and then" (Thompson, 2007; Sonesson, 2022).

But one of the strongest influences of phenomenology upon cognitive semiotics in the last two decades has arguably been methodological. In developing the

theoretical framework of the *Semiotic Hierarchy*, Zlatev (2009: 178) formulated the principle that cognitive-semiotic research was "predicated on a 'triangulation' of methods from the three perspectives, or what are usually called 'subjective', 'intersubjective' and 'objective' methods" and was initially illustrated as shown in Table 1.

This proposal was rather preliminary, and one can notice that even within "cells" the mentioned methods are rather heterogeneous; for example, "conceptual analysis" is a trademark of analytic (language-oriented) philosophy (e.g. Wittgenstein, 1953), while the other two first-person methods are clearly phenomenological. Nevertheless, there was something important about this classification, as it brought together academic approaches that are usually opposed, implying complementarity rather than antagonism. The inspiration came from linguistics – as such triangulation is required by the different ways in which the phenomenon of language is manifested: as language norms, interactions and behaviors. The respective roles and primacy of intuition, empathy and observation – the dominant modes of access corresponding to the three different manifestations of language listed above (Itkonen, 2008) – has been long debated. However, it is commonly recognized that they are not incompatible but complementary (Geeraerts & Cuyckens, 2007; Zlatev, 2011).

This principle was initially referred to as "methodological triangulation" (Zlatev, 2012), but this was a misnomer, as the latter only requests *two* kinds of methods or even data (e.g. Tashakkori & Creswell, 2007). Further, while these kinds of methods are often contrasted by being "qualitative" and "quantitative", this is not explicitly formulated in terms of the type of perspective (or viewpoint) the researcher takes on the object, and no priority of one type of method is presumed. Consequently, Pielli and Zlatev (2020) rephrased the principle as *phenomenological methodological triangulation*, and formulated it as follows:

> (…) begin the investigation by using first-person methods like phenomenological reduction and intuition analysis. This combines naturally with second-person methods like participant observation and interviews, which are grounded in empathy (e.g., Itkonen, 2008). Third-person methods, like experiments and computational modeling, are then ones where the relationship to the phenomenon is most distanced, and apparently "objective" by isolating aspects of the phenomenon that can be manipulated and quantified. (4–5)

Table 1 The first schematic presentation of the principle of phenomenological triangulation (from Zlatev, 2009: 178)

Perspective	Method	Appropriate for the study of
First-person	Conceptual analysis	Normative meanings, rules
	Phenomenological reduction	Perception
	Imaginative (eidetic) variation	Mental imagery
Second-person	Empathy	Other persons (e.g. as in conversation analysis), [including] "higher" animals
	Imaginative projection	
Third-person	Experimentation	Isolated behaviors (e.g. spatiotemporal utterances)
	Brain imaging	
	Computational modelling	Neural processes

As can be noticed, there is now an explicit precedence (and hence methodological dominance) of the perspectives, from top to bottom, and "objectivity" is formulated as a form of *distance* or detachment: a view of a more or less anonymous "they", rather than the more involved first-person ("I") or second-person ("you") perspectives. This, of course, was why the terms "subjective" and "objective" were used in scare quotes from the start, as it is never a matter of "mind-internal" vs. "mind-external" objects and corresponding methods that are being triangulated, but once again, of different perspectives, with that of the researcher's own subjectivity as the starting point. Or as stated by Gallagher and Zahavi (2012: 99): "Phenomenologists remind us that our knowledge of the world, including our scientific knowledge, arises primarily from a first- and second-person perspective, and that science would be impossible without this experiential dimension." Given that phenomenology is not only a philosophy but also a methodology that focuses precisely on different intentionalities and perspectives, it was only natural for the label to be once again adapted, and simplified to *phenomenological triangulation* by Mendoza-Collazoz (2022: 19): "the primacy of first-person methods (e.g., intuition-based analyses) and at the same time triangulation with second-person methods (e.g., interviews) and third-person methods (e.g., experiments)".

A more substantial extension of the principle was proposed by Sonesson (2022), who noticed a certain ambiguity in the way the terms of the three levels were being used. On the one hand, it is a matter of differences in the *mode of access*: (a) in direct givenness to the researcher, (b) in dialogue between the researcher and the study participant, or (c) abstracted from these, with the pluses and minuses that this implies, as "accessed" by an impersonal community. This plane is essentially epistemological, and corresponds to the three levels as *perspectives*, as reflected in Table 1. However, Sonesson noticed, the phenomena under study are of different kinds, belonging to different ontological regions: (i) the self, (ii) other subjects, and (iii) "neutral" entities. Sonesson tried out different terms for these, including the three Peircean categories (Firstness, Secondness, Thirdness), but in his final publication on this matter (Sonesson, 2022), he used the notions of "ipseity", "dialogicality" and "neutrality". These are, however, about as difficult to define as the Peircean categories, and perhaps as deeply controversial.[3]

Hence, we propose formulating this ontological plane as the three *dimensions* of Self, Others, and Things, using capitals when we refer to these as such, to differentiate them from the everyday English words. Crucially, it is the intertwinement of these dimensions that is a fundamental insight of phenomenology, as argued by Merleau-Ponty (1962: 66, our emphasis):

> The first philosophical act would appear to be to return to the world of actual experience which is prior to the objective world, since it is in it that we shall be able to grasp the theoretical basis no less than the limits of that objective world, restore to things their concrete physiognomy, to organisms their individual

[3] Sadly, Göran Sonesson passed away soon after this publication. So we must both give credit to Göran for this idea of extending phenomenological triangulation, and to express regret concerning the impossibility to continue the discussion with him on how best to formulate it.

> ways of dealing with the world, and to subjectivity its inherence in history. Our task will be, moreover, to rediscover phenomena, the layer of living experience through which other people and things are first given to us, *the system 'self-others-things' as it comes into being*.

As we elaborate in the next section, it is crucial to be able to distinguish, but to not dichotomize (or trichotomize) these dimensions, as they are fundamentally indivisible aspects of the (human) life world as a whole; when we turn our attention to one, we find ourselves necessarily intermingled with the others (Hass, 2008; Zahavi, 2019). Yet, by distinguishing them as in Table 2, we can clarify how they play out differently in terms of different (prototypical) methods. Starting with the fundamental first-person perspective of phenomenology emphasized in the quotation above: in reflecting on the Things of the life world, we see them as correlates of the *noetic* acts that we direct toward them as *noemata*, rather than as just "things out there", as we do when in our default, so-called, natural attitude. This is the essence of the famous phenomenological reduction: "In the natural attitude we head directly to the object; we go directly through the object's appearances to the object itself. From the philosophically reflective stance, we make the appearances thematic. We look *at* what we normally look *through*" (Sokolowski, 2000: 50). But in doing so, we are drawn to our own consciousness, and explore it in acts of reflection. At the same time, or perhaps even prior to this, developmentally speaking (see section "Triangulating Ontologically from a First-Person Perspective"), we *perceive* (rather than "infer") at least some of the intentionalities of other subjects through spontaneous, bodily-grounded empathy.

So far, we conduct the investigation using a fundamentally first-person, philosophical (and transcendental) perspective. But we may go on from this to a more empirical and carefully controlled form of investigation involving other researchers and participants, as in the social sciences. This, of course, does not imply leaving the philosophical first-person perspective, but rather complementing it with that of a more balanced viewpoint, where I treat my participation in the study on a par with that of other subjects. As we exemplify in section "Extending the life World with a Second-Person Perspective", now we can deepen our self-understanding by taking the perspective of an (empathetic) Other, as, for example, in psychotherapy. Alternatively, we turn our attention to the experiences of another person, as in a (qualitative) interview: a paradigmatic second-person method. Or compare our (still qualitative) observations of Things – for example of behavioral patterns – to establish descrip-

Table 2 Extended phenomenological triangulation along two planes: the three kinds of perspectives of the vertical level, and the three kinds of ontological dimensions on the horizontal, with example methods that are only prototypical and not exclusive for each cell, as we explain in the following sections

Dimension	Self	Others	Things
Perspective			
First person	Reflection	Empathy	Phenomenological reduction
Second person	Psychotherapeutic dialogue	Interview	Intersubjective validation
Third person	"Third-person data" analysis	Psychological experiment	Causal explanation

tions that can be claimed to be intersubjectively valid, and thus counter objections that they are "merely subjective".

Finally, we may go down even one more layer of "objectivity" to a third-person perspective, the hallmark of which is that it operates with formalizations and quantitative analysis. The degree of detachment to the phenomenon is now maximum, giving the impression that we are dealing with perspective-less "facts". But both theoreticians and practitioners of science are aware that this is an idealization: no matter if what we are "explaining" is ourselves, other persons or even the (inanimate) universe, the perspective of the previous two levels are at best backgrounded, not reduced away (Zahavi, 2010; Gallagher, 2018). So when (some) hard-nosed scientists wish to reduce "humans" to neuro-chemical mechanisms and, for example, to explain away agency as "illusional" (Wegner, 2018) they in fact indulge in self-deceiving "neuromania" (Tallis, 2011).

The point of our argument, however, is not so much to be critical but conciliatory, showing that while cognitive-semiotic research may follow phenomenological triangulation *explicitly*, various forms of it are performed *implicitly* in many other fields, even at the frontiers of modern science such as genetics and quantum physics, albeit not systematically. There is an added theoretical and methodological value, we claim, in actually spelling out the dimensions and perspectives and their various possibilities of combination. Table 2 presents this crossing of the ontological dimensions and the epistemological perspectives in a schematic way, with prototypical methods, in each cell, which we discuss in the following sections.

The reader should read each of the following three sections with the schema in Table 2 in mind, with each section adding one more layer to the one above.

Triangulating Ontologically from a First-Person Perspective

In one of the many forceful statements in the preface to *The Phenomenology of Perception*, Merleau-Ponty writes that "we shall find in ourselves, and nowhere else, the unity and the true meaning of phenomenology" (1962: xii). This highlights the fundamental role of (embodied) subjectivity but can be misinterpreted as closing oneself off from the world. Indeed, phenomenological reduction is sometimes claimed to be nothing but unreliable "looking into" the private corners of our minds, an "introspectionist bit of mental gymnastics" (Dennett, 1987: 153). But this, as we indicated in the first lines of this paper, is to misunderstand phenomenology completely, as its foremost aim is precisely to appreciate the carnal richness of the world. For example, in looking out through the window, one of us at the moment of writing this sees snow-covered fields in shades of blue shadow from the afternoon sun, with layers of multi-colored clouds in the sky; a few houses and trees in the distance, and a couple walking with their happy dog on the slippery path… These are all "things" in the life world. They are "given to", or disclosed by consciousness, but not inside it, as "in a box", as Husserl would say. Zahavi (2019: 58), formulates this intertwining of immanence and transcendence eloquently:

> Subjectivity is essentially oriented and open toward that which it is not, and it is exactly in this openness that it reveals itself to itself. What is disclosed by a phenomenological reflection is, consequently, not a self-enclosed mind, a pure interior self-presence, but an openness toward otherness, a movement of exteriorization and perpetual self-transcendence.

There is, in other words, a fundamental "symbiosis" between us and the world, one that is to some degree paradoxical, and impossible to capture in the dichotomous language of "subject" and "object". On the one hand, the Things that we reach out to are not independent of our own bodily experience – as the example above illustrates: the colors, the joyful movements of the dog, the careful ones of the walking couple, etc. While we *constitute* intentional objects, in the phenomenological sense of "bring it to light, to articulate it, to bring it forth, to actualize its truth", as clarified by Sokolowski (2000: 92), it is also the case that "phenomenology insists that identity and intelligibility are available in things, and that we ourselves are defined as the ones to whom such identities and intelligibilities are given. We can evidence the way things are" (ibid.: 4).

It is exactly this symbiotic relation between Self and Things that phenomenologists try so hard to articulate, as one of the first goals is "to liberate us from our natural(istic) dogmatism and make us aware of our own constitutive involvement, of the extent to which we are all involved in the process of constitution" (Zahavi, 2019: 38). Zlatev and Konderak (2022) attempt to illustrate this as in Fig. 1, schematically displaying *intentionality* as pointing away from the subject, towards the (objects of the) world, and the flip side of the coin, *semiosis* (understood as meaning-making in general, and not as sign use in particular), pointing backwards.

But as all representations, this does not do full justice to the richness of the phenomenon that is being represented. First, displaying intentionality as an arrow as customary, lends itself to the terminology of "projection", which as we showed in the introduction is problematic. The broader understanding of intentionality as "openness to the world" (*l'ouverture au monde)* (Merleau-Ponty, 1968: 37) is in this

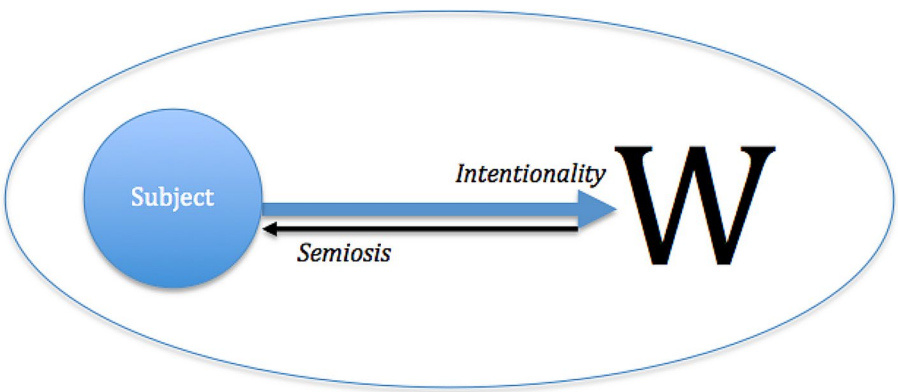

Fig. 1 The symbiotic relationship between Subject and World, with intentionality directed "outward", and semiosis (meaning-making, interpretation) "inward", as represented in a cognitive semiotics diagram (from Zlatev & Konderak, 2022)

respect more satisfactory, as it implies "beneath the intentionality of representations, of a deeper intentionality, which others have called *existence*" (Merleau-Ponty, 1962: 140). This includes layers of intentionality/semiosis that we are only marginally conscious of, as they are manifested not so much in our thoughts, but in our bodily comportment in the world, and very often are not even directed toward particular objects, as exemplified by Thompson (2007: 23):

> Many kinds of everyday experience, however, are not object-directed. Such experiences include bodily feelings of pain, moods such as undirected anxiety, depression, and elation, and absorbed skilful activity in everyday life. These activities are not or need not be "about" any intentional object.

Since we become the embodied subjects that we are as a result of all such conscious, semiconscious, and even unconscious intentional acts, it is more appropriate to label the relationship in Fig. 1 as *co-constitution*. A second reason why the figure is not optimal is because the (life) world is not what we are primarily directed to, or even open to, but the horizon of all Things as well as the Others that are embedded in it – at the same time that they (paradoxically) participate in its constitution. A third aspect of what is potentially misleading with Fig. 1 illustrating the co-constitutive, intertwined, "chiasmic" relationship between subjectivity and objectivity, is the representation of the "monadic", transcendental Subject – while as stated repeatedly, and as captured by the notion of ontological triangulation that we are here explicating, the symbiotic "system" involves Self, Things and *Others*. Such other subjects are fundamentally different from inanimate objects, or "things" as the term is ordinarily understood; in this respect, English and many other human languages are true to this basic experiential-ontological fact: "the second person" as a grammatical category distinguishes "you" from "I", and in the third person, while many languages, for example Thai, do not distinguish "he" and "she", they separate these pronouns from "it".

As mentioned in the "Introduction", the Self-Other relation is not only ethical but also ontological-epistemological. Husserl even goes so far as to state that if it were not for the "foreign subjectivity" of others we would not be able to escape solipsism: "Here we have the only transcendence that is genuinely worthy of its name, and everything else that is also called transcendent, such as the objective world, rests upon the transcendence of foreign subjectivity" (Hua 8/495, cited by Zahavi, 2003: 115).

A simple illustration of this is the certainty with which we "apperceive" the sides of physical objects that we cannot see from our present viewpoint. To some degree this is due to our embodiment, resulting in perception being dynamic and always interlinked with motility, in rich multi-sensory perception crucially involving kinaesthesia. But this is not ultimately sufficient to account for our experience of the transcendence of physical objects, as they contain automatic references not only to how I would be able to see them from another place and time, but how *Others* would do so – at this very moment: "I appreciate the object as so transcending my own viewpoint: I see it precisely as being seen by others and not just by me" (Sokolowski, 2000: 153).

But for such *transcendental intersubjectivity* to be possible, the Others must be simultaneously differentiated from Things on the one hand, and from the Self, on

the other hand. The essential component for achieving both conditions is *empathy*. Husserl, as well as Merleau-Ponty, understands this special form of intentionality as fundamentally rooted in a key characteristic of our embodiment, involving the intermixing of two different perspectives: "My body is given to me as an interiority, that is, as a volitional structure and a dimension of sensing (…), as well as a visually and tactually appearing exteriority. (…) [I]n both cases I am confronted with my own body" (Zahavi, 2003: 103). The first aspect is usually referred to with the German term *Leib*, while the second with the term *Körper*. As living, experiential bodies, we are existentially aware of this duality from the time we are born – though its dialectic undergoes development, not without thresholds, and sometimes traumas. A basic phenomenological insight is then that it is our universal *Leibkörper* nature that makes intersubjectivity possible: "I am experiencing myself in a manner that anticipates both the way in which an Other would experience me and the way in which I would experience an Other… The possibility of sociality presupposes a certain intersubjectivity of the body" (ibid.: 104).

When we touch one of our hands with the other, as in the famous example of "double sensations", we oscillate between the two perspectives not unlike as when we are presented an ambiguous image such as the Necker Cube: is it the right hand that is touching the left, or is it the left that feels being touched by the right? The way that our own selves are given to us both as immanent and as transcendent, and we pass more or less seamlessly from one to the other, is analogous (but not identical) to how we experience other subjects. Due to this, we do not need a "theory of mind" or "simulation" to perceive foreign subjectivity (Gallagher, 2012), but at least in some, and arguably the most fundamental, cases we *perceive* (rather than infer, imagine or interpret) this directly:

> For we certainly believe ourselves to be directly acquainted with another person's joy in his laughter, with his sorrow and pain in tears, with his shame in blushing, with his entreaty in his outstretched hands (…). If anyone tells me that this is not "perception", for it cannot be so, in view of the fact that a perception is simply a "complex of physical sensations" (…), I would beg him to turn aside from such questionable theories and address himself to the phenomenological facts. (Scheler, 1954, cited in Gallagher, 2005: 228)

Importantly, this type of empathy extends naturally beyond the perception of other people to at least animals, as originally argued by Hans Jonas in *The Phenomenon of Life* (1966). Recently there appears to have been a debate in the literature on whether Jonas' phenomenology succumbs to accusations of anthropomorphism (or even dualism), but we are in agreement with the clear defenses and explications offered by Hverven and Netland (2021: 327) that Jonas grounds his phenomenological analyses on the basis of "direct encounters" with non-human Others: "Experience of the reality of nonhuman others (and human others, for that matter) depends on encoun-

ters with these others, in which their "insistence on themselves" as purposive, living beings is "affectively felt"."[4]

It is easiest to exemplify this with animals that we are familiar with, and especially domestic animals. So if we return to the example of a few pages back, we can say that we are phenomenologically justified not only to use the term "perception" with respect to the careful movements of the people due to the slippery ice-covered path, but also for the happiness of the dog, expressed in the joyous jumps and playfulness. Importantly, however, we do not experience foreign subjectivity, either human or animal, in the same way as our own: it is a question of *likeness* rather than *identity* (Hverven & Netland, 2021). This is in fact essential for the second fundamental feature of empathy (as opposed to some more primitive forms of self-other interaction such as contagion): the perception of the other precisely as Other, rather than as a projection of myself:

> (…) we are dealing with a subject-subject relation insofar as the Other is experienced in its subjective inaccessibility. It is essential (…) that it involves an *asymmetry*. There is a difference between the experiencing subject and the experienced subject. But this asymmetry is a part of any correct description of intersubjectivity. Without asymmetry there would be no intersubjectivity, but merely an undifferentiated collectivity. (Zahavi, 2003: 114)

Once again, this non-reducibility of the Other to the Self is essential not only for providing "a correct description" as Zahavi notes, but as the necessary basis for the kind of ontological triangulation that is needed to co-constitute the life world. And as indicated above, this does not need to be a life world limited to human beings, since it is indisputable that we have subject-subject relations with at least some other animals as well. For example, all dog-owners will recognize the spontaneous acts of sorrow in separation, joy in reunion and companionship, and care in many potentially dangerous situations like swimming, expressed by our animal friends. While skeptics would cry "anthropomorphizing" and "projecting", we could with Scheler beg them to rather turn to "the phenomenological facts". Sokolowski (2000: 46) manages to formulate a particular touching illustration of a universal experience that captures the intertwinement between ourselves and others, and the world as a whole: the experience of grief and mourning.

> Since we live in the paradoxical condition of both having the world and yet being part of it, we know that when we die the world will still go on, since we are only a part of the world, but in another sense the world that is there for me, behind the things I know, will be extinguished when I am no longer part of it. Such an extinction is part of the loss we suffer when a close friend dies; it is not just that he is no longer there, but the way that the world was for him has also

[4] We are very grateful to an anonymous reviewer for pointing out this recent paper to us, as it helped clear up some of our own ambivalence about Jonas' work. Hverven and Netland (2021) point out some residual aspects of anthropomorphism in Jonas' argumentation, as well as directions in which they could be resolved, with focus on "likeness" rather than identity between Self and Others, and applying this to both human or non-human others.

> been lost for us. The world has lost a way of being given, one that has been built up over a lifetime.

This can help explain the grief that one of us feels after more than a year since the passing of a beloved dog: there is more than missing the security of habits like morning walks and other routines, or the selfish gratification of being the "master" (though these could be part of the experience as well). While all sentient non-human animals have different ways in which the world is given to them, with domestic animals we can experience this, and thus its loss when it is permanently gone. Perhaps not as much as family members or close friends, but nevertheless. And arguably both the presence and the absence of this subjectivity is still best captured by the rather outmoded word "soul".[5]

Extending the Life World with a Second-Person Perspective

The kind of extension of the life world based on the triangulation between Self, Others and Things that we discussed in the previous section is in a philosophical sense transcendental, and has *intuition* as its ultimate criterion of validity: "what is given or accepted as evidence must be actually experienceable within the limits of and related to the human experiencer" (Idhe, 2012: 9). But it is also possible to extend the scope of the investigation – and thus of the life world – by *explicitly* taking into account a perspective where you and I meet on the same level: a methodological second-person perspective. As pointed out by Sonesson (2009: 127), this poses no contradiction: given that phenomenology is fundamentally "a method of description, it should be considered an empirical method". In fact, a considerable amount of Husserl's work was dedicated to the possibility of a phenomenological approach to psychology as an alternative to the dominant at the time (and still so) physicalism, thus pioneering the development of *phenomenological psychology* (Gurwitsch, 1966; Spiegelberg, 1975; Scanlon, 1976). Such phenomenologically grounded investigations differ from the objectivism of mainstream psychology since:

> the question is how (…) persons comport themselves in action and passion—how they are motivated to their specifically personal acts of perception, of remembering, of thinking, of valuing, of making plans, of being frightened and automatically startled, of defending themselves, of attaching, etc. (Husserl, 1970: 317)

By foregrounding experience and meaning, phenomenological psychology does not aim at identifying causal factors and corresponding explanations. The goal is rather "to investigate intentional consciousness in a non-reductive manner, i.e., in a man-

[5] Of course, not in any dualistic sense, but rather in the sense intended by Jonas (1966: 57): "Thus, after the contraction brought about by Christian transcendentalism and Cartesian dualism, the province of "soul," with feeling, striving, suffering, enjoyment [, can be] extended again, by the very principle of continuous graduation, from man over the kingdom of life".

ner that respects its peculiarity and distinctive features" (Zahavi, 2019: 118). Such an approach recognizes that lived experience is complex, paradoxical, imbued with meaning, and goes beyond the premise that one explanation could account for the phenomenon under scrutiny.

Most forms of psychotherapy, and especially those that are phenomenologically informed (Binswanger, 1963; Moustakas, 1988; May, 1990) presuppose a second-person approach. As indicated in Table 2 in section *"Cognitive Semiotics and Extended Phenomenological Triangulation"* the focus here is on the Self dimension, since despite all differences between various kinds of practices, a common denominator is that the client is to obtain insights into their existential condition. This implies a joined sense-making process, where one attends to the Self through the Other, using the space that is created between them to unravel their experiences and to go deeper, palpate different paths and explore different interpretations, which could often be conflicting. The therapist should be typically more passive in the process, as pointed out by Maslow (1996: 13):

> Slowly and painfully we psychologists have had to learn (…) to wait and watch and listen patiently, to keep our hands off, to refrain from being…too interfering and controlling, and—most important of all in trying to understand another person—to keep our mouths shut and our eyes and ears wide open.

Unlike the practice of psychotherapy, in disciplines that incorporated ideas from phenomenology like sociology (Schutz, 1932; Garfinkel, 1967) and psychology (Katz, 1935; Straus, 1935), the focus has been more explicitly on the experiences of *other* human beings. More recently, a number of qualitative phenomenological approaches such as Micro-Phenomenology (Petitmengin, 2006), Phenomenological Psychology (Giorgi, 2009), Interpretative Phenomenological Analysis (Smith et al., 2009), the Existential Hermeneutic approach (van Manen, 1990), and the Phenomenological Interview (Høffding & Martiny, 2016) have been developed. Some of these were motivated by a crisis in psychology around the 1970's when the mainstream was perceived to be of "*a-historical/a-cultural, essentialist, dualist and scientistic nature*" (Langdridge, 2007:154, emphasis in original). Despite their diverse character, and criticism on the degree to which some of these approaches are consistent with phenomenological philosophy (Zahavi, 2019, Chap. 10), they have made an important contribution to understanding human experience from a methodological second-person perspective. Their main method is that of a phenomenologically informed *interview*, combined with participatory or non-participatory observation. A key element is to regard the mind of the other not as something internal and hidden that needs to be brought to the surface, but as immanent in the interaction, and expressed both verbally and non-verbally, with irreducible reciprocity. As stated by Zahavi (2005: 12): "On such an account, the second-person perspective involves a reciprocal relation between you and me, where the unique feature of relating to you as you is that you also have a second-person perspective on me, that is, you take me as your you".

In accordance with this, the phenomenological interview does not involve a rigid methodology or an established protocol, but rather stresses the reciprocal nature of the encounter between two subjects, and the co-generation of knowledge (Høffding

& Martiny, 2016). Here the roles of Self and Other are almost equally active in the process: the participant provides what is aimed for (e.g., the description of a lived experience), and the researcher engages in the interaction to facilitate it. In that sense, the knowledge produced is co-generated, since it is – to a large extent – defined by the dynamics between the participants in the encounter. Naturally, this implies the researcher's active presence and a holistic understanding of what is being communicated or observed, accounting for all possible meaning-bearing elements (e.g., bodily expressions, prosody, etc.). In the words of Varela and Shear (1999: 10), the role of the researcher:

> (…) is not that of a neutral anthropologist; it is rather of a coach or a midwife. His/her trade is grounded on a sensitivity to the subtle indices of his interlocutor's phrasing, bodily language, and expressiveness, seeking for indices (more or less explicit) which are inroads into the common experiential ground.

Validating the findings of such studies also essentially involves intersubjective, second-person practices such as eliciting "the phenomenological nod" (Munhall, 1994) as an expression of resonance, turning back to the participants for validating the outcome, and engaging in collaborative dialogues with research groups and peers in different stages of the process. In some cases, especially when more directly observable aspects of the interaction are concerned, like words and gestures – what would count as Things on this level of phenomenological triangulation – it is also possible to establish coding protocols and annotation schemes. But as noted by Stec (2015: 61), this is:

> a process which involves watching the data, creating and piloting an annotation scheme with multiple passes through one's data, improving that scheme as one makes new observations or encounters unexpected difficulties, implementing it and obtaining (if desired) measures of inter-rater reliability. However much we would like annotation schemes to be "objective" measures (…), they reflect theoretical choices and interpretations at every step of the way.

This is why we include *intersubjective validation* as the aspect of the second-person perspective that most directly addresses "Things" in Table 2. They are still (co-) constituted in experience as in the first-person perspective, but now from a more distanced approach, extending both the scope of the inquiry, and of the correlative life world.

Is it also possible to extend this beyond *human* experience, as we did for the first-person perspective in section "Triangulating Ontologically from a First-Person Perspective" with the co-constituting experience of animal Others? Standard comparative psychology, focusing on animal behaviors in laboratories in specifically designed experiments would, of course, say "no". Even most ethologists, with their focus on animal behavior in natural conditions, usually have the ideal of a third-person, "objective" observation as in the natural sciences, and are suspicious of any kind "anthropomorphizing" that would inevitably result if researchers would interact with animals on a more reciprocal level.

Interestingly, it was exactly such an environment involving close interactions between people, bonobos and chimpanzees that led to one of the breakthroughs in attempts to communicate with non-human animals through a basic form of language (Savage-Rumbaugh & Lewin, 1994). As often recalled (e.g. Deacon, 1997), the infant bonobo Kanzi "passively" participated when his adoptive mother Matata unsuccessfully took part in traditional, behaviorist-inspired attempts to teach her the basics of a language, and to everyone's surprise, later showed that he had learned much in the process. What followed was that Kanzi, and then other apes in the facility, started to communicate with their human interactants spontaneously, and made progress without explicit teaching protocols, but through improvised interactions, quite similar to how we interact with children. According to Segerdahl et al. (2005: 20), what allowed this was that:

> Kanzi already shared perspective with his human companions when his language developed. His linguistic development deepened the shared perspective – what we now call the intermediary Pan/Human culture – but language was not a prerequisite for a shared way of living. It was the other way around.

While not unique for this research group, their strong emphasis on a reciprocal relation between human beings and animals, within the limits that are possible, has been something of a trailblazer. They received much criticism at the time from both psychologists and linguists, but with their at least implicitly phenomenological (and for Segerdahl explicitly informed by the philosophy of the later Wittgenstein) approach, they seem to have been ahead of their time, for example by stating: "The moral relation to the apes must be the overriding factor of the work, its first principle, which means that apes allowed to affect us, just as we affect them: the emerging Pan/Homo culture is an intermediary form of life" (Segerdahl et al., 2005).[6]

Extending the Life World with a Third-Person Perspective

In one critique of phenomenology applied in psychology, Paley (2017: 30) argues that we should aim to "explain, theorise, model, test, hypothesize, evaluate, infer, simulate" human experience rather than to just describe it, and this requires a proper scientific approach. But as Zahavi (2019) points out, this criticism completely misses the mark, since phenomenology was never meant to replace natural scientific investigations, but rather to place these in their proper place: as a special type of activity involving embodied human beings and the social institutions that they participate in. As stated once again forcibly by Zahavi (2010: 2): "Scientific objectivity is something to strive for, but it rests on the observations and experiences of individuals; it is knowledge shared by a community of experiencing subjects and presupposes a triangulation of points of view or perspectives".

[6] This can be sadly contrasted with the killing of three chimpanzees and wounding a fourth in an incident that occurred in Sweden over a year ago. www.theguardian.com/world/2022/dec/14/three-chimpanzees-shot-dead-after-escape-from-swedish-zoo.

In our framework of phenomenological triangulation, the standard scientific approach fits nicely as the third-person epistemological perspective: a view not "from nowhere", but belonging to the "they" of the scientific community. Further, this is not a single monolithic view, as it is made up of multiple ones belonging to different researchers and different theoretical frameworks. As reflected in Table 2, the focus here is primarily on Things, and the usual aim is to produce causal explanations. Natural science has made great progress over the past century, from the understanding of (some of) the "building blocks" of matter and life, to technological and medical applications of these discoveries that are altering our everyday lives – for better and for worse. But it has suffered from hubris in several ways. The first is that mentioned above: the mistaken belief that it can be fully objective ontologically (by claiming to study "reality as it is") and epistemologically (by representing a "view from nowhere"). Even at the time when Husserl (1936) wrote *Crisis of the European Sciences*, these views were already becoming discredited, and the issue was how not to lapse into the opposite extreme of relativism. More troublesome today is another fallacy: to treat other subjects, and even ourselves as "things"! That is, to embrace one or another form of extreme "naturalization", where both subjectivity and intersubjectivity is claimed to be "in principle" reduced away:

> There is only one sort of stuff, namely *matter* – the physical stuff of physics, chemistry, and physiology – and the mind is somehow nothing but a physical phenomenon. In short, the mind is the brain. According to materialists, we can (in principle!) account for every mental phenomenon using the same physical principles, laws, and raw materials that suffice to explain radioactivity, continental drift, photosynthesis, reproduction, nutrition and growth. (Dennett, 1991: 33)

As phenomenologists of science like Romdenh-Romluc (2018) would argue, it is rather the other way round: "physical principles, laws, and raw materials" are in fact constituted intersubjectively through the interactions of researchers. At the same time as scientists aim, as they should, to leave aside their individual biases and not to allow their prior expectations to determine how they conduct their studies and analyze the results, when they interpret these results, they often need to make "abductive" leaps that help unite the individual findings in a coherent, meaningful explanation:

> Not only should scientists studying human existence aim to discover the essences of experience via a sort of insight, this is *in fact* what *all* scientists – including those studying human existence and those studying the natural world – are already doing. (…) [A] law of nature is an essence or meaning that unites disparate experiences. (ibid.: 355-6)

This is in fact how (ethically conducted) experiments with both human and animal subjects are justified. For example, one study showed that 18-month old and 24-month old Swedish children, and four chimpanzees (including some of those killed in the incident mentioned in footnote 6) were at chance level when they were given prompts on where to find a reward using photographs or 3D models; at the same time, they

managed much better when given indexical cues like points and post-it markers, while 30-month children could benefit from the iconic signs (Zlatev et al., 2013). However, as the authors show, there are several possible explanations of this finding, and it is hard to say which one is preferable.

To what extent can the third-person, natural-scientific perspective give any insights on the Self, and not in the generic sense, but in the subjective qualities of my own, ontologically first-person, subjective experiences? This is where natural science, and neuroscience has been at its weakest, and has often succumbed to "neuromania": a term used for over-enthusiastic but simplistic appeals to neuroscience in the humanities and social sciences (Tallis, 2011).[7]

But Varela (1996) and other neuro-phenomenologists have shown how it is possible to carefully correlate the data from neuroimaging experiments with the subjective reports of the participants, especially when the latter are taught to be observant of their experiences. Such studies have provided fruitful results, sometimes calling for re-examining some phenomenological analyses, and providing more detailed descriptions, showing the potential for "mutual illumination" (Gallagher, 1997; Thompson, 2007) between phenomenology and (neuro)biology.

So once again, with time and when it is successful, science extends the pre-scientific life world, without abandoning the ground from which it springs from. This is how Husserl conceived of the relationship between the pre-theoretical and the scientific levels of the life world, at least in some of his writings. Or, as stated by Zahavi (2019: 51–52): "It would be wrong to conceive of the relation between the lifeworld and the world of science as a static relation. Science draws on the lifeworld, but it also affects the lifeworld, and gradually its theoretical insights are absorbed by and integrated into the latter".

But while indispensable for natural science, and for the social sciences and the humanities when they aim at causal theories supported by quantitative measurements, the conclusion from phenomenological triangulation is that they "come third" – only after the first-person and the second-person perspectives, as our schema in Table 2 shows. As we mentioned in section "Cognitive Semiotics and Extended Phenomenological Triangulation", studies which "start from the bottom", or even claim to be limited to it, have already used the first-person and second-person perspectives implicitly. If not, they would be blind as to what they are studying, and unethical towards their participants.

To round off this section with how non-human subjectivity can be investigated on this level, we can once again take the case of domesticated and self-domesticated animals. The origins of language, and more generally the capacity to communicate with (true) signs as opposed to signals (cf. Zlatev et al., 2020) is actively researched, but continues to be an unresolved mystery. One of the key puzzles has been how to account for the emergence of the kind of *pro-sociality* that is necessary to support the altruistic sharing of information between individuals that sign use implies, in

[7] The problem of reductionism in cognitive science is also addressed by Gallagher (2018), who argues that it is a byproduct of a dated conception of "nature". However, understanding the latter in more inclusive ways, informed by both phenomenology and pragmatism, would frame the issue of "naturalizing phenomenology" in a new light, see also Zahavi (2010).

the face of the constraints posed by the "selfish gene" (Dawkins, 1976) principle of evolution, according to which the only features that spread in a population are those that promote the spread of their underlying genes. A recent proposal to solve the apparent paradox of the evolution of altruistic behavior (especially beyond "kin", i.e. genetically closely related individuals), is the so-called "self-domestication hypothesis", proposed by Hare (2017). According to this, human beings, bonobos and possibly also elephants, have undergone spontaneous selection for features that are quite unusual in the animal world, such as:

> (i) reduced aggression (…); (ii) socially sensitive cortisol levels, which are regarded as a reliable biomarker of altered stress responses and changes in the management and control of aggression; (iii) extended juvenile period and enhanced play behavior, as domestication usually results in neotenic features with child-like behavior favoring many of the processes associated with social learning; and (iv) sophisticated communication systems. (Raviv et al., 2023: 3)

Such a hypothesis and correlation of data across different domains could obviously only be formulated from the third-person perspective of science. But at the same time, we can note that the formulation above includes notions like "aggression", "play", "child-like behavior", and especially "sophisticated communication systems", which are not observable in any naturalistic sense. Rather, they presuppose both prior first-person, and second-person understanding of these phenomena. And in the process of theory-formation and further exploration, abductive, insight-like leaps will necessarily be required, in accordance with the argumentation of Romdenh-Romluc (2018), as we explained earlier.

Conclusions

Typical approaches within cognitive semiotics (e.g. Zlatev, 2012) and biosemiotics (e.g. Kull, 2015) may differ substantially in how they define basic notions like sign and semiosis, but they also strongly cohere by emphasizing the fundamental role of *subjectivity* in meaning-making, and its role in co-constituting the everyday world: von Uexküll's *Umwelt* and Husserl's *Lebenswelt*. As argued by Tønnessen (2023), there are also significant overlaps in methodology between the two traditions, by adopting, explicitly or implicitly, the principle of phenomenological triangulation.

While cognitive semiotics, grounded as it is in Husserlian phenomenology, necessarily departs from *human* experience, we have discussed how it should not be understood as limited to such experience. That is, it is not anthropocentric. The life world that we exist in is co-constituted by the interactions between Self and Things, with the necessary mediation of Others. And the latter can be non-human, as well as human subjects. By extending the concept of phenomenological triangulation along two planes, the ontological and the epistemological, we have tried to show how both human and non-human subjectivity can manifest on the philosophical first-person perspective, the psychological second-person perspective, as well as on the natural-scientific (e.g. biological) third-person perspective.

We exemplified with domestic and (self) domesticated animals, since they are closest to us, psychologically and experientially, and it is easiest to step beyond the human life world with their help. But there is no reason to stop there, and one can, with appropriate encounters, continue the process of extension far beyond, for example to octopi, as shown in the wonderful documentary *My Octopus Teacher* (Ehrlich & Reed, 2020). The important constraint is that we cannot just "postulate" non-human subjectivity on theoretical principles. Rather, we need to experience it in intersubjectivity: ontologically on the first-person perspective level, and methodologically on the second-person level. From then on, we can go on and produce scientific explanations of animal minds from the third-person perspective of science, analogously to how we do so with ourselves, with the help of the most recent developments in neuroscience and technology. The classical work by Jonas (1966), and perhaps even more so some of its current interpretations and elaborations (e.g. Hverven & Netland, 2021), suggest fruitful ways in which these lines of inquiry can be further pursued.

The main difference is that when we apply this approach to ourselves, we can triangulate such causal explanations with subjective experience on the first-person level, or the reports of participants on the second-person level, as in Varela's neurophenomenology. It is much harder to do so with non-human animals, since they can alas not *describe* their first-person experience, either for themselves or for us – because they lack language. So even for this reason, a breakthrough in linguistic communication with animals such as the one we described in section "Extending the life world with a second-person perspective" would have immense significance. Yet even in its absence, this would not absolve us from the need for an ethical relation to animal Others, and especially towards those whose lives are totally dependent on us. For these and similar reasons, we anticipate further rapprochement between cognitive semiotics and biosemiotics.

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References

Binswanger, L. (1963). *Existential Psychiatry: Being-in-the-World. Selected papers, trans. J. Needleman*. Basic Books.
Dawkins, R. (1976). *The selfish gene*. Oxford University Press.
Deacon, T. (1997). *The symbolic species: The co-evolution of language and the brain*. Norton.
Deely, J. (2009). *Purely objective reality*. De Gruyter.
Dennett, D. (1987). Eliminate the middletoad! *Behavioral and Brain Sciences*, *10*(3), 372–374.
Dennett, D. (1991). *Consciousness explained*. Penguin Books.
Dennett, D. (2001). Are we explaining consciousness yet? *Cognition*, *79*(1-2), 221–237.
Ehlrich, P., & Reed, J. (Directors) (Eds.). (2020). *My Octopus teacher [Film]*. Sea Change Project, Off The Fence and ZDF Enterprises.
Gallagher, S. (1997). Mutual enlightenment: Recent phenomenology in cognitive science. *Journal of Consciousness Studies*, *4*(3), 195–214.
Gallagher, S. (2005). *How the body shapes the mind*. Oxford University Press.
Gallagher, S. (2012). Neurons, neonates and narrative. In A. Foollen, U. Luedke, T. Racine, & J. Zlatev (Eds.), *Moving ourselves, moving others* (pp. 167–196). Benjamins.
Gallagher, S. (2018). Rethinking nature: Phenomenology and a non-reductionist Cognitive Science. *Australasian Philosophical Review*, *2*(2), 125–137.
Gallagher, S., & Zahavi, D. (2012). *The phenomenological mind*. Routledge.
Geeraerts, D., & Cuyckens, H. (2007). *The Oxford Handbook of Cognitive Linguistics*. Oxford University Press.
Gibson, J. (1979). *The Ecological Approach to Visual Perception*. Houghton Mifflin.
Giorgi, A. (2009). *The descriptive phenomenological method in psychology*:A ModifiedHusserlian Approach. Duquesne University Press.
Gurwitsch, A. (1966). Edmund Husserl's conception of Phenomenological psychology. *Phänomenologische Psychologie Review of Metaphysics*, *19*(4), 689–727.
Hare, B. (2017). Survival of the Friendliest: *Homo sapiens* Evolved via Selection for Prosociality. *Annual Review of Psychology*, *68*(1), 155–186.
Hass, L. (2008). *Merleau-Ponty's Philosophy*. Indiana University Press.
Høffding, S., & Martiny, K. (2016). Framing a phenomenological interview: What, why and how. *Phenomenology and the Cognitive Sciences*, *15*(4), 539–564.
Husserl, E. (1970). [1936]. *The Crisis of European Sciences and Transcendental Phenomenology: An Introduction to Phenomenological Philosophy*, trans. D. Carr. Northwestern University Press.
Husserl, E. (2001). *[1900–1901]. Logical investigations I-II, trans*. J.N. Findlay.
Hverven, S., & Netland, T. (2021). Projection or encounter? Investigating Hans Jonas' case for natural teleology. *Phenomenology and Cognitive Science*, *22*, 313–338. https://doi.org/10.1007/s11097-021-09748-9
Idhe, D. (2012). Postphenomenological re-embodiment. *Foundations of Science*, *17*(4), 373–377.
Itkonen, E. (2008). The central role of normativity for language and linguistics. In J. Zlatev, T. Racine, C. Sinha, & E. Itkonen (Eds.), *The Shared mind: Perspectives on Intersubjectivity* (pp. 279–305). John Benjamins.
Jonas, H. (1966). *The Phenomenon of Life: Towards a Philosophical Biology*. Northwestern University.
Katz, D. (1999). [1935]. *The World of Colour, trans*. and C.W. Fox. Routledge. R.B. MacLeod.
Konderak, P. (2018). *Mind, cognition, semiosis: Ways to Cognitive Semiotics*. Maria Curie-Sklodowska University.
Kull, K. (2015). Semiosis stems from logical incompatibility in organic nature: Why biophysics does not see meaning, while biosemiotics does. *Progress in Biophysics and Molecular Biology*, *119*, 616–621.
Langdridge, D. (2007). *Phenomenological psychology: Theory, Research and Method*. Pearson Education.
Levinas, E. (1969). [1961]. *Totality and Infinity: An Essay on Exteriority*, trans. A. Lingis. Duquesne University Press.

Maslow, A. (1996). *The psychology of Science: A reconnaissance*. Gateway.
May, R. (1990). On the phenomenological bases of therapy. In K. Hoeller (Ed.), *Readings in existential psychology & Psychiatry* (pp. 49–61). Review of Existential Psychology & Psychiatry.
Mendoza-Collazos, J. (2022). Agency and Artifacts: A cognitive semiotic exploration of design. PhD. Thesis, Lund University.
Mendoza-Collazos, J., & Zlatev, J. (2022). A cognitive-semiotic Approach to Agency: Assessing ideas from Cognitive Science and Neuroscience. *Biosemiotics*, *15*(1), 141–170.
Merleau-Ponty, M. (1962). *Phenomenology of Perception*. Routledge & K. Paul.
Merleau-Ponty, M. (1964). *[1960]. Signs, trans. R.C. McClearly*. Northwestern University.
Merleau-Ponty, M. (1968). *The visible and the invisible*. Northwestern University.
Moustakas, C. (1988). *Phenomenology, Science and Psychotherapy*. Family Life Institute.
Munhall, P. (1994). *Revisioning phenomenology*. National League for Nursing.
Nagel, T. (1986). *The view from nowhere*. Oxford University Press.
Paley, J. (2017). *Phenomenology as qualitative research: A critical analysis of meaning attribution*. Routledge.
Petitmengin, C. (2006). Describing one's subjective experience in the second person: An interview method for the science of consciousness. *Phenomenology and the Cognitive Sciences*, *5*(3–4), 229–269.
Pielli, L., & Zlatev, J. (2020). The cyborg body: Potentials and limits of a body with prosthetic limbs. *Cognitive Semiotics, 13*(2).
Raviv, L., Jacobson, S., Plotnik, J., & Benítez-Burraco, A. (2023). Elephants as an animal mode for self-domestication. *Proceedings of the National Academy of Sciences, 120* (15).
Romdenh-Romluc, K. (2018). Science in Merleau-Ponty's phenomenology. *The Oxford Handbook of the History of Phenomenology*, 340–359.
Savage-Rumbaugh, S., & Lewin, R. (1994). *Kanzi: The ape at the brink of the human mind*. John Wiley.
Scanlon, J. (1976). Translator's Introduction. In Phenomenological Psychology: Lectures, Summer semester; 1925 (pp. ix-xv). Edmund Husserl. Martinus Nijhoff: The Hague.
Schutz, A. (1967). [1932]). The Phenomenology of the Social World, trans. G. Walsh& F. Lehnert. Northwestern University Press.
Segerdahl, P., Fields, W., & Savage-Rumbaugh, S. (2005). *Kanzi's Primal Language: The cultural initiation of primates into language*. Springer.
Smith, J. A., Flowers, P., & Larkin, M. (2009). *Interpretative phenomenological analysis: Theory, Method and Research*. SAGE.
Sokolowski, R. (2000). *Introduction to Phenomenology*. Cambridge University Press.
Sonesson, G. (2009). The view from Husserl's lectern: Considerations on the role of phenomenology in cognitive semiotics. *Cybernetics and Human Knowing*, *16*(3–4), 107–148.
Sonesson, G. (2010). From mimicry to Mime by Way of mimesis: Reflections on a General Theory of Iconicity. *Sign Systems Studies*, *38*(1–4), 18–65.
Sonesson, G. (2022). Cognitive Science and Semiotics. In J. Pelkey (Ed.), *Bloomsbury Semiotics volume 4: Semiotic movements* (pp. 293–312). Bloomsbury Academic.
Spiegelberg, H. (1975). The relevance of Phenomenological Philosophy for psychology. In E. N. Lee, & M. Mandelbaum (Eds.), *Doing phenomenology. Phaenomenologica* (Vol. 63). Springer.
Stec, K. (2015). Visible Quotation: The multimodal expression of viewpoint. PhD Thesis. University of Groningen.
Steinbock, A. (2003). Generativity and the scope of generative phenomenology. In D. Welton (Ed.), *The New Husserl: A critical reader* (pp. 289–325). Indiana University Press.
Straus, E. (1963). [1935]. The Primary World of Senses: A Vindication of Sensory Experience trans. by J. Needleman. The Free Press of Glencoe.
Tallis, R. (2011). *Aping mankind: Neuromania, Darwinitis and the misrepresentation of humanity*. Acumen Publishing.
Tashakkori, A., & Creswell, J. W. (2007). Exploring the nature of research questions in mixed methods research. *Journal of Mixed Methods Research*, *1*(3), 207–211.
Thompson, E. (2007). *Mind in life: Biology, Phenomenology, and the sciences of mind*. Harvard University Press.
Tønnessen, M. (2023). Phenomenological Triangulation in the Study of Humans and Animals as Subjects of Phenomenology: Perspectives from Cognitive semiotics and Biosemiotics. Cognitive Semiotics Seminar, Lund University, June 1st, 2023.
van Manen, M. (1990). *Researching lived experience: Human Science for an action sensitive pedagogy*. Althouse.

Varela, F. (1996). Neurophenomenology: A methodological remedy for the hard problem. *Journal of Consciousness Studies*, *3*(4), 330–349.
Varela, F., & Shear, J. (1999). *The view from within. First-person approaches to the study of consciousness*. Imprint Academic.
Wegner, D. (2018). *The illusion of conscious Will*. MIT Press.
Wittgenstein, L. (1953). *The philosophical investigations*. Blackwell.
Zahavi, D. (2003). *Husserl's phenomenology*. Stanford University Press.
Zahavi, D. (2005). *Subjectivity and selfhood: Investigating the first-person perspective*. MIT Press.
Zahavi, D. (2010). Naturalized phenomenology. In S. Gallagher, & D. Schmicking (Eds.), *Handbook of Phenomenology and Cognitive Science* (pp. 2–19). Springer.
Zahavi, D. (2019). *Phenomenology: The basics*. Routledge.
Zlatev, J. (2009). The Semiotic Hierarchy: Life, consciousness, signs and language. *Cognitive Semiotics*, *4*, 169–200.
Zlatev, J. (2011). From cognitive to Integral Linguistics and back again. *Intellectica*, *56*, 125–148.
Zlatev, J. (2012). Cognitive semiotics: An emerging field for the transdisciplinary study of meaning. *The Public Journal of Semiotics*, *IV*(1), 2–24.
Zlatev, J. (2013). The mimesis hierarchy of semiotic development: Five stages of intersubjectivity in children. *Public Journal of Semiotics*, *4*, 47–70.
Zlatev, J. (2018). Meaning making from life to language: The Semiotic Hierarchy and phenomenology. *Cognitive Semiotics*, 11(1).
Zlatev, J., & Konderak, P. (2022). Consciousness and Semiosis. In J. Pelkey (Ed.), *Handbook of semiotics*. Bloomsbury.
Zlatev, J., Zywiczynski, P., & Wacewicz, S. (2020). Pantomime as the original human-specific communicative system. *Journal of Language Evolution*, *156*, 174.