ON KNOWING AND MOTIVATING ONE'S CHOICES

- Markers of uncertainty and cognitive load in manipulated choice-reports

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Abstract

The Choice Blindness-methodology has introduced a novel way of investigating the properties of confabulation in introspective verbal reports. Johansson et al (2005a) showed participants 15 picture-pairs of female faces and asked them to, for each pair, choose the one they found most attractive. By asking participants to motivate their choices and by, unknown to the participants, manipulating the outcome of some of these choices, the experimenters have shown that it comes quite naturally to a normal person to motivate a choice he or she manifestly did not *intend to make. This thesis aims at investigating such manipulated choice-reports by comparing them with the non-manipulated choice-reports from the same experiment. It is shown that while there are differences between manipulated and non-manipulated choice-reports, these are few and difficult to interpret.*

Keywords: Introspection, Verbal Report, Confabulation, Choice Blindness, Word-Frequency Analysis, Markers of Uncertainty, Cognitive Load

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Appendix

1. Introduction

The debate on how to interpret introspective verbal reports goes back to the dawn of psychology as an empirical science in the late nineteenth and early twentieth century (Wilson 2003). As evident from the two recent introspection-volumes of *The Journal of Consciousness Studies* (Jack & Roepstorff 2003b, 2004), this debate is far from over. Unlike the behaviourist scepticism of the possibility of studying human consciousness dating from the first part of the twentieth century (Wilson 2003), many researchers today would grant introspection and verbal reports an important role in attempts to understand the human mind. But this is where the consensus ends. Instead, the controversy lies in determining precisely *what* verbal reports can tell us about the mind. While the much-cited study by Nisbett and Wilson (1977), summarised in section 2.2., suggested that introspective reports often are inaccurate and heavily based on folk-psychological (mis)conceptions of how the mind works, their findings have since been re-evaluated and many scientists now see them as only one part of a larger and more complex picture (e.g. Prinz 2004). The *heterophenomenology* of the philosopher Daniel Dennett recommends that introspective reports should be treated simply as the *beliefs* of the subject, to be taken seriously by the scientists as a form of measurable behaviour, but not necessarily indicative of what actually goes on in the brain of the person (Dennett 1991, 2003). While Dennett argues that his heterophenomenology is just the standard scientific procedure used in most laboratories of the world, other writers (e.g. Jack and Roepstorff 2003a) regard reports on mental events as a more special type of evidence, distinct from other observable behaviour such as heart-rate or eye-movement. Therefore, such reports should also be treated differently.

There are many proposals on how to optimize the validity of introspective reports, ranging from a thorough training of the subject before experiments (Lutz and Thompson 2003), to heightening the scientists awareness of their own theoretical bias in interpreting the reports (Cytowic 2003), to recognizing that certain types of cognitive processes are notoriously difficult to introspect (Prinz 2004, Lutz and Thompson 2003). The phenomenological method, as propounded by Husserl a century ago is still used. It attempts to analyse data regarding private experiences for the sake of finding an *invariant structure* of the given experience (e.g. Gallagher and Sorensen 2006).

While it is generally accepted that people at times simply are wrong in their introspective reports, the private nature of subjective experience makes this claim very hard to verify and control experimentally. However, a recently published study shows that this is indeed

possible. Johansson et al (2005a) conducted an experiment to investigate the relation between *intention*, *choice* and *introspection*.

Participants were shown pairs of photos of female faces and were asked to choose the one that they found most attractive. The chosen picture was slid to them over the table and, with the picture in their hand, they were asked to explain why they made that particular choice. However, on certain trials the experimenters used a double-card trick and manipulated the outcome of the participants' choice so that he or she was given the photo *not* chosen. All in all, only 27% of these manipulations were detected, leaving the experimenters with a wealth of motivations for a choice obviously not made.

Counterintuitive as this high-frequent failure to register the manipulations was, the authors examined the verbal reports, supposing the manipulated reports would differ in many respects as compared to the non-manipulated ones. However, their analyses did not show any major differences in this respect. In addition to this, by providing a description of the manipulated reports the authors showed that these were far from homogenous; there were striking differences in how participants motivated their "choice". Johansson et al (2005a) highlighted that the method they had developed could prove useful in detailing the properties of confabulatory reports. After carrying out a new set of experiments using the same method, the authors wanted to continue and expand upon the analysis of manipulated trial reports, the result of which will be a joint article (Hall, Johansson, Sikström, Tärning and Lind 2006), a poster presentation at the Language, Culture and Mind-conference in Paris (Lind, Johansson, Hall, Tärning and Sikström 2006) and the present thesis.

1.1. Goals of this thesis

This thesis, contrasting somewhat with the forthcoming article, will deal mainly with the question of what the data can tell us about the internal constitution of the manipulated reports and how this constitution may relate to differing degrees of access to cognitive processes during the experiment. By doing so I hope to contribute to what I interpret as an ongoing project of attempting map out the limits of introspection.

1.2. Structure of the thesis

In chapter 2, relevant concepts will be introduced and defined. By elaborating upon these concepts, the debate on introspective reports as it relates to the present study will be summarised. The studies on Choice Blindness by Johansson et al (2005a & b) will be presented and their relevance to the debate described. Chapter 3 will tie the more theoretical

approaches to introspective reports presented in chapter 2 to the present empirical study which is aimed at investigating the verbal reports on manipulated choice situations. Here, the method used will be presented. In chapter 4 I will present my hypotheses and in Chapter 5 the results of my study. In chapter 6, I discuss different interpretations of the results, and potential implications of my findings.

2. Theoretical background

Today it is commonly thought (though, cf. Searle 1992 for a dissenting view) that the human mind is constituted by a mass of complex, highly automatic and largely unconscious processes. Although clearly not advocating a return to principles of Freudian psychology, some do not hesitate to use the image of consciousness as being just the tip of an enormous iceberg with conscious thought represented by the 5% or less visible above the surface (Wilson 2003, Lakoff and Johnson 1999). Because of this, several problems concerning the use of introspective methods have been pointed out. At the same time, the use of these methods has been given a prominent role in the thriving enterprise of cognitive science and the exploration of the mind. Therefore, it is not surprising that the validity of introspective reports is a debated subject.

In the following pages, some of the reasons for the difficulty that scientists have had of agreeing upon a standard methodology for eliciting verbal reports are presented.

2.1. The subjectiveness of introspective reports

Ericsson (2003) touches upon an important point while reviewing the history of the use of introspective methods. Unlike with more easily measurable forms of behaviour where different variables can be controlled and easily compared between subjects, there is no actual way of ”inducing the same mental states in many observers where the states [are] sufficiently stable to allow consistent judgements across observers” (p. 5). If there is no way for anyone, including the introspecting person, of knowing the mental states being accessed and elaborated upon, then we can not know precisely what the introspection is referring to, or how ”truthful” it is. So, while measurements of heart-rate, or the tracking of eye-movement while reading a text, are specified enough by their respective methods to be relatively ”objective” measurements, introspective reports on subjective experience are more problematic. For these reasons, some have dismissed introspection altogether as a serious method, condemning it as too unreliable. Generally, however, it is regarded as a much too potent source of knowledge about the mind to be missed out on.

Jack and Roepstorff (2003a) write that the construction of a ”maximally robust methodology for introspective evidence” is not possible in the absence of ”a detailed understanding of the operation of introspective processes” (p. vi). But, as we could not be said to have such an understanding yet, ”the practical question is: What attitude should we take given our relative ignorance of introspective processes?” (ibid. vi).

2.2. Confabulatory reports

Confabulation or confabulatory reports is a well-known phenomenon in the debate on introspection. In a classic study, Nisbett and Wilson (1977) reviewed a large number of psychology and social psychology studies, as well as making complementary experiments of their own. In doing this, they were able to show clear discrepancies between the effect a certain stimuli had on subjects and the way subjects actually reported on these effects. Nonetheless, participants in the experiment often gave articulate reports on why they behaved a certain way or how they came up with the solution to a problem. In other words, subjects often explained their behaviour with reference to factors known by the experimenters to have been unimportant, while failing to report factors that were known to have been important[1]. For example, under the guise of a consumer survey in commercial establishments, they were able to show that subjects had a tendency to make quality-judgments of nightgowns based on the position of the gown. However, no subjects reported the importance of position, and almost all denied this importance when asked about it.

This led the authors to conclude that while we probably have little or no ability to gain introspective access to many higher order cognitive processes, we may often give reports as if we did have such access. These reports, generally referred to as confabulatory reports, are, according to Nisbett and Wilson, often based on a priori theories about behaviour (p. 248). These theories may be cultural or personal, or both. For example, when people are asked, retrospectively, to report on the importance of a certain stimuli on their response they may try to determine this importance based not upon a memory of the mental processes important to their response but rather upon a pre-existing model of how important the stimuli *ought to have been*, given, for example, how salient it seemed to them. Nisbett and Wilson further claim that while introspective reports are sometimes correct, this is often due to an accidentally correct use of a causal theory rather than to actual introspective awareness (p. 233).

Given how influential these arguments have been[2], it is not surprising that great caution has often been advised when eliciting verbal reports in cognitive science and related fields.

2.2.1. Heterophenomenology

The philosopher Daniel Dennett has argued extensively (e.g. Dennett 1991, 2003) for an agnostic attitude towards introspective reports. Our often verbose way of speaking of our

[1] Hence the title of the article: ”Telling more than we can know”.
[2] Nisbett and Wilson (1977) is one of the most cited social psychology-articles ever (2580 times according to ISI:s Web of Science Index).

inner lives does not rule out that we are sometimes mistaken in the endeavour to verbally report on subjective experiences. Thus, in the scientific pursuit of a theory of consciousness, the scientist must, Dennett writes, reserve judgement about the validity of what is being said. Introspective reports are observable behaviour on a par with heart-rate and eye-movement, and while taking them seriously, the scientist should only see them as indicative of the subject's *heterophenomenological world*, which is made up of all the beliefs, desires and so on, of the subject. This heterophenomenological world, Dennett argues, is not to be confused with the real world (Dennett 1991:81); such confusion can lead to serious problems in the study of consciousness.

Dennett's stance is controversial. It advocates wholesale scepticism towards introspective reports, and many (e.g. Jack and Roepstorff 2003a) believe this may be neither necessary nor desirable.

2.2.2. Phenomenology

The basic tenets of phenomenology were derived from Husserl in the beginning of the last century (Husserl 1999 [1917]), but are still relevant. Gallagher and Sørensen (2006) provide a description of how the phenomenological method is used today.

The phenomenological method has as its goal to investigate private experiences not for their own sake, as is done with common introspection. Rather, the experimenter is interested in private experiences ”only insofar as they are representative of [] the invariant self-organizing structure of the experience” (p. 3). This method involves training the subject; telling him or her to ”suspend the common senses attitude”, that is, to exclude all beliefs, opinions and theories he or she might have about the experience being investigated, so that as much focus as possible is on the experience itself. The reports gained from such experiments are then analyzed qualitatively and compared in an attempt to find an intersubjective *invariant structure* of the experience investigated.

This is in striking contrast to heterophenomenology and these two methodologies are in many ways representative of two diametrically opposed poles in the debate on introspective reports. But one can also discern a simultaneous project, in comparison relatively free of theoretical bias, that may prove more fruitful in solving some of the problems posed by the use of introspective reports.

2.3. Optimizing the Reliability of Introspective Reports

Nisbett and Wilson (1977) argued that instances of accurate reports are due to ”incidentally correct employment of a priori causal theories” (p. 233), rather than direct introspective awareness. But they also posed three questions that sum up the topic of the present study:

> [If] people are sometimes accurate, several questions arise. (a) What is the basis of these accurate reports? (b) Are accurate reports fundamentally different in kind from inaccurate ones? (c) Is it possible to specify what sorts of reports will be accurate and what sorts will be inaccurate? (p. 232)

While Nisbett and Wilson (1977) investigated these questions themselves, their answers were by no means conclusive. The questions of introspective validity continue to lie at the heart of the theoretical debate on introspection. Discussing the epistemology of introspective reports, Goldman (2004) writes that ”[a] crucial problem for the theory of introspection is to fix its range of reliability” (p. 14).

The concept of introspection suggests that we are dealing with a unitary phenomenon, but this is hardly the case. Prinz (2003) devotes a whole article to this point and starts out claiming that ”introspection is Janus-faced. It splinters of into several different species, involving different underlying mechanisms” (p. 40). Different types of cognitive processes will vary in the degree of introspective access that we have to them and thus verbal reports on different types of introspection will vary in their trustworthiness. One insight from this reasoning worth noting is that it can be misleading to over-generalize our inability to introspect. For example, Nisbett and Wilson (1977) has received much critique for questioning participants about the *causes* of their mental states, a type of process that we are often said to have little or no introspective access to (see e.g. Lutz and Thompson 2003). Several different typologies are proposed for what types of consciousness there are and what degree of access we may have to them (see e.g. Lutz and Thompson 2003, Prinz 2003) and while there seems to be little consensus on how to conceptualise distinctions between what we do and do not have access to, it is often maintained that introspective access is gradient rather than absolute.

A recent experiment that has provoked some attention may prove a very valuable tool in this project of fixing the range of introspective reliability.

2.4. Choice Blindness

The experiment by Johansson et al (2005) represents a new and interesting way of studying some of the mechanisms behind confabulation. By contrasting reports given to both manipulated and non-manipulated choices, it very elegantly enables a comparison of introspective reports that appear to be confabulatory with very similar "truthful" reports. This should be of great interest to anyone, irrespective of theoretical belongings, using introspective methods for experimental research. The experiment uses the well-known phenomenon of change blindness (see e.g. Simons and Rensink 2005) and applies it to a judgement-task between two pictures.

2.4.1. General procedure

Participants were told the experimenters were investigating choice and facial attractiveness. Each participant was shown fifteen pairs of black and white photographs of female faces[3]. For each trial the participant was instructed to choose, by way of pointing, the face they found most attractive. In six of these trials verbal reports were elicited. After the choice was made, the cards were laid down on the table and the chosen picture was slid to the participant, who was asked the question "why did you choose this picture?" Three of these *verbal report-trials* were manipulated by way of keeping a picture of the opposite face on top of each picture.

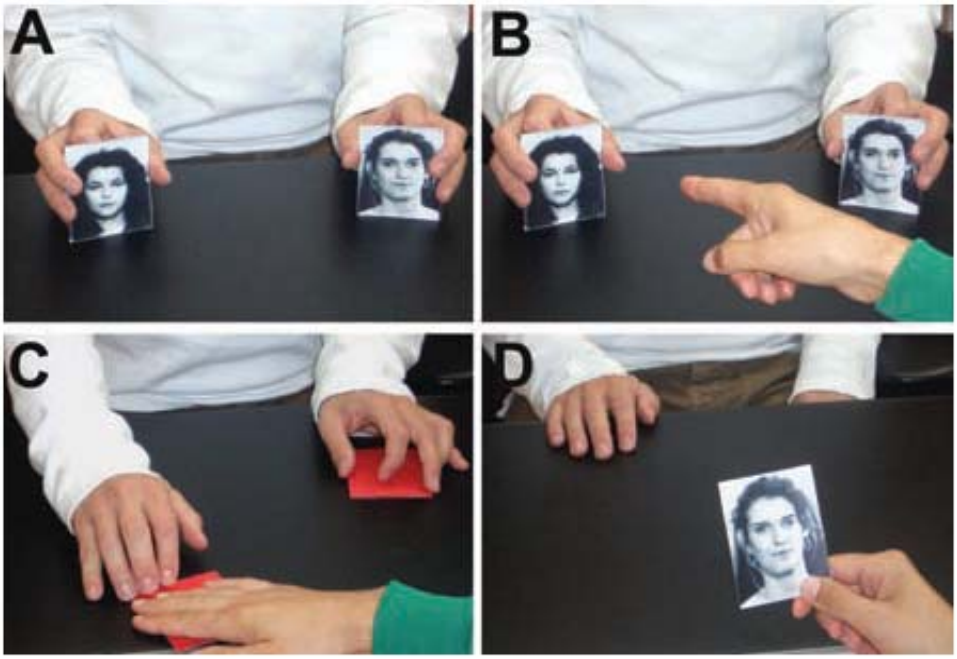

Figure 2-1. The Choice-Blindness procedure

[3] The photographs were taken from The Psychological Image Collection at Stirling (PICS).

Figure 2-1 demonstrates this: after the participant has chosen the picture on the left (B), the cards are laid down on the table and the hidden, rejected, picture is slid to the participant (C). The participant picks it up and is asked to motivate the choice (D).

Three types of detection were recorded, one concurrent and two retrospective. If the participant explicitly said that the cards had been switched or that something must have gone wrong, this was labelled as a *concurrent detection*. After each participant had finished all fifteen pictures a post-experimental interview was held. By asking a series of increasingly specific questions the experimenters tried to determine if the participant had, without reporting so, noticed something strange about the experiment and the outcomes of his or her choices. If the participant said "no", the true nature of the experiment was revealed and the participant was asked if he or she had noticed something similar to what was described. If the participant said "yes" he or she was asked to determine which of the fifteen pictures had been manipulated. When done correctly, the trial was marked as *retrospectively detected*. The label *possible retrospective detection* was used for two similar scenarios. First, when the participant correctly points out a manipulated picture, but also, as was done in some cases, judges one or more non-manipulated trials to have been manipulated. Second, when the participant points out one or more non-manipulated pictures but none of the manipulated ones.

2.4.2. Analysis of the reports

Starting with the supposition that manipulated reports can be expected to differ in a number of ways from the non-manipulated ones, Johansson et al (2005a and 2005b) conducted a three-step analysis of the reports. For all these steps, three independent raters were used.

First, they compared four variables: (a) *empty reports* (where participants simply answered "I don't know" or something equivalent), (b) the *tense* of the reports, (c) the *length* of the reports and (d) the amount of *laughter* in the reports. For all measures (a-d), no differences were found. Second, they compared four psychological variables: (e) the level of *emotional engagement* in the reports, (f) the *specificity* of the description in the reports, (g) the *certainty* or *confidence* of the reports, and (h) *dynamic self-commentary* (where participants reflect upon their choice, and often question it). For measures (e-g) no differences were found, but there were significantly more dynamic self-commentary in manipulated reports (although only in 5% of the manipulated reports).

This difficulty of finding salient differences between manipulated and non-manipulated reports makes the authors speculate that maybe both types of reports are so similar simply

because they are derived in the same way: “confabulation could be seen to be the norm and truthful reporting something that needs to be argued for” (Johansson et al 2005a: 118).

Recognising a need to describe the reports as well as searching for differences, the authors conducted a third analysis. They divided all manipulated reports into eight different categories, providing a sort of (rough) continuum of confabulation showing quite clearly a surprising range of differences within the group of manipulated reports. Two categories point to some of these differences. Falling into the category *specific confabulation* were manipulated reports where participants made reference to features that were unique to the manipulated picture (i.e. absent in the picture the participant actually chose). The category *original choice* contained reports where participants motivated their manipulated choice by referring to features unique to the picture they actually chose (even if those were absent in the picture presented to the participant).

2.4.3. The second study

In order to investigate these issues further, a new study along the same lines was carried out, and it is the data accumulated from this new study which will be analysed in this thesis. 80 participants between the ages of 17 to 43 (with an average age of 23), 49 female and 31 male, took part in the experiment. Fifteen pairs of pictures were shown for each participant[4]. As in the previous study, six of these were verbal report-pairs[5], and three of these six were manipulated. All pictures were shown for four seconds.

Some things differed from the original experiment. There were two different conditions for the verbal reports. In the first condition the participant was simply asked the question and when he or she had answered, the experimenter moved on to the next pair of pictures. This condition included 40 participants. In the second condition, also including 40 participants, the same question was posed, but by asking follow-up questions, an attempt was made to make the participant speak for about one minute. The reports elicited in the first condition are referred to as *short reports* and reports from the second condition are referred to as *long reports*.

As in the previous experiment, three types of detection were recorded. 26 of these were concurrent detections, 20 were retrospective detections and 9 were possible retrospective detections.

[4] The photographs for this study were taken in a campus café at Lund University under similar circumstances and differed mainly in the appearance of the photographed woman.
[5] These were the same six for all participants.

3. Major theoretical questions and method

3.1. The aims of this study

On a general level, the present study investigates the relationship between choice and introspective reports. More specifically, it is aimed at investigating some of the linguistic properties of manipulated reports. This investigation has been done by comparing these reports against the seemingly very similar non-manipulated reports. The aim of the investigation is to shed light on a few seemingly related phenomena.

First, it aims to answer the question of whether manipulated and non-manipulated reports are different from each other. A presence of markers that suggest some form of detection of manipulations will say something about our ability to access certain cognitive processes underlying choices *to a degree*, perhaps shedding some light on two things. First, that introspective access to the cognitive processes may not be an ”either/or” ability but rather dependent upon many factors such as degree of awareness, motivation and interest during the choice. Second, that manipulated reports are not a homogenous type of report as such, but may differ in their internal constitution. It is an aim of this study to try and find markers that distinguish manipulated from non-manipulated reports. Such knowledge would be a contribution to the discussion on when verbal reports may rightfully be handled with scepticism, and when they may be trusted (see e.g. Jack and Roepstorff 2003a).

3.2. Major questions

Starting from the presented debate on what stance to take on introspective reports and the findings made by Johansson et al (2005a), this inquiry is guided by the following two questions:

- What kinds of differences are there (if any) between manipulated and non-manipulated choice-reports?
- How can such (potential) differences be explained?

In the next section I will survey the data and narrow down two main hypotheses. These will be expanded upon in chapter 4 in conjunction with a more rigorous analysis of the data. There they will be worked into a number of testable predictions.

3.3. Hypotheses

For the great majority of all manipulated reports (185 out of 240) there were no directly discernible signs of detection. Table 3-1 repeats the detection criteria as defined by Johansson et al (2005a).

Table 3-1. Detection criteria

Type of detection	*Instances*
Concurrent	26
The participant *immediately* notices the manipulation and points this out or otherwise indicate that something must have gone wrong with their choice	
Retrospective	20
The participant motivates the manipulated choice but shows post-experimental signs of detection and is able to indicate which trials had been manipulated	
Possible retrospective	9
The participant the manipulated choice but shows post-experimental signs of detection and indicates the manipulated trials in addition to one or more non-manipulated trials or alternatively indicates one or more non-manipulated trials	

This continuum of detection seems to reflect differing degrees of access to the cognitive processes underlying the choice. A low degree of access to these processes may well result in no detection and reports where no differences at all can be found between manipulated and non-manipulated reports. However, the continuum of confabulation and the higher degree of dynamic self-commentary in manipulated reports (see Johansson et al 2005a) indicates that the failure to detect a manipulation does not necessarily mean that there are no discernible indications of ”something being wrong” within the motivation itself. This implies that, even in an undetected trial, there may be a degree of access to the cognitive processes underlying the choice. This, in turn, may lead to a *reluctance* towards motivating a choice not actually made, resulting in a report qualitatively and/or quantitatively different from a non-manipulated one. Furthermore, there is a possibility that such differences may be found only in reports where there was either a retrospective or a possible retrospective detection. This would correlate with a higher degree of access to relevant cognitive processes. Table 3-2 portrays these hypothesized differences in access as they relate to the detection criteria, and it also shows possible overt markers of the different degrees of access.

Table 3-2. Hypothesised relationships between type of detection, degree of access and overt markers in manipulated reports.

	Type of Detection	*Degree of access*	*Markers in reports*
1.	Concurrent	High	- Protest against manipulation - Dynamic self-commentary
2.	Retrospective	Considerable	- Reluctant report, resulting in differences as compared to non-manipulated reports
3.	Possible retrospective	Intermediate	- Reluctant report, resulting in differences as compared to non-manipulated reports
4.	None	Low	- Reluctant report, resulting in differences as compared to non-manipulated reports
		None	- None

There is a relatively straightforward way of investigating the first row in table 3-2, namely to count all reports containing protests or dynamic self-commentaries. The main weight in this thesis will accordingly be put on investigating rows 2-4.

The hypothesized reluctance may manifest itself as (i.e. be the equivalent of) a relatively overt feeling of something being not-quite-right. In such a case there are several possible reasons as to why the participant does not directly object to the manipulation; he or she might not at al consider the possibility of the experimenter changing the pictures and the situation may pressure him or her into providing an answer to the question posed. The reluctance may also manifest itself more subtly and, perhaps, imperceptibly as an increased difficulty with providing a motivation. There is a mismatch of intention and outcome in manipulated trials and providing a motivation for these choices may be a markedly different challenge as compared to motivating a non-manipulated choice. Two hypotheses can thus be put forward; motivating a manipulated choice may result in:

(1) an increased feeling of uncertainty and insecurity
(2) a heavier cognitive load

The two hypotheses should not be thought of as two clearly separate manifestations, but rather as two points on a continuum; the increased cognitive load could at times be so palpable as to manifest itself as a feeling of uncertainty.

To show how these issues are investigated, the next section offers a more elaborate analysis of the data, as well as a description of the method used. In chapter 4, the hypotheses will be expanded further.

3.4. Data analysis

The audio-recorded interviews were transcribed[6] and are inserted within an Excel-document along with relevant data such as participants' age and sex, if the participant gave short or long motivations and whether or not the choice was manipulated. Also indicated were the three types of detection. As mentioned, there were a total of 480 reports and the average length of the reports was 19,5 words for the short ones and 97,4 words for the long ones. The utterances of the experimenter, which are present in almost all the long reports, are included in the transcriptions. Also included are pauses, filled hesitations, laughter and interjections (see the appendix for a list of filled hesitations and interjections).

The obvious thing to do when initiating the analysis of the verbal reports was simply to look at them with a naked eye and try to determine variables that could plausibly differ predictably when compared across manipulated and non-manipulated reports. This was done in a number of steps.

3.4.1. Word-frequencies

Attempting to get an overview of the data, a frequency-list of all the words used in the total data was created using the soft-ware CLAN (MacWhinney 2000). This totalled 1691 word-types and 27528 word-tokens. The frequency-list was then tagged for word-class, showing, as one would expect from spoken language (see e.g. Halliday 1985), that open-class words (verbs, nouns, and adjectives) make up the majority of types (78,4%) but that closed-class words make up the majority of tokens (70,9%). Laughter, pauses, filled hesitations and inaudible forms[7] make up a third category, belonging neither to open nor closed-class words, and totalling 38 types[8] with a total frequency of 3845 (see table 3-3).

Table 3-3. Type/token-relationships.

	Open-class words	%	*Closed-class words*	%	*Words total*	*Other*	*Total*
Types	1296	78,4	357	21,6	1653	38	1691
Tokens	6882	29,1	16801	70,9	23683	3845	27528

3.4.2. Content-analysis

Next, an attempt was made to describe the contents of the data. This was done by first arranging the motivations into different themes, based on the content of the participant's discourse. Due to the specific subject matter of the texts, three main themes are rather easily

[6] Transcriptions were made by Betty Tärning, a native speaker of Swedish.
[7] Totally 30 forms were labelled as "inaudible".
[8] This high number is mainly due to different variants of filled hesitations.

distinguished. The first theme can be seen as a direct answer to the question that participants were asked, namely ”why did you choose this picture?” This exclusively involves talk about the picture the participant is holding in their hand (theme: *why*), as exemplified in (1).

(1) Ja, det var för att det var nån, det påminde mig om nån jag känner
Yeah, it was because it was someone, it reminded me of someone I know

(2) demonstrates the second theme, which involves the participant comparing the two pictures (theme: *comparison*).

(2) Ehh, dom två liknade varandra väldigt mycket, jag vet inte om det kan vara frisyren, jag vet inte, hon ser trevligare ut.
Ehh, those two looked a lot like each other, I don’t know if it could be the hair, I don’t know, she looks nicer.

The third theme, exemplified in (3) concerns all talk about the picture *not* chosen (theme: *rejected picture*).

(3) Hon såg så stel ut den andra liksom lite trött ut, lite mer ja.
She looked so strict the other one kind of a little tired, a little more yeah.

It can be noted that *why* and *comparison* are the two main themes, while *rejected picture* is markedly more infrequent.

When analysing the texts thematically, it soon became obvious that large parts of the motivations were not dealing with the pictures and choices as such, but were rather comments upon a range of things pertaining to the situation that participants were in during the experiment. In each motivation a distinction was made between *thematic content* and *metadiscoursal comments*. The distinction is described in Brown and Yule (1983) who state that metadiscoursal comments are parts of utterances

> …in which the speaker/writer specifically comments on how what he is saying should be taken. [] It is clear that this thematised ”metalingual” comment is not to be integrated with the representation of content which the recipient is constructing. (pp. 132-33)

The three themes are thus represented in the thematic content of the motivations, while the contents of the metadiscoursal comments are quite varied. They are often made up of reflections on the degree of difficulty of the choice, and the inability of providing a good motivation, as exemplified in (4) (metadiscoursal comments are in italics).

(4) *Oj oj oj, det är svårt, man vet inte vad man ska säga [skratt], varför äh, jag tycker bara helt enkelt att* **hon ser bättre ut än den andra**.
Oh oh oh, it´s difficult, you don´t know what to say [laughter], why eh, I quite simply think **she looks better than the other one.**

Another prominent feature is reflections on attractiveness. These often take the form of comments on which features play a role in the individual participant's conception of beauty as in (5), but also in the more general notion of what society at large considers beautiful.

(5) *Ja… ja det undrar jag också, bara för det så glömde jag ju den andra, jo men det e, jag tittar på ögonen faktiskt och jag vet inte, helheten jag kan inte riktigt, ja ögonen, jag vet inte vad* **det e, nåt särskilt med ögonen i alla fall**, *det var ingen bra förklaring kanske.*
Yeah… yeah I wonder that too, just because I forgot the other one, yeah but it's, I look at the eyes and I don't know, the whole I can't quite, yeah the eyes, I don't know what **it is, something special about the eyes anyway**, *that was no good explanation perhaps.*

A few reports consist exclusively of metadiscoursal comments. When measured across all reports, 47% of all words belong to the thematic content and 53% belong to the metadiscoursal comments.

3.5. Method

The approach taken in this analysis differs in many respects from the one taken in Johansson et al (2005a and 2005b). No independent raters were used. Instead, the basic strategy employed when comparing the manipulated reports with the non-manipulated ones is basically word-counting. But it is also qualitative in the sense that the data was analysed and processed in order to target possible markers of detection. Some remarks on this method follow.

3.5.1. Word-counting and content-analysis

It is an often held assumption that the *way* in which a message is conveyed can often be as telling as *what* is conveyed (see e.g. Pennebaker et al 2003). Newman et al (2003) investigated the possibility of detecting lies through language-use, basing their approach on the notion that categorizing and counting the words a person uses may say a lot about that person's motives, thoughts and emotions. While most people can successfully lie about a wide variety of things, there are aspects of communicating verbally that are less easy to consciously control. Newman et al (2003) refer to an insight from the literature on reality monitoring, stating that "stories based on imagined experiences are qualitatively different from stories based on real experiences" (p. 665). The fact that the speaker is lying may not be easy to detect from *what* he or she is saying, but maybe from *how* he or she says it; the liar's "underlying state of mind" may surface through the way that he or she speaks. This notion of

linguistic style bearing information in itself appeared to be a promising way of approaching the present investigation. As outlined in section 3.3., I focus on markers other than concurrent detections. It is easy to see *what* participants are saying, so rather than looking for explicit indications of conscious detection, what needs more careful analysis is the *way* they are saying it.

Taking inspiration from the LIWC-program (Pennebaker et al 2001), the main procedure in this thesis has been to try to target certain words or groups of words, the frequency of occurrence of which can potentially show differences between manipulated and non-manipulated reports. The data has then been further analysed to see if these words are prominent enough for statistical testing and if, when possibly ambiguous, they are used in the predicted sense or perhaps in multiple senses. Variations of this strategy were used throughout.[9]

[9] A word-count program was written specifically for this study, by Sverker Sikström.

4. Hypotheses and predictions

In this chapter I will further specify and motivate a number of predictions designed to provide measures of the two hypotheses. As propounded in chapter 3, the hypotheses are that the motivating of a manipulated choice may result in:

(1) an increased feeling of uncertainty and insecurity
(2) a heavier cognitive load

This chapter has two main sections in which the hypotheses are further introduced, followed by a number of predictions generated from the two hypotheses. Each of these predictions are first elaborated in more detail, after which they are operationalised.

4.1. Hypothesis 1 – An increased feeling of uncertainty and insecurity

Uncertainty and insecurity may, of course, result in a myriad of linguistic and extra-linguistic manifestations. Against the background of the content-analysis, and further analysis of the data, six predictions have been made about how a heightened uncertainty and insecurity may manifest itself in this particular data. Manipulated reports may be distinguished by an increased use of *words marking uncertainty*, by a lessened degree of *specificity*, by a framing of the motivation in *the past tense*, by a decreased use of *positively toned words*, by a decreased use of *first-person singular pronouns*/increased use of *the generic pronoun "man'*, and by a increased amount of *laughter*.

4.1.1. An increased use of words marking uncertainty

Within a given language, a speaker usually has a wide variety of ways of expressing his or her attitude towards what is he or she is saying (see e.g. Frawley 1992). When analysing the material, special attention was put on words that, in Swedish, are used to mark the speaker's uncertainty. Specific high-frequency words proved to be predictable means by which this is done. Those were the modal adverbials *kanske* (frequency: 188), *ju* (131), *väl* (114) and *nog* (106) and the propositional attitude-verbs *vet* (297) and *tror* (135). Table 4-1 shows the, by far, most usual meanings of these words as they are used in the texts.

Table 4-1. Words marking uncertainty (English translations refer only to the contextual meaning. All examples are drawn from the short reports for space considerations)

Word	***English Tr.***	***Freq.***	***Usage***	***Example***
kanske	*perhaps/ maybe*	188	refers to the certainty of *what attributes* made the subject choose the picture	”Ja, jag vet inte, kanske för att det var [paus], ja [skratt] vet inte riktigt, jag tror det var bara att det nog var ganska enkla drag bara helt enkelt.” ”Yeah, I don’t know, perhaps because it was [paus], yeah [laughter] don’t really know, I think it was just that it probably was kind of simple features.”
ju	roughly *you know*	131	a more general marker, seemingly giving reference to an ”objective” or ”correct” view of the things discussed (*what the person in the picture looks like*, and concepts like *beauty* and *how beauty is judged*), and it often seems to signal an expectance of agreement on behalf of the experimenter	“Alltså det är mer intuitivt jag vet faktiskt inte varför [paus] det var ganska, där var det närmare den här gången tror jag, jag vet inte [skratt] det e svårt att förklara det e, ja hon ser ju ganska bra ut.” ”You know it’s more intuitive I really don’t know why [paus], it was kind of, it was closer this time I think, I don’t know [laughter] it’s kind of difficult to explain it, well she looks kind of good, you know.”
väl	roughly *I suppose*	114	expresses that an utterance on, for example, what attribute made the participant choose the picture is not certain but rather a supposition	“Det e väl kanske för att hon var mest symmetrisk på något vis, jag vet inte.” ”I suppose it is perhaps because she was the most symmetrical in some way, I don’t know.”
nog	*probably*	106	usually refers to the certainty of *what attributes*, more precisely, made the subject choose the picture	”[paus], näe, jag tyckte nog att hon såg lite gladare ut [skratt] eller nånting.” ”[paus], no, I probably thought she looked a little more happy [laughter] or something.”
vet	*know*	297	almost exclusively used as *vet inte/jag vet inte* (*don´t know/I don´t know*) to express uncertainty over *why* the particular choice was made	“Ehm, [paus], jag vet inte, man går väl lite på vilket intryck man får också när man ser ehh, behaglig ut kanske man får nån positiv eller lugn känsla av personen.” ”Ehm, [paus], I don’t know, I suppose it depends on what impression you get also when you look ehh, attractive perhaps you get some positive or calm feeling from the person.”
tror	*thinks* or *believes*	135	the only verb in the texts truly expressing a propositional attitude, usually taking as a complement a clause expressing either *what attributes made the subject choose the picture* or *what the participant, in retrospect, believes it thought or felt about the picture and how this (‘must have’) influenced the choice*	”Ja, det är samma sak igen, jag tror det är ansiktsuttrycket, dom uttrycker, vad dom har för ansiktsuttryck, det är nog det som avgör” ”Yeah, it’s the same thing again, I think it’s the facial expression, they express, what their facial expression is, that is probably what settles it”

These words can be seen as markers of uncertainty, with the absence of them implicitly indicating a stronger commitment to what is being said. Thus, the following prediction can be stipulated:

Hypothesis 1 (a)

Participants will use the words *kanske, ju, väl, nog, vet* and *tror* to a higher degree when motivating a manipulated choice.

4.1.2. A lessened degree of specificity

When motivating the preference of one face over another the participants often refer to the characteristics of the chosen face that were, or seemed like, determining factors in their choice. When presented with the picture *not* chosen, these characteristics have of course changed. It can thus be expected that the participant makes his or her motivation more vague in the case of a manipulated trial. For example, maybe the participant has rejected a picture because he or she thought, among other things, that the eyes of the face looked tired. Being then presented with this picture as if he or she had chosen it, it is improbable that the participant will refer to these distinctive features when asked to motivate the choice. Instead, he or she may want to refer to more general characteristics of the face such as in the example of *simple confabulation* in Johansson et al (2005a): ”Just a nice shape of the face, and the chin” (p. 118).

All nouns pertaining to the picture and the abstract concept of *human* or *person* were divided into *general* and *specific* nouns. Specific nouns refer to details of the face such as *the eyes*, *the nose* and *the mouth*, details of the picture as such, such as *the hair*, and *the hair-style* but also specific characteristics of the face such as *the smile* and *the gaze*. General nouns are nouns of a higher level of abstraction such as *the face*, *the image/picture* and *the person*; *the form*, *the look* and *the features*, but also nouns referring to more person-specific qualities such as *the symmetry*, *the facial-expression* and *the proportions*. The total frequencies were 609 for general nouns, and 1030 for specific nouns (see the appendix for a total list of these). The prediction reads:

Hypothesis 1 (b)

Participants will use specific nouns to a lesser degree when motivating a manipulated choice.

4.1.3. A framing of the motivations in the past tense

Initially, it was speculated that participants may use complex tenses, such as the perfect and pluperfect tense, to a higher degree when motivating manipulated choices since this, it could be argued (see e.g. Frawley 1992), would indicate a wish to "dissociate" oneself from the utterance. However, there are very few instances of complex tenses in the data; the main distinction is between the present and the past tense. It seemed interesting to investigate differences in the framing of motivations in different tenses. Frawley (1992) writes that, conceptually, the past tense is connected to, among other things, nonactuality and hypotheticality (p. 352).

All verbs were categorised after their endings, and the following prediction was stipulated.

> *Hypothesis 1 (c)*
>
> Participants will frame their motivations in the past tense to a higher degree when motivating a manipulated choice.

4.1.4. A decreased use of positively toned adjectives

While uncertainty can be seen as a specific type of emotional response to the situation of motivating a manipulated choice, there is another level of emotional involvement. This may be best described as something akin to an enthusiasm over the choice that was made. Such enthusiasm can of course be suspected to be greatly toned down in the case of manipulated choice-reports.

While the task of motivating a choice, manipulated or non-manipulated, would seem to involve an almost natural use of positive words, this may not be the case at all. It can be expected that participants do not use strongly positive words when describing a picture they did not actually choose. More importantly, they may well restrain their use of positively toned words entirely. Conversely, these words may be ”saved” for the non-manipulated pictures.

All adjectives were divided into two categories: *neutral* and *emotional*. The emotional words were then divided into *positive* and *negative* subcategories. This was done according to the word's meaning in this particular context; words that may be ambiguous for positive or negative shades of meaning were analysed in all their contexts and tagged according to the way they are used (see the appendix for a list of these words). The total frequencies of positive and negative adjectives were 974 and 262 respectively.

The three themes imply different uses of the emotionally toned adjectives and, when more closely inspected, this proved to be the case. The *comparison*-theme involves both positive

and negative adjectives to a seemingly equal degree, which seems quite natural; participants are explaining their reasons for choosing one picture and rejecting another. The *rejected picture*-theme involves negative adjectives to a higher degree, also quite natural. Of greatest interest, then, is the *why*-theme. Here, the participants are exclusively talking about the picture they have chosen or, importantly, *believe* they have chosen. In doing so, they use both positive and negative adjectives.

From this analysis, two predictions are postulated:

Hypothesis 1 (d)

Participants will use less positive adjectives to a higher degree when motivating a manipulated choice.

Participants will use less positive adjectives, specifically in the *why*-theme, to a higher degree when motivating a manipulated choice.

4.1.5. A decreased use of first-person pronouns and an increased use of the generic pronoun 'man'

Investigating differences in language-use between deceptive and truthful written and oral language, Newman et al (2003) found a decreased use of *first-person pronouns* to be indicative of deceptive language-use. The authors speculated that a reluctance of using first-person pronouns may signal a speaker's wish to distance or "dissociate" him- or herself from what he or she is saying.

While there are no direct correspondences between lying and motivating a manipulated choice the manipulated choice-situation may lead the participant to avoid making such self-references.

Self-reference by use of pronouns is a very prominent feature of the reports, the first-person singular *jag* (*I*) being the most frequent word in the entire data (with 1284 hits it is second only to the item *small pause*). Other first-person singulars were less frequent: *mig* (*me* 46), *min* (*my* 6), *mina* (*mine* 3), *mitt* (*my* 2). In Swedish there is also a pronoun with no true equivalent in English, namely the generic *man*. The closest counterpart for this pronoun is the English *one*, as in "*one might say…*". In Swedish, *man* can be used instead of a first-person pronoun and it could be seen as signalling a detachment to an utterance by shifting the responsibility of what is said from the self to a wider "entity', namely the "general point of

view" of the society or an acknowledged subgroup of society.[10] Two converse predictions can thus be stipulated:

Hypothesis 1 (e)

Participants will use less first-person pronouns when motivating a manipulated choice.
Participants will use the generic pronoun *man* to a higher degree when motivating a manipulated choice.

4.1.6. An increased amount of laughter

The item "laughter" has a frequency of 221. People may, of course, laugh for a number of different reasons, each reason suggesting a different underlying state of mind. No visual recordings were available to provide further cues as to why a given participant laughs in a given situation but, from reading the transcriptions, one certainly gets the feeling that laughter in this context seems to indicate, above all, an uncertainty, perplexity and, perhaps, nervousness. This is exemplified in (1):

(1) Ahh, den var svår, jag kunde inte riktigt bestämma mig där, ehh, kan man få se den andra igen så jag kan motivera varför jag inte tog den, ahh, jag vet inte, [skratt], bara tog den
Ahh, that was a tough one, I couldn´t quite decide there, ehh, could you see the other one again so I can motivate why I didn´t choose it, ahh, I don´t know, [laughter], just took it

Based on these observations, the following prediction was made:

Hypothesis 1 (f)

Participants will laugh more when motivating a manipulated choice.

4.2. Hypothesis 2 – A heavier cognitive load

As a result of the mismatch of decision and outcome in manipulated trials, participants are forced to come up with a motivation for their "choice" *on-line* rather than just freely verbalising the reasons supposedly formed at the time of the choice. There is good reason to believe that this task should consume comparatively more cognitive resources (see e.g. Newman et al 2003:666). Such increased taxation of cognitive resources may well lead to a speech that is quantitatively and/or qualitatively different as compared to non-manipulated reports. With this hypothesis as a point of departure, eight markers have been judged to be potent measures of such an increased cognitive load. As compared to non-manipulated motivations, manipulated motivations may be distinguished by a decreased amount of *nouns*

[10] It is also the Swedish word for *man*, (i.e. *human male*), but is not used at all in this sense in the data.

and adjectives, by an increased amount of *pronouns*, by an increased amount of *predictable nouns*, by an increase in *repetition of nouns*, by an increased reference to *the picture in the participants hand* (the *why*-theme), by an increased reference to the past situation of choice, by a general increased difficulty of providing a motivation, resulting in a heightened degree of *metadiscoursal comments*, and, finally, by an increased amount of *pauses and filled hesitations*.

4.2.1. A decreased amount of nouns and adjectives

The use of content-words is more cognitively demanding as compared to closed-class words. A heavier cognitive load on participants can therefore result in a general decrease in the use of nouns and adjectives. Furthermore, one may speculate that a manipulated choice-report may be less verbose, something that will mainly affect content-words. The following prediction was stipulated:

Hypothesis 2 (a)

participants will use less noun types when motivating a manipulated choice.
participants will use less adjective types when motivating a manipulated choice.

4.2.2. An increased amount of pronouns

In relation to the prediction that participants motivating a manipulated choice will use less nouns and adjectives is the supposition that the use of pronouns will increase. Grammatical markers are considered easier to access and pronouns can be expected to replace nouns in this context.

The whole word-class of pronouns was counted for this measure (as opposed to the more specific measure of first-person singulars):

Hypothesis 2 (b)

Participants will use more pronouns when motivating a manipulated choice.

4.2.3. An increased amount of predictable nouns

A heightened cognitive load may lead to a greater difficulty of accessing certain less *predictable* words. The notion of predictability suggests a way of measuring the degree to which participants may use more easily accessible words. The predictability of a word in a specific context is a reflection of, among other things, its *frequency*, *familiarity* and the

context of the preceding speech (Harley 2001:374). The frequency of a word can be obtained through a large corpus of written or oral language designed to represent the language-use of a specific language-group or, depending on your matter of inquiry, from the specific corpus you are analysing. The familiarity of a word is more difficult to obtain since it is a subjective measure of how familiar a word is (or seems) to a given person (Tufvesson, Zlatev & van de Weijer 2004). For this data, the context of the preceding speech is all previous verbal reports given by each individual participant.

Concentrating here on nouns, the list of nouns was lemmatised and the following prediction was stipulated[11]:

Hypothesis 2 (c)

Participants will use more predictable nouns when motivating a manipulated choice.

4.2.4. An increase in repetition of nouns (short-term priming)

Another consequence of relying more heavily on the preceding context of speech when giving a manipulated report may well be that a taxation of cognitive resources leads the participant to use words he or she has already used before, in previous motivations. These words are very likely to remain active in the participants' memory during the remaining reports and are supposedly more easily accessed during the execution of these.

A way of measuring this is to look at the reports of each participant individually and assume that all preceding reports function to prime certain words so that they are active in the participants' memory. Here, the focus will be on nouns. Of the six reports, three were manipulated. By lemmatising the list of all nouns used in the total data and counting the number of *new nouns*[12] in each report, you get a measure of the degree to which the individual participant is relying on the lexical/semantic context they are continuously creating for themselves (in conjunction with the situation)[13]:

Hypothesis 2 (d)

Participants will not produce as many *new* nouns when motivating a manipulated choice as when motivating a non-manipulated choice.

[11] A large corpus was not used for this as it could be argued that, as the data is so specific, it is the optimal indicator of its own semantic context.
[12] *New nouns* are defined as nouns that have not appeared in previous reports.
[13] This measure was constructed based on suggestions by Victoria Johansson of Lund University.

*4.2.5. An increased reference to the picture in the participant's hand (*why-*theme)*

There may be a heightened awareness of *what* is being talked about in manipulated choice-motivations. It was predicted that, when motivating a manipulated choice, participants would, to a higher degree as compared to non-manipulated choice-motivations, tend to talk about the picture they are holding in their hand. There are two main reasons as to why talking about the rejected picture should be avoided. First, participants will be too occupied with finding a reason for their ”choice” to be, in addition, thinking and talking about the ”rejected” picture. Second, it does not make sense to reason about why the other picture was rejected since it was, in fact, actually the one that was chosen.

Starting from the analysis of the thematic content of the reports presented in section 3.4., it is easy to further specify the prediction:

> *Hypothesis 2 (e)*
>
> Participants will refer to the picture in their hand (*why*-theme) to a significantly higher degree when motivating a manipulated choice.

4.2.6. Increased past time-reference

In addition to counting present and past tense verb-forms to find out the general tense-framing of motivations, there is a more specified way of measuring *time-reference* in the data. Having distinguished the thematic content from the metadiscoursal comments, each theme in each motivation can be specified for time-reference. In contrast with counting verb-forms, where each motivation, as a whole, most often mixes tense-forms to an intricate degree, specifying the time-reference of each thematic content-part results in clear patterns of time-reference. It turns out that, most often, each part of thematic content is framed *either* in the present *or* the past tense, i.e. tenses are very rarely mixed within a given strain of thematic content. This provides a different type of measure, not quite of tense, but rather, as mentioned, of time-reference.

As when measuring emotionality, relating tense to *what* the participants are talking about proved to be a way of specifying the prediction even further. From random analysis of the time-specified thematic content of all reports, irrespective of whether they were manipulated or not, it turns out that the different themes have distinct patterns of time-reference. *Comparison* is framed more in the past than in the present tense and *rejected picture*, the least frequent, is also framed more in the past than in the present tense. *Why* is the interesting

theme here because it is not, like the other two themes, inherently bound to a specific time-reference, but rather just as likely to occur in the present as in the past tense.

Hypothesising that there may be differences in these patterns of time-reference for the *why*-theme, the same general prediction as when counting verb-forms has been followed:

Hypothesis 2 (f)

Participants will frame the *why*-theme in the past tense to a higher degree when motivating a manipulated choice.

4.2.7. A heightened degree of metadiscoursal comments

The metadiscoursal comments constitute roughly half of both the short and the long reports providing a clear pattern where about half of the reports are concerned with verbalising an actual motivation, and the other half is concerned with framing these motivations in different ways (see section 3.4. for a fuller discussion). This type of pattern is quite typical for spoken language (although the exact ratio of metadiscoursal comments vs. thematic content may of course follow genre-specific patterns). The parts of utterances here labelled as metadiscoursal comments obviously fulfil a very important part of verbal communication, but they may also, no doubt simultaneously, serve the purpose of giving the speaker more time to plan the thematic content.

A higher cognitive load may result in a general increased difficulty of providing a motivation. There will thus be a greater need of time to plan the thematic content, which in turn may result in a heightened degree of metadiscoursal comments in manipulated trial-reports:

Hypothesis 2 (g)

The metadiscoursal comments will constitute a greater part of manipulated trial-reports as compared to non-manipulated trial-reports.

4.2.8. An increased amount of pauses and filled hesitations

As elaborated in Harley (2001:374-76), evidence suggests that there is no single function of pauses in spoken language. Rather, they may serve several different purposes such as giving the speaker more time to retrieve a difficult word (microplanning) or plan the syntax and content of an entire clause (macroplanning). Furthermore, they can be used by the speaker to make the speech more easily comprehensible for the listener, or just for the effect of

appearing more thoughtful. It could be argued that pauses are put to these uses in this data just like they are used in many conversations but that, due to the increased cognitive load the manipulated trials are hypothesised to provoke, verbal reports for these should be characterized by *more* of these pauses.

Topping the frequency list is ”short pause”, appearing 1834 times in the material. ”Pause’, signifying a slightly longer pause is the seventh most frequent item on the list, appearing 632 times. During transcribing, the difference between these two types of pauses has not been established by timing them and one can not rule out that this difference is not somewhat arbitrary. Therefore, this distinction will be disregarded; all pauses will be regarded as equal, called simply ”pause” (with a united frequency of 2466). Filled hesitations appear 1132 times (see the appendix for a full list of these):

Hypothesis 2 (h)

Manipulated trial-reports will display more unfilled pauses.

Manipulated trial-reports will display more filled hesitation.

4.3. Summary of predictions

Table 4-2 provides a summary of all predictions.

Table 4-2. Summary of predictions.

Hypothesis 1	**M**	**NM**	**Hypothesis 2**	**M**	**NM**
Words marking uncertainty	More	Less	Noun-types	Less	More
Specific nouns	Less	More	Adjective-types	Less	More
Past tense	More	Less	Pronouns	More	Less
Positively toned adjectives	Less	More	Predictable nouns	More	Less
1st person pronouns	Less	More	New nouns	Less	More
Generic ‘man’	More	Less	Why-theme	More	Less
Laughter	More	Less	Past time-reference (theme: *why*)	More	Less
			Metadiscoursal comments	More	Less
			Unfilled pauses	More	Less
			Filled pauses	More	Less

5. Results

Two conditions were set up for all statistical analyses:

Condition 1. All reports where some form of detection was reported were removed (55 in total). As such, this condition investigates row 4 in table 3-2, i.e. potential markers of uncertainty and increased cognitive load in reports where no type of detection was reported. Short and long reports were analysed separately. Their difference in size, as described in section 3.4., calls for separate treatment.

Condition 2. Both types of retrospective detection were analysed against all non-manipulated reports. This was done to investigate points 2 and 3 in table 3-2, i.e. whether the predicted markers of detection were present only where a corresponding retrospective or possible retrospective detection was reported.[14]

Most of the variables in this study do not follow a normal distribution curve. Therefore, statistical significance is measured with a nonparametric test (Mann-Whitney U test). The exceptions are measures 5.2.5. and 5.2.6. which are based on a nominal scale, therefore the Chi-Square test is used instead. The p-value for each measure is presented, even if the results are not significant. All statistical tests employed an alpha level of .05.

In sections 5.1. and 5.2., the results for all individual predictions will be presented following the same sequence as used in chapter 4. In order to avoid unnecessary repetition, each subsection is simply opened with a restatement of the prediction in question. A general discussion and interpretation of the results will be the subject of chapter 6.

5.1. Hypothesis 1 – An increased feeling of uncertainty and insecurity

5.1.1. An increased use of words marking uncertainty

Hypothesis 1 (a)

> Participants will use the words *kanske, ju, väl, nog, vet,* and *tror* to a higher degree when motivating a manipulated choice.

Condition 1. Figure 5-1 shows the percentage of words marking uncertainty in both long and short reports. The differences follow the prediction but are not significant, neither for short (p=(0,999) > .05) nor long (p=(0,438) > .05) reports.

[14] For all statistical tests, all six reports made by four participants were removed. One of these removals were due to faulty recording. The other three were removed because the participants mixed Swedish and English to such a degree that they were judged unsuited for the method used. Also removed were the utterances of the experimenter.

Condition 2. For condition 2, there are no significant differences (p=(0,610) > .05). Note that the differences do not follow the prediction (figure 5-2).

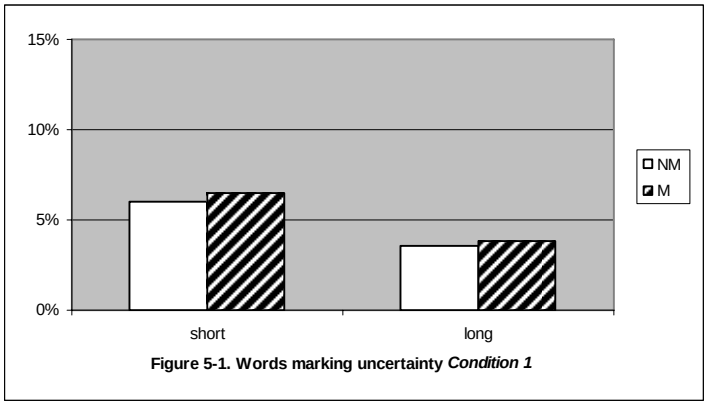

Figure 5-1. Words marking uncertainty *Condition 1*

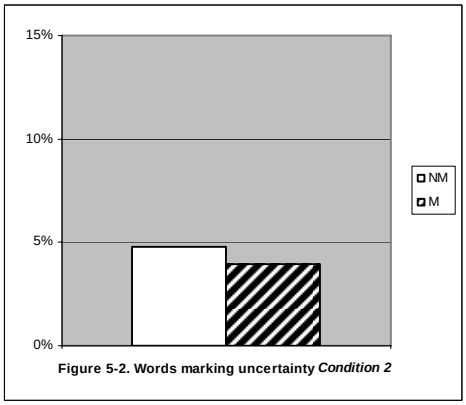

Figure 5-2. Words marking uncertainty *Condition 2*

5.1.2. A lessened degree of specificity

Hypothesis 1 (b)

Participants will use specific nouns to a lesser degree when motivating a manipulated choice.

Condition 1. There are no significant differences in use found neither for the short (p=(0,320) > .05) nor the long (p=(0,178) > .05) reports. Figure 5-3 shows that the differences that do exist follow the predictions.

Condition 2. In the second condition no significant differences are found (p=(0,165) > .05). Figure 5-4 show that the differences follow the predictions.

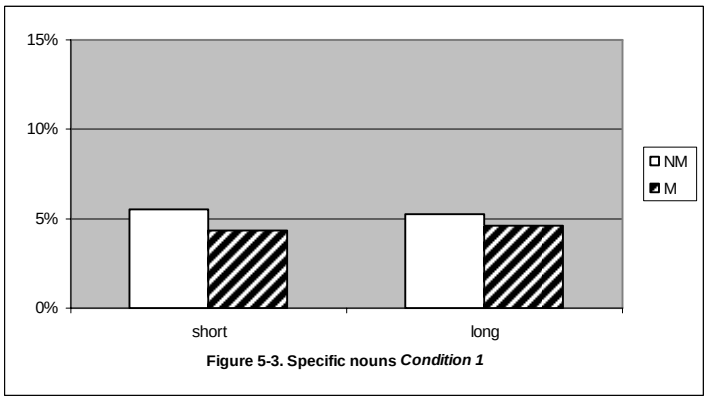

Figure 5-3. Specific nouns *Condition 1*

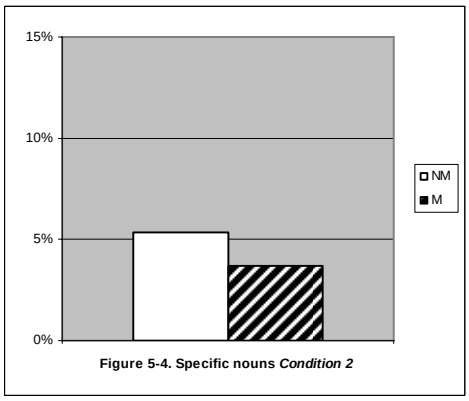

Figure 5-4. Specific nouns *Condition 2*

5.1.3. A framing of the motivations in the past tense

Hypothesis 1 (c)

Participants will frame their motivations in the past tense to a higher degree when motivating a manipulated choice.

Condition 1. There are no significant differences found for neither short (p=(0,746) > .05) nor long (p=(0,612) > .05) reports. Figure 5-5 shows that the differences that exist follow the prediction.

Condition 2. The differences follow the predictions (see figure 5-6) but they are not significant (p=(0,409) > .05).

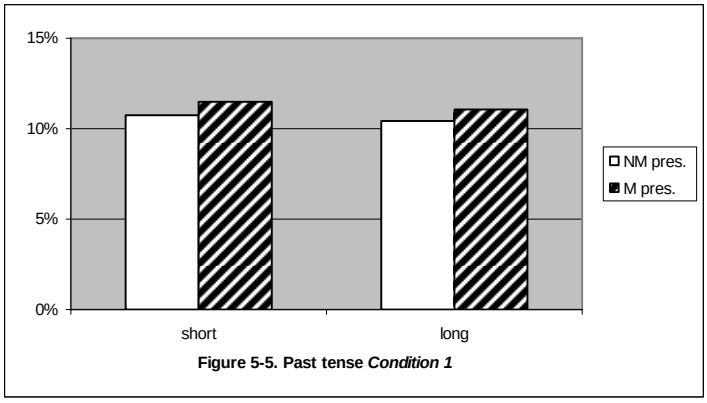

Figure 5-5. Past tense *Condition 1*

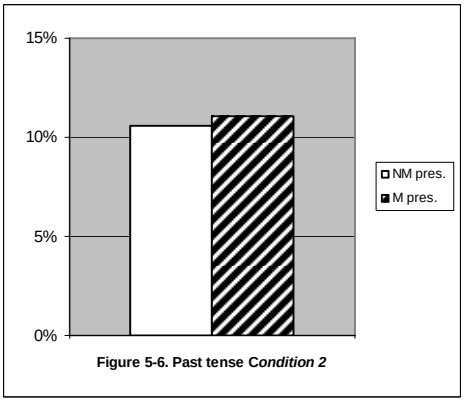

Figure 5-6. Past tense *Condition 2*

5.1.4. A decreased use of positively toned adjectives

Hypothesis 1 (d)

Participants will use positive adjectives to a higher degree when motivating a manipulated choice.

Participants will use positive adjectives, specifically in the *why*-theme, to a higher degree when motivating a manipulated choice.

Condition 1. Figure 5-7 show the percentage of positive adjectives in manipulated and non-manipulated reports, both when measured across all reports and when measured exclusively in the *why*-theme. There is a significant difference in the use of emotionally toned adjectives for the long reports (p=(0,016) < .05) but not for the short ones (p=(0,853) > .05). As can be seen, the differences for the long, as well as the short, reports are in the predicted direction. There are no significant differences, however, when measured exclusively in the *why*-theme, neither for short (p=(0, 369) > .05) nor long (p=(0,141) > .05) reports, but here, as well, the differences that do exist are in the predicted direction.

Condition 2. There are no significant differences for the second condition, neither when measured across the reports in their entirety (p=(0,082) > .05), nor when measured exclusively in the *why*-theme (p=(0,493) > .05), but figure 5-8 show the differences that do exist to be in the expected direction.

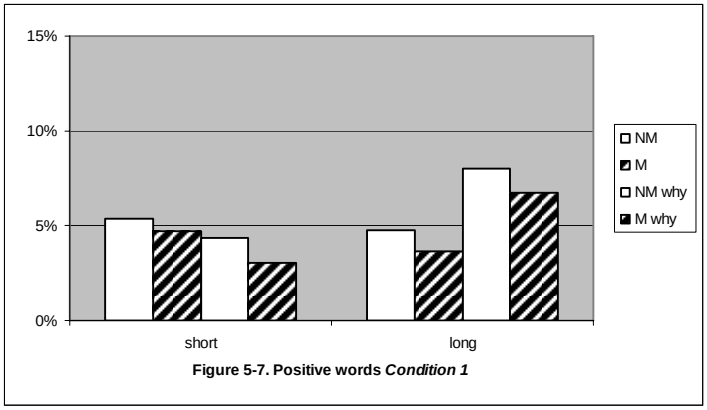

Figure 5-7. Positive words *Condition 1*

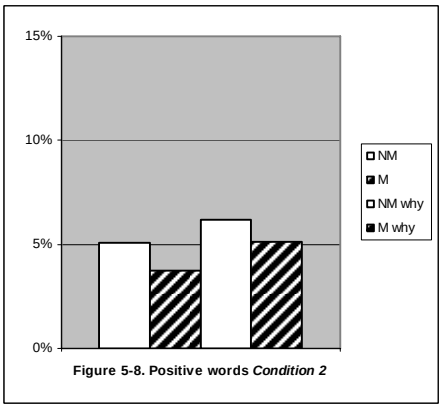

Figure 5-8. Positive words *Condition 2*

5.1.5. A decreased use of first-person pronouns and an increased use of the generic pronoun 'man'

Hypothesis 1 (e)

> Participants will use less first-person pronouns when motivating a manipulated choice.
> Participants will use the generic pronoun *man* to a higher degree when motivating a manipulated choice.

Condition 1. For first-person pronouns, the analysis shows no significant differences for neither short (p=(0,676) > .05) nor long reports (p=(0,191) > .05). Figure 5-9 show that the differences that are found are not in the predicted direction. There are also no significant differences for the generic pronouns *man* for neither short (p=(0,367) > .05) nor long reports (p=(0,911) > .05). Due to the low frequency of *man*, no diagram will be provided. Differences that are found, however, are in the predicted direction (short: manipulated mean: 0,006, non-manipulated mean: 0,004 – long: manipulated mean: 0,006, non-manipulated mean: 0,007).

Condition 2. There are no significant differences for the second condition for first-person pronouns (p=(0,099) > .05) and, as can be seen in figure 5-10, the differences that are found go against the prediction. Due to too few instances of *man* in the retrospectively detected motivations it is impossible to compare the use of man in the second condition.

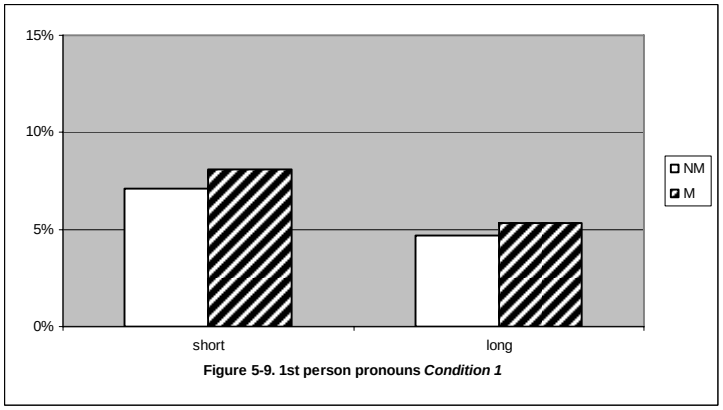

Figure 5-9. 1st person pronouns *Condition 1*

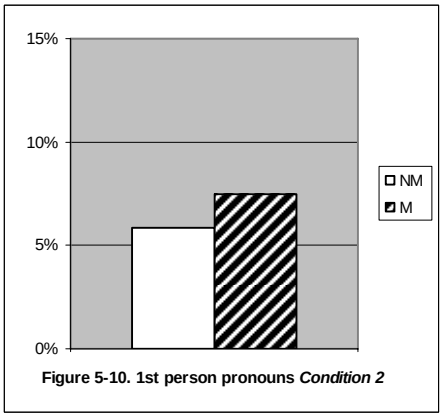

Figure 5-10. 1st person pronouns *Condition 2*

5.1.6. An increased amount of laughter

Hypothesis 1 (f)

Participants will laugh more when motivating a manipulated choice.

Condition 1. The short reports show no significant difference in the amount of laughter (p=(0,343) > .05) and neither did the long reports (p=(0,590) > .05). Due to the small amount of laughter, no diagrams are shown, but the differences that are found are in the predicted direction (short: manipulated mean: 0,019, non-manipulated mean: 0,010 – long: manipulated mean: 0,010, non-manipulated mean: 0,008)

Condition 2. There are also no significant differences for the second condition (p=(0,444) > .05). The mean for manipulated reports are 0,013 and for non-manipulated reports 0,010.

5.2. Hypothesis 2 – A heavier cognitive load

5.2.1. A decreased amount of nouns and adjectives

Hypothesis 2 (a)

Participants will use less noun types when motivating a manipulated choice.

Participants will use less adjective types when motivating a manipulated choice.

Condition 1. For the nouns, there is a significant difference for the long reports (p=(0,019) < .05) but not for the short ones (p=(0,348) > .05). For the adjectives, there are no significant differences for the short (p=(0,156) > .05) nor the long reports (p=(0,284) > .05). Figure 5-14 show that all differences that are found are in the expected direction.

Condition 2. For the nouns, there are no significant differences for the second condition (p=(0,471) > .05). There is, however, a significant difference for the adjectives (p=(0,015) < .05). This difference is in the predicted direction, as can be seen in figure 5.15.

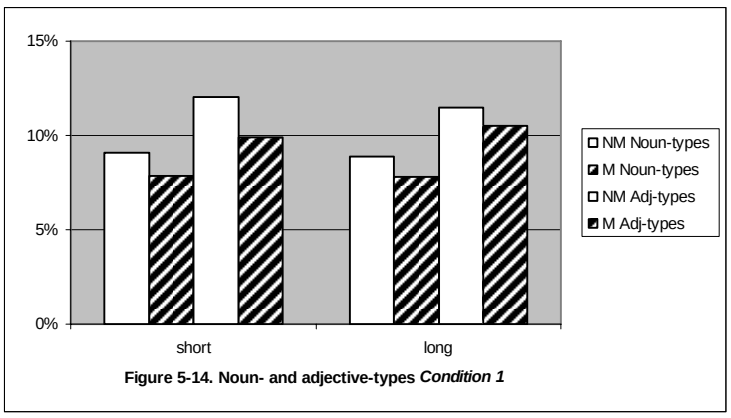

Figure 5-14. Noun- and adjective-types *Condition 1*

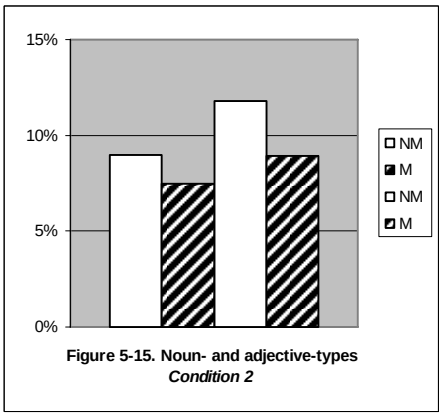

Figure 5-15. Noun- and adjective-types *Condition 2*

5.2.2. An increased amount of pronouns

Hypothesis 2 (b)

Participants will use more pronouns when motivating a manipulated choice.

Condition 1. There are significantly more pronouns in manipulated reports for the short reports (p=(0,046) < .05) but not in the long ones (p=(0,605) > .05). Figure 5-16 show the differences to be in the predicted direction.

Condition 2. There are no significant differences for the second condition (p=(0,139) > .05), but, as seen in figure 5-17, the differences that are detected are in the predicted direction.

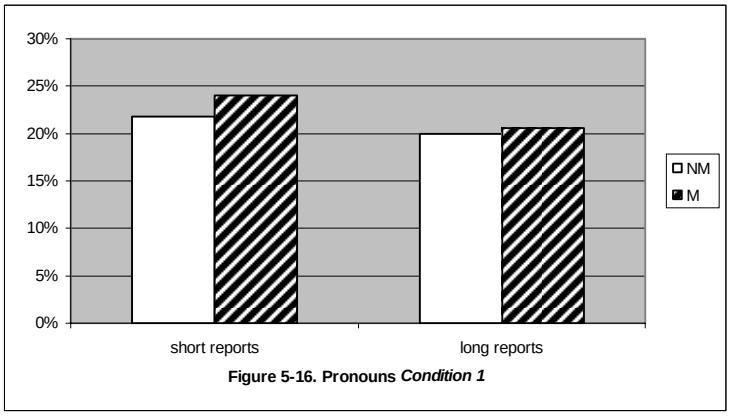

Figure 5-16. Pronouns *Condition 1*

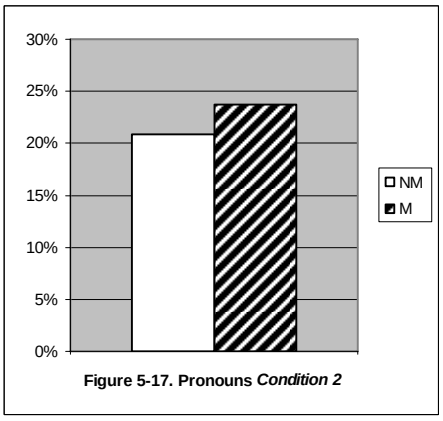

Figure 5-17. Pronouns *Condition 2*

5.2.3. An increased amount of predictable nouns

Hypothesis 2 (c)

Participants will use more predictable nouns when motivating a manipulated choice.

The measure used is the inverse of the frequency of each lemma.

Condition 1. There were no significant differences for neither short (p=(0,808) > .05) nor long reports (p=(0,460) > .05).

Condition 2. There were too few instances for this measure to be meaningful.

5.2.4. An increase in repetition of nouns (short-term priming)

Hypothesis 2 (d)

Participants will not produce as many *new* nouns when motivating a manipulated choice as when motivating a non-manipulated choice.

Condition 1. No significant differences for neither short (p=(0,483) > .05) nor long reports (p=(0,672) > .05) are observed. Figure 5-18 show the mean of new nouns in manipulated and

non-manipulated short and long reports. The very small differences are in the predicted direction for the short ones but not for the long ones.

Condition 2. There are no significant differences for the second condition (p=(0,386) > .05). Figure 5-19 show the mean of new nouns in manipulated and non-manipulated short and long reports for the second condition. The differences are not in the predicted direction.

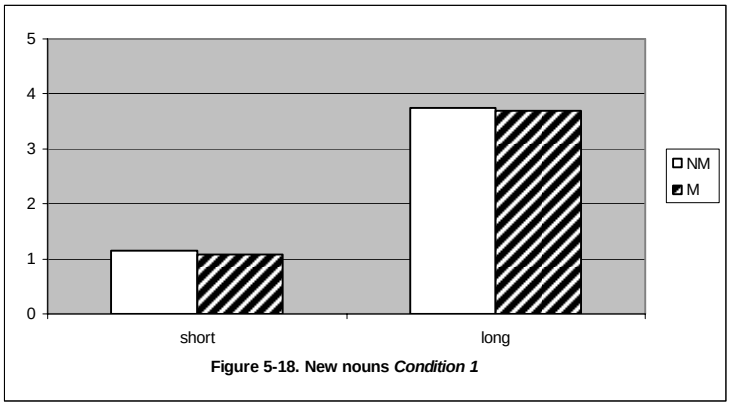

Figure 5-18. New nouns *Condition 1*

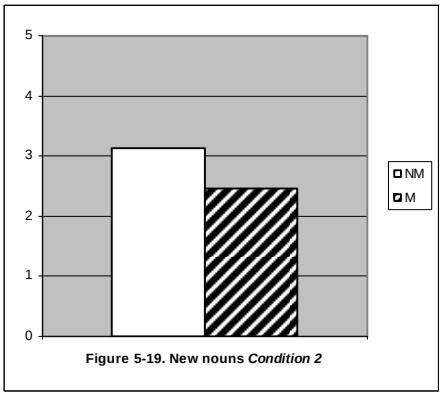

Figure 5-19. New nouns *Condition 2*

*5.2.5. An increased reference to the picture in the participant's hand (*why-*theme)*

Hypothesis 2 (e)

Participants will refer to the picture in their hand (*why*-theme) to a significantly higher degree when motivating a manipulated choice.

Condition 1. There are no significant differences for the first condition (short (p=(0,139) > .05), long (p=(0,061) > .05)). Figure 5-20 show the differences that exist to go against the prediction in the short reports but with it in the long reports.

Condition 2. No significant differences for the second condition (p=(0,444) > .05). Figure 5-21 show the detected differences to go against the prediction.

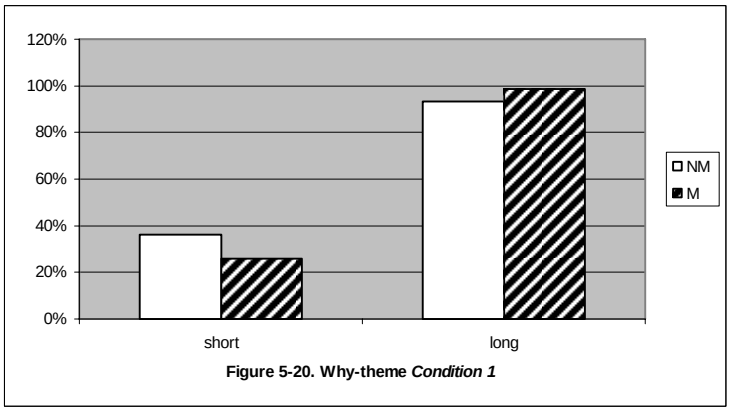

Figure 5-20. Why-theme *Condition 1*

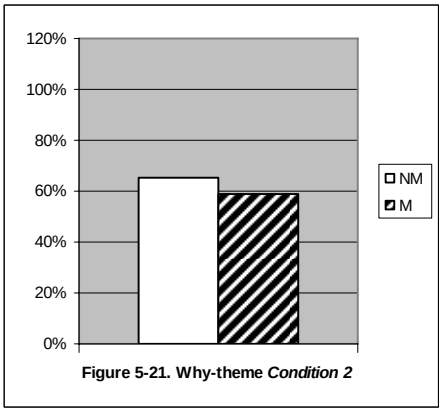

Figure 5-21. Why-theme *Condition 2*

5.2.6. An increased past time-reference

Hypothesis 2 (f)

Participants will frame the *why*-theme in the past tense to a higher degree when motivating a manipulated choice.

Condition 1. There are no significant differences for neither the short (p=(0,125) > .05) nor the long reports (p=(0,274) > .05). Figure 5-22 show that the differences that are found do not follow the prediction.

Condition 2. There were also no significant differences for the second condition (p=(0,986) > .05). Figure 5-23 show that there is almost no difference at all between manipulated and non-manipulated reports.

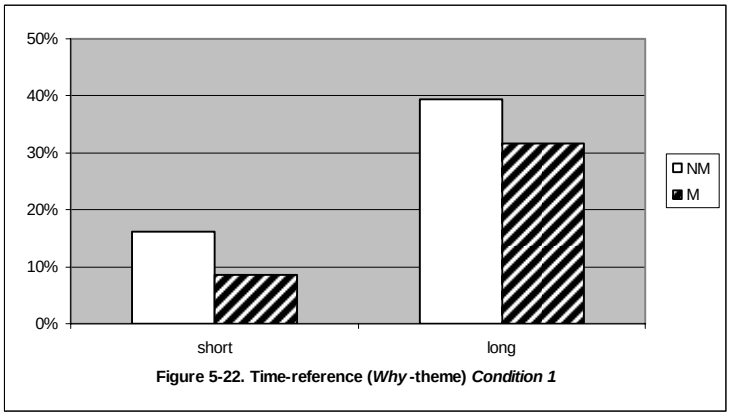

Figure 5-22. Time-reference (*Why*-theme) *Condition 1*

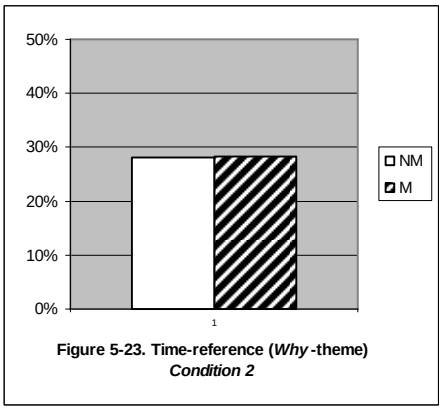

Figure 5-23. Time-reference (*Why*-theme) *Condition 2*

5.2.7. A heightened degree of metadiscoursal comments

Hypothesis 2 (g)

The metadiscoursal comments will constitute a greater part of manipulated trial-reports as compared to non-manipulated trial-reports

Condition 1. There are no significant differences for short (p=(0,296) > .05) or long reports (p=(0,745) > .05). The differences that were found were in the predicted direction (see figure 5-24).

Condition 2. There is a significant difference for the second condition. Metadiscoursal comments (p=(0,015) < .05). This difference was in the predicted direction (see figure 5-25).

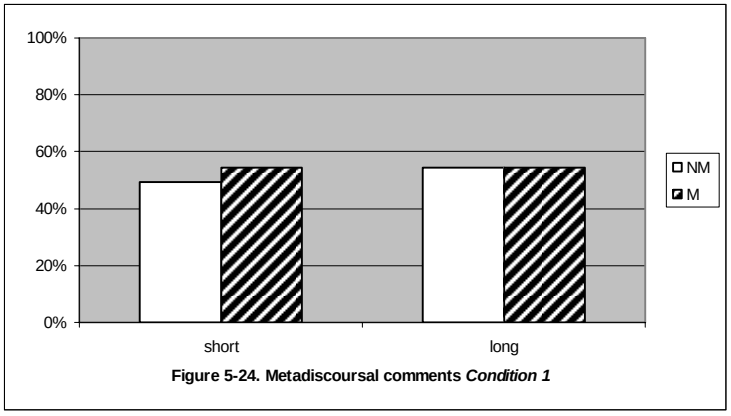

Figure 5-24. Metadiscoursal comments *Condition 1*

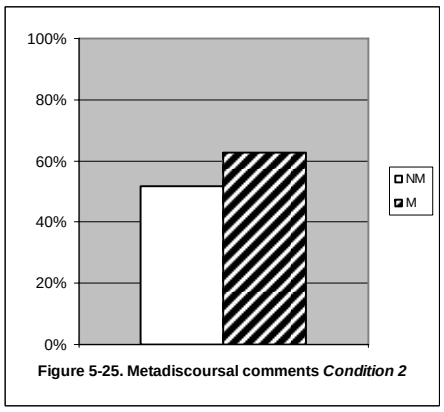

Figure 5-25. Metadiscoursal comments *Condition 2*

5.2.8. An increased amount of pauses and filled hesitations

Hypothesis 2 (h)

Manipulated trial reports will display more unfilled pauses

Manipulated trial reports will display more filled hesitation

Condition 1. There were no significant differences for neither unfilled pauses (short reports (p=(0,135) > .05), long reports (p=(0,262) > .05)) nor filled hesitations (short reports (p=(0,452) > .05), long reports (p=(0,228) > .05)). No diagrams are provided but the differences are in the predicted direction.

Condition 2. There were also no differences for the second condition for neither unfilled pauses (p=(0,784) > .05) nor filled hesitations (p=(0,972) > .05). No diagrams are provided but the differences that are found go against the prediction for unfilled pauses, and in the predicted direction for filled hesitation.

5.3. Results summary

Table 5-1 provides a summary of all results.

Table 5-1. Summary of all results in Condition 1 (C1) and Condition 2 (C2), indicating whether there were statistically significant differences (SD) and whether differences (significant or not) were in the predicted direction (PD).

	C.1		C.2			C.1		C.2	
Hypothesis 1	*SD*	*PD*	*SD*	*PD*	**Hypothesis 2**	*SD*	*PD*	*SD*	*PD*
Words marking uncertainty	-	+	-	-	Noun-types	+	+	-	+
Specific nouns	-	+	-	+	Adjective-types	-	+	+	+
Past tense	-	+	-	+	Pronouns	+	+	-	+
Positively toned adjectives	+	+	-	+	Predictable nouns	-	o	-	o
Positively toned adjectives (theme: *why*)	-	+	-	+	*New* nouns	-	-	-	-
1st person pronouns	-	-	-	-	*Why*-theme	-	-	-	-
Generic 'man'	-	+	-	o	Past time-reference (theme: *why*)	-	-	-	-
Laughter	-	+	-	+	Metadiscoursal comments	-	+	+	+
					Unfilled pauses	-	+	-	-
					Filled pauses	-	+	-	+

6. Discussion

This thesis has investigated linguistic properties of manipulated and non-manipulated choice-reports. The investigation's main questions were:

- What kinds of differences are there (if any) between manipulated and non-manipulated choice-reports?
- How can such (potential) differences be explained?

In response to the question of whether manipulated reports were different from non-manipulated ones, it can be said that there *are* differences, although they are few. In the following pages these differences, their possible interpretations and the investigation as a whole, are discussed.

As regards the two hypotheses, the results can not be said to be nearly as systematic as one would wish in order to draw any strong conclusions about their predictive power. In retrospect, their main value has been in guiding this investigation and generating a number of potential markers of motivation of a manipulated choice.

It may, however, be a mistake to build a methodology around such ”obvious” notions as, for example, *uncertainty* and *specificity*. These are not clearly demarcated concepts as they relate to language-use and there are most certainly differences between individuals in how they manifest themselves in patterns of language-use. Positively toned adjectives were used significantly less in manipulated reports. This was tied to something akin to an enthusiasm over the choice that was made, and this enthusiasm was hypothesised to be decreased in the case of manipulated reports. It could be argued that this has little to do with uncertainty in the narrow sense and, as such, it provides an indication of a better classification of what types of differences to expect.

Perhaps the information-processing approach (i.e. hypothesis 2) is a more fruitful point of departure for this type of analysis, even though it may need further specification in conjunction with a more rigorous analysis of the data being investigated. Four predictions derived from this hypothesis turned out to show differences between manipulated and non-manipulated reports. These were of the more general kind (i.e. non of the more ”elaborate” predictions such as those described in sections 4.2.3. and 4.2.4. showed significant differences) and concerns word-types that are relatively uncontroversially regarded to be connected to cognitive complexity. The fact that noun-, adjective- and pronoun-use point to a

heavier cognitive load when motivating a manipulated choice seems to be the strongest answer to the second research question that the results can provide.

One aim of this study was to find linguistic markers that may indicate that introspective access is not an ”either/or”-ability. There was not a clear pattern where all or most of the predictions turned out to show significant differences only for reports where there had been a retrospective or possible retrospective detection (referred to as *condition 2* in the results-section) but not for reports without any type of detection (*condition 1*). Had there been such a clear pattern, it would show that the motivating of a completely undetected manipulated choice was different from the motivating of a retrospectively detected choice. Retrospective detection, of course, would indicate that there was some type of awareness of ”something being wrong” even at the time of the report. It would then be easy to argue that there were, in fact, linguistic markers pointing to the conclusion that introspective access is a not an ”either/or”-ability, but that it can depend on many things such as awareness, motivation and interest. There were two differences that showed only in retrospectively detected trials, namely for adjectives and for metadiscoursal comments. None of these showed for the first condition, which indicates that they could be signs of a higher awareness, but it is quite hard to draw any strong conclusions as to why, exactly, these two predictions would indicate an inkling of detection not present in reports without any type of detection. The fact that adjectives showed such a pattern is a bit unexpected since nouns, the other big open word-class hypothesised to differ across manipulated and non-manipulated choice-reports, showed differences in the first condition but not the second. As for metadiscoursal comments, it may just be that participants are more hesitant and need more time to produce utterances in reports labelled as retrospectively detected.

The continuum of confabulation presented in Johansson et al (2005a) suggested that confabulatory reports are not necessarily homogenous, and it was an aim of this study to provide some further information on possible differences in their internal constitution. Again, the lack of a clear pattern of positive results for a high number of predictions makes it very difficult to draw any strong conclusions in this regard.

A few things regarding the methodology as it relates to the findings need consideration. It is interesting to note that a majority (23 of 36) of all results follow the predictions, producing a pattern of tendencies but very few significant differences. Exactly how to interpret this is not so obvious. One could, of course, speculate that there are in fact a large number of factors that distinguish manipulated and non-manipulated reports from each other, and that the word-count strategy had shown these more clearly in a larger data with longer motivations. The fact

that both nouns and positively toned adjectives showed significant differences for the long reports but not for the short ones seems to support this conjecture. There are most likely individual variations in the display of markers of both uncertainty and cognitive load. The word-count strategy is a statistical tool designed to show differences across a large population, and it may be insensitive to such individual differences, something that may speak against using it in too small a sample. If an experiment is constructed where participants are encouraged to speak for longer periods, there may well be more to say about differences between manipulated and non-manipulated reports with the aid of the predictions proposed in this thesis. This would be an interesting topic for a future research-project. Furthermore, although the strategy of specifying predictions to certain themes within the text did not show any significant differences across manipulated and non-manipulated choice-reports, there is not necessarily something inherently wrong with this idea. This type of semi-qualitative analysis may, however, not be suited for this particular data and it may require an even more precise analysis and hypothesis.

In conclusion, how did my findings contribute to the discussion on when introspective reports may be treated with scepticism, and when they may be ”trusted’? It has been shown that it is in fact possible to find differences between manipulated and non-manipulated choice-reports. There may be a heavier cognitive load in producing a motivation for a manipulated choice, and the task of further describing manipulated reports can be guided by this finding. A further specification of what the linguistic markers of such a heightened cognitive load may result in is needed, and in conjunction with an experiment-(re)design informed by these findings such specification may well lead to more conclusive results.

6.1. Future studies

Of course, this study is in no way exhaustive, even from a strictly linguistic point of view. It would be interesting to search for correlations between a number of other measures (such as eye-tracking, galvanic skin response and ERP-measures) and linguistic markers. Perhaps linguistic markers of detection are only present where other signs of detection are also present, suggesting a way of further specifying what psychological correlates there are to possible linguistic markers.

Apart from avoiding the not-so-sound messages sent by using only female faces in the trials, including male faces as well may widen the semantic field, and provide more potential markers. A way of lengthening reports without need to put too much pressure on participants

may be to construct a more elaborate choice-situation where two or more choices have to be motivated in relation to each other.

The participants should also be evaluated more carefully; factors such as fear of authority are important in the context of the experiment, as are physiological factors such as hunger, tiredness, sickness, nearsightedness and prosopagnosia (face-blindness).

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Thank you also…
…Victoria Johansson and Mats Andrén for all the discussions and suggestions.
…Betty Tärning for transcribing all the data.
…Joost van de Weijer and Sverker Sikström for the help with the statistical analyses.
…Åsa Wengelin, Lars Hall, Mats Eeg-Olofsson, Gerd Carling, James Pennebaker, Emelie Johansson, Anna Johansson, Johan Blomberg and Holger Andersson for help, tips and discussions.

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Appendix

Filled hesitations	Interjections	General nouns			Specific nouns		
ehh	ehh	ansikte	minen	symmetrin	ögonen	ordföranden	sagofigur
mmm	näe	bilden	självförtroende	symmetriteorin	ögon	tänderna	sagoväsen
ehm	jaa	ansiktet	tjejens	utstrålning	håret	öga	sidbena
hmm	ja	drag	tjejer	utseede	näsa	överläppen	självlock
ahh	mmm	utseende	utstrålning	uttryck	munnen	.håret	smycken
nja	ehm	person	värme	uttrycket	mun	80-tal	snedbena
o	hmm	personen	anlete	volym	näsan	80-talet	sommartjej
ehhm	ahh	bilderna	ansiktsfoto	ålder	hår	antydan	tankar
ähh	jo	bild	ansitet	öppenheten	frisyr	brunett	underbett
ehmm	näemen	tjejen	asymmetri		ögonbryn	dansös	uppåtnäsa
äh	nämen	ansiktsform	attitydsgrej		frisyren	dockmun	utslag
tja	nja	tjej	balans		ögonbrynen	dubbelhaka	vinkel
eh	oj	ansiktsformen	del		läppar	finnar	vinklar
hehh	ehhm	fotot	delar		panna	flätor?	ögonbryenen
åhh	ähh	människa	delarna		blick	frilla	ögonet
.ehh	ehmm	symmetri	detaljer		blicken	glimten	ögonfransarna
a	äh	form	drag?x		hakan	grejen	ögonlocket
aaa	tja	huvudet	empati?		lugg	hakpartiet	ögonmascara
ehhh	eh	formen	energi		leende	hål	örat
ehhmm	gud	ansiktsuttryck	felproportion		kompis	hårfäste	öron
ehhxpausx	hehh	ansiktsuttrycket	flickan		luggen	håruppsättning	öronen
mmmm	skit	helhetsintrycket	foto		smink	idrottstjej	överbett
ähm	wow	proportioner	foton		örhängen	jättemun	överläpp
	åhh	proportionerna	färgerna		fräknar	jättenäsa	
	.ehh	skönhet	grej		hy	jättepanna	
	a	uppsyn	helhelten		kindben	kanterna	
	aaa	utseendet	helheltsintrycket		kinder	kille	
	ehhh	ansikten	helhetsintryck		leendet	kindbenen	
	ehhmm	dragen	humör		underläppen	kinderna	
	ehhxpausx	kortet	huvudform		ögonfransar	kiner	
	fan	tjejerna	hållning		örhängena	kläderna	
	jaa.	ansiktena	inramning		färg	klämma	
	jaha	ansiktsdrag	komposition		haka	käken	
	jamen	bilder	konstallationen		linjer	käklinjen	
	mhm	detalj	konturer		läpparna	käkparti	
	mmmm	folk	konturerna		pannan	lockar	
	njaa	former	kvinna		ögat	läpp	
	nje	formerna	look		ögonbrynet	lärarinna	
	nä	färgen	medelansikte		ögonpartiet	mamma	
	näe.	färger	mode		alshammar	mittbenan	
	näeee	glädje	personenrna		halvan	mungipor	
	nähä	helhet	personligheten		iris	mungiporna	
	usch	helheten	proportion		käkarna	munne	
	xjax	huvet	påbrå		käkben	näsborrar	
	ähm	huvud	sakerna		käkbenet	näsborrarna	
		karaktär	signaler		käke	potatisnäsa	
		känslan	snygghet		linje	pupill	
		känslor	stil		mascara	pussläppar	
		liv	storlek		mascaran	pussmun	
		ljus	stämningsutseende		näsor	rosenknoppsmun	

Positively toned adjectives

fina	söta	avslappnat	roli
fint	sött	ball	romantiskt
bra	öppen	behagligt	rättare
fin	avslappnad	busig	skojigare
bättre	behaglig	bäst	skojigt
snäll	cool	coolare	smart
glad	framåt	feminina	smickrande
söt	gullig	filuraktig	småleende
vacker	gulligt	finurlig	småmullig
vackra	härliga	finurligt	smårund
vackrare	inbjudande	friserat	snyggast
finare	intensiva	fräschare	snyggst
trevlig	jättefin	fräscht	snällast
snyggt	jättevacker	fångande	solbränd
symmetriskt	klassiskt	gott	sportig
trevligare	nätt	gulliga	stabil
vackert	oskyldig	harmoniskt	strålande
snygg	roligare	healthy	symetriskt
öppet	roligt	häftigt	symmet
öppna	uttrycksfulla	härlig	tidlös
piggare	vaken	intressanta	tilldragande
snyggare	vän	iögonfallande	tindrande
sötare	vårdad	justare	tjusig
trevligt	yngre	jätteglad	tjusigare
gladare	charmig	jätterolig	trygg
intressant	drömskt	jätteroligt	vackrast
pigg	finast	jättesnygg	vaket
tilltalande	generös	jättesnyggt	vildvuxet
symmetrisk	go	jättevårdad	välansade
harmonisk	intressantare	klarvaken	välformade
mjukt	jättebra	kry	välkomnande
naturlig	jättefint	len	välplockade
sympatisk	jättevackra	livligare	välproportionerade
glada	klassisk	lugnt	välskött
intresserad	kvinnlig	lyckat	vänligare
jättefina	livlig	mysigt	vänligt
jättesöt	mjukare	mystisk	vårdat
levande	mysig	mystiskt	övervältigande
positiv	pigga	målmedveten	
snygga	proportionerligt	naturligare	
snällare	speciellare	naturligt	
speciell	spontan	näpen	
trevliga	sötast	näpet	
juste	varm	oskuldsfull	
kul	välformad	passande	
lugn	välkammad	perfekt	
låter	välvårdad	platt	
personligt	vänlig	positiva	
rolig	ärlig	positivt	
snälla	öppnare	proportionerliga	
speciella	abslappnad	proportiornerliga	
symmetriska	attraktivt	ren	

Negatively toned adjectives

trött	flummiga	slitet
vanlig	frånvarande	slitna
tråkig	fula	småsur
konstigt	full	småtråkig
trötta	fult	småtråkigt
vanligt	förkyld	spänd
arg	förvirrad	stackars
fel	galen	stel
ledsen	gråare	stirrande
sur	halvdan	sömnig
alldaglig	halvintresserad	sömniga
ful	hoptryckt	sömning
intetsägande	hängig	taskig
kaxig	hängigt	taskigt
ovårdat	hårda	taskigt?xpausx
alldagligt	högfärdig	tilldragen
blek	ihopsnörd	torr
gammal	jobbigt	trumpen
grå	jättedumt	tråkigt
hemskt	jättehemskt	tröttare
konstig	kall	tunn
rädd	kalla	tunna
rädda	knäppt	tunnare
strikt	konstiga	udda
synd	kufisk	underligt
aggressiv	ledsamt	uttjatade
drogad	manligt	uttråkad
dålig	maskulin	värst
elak	mesig	
förskräckt	missnöjd	
grov	märkvärdigt	
manlig	negativa	
osäker	nervös	
skevt	nollställd	
sorgsen	näbbig	
sura	oattraktiv	
tillgjord	oattraktiva	
trist	obekväm	
vardagligt	oglad	
arga	ointressant	
argare	okvinnligt	
assymmetriskt	opproportionerlig	
asymmetrisk	oproportionerlig	
asymmetriskt	ordinärt	
bakis	otrevlig	
barnsligt	ovårdade	
bekymmrade	plain	
bekymrad	pårökt	
bister	retligt	
bitsk	sammanbiten	
blekt	skör	
däst	slarvig	