

Biowaste Non-Sorters – Who Cares

Examining Arguments and Factors from Citizens Not Sorting
Biowaste in Copenhagen and Recommendations for a Way
Forward

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Abstract:

The Danes' have the highest municipal waste generation per capita in the European Union and it is estimated that 40% of residual waste is biowaste. Fortunately, it is possible to address environmental pressures and counteract resource loss from incineration by the process of bio-gasification of collected biowaste in Denmark. However, despite efforts to reduce barriers of convenience and accessibility in a newly implemented biowaste sorting scheme, 24% of Copenhageners do not sort biowaste. This study aimed to examine influences contributing to and/or reinforcing non-sorting practices and therefore asked: what influences people to not sort biowaste in Copenhagen?

Studies provide limited evidence of socio-economic or demographic characteristics for (non)recyclers. Still, non-sorters tend to be portrayed, in Danish grey literature, as one group, the "indifferent", who are unwilling to sort. Therefore, limited in-depth knowledge exists about non-sorters in Copenhagen. This study is based on a social-environmental problem-solving perspective, and its findings support a solution-oriented way forward.

Interviews with 11 non-sorting households provided first-hand insight into what influences the citizens. Findings across respondents showed that practical, societal and rational arguments, as well as numerous distinctive factors, influenced their non-sorting practices. However, what influence respondents not to sort are neither simple within individual households nor across. From this, examining individual households' most influential factors, findings showed factors relating to practical arguments are most numerous, but suggest that factors related to societal and rational arguments are highly influential when present, despite small in numbers. Further, five of the 11 households had previously sorted biowaste, but stopped, which supports studies suggesting that a strict distinction of sorters and non-sorters is an erroneous dichotomy. Moreover, questions of scale and fear of freeriding, challenges the positive biowaste-environment correlation found, which have altruistic potential.

The findings suggest that seeing non-sorters homogenously gives an incomplete understanding, and considering heterogeneity unravelled non-sorters who care, know and are willing to sort biowaste. Thus interventions in line with the findings could push for more sorting, hence a list of recommendations was created. Knowledge accumulated could benefit policy-makers and stakeholders working within the field municipal waste management and resource recovery in Copenhagen and similar cities.

Keywords:

Biowaste, Recycling, Waste Hierarchy, Municipal Waste Management, Urban Resource Management, Phosphorous Recovery

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List of abbreviations

European Union (EU)

Climate Action Plan (CAP)

Municipal waste sorting (MWS)

Gross Domestic Product (GDP)

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1 Introduction

The Danes have the highest municipal waste generation per capita in the European Union (EU), producing 777 kg a year, which is 61,9% higher than the 28 EU average (Eurostat, 2018); furthermore it is estimated that around 40% of the residual waste is biowaste¹ (Copenhagen Municipality, 2012b). In the EU's waste legislation from 2018, the recycling targets for 2025 have been increased across the board and specifically state that biowaste must "either [be] collected separately or recycled at source (e. g. home composting)" (Council of the EU, 2018) as requirement already by 2023.

On a national level, Denmark aspires to double all its recycling to 50% by 2022 from the benchmark 22% in 2012 (Danish Environmental Protection Agency, 2014; Danish Government, 2013). Furthermore, a larger vision of handling all resources sustainably by 2050 is included in the Danish resource plan for waste management entitled "Denmark without waste" (Danish Environmental Protection Agency, 2014).

The capital and largest city, Copenhagen, has at its municipal level a Climate Action Plan (CAP) with the ambitious goal of becoming a carbon-neutral city by 2025 (Damsø, Kjær, & Christensen, 2016). Included in the CAP is a waste strategy that aims to decrease residual waste sent to incineration by 20% and secure 45% recycling of residual waste by 2020 (Copenhagen Municipality, 2014; Damsø, Kjær, & Christensen, 2017). As part of this, Copenhagen Municipality implemented a biowaste sorting scheme to around 300,000 households in 2017 (Danish Government, 2013), which is a focal point in this thesis and further elaborated later on.

Regarding the Danes' adaptation of enhanced recycling, the numbers look promising. A previous study found that up to 88% of the population has stated that they would like to sort more waste than today (Danish Waste Association, 2013), and 78% of Copenhageners' stated that they are willing to sort their biowaste (Copenhagen Municipality, n.d.). Also, recent numbers show that approximately two-thirds of the population already sort some types of waste (Bolius, 2016). Thus, a majority already sort or are open towards it, and significant attention in local grey literature are concerned with understanding and portraying the user group (Bolius, 2016; Danish Waste Association, 2013;

¹ In this thesis, the term "biowaste" is used to cover the biodegradable waste produced in households also known as organic waste. In literature and municipal documents the term covers different things according to the specific waste scheme. In Copenhagen, biowaste is: food scrapes, coffee and tea incl. filters, meat, fish and bones, gravy, fat and flowers. Not included is: soil, grass and other garden waste.

Miljøstyrelsen, 2017; Norup & Ryberg, 2015; Rådgivende Sociologer, 2017; Thomsen & Andersen, 2017). Currently, several types of “personas”² portray the whole user group, where non-sorters are entitled “indifferent” (Biener, Japutra, & Morales, 2013; Danish Waste Association, 2013; Thomsen & Andersen, 2017; Toftegård, 2018). The “indifferent” people possess personality traits such as unwillingness to sort, they find it cumbersome and cannot be bothered to do so. The “indifferent persona’s” most important barriers for not sorting are convenience and accessibility (Danish Waste Association, 2013).

While the simplified personas allow for some sort of steering, the knowledge pertained in these are not accurate to the complex and multifaceted variety of people they portray (Kaspersen, 2007). International studies on factors contributing to recycling and non-recycling practices provide limited evidence of uniform personality traits or characteristics (Kirakozian, 2016; Martinho & Vitor, 2009; Vicente & Reis, 2008). Overall, key literature on the topic shows no clear socio-economical or demographic trends for (non)recyclers, and the numbers are ambiguous at best but mostly provide “mixed results and [are] sometimes contradictory” (Kirakozian, 2016, p. 7). Consequently, using “personas” for information, little in-depth knowledge exists about the people in the group of non-sorters in Copenhagen, ultimately leaving stakeholders and policy-makers in the blind.

Despite this, in the case of the implementation of biowaste sorting in Copenhagen (the aforementioned intervention launched in 2017), considerable measures to increase convenience and accessibility were made. Biobins were delivered on citizens’ doorstep free of charge or effort and the accompanying infrastructure too (Copenhagen Municipality, n.d., 2017; DAKOFA, 2017). Yet, despite measures to increase convenience and accessibility, approximately 24% of Copenhageners’ still do not sort biowaste (J. Borregaard, personal communication, April 13, 2018).

With this knowledge and paired with the promising percentage of Copenhageners’ willingness to sort presented above, it is difficult to understand what prevents some citizens from sorting biowaste. The goal of this thesis is therefore to explore this gap in knowledge; if it is not convenience or accessibility retaining some Copenhageners from sorting biowaste – what is it then that influences them to not sort? This thesis, therefore, sets out to examine what influences people in Copenhagen to not sort biowaste. Understanding arguments advanced by biowaste non-sorters in Copenhagen and examining the factors contributing to their practice provides knowledge and in-depth insights for

² A “persona” is a constructed abstraction that personifies individuals or a group of people by giving them certain personality traits, demographics or other characteristics. This unifies complex attributes into one condensed, constructed “persona”. It is often used in marketing to understand a target group (Danish Waste Association, 2013)

decision-making and communication within the realm of waste management in the Copenhagen council, relevant stakeholders or similar cities.

1.2 Research aim and - questions

This thesis aims to examine the influences that contribute to and/or reinforce non-sorting practices³ among residents of Copenhagen. To achieve this aim, this study asks one overarching research question:

What influences people to not sort biowaste in Copenhagen?

In line with the critique of the simplistic portrayal of non-sorters as being indifferent and unwilling, this thesis examines what influences Copenhagen non-sorters broader and more nuanced. It does so by regarding possible influences in the light of three aspects that together constitute social life, namely experiences, discourses and objects (Brinkmann, 2012). By examining influences in this way it is possible to see and include a broad array of what contributes to not sorting biowaste. Therefore, the overarching research question is further divided into two operational sub-questions:

1. What arguments are advanced by people who do not sort biowaste when explaining their non-sorting practice?
2. What factors contribute to individual household's non-sorting practices and which are most influential?

1.3 Thesis overview

After a brief introduction to the background for biowaste sorting in Copenhagen and larger environmental considerations, the two theoretical concepts (structuration and waste sorting as an everyday practice) are presented that form the basis for my methodology, ontology and epistemology. Thereafter, the utilised methods are described which in turn form the empirical foundation for the two findings sections (table of three types of arguments and a figure depicting the individual households most influential factors contributing to their non-sorting practice) and discussion that inform a list of recommendations before ending with a conclusion.

³ Immediately, the term "non-sorting practice" appears to be an oxymoron since the prefix "non-" seemingly negate practice. However, the term non-sorting practice(s) is applied because it covers all the practices that separately and together surrounds and produce the foundations for not sorting. The term is further elaborated and conceptualised in terms of everyday life in the section under theoretical concepts (3.2)

2 Biowaste sorting in Copenhagen

2.1 A brief history

In the fall of 2017, biowaste sorting was introduced to 300,000 households in Copenhagen. The implementation included rollouts of biowaste courtyard containers as well as a home sorting solution for households, where a free plastic biobin was delivered on the doorstep together with 100 biodegradable bin-bags (Figure 1) with the possibility for free refill of bags via online order (Copenhagen Municipality, n.d.). The implementation cost 78 million DKK and was financed via the municipal waste budget to reach the 45% recycling goal (Administration for technology and environment, n.d.). This thesis focuses on biowaste due to its contemporaneity and because it is the first time the municipality provided a home sorting solution (biobin and biobags) as part of the sorting scheme.



Figure 1. The delivered biobin (Own illustration, 2017)

The picture depicts the free plastic biobin delivered on 300,000 Copenhageners' doorstep. The bin included 100 biodegradable biobin bags and information material. The households had been informed about the delivery via the public communication system (e-boks) prior to its arrival.

It is compulsory by law to sort waste when options are provided (Copenhagen Municipality, 2015), but this is not enforced by sanctions due to lack of political will but mostly because it is very difficult to control (A. Kiil, personal communication, August 24, 2017). The political direction, conversely, is based and dependent on personal motivation and voluntarism (A. Kiil, personal communication, August 24, 2017). The fact that there is legislation on the subject matter is unknown to most citizens (Rådgivende Sociologer, 2017).

The municipal waste sorting (MWS) system in Copenhagen is largely characterised by a door-to-door separate bin collection system (European Commission, 2015) where waste containers are placed in

apartment buildings' courtyards for each of the six main fractions, which are metal, paper, cardboard, hard and soft plastic and biowaste⁴ (European Commission, 2015). Households recycle on average 27%, which is less than the industry and construction sector who recycle 47% and 87% respectively (Copenhagen Municipality, 2012a). The MWS system is further characterised by high incineration rates of approximately 80% and low landfill rate of 1-4% (Danish Environmental Protection Agency, 2017b; European Environment Agency, 2013b).

2.2 Environmental considerations

The Danish waste production follows the high national gross domestic product (GDP) trends, and despite a slight decrease in both after the financial crisis of 2008, they have increased again (Copenhagen Municipality, 2012a). Overall, reports show that there is a connection between a country's high economic growth, high consumption and high waste production (European Environment Agency, 2009; Eurostat, 2018) all of which are relevant in the case of Denmark and especially Copenhagen since waste amounts, in general, are higher in urban areas (European Environment Agency, 2009).

Sorting biowaste for bio-gasification has two major benefits compared to the status quo; incineration. From an environmental perspective, sorting biowaste makes it possible to recirculate nutrients and valuable minerals, such as phosphorous and nitrogen, back into the ecosystem since it is preserved in bio-gasification⁵ as opposed to incineration (Lybæk, Christensen, & Kjær, 2013b). Secondly, from an energy perspective, biogas derived from the process can be stored, which is specifically useful in the future renewable energy system due to its fluctuating nature. Furthermore, bio-gasification can not only be used as energy and heat, but also fuel (Lybæk, Christensen, & Kjær, 2013a; Lybæk, Christensen, et al., 2013b; Lybæk, Andersen, & Christensen, 2014).

According to EU's Waste Directive, using biowaste for bio-gasification and its production's bi-product as fertiliser, its status in the waste hierarchy is raised from Other Recovery to Recycling (Figure 2) because of the recirculation of nutrients (European Environment Agency, 2013a)

⁴ Moreover, separate battery, electronics and hazardous waste containers are often available. Glass is recycled at public bring points and bulky waste is either in courtyard or civic amenity sites. Deposit bottles are brought to supermarkets for monetary refunds (European Commission, 2015).

⁵ Bio-gasification is the processing of biowaste and other biodegradable/organic material into biogas. When the material is being processed, biogas evaporates and can be gathered and stored. Further, the production's leftover residue can be used as fertiliser (Christensen, Kjær, Fredenslund, & Lybæk, 2012).



Figure 2. EU's Waste Hierarchy (Own illustration, after Copenhagen Municipality, 2014)

The waste hierarchy considers the further left the better. By using biowaste for bio-gasification, nutrients get recalculated instead of burned in incineration, and this raises the waste's status from Other Recovery to Recycling – in line with priorities from EU's Waste Directive.

On a larger environmental level, the global phosphorous cycles are approaching its planetary boundary, which both refers to the maximum capacity of amounts leached into water bodies (Rockström et al., 2009) but also to the amount of existing phosphorous remaining (Dawson & Hilton, 2011). Phosphorous is extracted from mining and it is most vital for plants and humans and is key in modern agriculture (Dawson & Hilton, 2011; Rockström et al., 2009). However, it is a finite resource and is anticipated to be depleted within 50-100 years (Cordell, Drangert, & White, 2009; Dawson & Hilton, 2011). Finally, phosphorus ores are only found in a handful of countries, which causes geopolitical concerns since our dependency, and its unsubstitutability should demand more attention (Cordell et al., 2009; Dawson & Hilton, 2011).

Sorting biowaste in Copenhagen will clearly not be the sole solution to all these considerations but, as the literature suggests, all possible measures to prevent a possible resource depletion or geopolitical crisis must be taken (Dawson & Hilton, 2011; Lybæk, Andersen, & Christensen, 2013).

Including environmental concerns in what will prove to be a social scientific thesis underlines its background within sustainability science. Sustainability science indeed explores “the dynamic interactions between nature and society” (Clark & Dickson, 2003, p. 8059), here exemplified by the possible resource recovery embedded in biowaste sorting. From the quote it is evident that sustainability scientific research can include societal elements. That is the case in this thesis. However, here specific attention is given to citizens' experiences on what influences them to not sort biowaste. Therefore, a conceptualisation of the relationship between the system and its citizens is practical to gain, which is what the next chapter starts by presenting.

3 Theoretical concepts

The implementation and success of municipal waste sorting (MWS) systems are highly dependent on the participation and compliance of its citizens that in turn eventually can help obtain municipal recycling goals. As explained in the introduction, the municipality of Copenhagen have ambitious recycling goals, and the biowaste sorting scheme was implemented in 2017. Despite initial success, around one in four does still not sort (J. Borregaard, personal communication, April 13, 2018), which indicates the potential for improvement.

The following chapter presents two core theoretical concepts that underpin this thesis, namely structuration and waste sorting as an everyday practice. Structuration is relevant to understand the dialectical relationship between MWS system and its citizens. An everyday life perspective on waste sorting will continuously help see and comprehend the collection of arguments and factors that stem from various aspects of the social life, in a broad an open manner.

3.1 Structuration: A dialectic relationship between non-sorters and its recycling system

The (non)practice of waste sorting exists within a system that requires infrastructure, weekly emptying, management of facilities and so on. In turn, this system depends on the citizens' sorting practice to operate. One theory that depicts this dialectical relationship is the concept of structuration. Knowledge about what influences non-sorting practices and seeing them in relation to the system it is embedded in can inform the system about shortcomings and thus improve it.

Giddens' concept of 'structuration' seeks to reconcile the classical dualism of social action as stemming from agents *or* structure (Kaspersen, 2007). Structuration overcomes the dualism of social action by recognising their interdependency and dialectical relationship as presented in Figure 3 below.

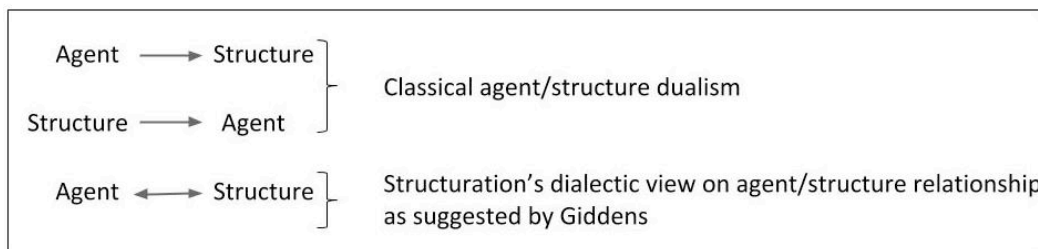


Figure 3. Dualistic versus structuration's view on social action (Own illustration, 2018, informed by Kaspersen, 2007)

The figure depicts a simplification of the explanation of social action as a classical dualism between agent and structure. It also shows a simplified display of Giddens' concept of structuration that overcomes this dualistic understanding by recognising their dialectic relationship.

Viewing the dialectic relationship is relevant in this thesis due to the constant production and reproduction of the MWS systems through citizens' and households' practice. This is because the citizens' participation and compliance (or lack thereof) directly affects a municipality's recycling success and ultimately its recycling statistics and is thus instrumental for achieving its recycling goals.

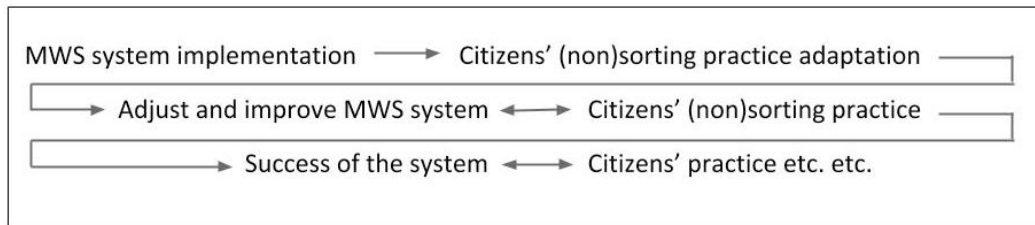


Figure 4. Dialectic relationship between MWS systems and citizens' practice (Own illustration, 2018, informed by Kaspersen, 2007)

The figure depicts a simplified dialectical relationship between MWS systems and citizen's practice informed by Giddens' concept of structuration. It shows the dialectical relationship between adaptation, adjustment and improvement. The system's boundaries are limited to the implementation and citizens' practice coherent with this thesis' scope.

This thesis contributes to knowledge of the second phase in Figure 4, namely how a MWS system is (re)produced (or lack of the same) in the citizens' sorting practice. This knowledge can help adjust the system and possibly improve it, resulting in further success of the system.

While structuration contributes to an understanding of waste sorting's placement within larger structures, it cannot help inform what influence people's practices. For this, Brinkmann's (2012) triangular conceptualisation of what constitutes individuals' everyday life is relevant.

3.2 Waste sorting - an everyday practice

Perceiving household waste sorting (or lack of it) through an everyday life lens is appropriate for getting in-depth, nuanced insights of what influences people since (non)practices are embedded within the individual's everyday life. Yet, since everyday life is inherently complex and consists of limitless amount of variables, the triangular theoretical conceptualisation presented here helps structure an understanding.

In Figure 5 on the next page, two triangles, informed by Brinkmann (2012), help conceptualise everyday life, or the social world as he calls it, into three distinctive spheres, namely relating to discursive aspects, phenomenological (or experience) aspects and object aspects. This is, as Brinkmann (2012) informs us, because everyday life does indeed include all these aspects. Excluding one of these core spheres of the social world would be as unwise "as it would be to demand of the carpenter that she should use only a saw in her work." (Brinkmann, 2012, p. 34).

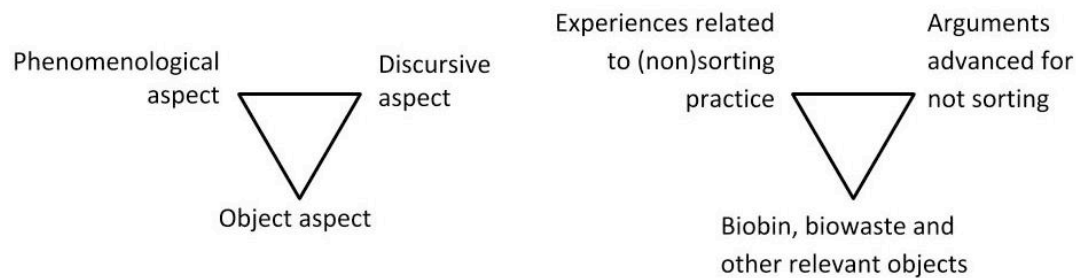


Figure 5. Theoretical and applied triangles of spheres in the social world (Own illustration, 2018, adapted after Brinkmann, 2012)

The triangles show three spheres of the social world. The left triangle is the theoretical triangle with abstract concepts whereas the right triangle depicts an applied conceptualisation of three different spheres associated with household's biowaste sorting practice and how they are connected.

As explained, separating non-sorting practices into these three spheres is not to regard the contributing factors in isolation. Contrarily, the triangular construct allows us to perceive heterogeneity logically apart. From this, the theoretical and applied conceptualisation of waste sorting through a triangular everyday lens allows for more nuanced insights to the arguments and factors contributing to non-sorting practices than the “personas” presented in the introduction. This is in line with an important learning from qualitative research that states that the social scientist's role is not to reduce complexity, but rather to make sense of it (Miles & Huberman, 1994) and are useful for answering the research questions.

Analyses applying this triangular conceptualisation of the everyday life can begin from any of the corners but needs to be attentive to all three since “the best social analyses take all three into account” (Brinkmann, 2012, p. 34). Simultaneously, respecting the spheres' coexistence and overlaps are essential (Brinkmann, 2012).

As Figure 5 depicts this thesis perceives three different aspects of the everyday life. With discursive aspects, Brinkmann (2012) refers to “the [part of the] social world and its practices [that] are primarily constituted by conversations in a broad sense, i.e., by the human capacities for accounting” (p. 35). The discursive aspect of the theoretical triangle is in this thesis applied to arguments advanced by non-sorters. As the method chapter shows and later findings section unfolds, interviews with 11 households who do not sort biowaste were conducted, and the respondents' arguments provide insight to non-sorting practices.

For the object aspect, the provided biobin and biowaste itself seem of importance. However, all objects relating to non-sorting practice are helpful for the analysis because they have agency (Brinkmann, 2012). These mundane objects have agency because they facilitate or inhibit waste sorting for example by not having room or placement for them and thus seizes to become integrated into the everyday practice. As Brinkmann (2012) reminds us, influenced by Latour (1996), “Notably,

we should not ignore the fact that almost all forms of human interaction involve technologies and artefacts” (p. 34).

Lastly, the respondents’ experiences of non-sorting practices are understood in the light of concepts from phenomenology. Here, personal experiences of specific situations from the respondent’s point of view are in focus. The situation of interest is the whole array of experiences relating to not sorting. Even experiences regarding respondents’ normal waste practice can help cast light on why people do not sort since these are “often so implicit in our life processes that we fail to recognise [them as important]” (Brinkmann, 2012, p. 35).

Perceiving (non)sorting practices like Figure 5, allows us to theoretically and conceptually separate different spheres of the everyday life. This, in turn, enables the analysis to logically disentangle various arguments and factors contributing to the non-sorting practices and makes it possible to see them separately. Yet, as the findings and discussion (chapter 5) will also show, these factors are in fact *not* separate, and viewing them in isolation does not provide the whole picture.

Since the insights needed to examine factors contributing to non-sorting practices only exist inside the head of the citizens, this study needs a method that allows for the analyst to come into contact with the lifeworld of the agents (people). One such method is interviews and is described in the methods section. Before this, the methodology section clarifies the ontological and epistemological stance of the thesis.

4 Methodology

In qualitative studies, knowledge about the world (ontology) and knowledge about knowledge of this world (epistemology) is not always given (Kvale & Brinkmann, 2014). Therefore, the researcher needs to reflexively approach questions of ontology and epistemology before entering the field of interest and before gathering empiric material. This was done in this thesis, so before diving into the more practical aspects of data gathering methods (4.4.) the methodological perspectives of this thesis, namely abduction and pragmatic pluralism, consistent with the overarching philosophical perspective of interpretivism, are presented.

4.1 Theoretical basis for research design

4.1.1 An *abductive stance*

This thesis is based upon methodological foundations stemming from the notion of abduction. Abduction is the lesser-known approach amongst its methodological relatives: induction and deduction. Abductive analyses' inquiries stem from a bewilderment or mystery noticed by the researcher (Brinkmann, 2014). In connection to this thesis, abduction is relevant because the idea to investigate influences of Copenhagen non-sorters came from the author's own experiences and astonishment about why some co-citizens do not sort their biowaste when a free bin and infrastructure was provided. Closely related to this, one of the cornerstones of sustainability science is that it is problem-driven, which was the starting point for this thesis (Clark & Dickson, 2003).

4.1.2 *Pragmatic pluralism*

An abductive approach opens up for a rather comprehensive ontological stance, which Brinkmann (2012) refers to as a "pragmatic pluralism" (p. 34). Briefly explained, interpretivism, as elaborated below, is the overarching philosophical perspective, but the ontological basis is threefold and consist of a phenomenological, a discursive and an object aspect since, as explained by Brinkmann (2012) and presented in the previous chapter. The ontological triangle is depicted on Figure 6 below.

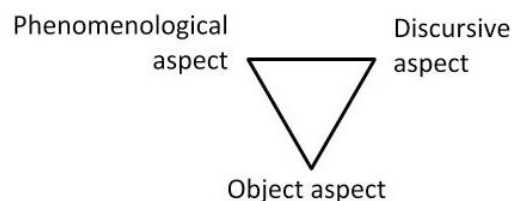


Figure 6. Ontological triangle (Own illustration, 2018, adapted from Brinkmann 2012, p. 35)
The ontological triangle depicts three separate spheres of the social world.

In sum, from the theoretical conceptualisation above together with an abductive stance, certain seemingly mundane situations become exoticised and applicable for qualitative inquiry. It should, of course, be highlighted that the researcher's astonishment needs to be seen in relation to their (inherent) scientific knowledge and an ability to theoretically reflect and distinguish the situation from reality (Brinkmann, 2014).

4.2 Interpretivism – a philosophical paradigm of science

This thesis is based on an ontological and epistemological basis consistent with the philosophical paradigm interpretivism. Briefly explained, interpretivism places itself in the branch of research that aims to understand social reality by interpreting the subjective meanings intended or expressed by respondents (Chowdhury, 2014). Research methods used within this paradigm values qualitative inquiries, subjective experiences, small number of respondents and not least detailed examinations (Chowdhury, 2014). This informs the methods applied and is represented later in the findings and discussion (Chapter 5).

Ontologically, interpretivism relates to the multitude of subjective experiences of the world and that the interpretivist should seek to “understand social reality through the eyes of those being studied” (Chowdhury, 2014, p. 434) and thus appreciate the inherent meaningfulness of social reality depicted through the descriptions and accounts advanced by the respondents, as presented in the findings chapter.

The epistemological foundation in interpretivism emphasises the coexistence of “multiple perspectives of reality” (Chowdhury, 2014, p. 433) as experienced by different people, and is evident in the diverse arguments advanced by respondents in this thesis. To sum up, research conducted within this paradigm value qualitative data, divergent worldviews and multiplicity of opinions.

4.3 Author’s situated knowledge, motivation and reflexivity

I acknowledge my positioning and knowledge as being situated within the field of study (Haraway, 1988), since I too, am a Copenhagen citizen who have received the biobin. In addition, as mentioned initially in this chapter on abduction, this thesis is exactly driven by a personal motivation to understand why some of my co-citizens do not sort biowaste, when it was made – according to me – so simple and convenient.

Furthermore, I embrace normativity of sustainability science, where recovering nutrients from biowaste in bio-gasification is considered normatively better due to its environmentally sustainable, long-term outlook compared to the linear, short-term perspective associated with incineration (Wiek, Ness, Schweizer-Ries, Brand, & Farioli, 2012). Lastly, providing knowledge and recommendations (Section 5.6.) is thus considered part of the continued success of the biowaste MWS system in Copenhagen in line with sustainability science’s effort to be problem-driven and solution-orientated (Clark & Dickson, 2003; Wiek et al., 2012).

4.4 Methods

While the former sections revolved more around the theoretical foundation for this thesis, the following sections are more practically oriented by describing the data collecting and data analysing methods.

4.4.1 Introduction to the study and respondents

This thesis is a qualitative study, using empirical material gathered from eight interviews with 14 respondents who represented 11 households (see Appendix A). The interviews were conducted in Copenhagen from March 11 to 19 2018 and were held at the respondent's homes, workplace or home's community room, depending on what suited the respondent best. The interviews were conducted in Danish or English. The semi-structured interviews lasted between 30-55 min (see Appendix A). The study applied one-to-one as well as group interviews, again depending on suitability for respondents. Two different types of group interviews were conducted. One type with partners or people living together and another with neighbours or colleagues who live separately. The former is considered one household since they share biobin and the latter represent separate households⁶ since they have individual waste facilities and separate biobins (see Appendix A).

Six of the respondents were women, eight were men and they were between 23 and 74 years of age. Of all the respondents, 11 were Danish and born in Denmark, one Vietnamese from Vietnam, one Turkish born in Denmark and one American from the United States. The respondents were fairly highly educated because 12 respondents had either short, middle or long upper secondary degrees, one had a high school degree and one had grade school/grade 10 as their highest completed education. For the main occupation, eight respondents were employees, five were students and one was retired. Six households rented their apartment, five co-owned⁷ and no one owned. The respondents covered many household types from single men and women, to couples or brothers living together to one family with children (see Appendix B2). In short, the respondents cover a broad spectrum of demographics and household compositions.

⁶ This explains why the study has 14 respondents and only 11 households. See table of interviews (Appendix A) for more information. This information is also important for understanding the background information (Appendix B2).

⁷ Copenhagen co-ownership apartments are (andelsbolig) "a cooperative housing association intended to own and operate a property on a cooperative basis. The members of the association own a share of the union's assets. For the share there is a right of use to a dwelling in the association's property."
<https://erhvervsstyrelsen.dk/hvad-er-en-andelsboligforening> Assessed May 10 2018

4.4.2 Selecting and recruiting respondents

The selection strategy for respondents matches purposive sampling. Purposive or purposeful sampling refers to selecting people from a purpose (Krueger & Casey, 2015). Here, the purpose is to talk to people who self-reportedly do not sort biowaste. The thesis further only focuses on people living in apartment buildings for three reasons. Firstly, 280.000 of the 300.000 new biobin owners live in apartments (Copenhagen Municipality, n.d.), which is consistent to the fact that 92% of the households in Copenhagen are apartments (Videnskab.dk, n.d.). Secondly, people living in apartment buildings are often decoupled from the service provision and do not register economic fluctuations in waste fees (Kommunernes Landsforening, 2017). Lastly, many apartment buildings are so-called mixed-used, meaning they have commercial as well as residential use, which can cause problems when managing and measuring waste since it is impossible to know where the waste comes from (European Commission, 2015).

Two different recruitment strategies were applied, one by nomination⁸ and another utilising snowballing (Bryman, 2008). For the first recruitment method, nomination, a representative from Teknik og Miljøforvaltningen (administration for technology and environment) “nominated” apartment buildings in an area of Copenhagen (a part of Islands Brygge), which match demographic and socio-economic criteria (education, employment rate and income) as equal to Copenhagen average as possible (A. Kollerup, personal communication, January 24. 2018). Four co-ownership apartment buildings allowed invitations on stairway’s notice boards and invitations on their Facebook page, covering over 940 households. Admittedly, this recruitment method proved rather inefficient and only three households stem from this method (see Appendix A).

The second and most efficient method was snowballing recruitment (Bryman, 2008), where eight households were reached. Respondents “snowballed” from family’s workplace, office-colleague’s neighbours and former fellow students, none of which the author see on a regular basis.

4.4.3 Interview process and data collection

All interviews were semi-structured and divided into three distinctive phases (see Appendix C). The first phase concerned the respondent’s general view on biowaste and possible previous experience with sorting biowaste. In the second phase, respondents were asked to state all the reasons why they do not sort biowaste as a bulleted list including all the ones already discussed (see Appendix D).

⁸ Nomination refers to a recruitment strategy where you ask neutral parties to point towards relevant people (Krueger & Casey, 2015, p. 83)

Afterward, this list was prioritised and discussed. The third phase consisted of the respondent placing 22 pre-printed statements from others of why people do not sort biowaste (see Appendix E) into “agree”, “disagree” and “neutral” piles. These statements were discussed. After this, the “agree” pile was prioritised on the most-important-less-important-matrix (see Appendix F) and discussed. The interviews ended by the respondents stating what it would take for them to start sorting biowaste. In brief, the interview guide attempted to cover all three aspects influencing everyday life so that, if relevant for the respondent, both experiences, discursive and object-related aspects were brought to the surface (Brinkmann, 2012).

All interviews were conducted by the author alone, tape-recorded and transcribed according to an abridged principle, where the analyst transcribes all relevant portions (Krueger & Casey, 2015). For the 5,5 hours of recorded interviews, 38 pages of transcriptions were obtained. Other material, such as the bullet-point paper, the piled statements and most-important-less-important-matrix were catalogued and filed for later analyses. Moreover, the 14 completed background information papers (Appendix B1) were digitalised and compiled to an excel sheet for analysis (Appendix B2). Debriefing documents after each interview recorded the discussed themes; the most important insights; surprising and unexpected insights; particularly interesting, useful and insight-rich quotes; and, lastly similarities and differences to other interviews. The author took photos of respondent's kitchens and sorting systems or sent afterward, except for three households (See Appendix G). To sum up, the foundation of the analysis comes from the multitude of types of data material.

4.4.4 Data analysis

The thesis applied the eclectic ‘ad hoc’ approach that includes three analysis methods as a sort of umbrella term. The three methods are meaning condensation, categorisation and narrative structuration (Kvale, 1997). The eclecticism of the ad hoc method was useful for this thesis due to the broad focus consistent with the research questions. In addition, this analysis method is appropriate due to its inclusive nature consistent with pragmatic pluralism (see section 4.1.2). The analyses paid attention to all three spheres of the social world; the discursive, the phenomenological and the objects (Brinkmann, 2012)

Firstly, the transcriptions were analysed by a deductive meaning condensation as well as categorisation⁹. The two broad deductive concepts were ‘arguments contributing to or reinforcing

⁹ Meaning condensation method is when the analyst reduces larger text to shortened bits, i.e. condenses the meaning from the transcription. Categorisation produces one-word categories, also from the transcriptions (Kvale, 1997)

non-sorting practices' and 'factors contributing to or reinforcing non-sorting practices', in line with research question one and two. The occurred categories were inserted into a matrix where the meaning condensations helped inform the matrix' subcategories and descriptions. Afterward, one-page summaries were made for each household using narrative structuration¹⁰ (see Appendix H). The two condensed, structured documents created the foundation for a new matrix gathering the emerging patterns that inform the table the findings section (see section 5.1, Table 1). The author has translated all quotes, except the two English respondents. For convenience and due to respondent anonymity, the respondents were given individual codes representing their initial letter and age (e.g. "E35", see Appendix A). These codes are also utilised in the findings and discussion session when referring back to specific respondents or when citing.

Lastly, for the findings and discussion (chapter 5), a diagram inspired by scatterplot display method (Miles & Huberman, 1994) provides a visual representation of the most influential factors (section 5.2). The most influential factors for each household were extracted from the matrix as well as the one-page summaries and then valued according to their level of influence, 1 being the lowest, 5 highest and 3 medium. The level of influence was based on the respondents' prioritisation and the analyst's interpretations.

By combining these different methods of analysis, the findings become verified since they are backed up by cross-analysed data. Lastly, applying several methods of analysis reduces the likelihood of missing essential or avoiding deviant insights (Kvale, 1997; Miles & Huberman, 1994).

4.5 Verifiability and generalisability

As just portrayed in the method section (4.4), several systematic approaches form the basis of the analyses and their findings. In general, systematic approaches reduce bias and increase verifiability since they allow for insights that otherwise could have been missed (Krueger & Casey, 2015). Furthermore, by being transparent in the approach makes the steps of the process open for verification. Further insights to this thesis' methods and data are available through a zip-file, which can be made available upon request.

Seeking generalisability to the whole group of non-sorters is neither appropriate from this method nor within the scope of this paper. This is in line with interpretivism that appreciates the existence of

¹⁰ Narrative structuration summarises and combined information from the many data materials (Kvale, 1997) and allows the analyst to easier comprehend and analyse various or even contradictory arguments from the respondents. This permits a more context attentive analysis than e.g. categorisation or meaning condensation, that tends to isolate statements (Kvale, 1997).

multiple lifeworlds and embraces complexity and multiplicity instead of uniformity. Further, interpretivism has an inherent openness to discuss and understand alternate interpretations (Chowdhury, 2014).

4.6 Ethical considerations

Despite the fact that the issue of waste sorting might not immediately seem connected to or stir deep personal or emotional matters, the topic is still related to personal choice and pose inquiry to the respondents' everyday life and thus ethical considerations regarding the research are necessary (Kvale & Brinkmann, 2014). First of all, a consent form stating the purpose of the study, the intended use and publication, no third party involvement or data-sharing, confidentiality, anonymity, volunteerism and recording (Ölander & Kaijser, 1999) was presented in print and orally approved by all respondents prior to the interview (see Appendix I). Secondly, involving people in scientific inquiries always influence the subject, either practically due to, e.g. time use or personally, e.g. by reflecting and discussing the subject matter (Kvale & Brinkmann, 2014). It can be personal to talk about not sorting, since it is related to social stigma (Danish Environmental Protection Agency, 2017a) so attention to this was given and the confrontational nature of the subject matter as well as considering the possibility for defensive reactions.

4.7 Limitations and assumptions

Since this thesis' scope is limited to non-sorters' arguments and factors contributing not sorting biowaste, it was considered unnecessary to conduct interviews with all respondents 'in-situ' (e.g. kitchens or homes). However, this is a limitation to the quality of the findings, since being 'in-situ' often adds to respondents' accounts (Ölander & Kaijser, 1999). This type of fieldwork was opted out due to an assumed and experienced difficulty of recruiting respondents for such an intervention and the fact that a non-sorting practice can be difficult to observe. The shortcoming of not being in-situ was coped with by allowing for wide ranging accounts from the respondents using the different probe techniques (e.g. the 22 statements from others) during the interview (Ehn, 2008). Using probes when interviewing broadens the insights to not only include the respondents' descriptions about the subject of interest. Furthermore, all respondents, except three, sent pictures of their kitchen, waste and sorting solutions after the interviews to allow for brief observation (see Appendix G). In continuation of this, a key assumption in cultural science is that there is a difference between

what people say they do and what they actually do. In this context, observations are specifically important¹¹ (Ölander & Kaijser, 1999).

The recruitment was not topic blind, meaning that respondents knew the interview topic in advance (Krueger & Casey, 2015). This means that the respondents can have presumptions, expectations or had time to prepare. This could also affect which respondents who agreed to be interviewed. For example, maybe people who are more positive towards biowaste sorting are prone to participate. One respondent even stated to have read an article about Copenhagen's biowaste sorting prior to the interview and wanted to start sorting, but just lacked a "push" as one respondent puts it.

Lastly, the respondents turned out to be fairly highly educated (see Appendix B2). Despite not intentionally sampled amongst, it is worth mentioning. However, as briefly mentioned in the introduction, previous literature on factors contributing to non-recycling practices states socio-economical aspects such as education level as a difficult and ambiguous topic (Kirakoian, 2016; Martinho & Vitor, 2009; Vicente & Reis, 2008). Also, some might argue that 11 households are a small number of respondents. I, however, argue that it is a suitable number for a study of this scope, which is the short duration of a thesis process. To both these points, it is worth repeating that findings from qualitative inquiries are not intended to be generalisable (cf. section 4.5).

5 Findings and discussion

This thesis started by addressing a knowledge gap about insights non-sorters, namely that if neither convenience nor accessibility are central barriers, what are then? As these findings reveal, it is a large number of arguments and factors that separately and together contribute to and reinforce the respondents' non-sorting practices.

The following chapter presents two distinctive findings sections corresponding to sub-research question one and two. The preceding analyses for these findings were sensitive towards and attentive to include aspects related to all three spheres of the social world as Brinkmann (2012) argues are important for qualitative inquiries dealing with everyday life. The first section (5.1) presents and unfolds three different types of arguments and the factors relating to these arguments – from across the interviews. The second part (5.2) further explores the arguments and factors, but

¹¹ One example of this is from a respondent's home, who stated 'no room in the kitchen' as main reason for not sorting. Here, it was observed that the biobin was left in plain sight on the kitchen floor, not used for biowaste but for small recyclable glass items. This respondent had had the biobin for just over six months, so it is interesting that this was still the temporary alternate solution used for the provided biobin (see Appendix G).

focus on individual households most influential factors, since the arguments and factors should not be seen in isolation.

5.1 Arguments advanced by non-sorters - a nexus of practical, societal and rational factors

In Table 1 below, three types of arguments and an array of factors that influence non-sorting practices *across* the respondents are presented. These are practical, societal and rational arguments. Furthermore, the arguments' categories and subcategories are presented and this section answers sub-research question one: "What arguments are advanced by people who do not sort biowaste when explaining their non-sorting practice?"

Table 1. Practical, Societal and Rational Arguments (Own illustration, 2018)

ARGUMENT TYPE	CATEGORY	SUBCATEGORY	DESCRIPTION
Practical	Biowaste itself	Waste type, disgust, amount	Biowaste smells and is sticky. One gets fruit flies and only produces small amounts.
	The biobin	Functionality, aesthetics, holes, lid, placement, space, biobag	Shape(s) and design affects practice. The bin is considered ugly, the holes lets out air and is unhygienic, the lid is a nuisance, there is neither enough space nor good placement and the bag breaks
	Habits	Everyday life, in apartment, forget, sorting system, to courtyard	Changing habits, e.g. when cooking, forget to use, fill-the-bag-mentality, suitable sorting system in general. Transportation to courtyard containers
Societal	Policymaking	Environmental policies, state/national level, municipal level, laws/sanctions	Attention to environmental policies, mostly agriculture and fishing. Higher levels of jurisdiction have the relevant power, municipal levels or efforts are not efficient. Waste should not have laws/sanctions
	Scale	Large food handlers, workplace	Relating ones individual practice to larger food handlers, e.g. supermarkets, restaurants, large companies and one's workplace, makes one's effort seem minuscule in the scale of things
	Social comparison	Norm, neighbours	Diverging opinions on whether sorting waste is the norm, but it demotivates when you think or know that your neighbours or neighbouring buildings do not sort
Rational	Knowledge	Stories and myths, doubts and distrust, takes time, later processing	Several stories and myths from various sources exists and influence, some of which create doubts and distrust. New knowledge takes time to sink in. Little, incorrect or no knowledge about biowaste's later processing
	Environmental concerns	The environment, biowaste transportation	Biowaste is relatable to the environment and concerns about CO ₂ emissions from the transportation of biowaste
	News and media		Negative media coverage affect on their perception on the biowaste sorting system's credibility

Note. The table depicts three types of arguments that influence non-sorting practices, namely practical, societal and rational arguments. The individual arguments' categories and subcategories are also presented as well as a description to every category.

5.1.1 Practical arguments

Overall the practical arguments relate to basic practical genes relating to biowaste itself, small annoyances with the biobin and habitual elements as depicted in Table 1. This argument type bears many overlaps between the experience and object-sphere of everyday life.

As a waste type, few respondents stated that they regarded biowaste differently to other types of waste. Yet, when talking, it became clear that most respondents regarded it differently, for example as having different properties or characteristics, where an important aspect was the decay factor; the fact that biowaste cannot be left as long as other types of waste and before it start smelling. From this, arguments relating to biowaste itself often revolved around some type of disgust. Here genes such as smell and fruit flies are highly recurring categories, but also smaller genes related to biowaste such as its greasiness, stickiness or hygienic concerns (germs, bacteria, contact) was mentioned. As E35 explains:

When I say cleanliness I mean like germs and bacteria. So when I'm eating something and then I'm putting it there and then it's growing and then it's going into the air and then if I spill it and then there's stuff everywhere. It's different from tidiness, cleanliness. Like when you know all the trash is in one place, then you know all the germs and dirt is in one place. When you have kids, you have to think about this.

In prolongation of this, three households mentioned that the biobin should not be on the kitchen table or in a cabinet with other things. Remarkably, four respondents, who had never sorted, talked about how it smells after some time, for example by being in the bag too long or forgotten.

A recurring theme influencing respondents are the small amounts produced, for example, if you live alone or do not cook that often. This subcategory and the next are exemplary of how the experience of for instance biowaste as well as more object-sensitive aspects influence the respondents.

For arguments related to the biobin, seven subcategories emerged. The first concerns its overall (non)functionality that is described as “irritating”, “unhandy” and associated with many “small irritants”.

It was repeatedly mentioned that the biobin itself lacks aesthetical value, which affects the possibility to be placed in the kitchen. Four households found the bin ugly, as L26 explains “I find it ugly. I just really find it but ugly”. Or as another respondent describes, “it's fair enough that they want to make

it green because hey it's environment and one gets the point [...] but how many people think that this green colour fits in in their kitchen?" This is related to the fact that respondents for example have either a designer-kitchen or try to keep surfaces free and clean from stuff in general or to be able to cook. This is partly connected to the third subcategory, namely the bin's lid. This is described in terms of *"unpractical, when hands are full", "unhandy", "annoying" and "can't stay up"*. Also, hygienic elements such as touching the bin while cooking and the fact that it is not *"air-tight"* was mentioned. The bin's holes also cause some problems. Here, their sharpness is mentioned as well as the fact that they are ugly because you can see the biobag. Again, the question of air or ventilation is related to something unhygienic and smelly.

The fifth subcategory placement is indirectly connected to aesthetics because if you do not want the biobin out in plain sight, one either forgets to use it, to empty it or it becomes more cumbersome to use since *"one can't dump the waste into it as a normal bin"* as one respondent explains. Further, for lack of space in their kitchen or cupboards, a good example is J27 who states;

that thing about not having room in the kitchen, what can you say, it's subjective. There's definitely some who would think our kitchen is of ample size and we have space. There are several of my friends who have it standing on the middle of the kitchen table even in smaller kitchens than ours, so they would probably think we have space. But I don't think we have space.

Lastly, the biobag was once mentioned as sticky and having bad consistency. Moreover, an interesting insight points to a *"fill-the-bag-mentality"*. The respondents feel they need to fill the biobag before emptying it, sometimes resulting in smell and/or fruit flies. This seems to be connected to the fact that people normally use regular plastic bags for waste and do not want to waste one by not filling it, as one respondent puts it, *"I also think that it can be inhibiting, that I feel that when I use such a [bio]bag, you can't just throw 200 grams in it, so I feel, that you have to fill it up before emptying it. [...] you think that it's a waste of bag."*

The last finding regarding the biobin is that it seems as if respondents do not think that they can buy a new biobin themselves. It seems as if that because the first one was delivered for free, that is how one gets bins.

The last category under practical arguments is habits. Habitual elements are seldom mentioned as primary reason, but rather as a secondary thing. For its subcategories also, it is not necessarily cumbersome to sort waste, it is just different. It requires an effort to begin with. Everyday life makes

changing habits somewhat invisible. For example M28 who thinks, *“I am aware that it [biowaste] is something different, but like in the everyday I don’t really think about it”*.

This has to do with one’s practice in the kitchen. People are used to their ways around their apartment and since waste sorting is closely connected to another everyday practice, namely cooking, it seems difficult to change. The way ones cooks and handles waste while cooking (e.g. uses the sink as a preliminary bin, see Appendix G) influences since you, for example, need a hand to open the lid. This is in line with a respondent who experiences barriers for habit change in relation to her *“bodily practice”*. Here, the design and placement of the biobin prevents her from using it naturally. Other types of waste seem more “natural” to sort in the apartment when one has gotten used to it. But also, other types of waste can lie around for longer, until the place, bag, box, pile or container is full – which is quite different from biowaste.

It was repeatedly mentioned that respondents simply forgot to use the biobin if it is not placed in plain sight, where others forget that they have used it and then it starts smelling. Respondents do not feel that they have a suitable sorting system in their apartment, which somehow is a common denominator for numerous other reasons. It seems that one extra type of waste cannot fit in and sorting system limits are reached.

Regarding availability of or access to the courtyard containers there are divergent opinions. For some it causes problems, for others not. In fact, it was repeatedly said that it is not a problem, since it is the same way and place as the other waste and, even less, if you leave your apartment often to walk your dog, as one respondent mentions. Some of these factors are, however, not exclusively connected to biowaste sorting. Five examples that influence negatively are for example one respondent that stopped sorting biowaste after the courtyard container was moved or another who thinks it adds cumbersomeness since the bio-container is in a different waste room than she usually goes to. For another household, it is cumbersome to get to the courtyard because of narrow backstairs. Moreover, another household do not see distance or access to the courtyard containers as a problem, for them it is a nuisance that they cannot lock the back door from the outside. Lastly, a fifth respondent mentioned that managing several types of waste is challenging when you, literally, have to balance them.

It was further mentioned that sorting takes additional time by the containers, but this was not specifically related to biowaste. Further, regarding time, little was mentioned, but one think waste sorting is time-consuming in the apartment. Most, however, explicitly mentioned that they do not consider it a problem since they sort many other types of waste already.

The habitual elements bear marks from the experience sphere, and having focused on this, enabled the findings to examine inhibiting factors from the point of view of the respondents, which reveals implicit everyday life factors that separately and together contribute to not sorting.

5.1.2 Societal arguments

As shown in Table 1 above, there are three different categories of societal arguments, namely policymaking, scale and social comparison. Societal arguments relate to the more discursive sphere of the social world, where the way biowaste is described, talked about and debated influences the respondents.

The category policymaking covers notions about policies, legislation, and governmental levels. The four subcategories are environmental policies, state/national level, municipal level and laws/sanctions.

A returning factor mentioned by respondents was that environmental policies (mostly agriculture and fishing) or how mistreatment of the environment, demotivated or directly contributed to a non-sorting practice, as S32 articulates;

[W]hat I think, it's if [policymakers] really want to do environmental policy then you should go in and make some rules, i.e. some limit values on what should be done, right. But that has to be on a large scale, at the state level. The fact that we get a bin at the municipal level and then this thing with the agricultural reform, that's changed at the state level.

The environmental policies are linked to the state/national level, where respondents consider decisions (affecting the environment) are made. This is connected to the municipal level as being insufficient to deal with national or global issues of, for example, environmental degradation. Again, S32: “when I say laws are needed, then it is because I think that when you go and destroy 25 years of environmental work with the new agriculture policy [...] then you fuck everything up on the level with who in reality rules and makes the law”. These respondents do not feel that what is being done (e.g. a new biowaste sorting scheme) on a municipal level is efficient enough, partly because of shortcomings on the higher levels.

Regarding laws/sanctions, no one mentioned that they knew about the requirement to sort waste, but five respondents directly state that they do not think there should be. This topic came up in the interviews as part of one of the exercises (Appendix E). This is because one report states that if

people not sorting biowaste knew that it was under the law, people from this group would be motivated to do so (Rådgivende Sociologer, 2017).

The subcategory scale refers to respondents comparing their individual effort to larger scales, for example, supermarkets. When it comes to individual effort versus larger scale, K36's accounts stand out. He informs how seeing vast amounts of biowaste being thrown out in his canteen at work demotivates him from sorting his small quantities at home. Also, other larger scales, such as supermarkets, large companies should carry some responsibility he thinks;

Yes, it's generally that I think the responsibility is easily just being placed on us citizens, instead of maybe looking at supermarkets, restaurants, others who handle food considerably more than I do. Because it would maybe also make more sense for me to [sort biowaste], if they were given legal requirements, then I would do it too.

In addition, his knowledge of the environmental policies regarding fishing, which he found inadequate, makes K36 see his own efforts critically in the scale of things.

Another important example is N40 who, briefly explained, disbelief in the system and society which makes him less willing to contribute to such a system. N40 says:

[W]ell, this thing with waste in everyday life. For me the problem is that we spray [fertilize] our land into pieces and have cultivated everything into these fucked up deserts, where there's no nature and we have larger problems than like 'sorting a bit of waste'

In social comparison, the last category of societal arguments, the subcategories norm and neighbour were recurring themes. There were diverging opinions about whether waste sorting is the norm. Two stated directly that they thought so and that it is connected to the popularity of being environmentally conscious in Copenhagen. Others took a more pragmatic stance, where one did not care about whether it is the norm and another claimed to be more guided by reason than norms. In addition, two others were more hesitant and did not know whether it is the norm. One, for example, stated that he was quite sure it was not because he knew that other apartment buildings in the neighbourhood do not sort. This is somewhat related to the last subcategory, namely neighbours. If you know or think people in neighbouring buildings do not or cannot sort, it demotivates the respondents' sorting practice. Moreover, when respondents see their bio or other recycling containers are used wrongly, it demotivated them, mostly because one's effort is wasted and less because others do not care.

5.1.3 Rational arguments

Rational arguments largely relate to knowledge and information about biowaste in general, but also the whole sorting system where either lack of knowledge or certain acquired knowledge indirectly reinforce or directly contribute to non-sorting practice. This type of argument is most representative of the discursive sphere.

When it comes to the category of knowledge about biowaste and the biobin, several stories and myths from various sources (news, media, TV, friends, pamphlets, local newspapers) exist and both indirectly and directly influence the respondents as depicted in Table 1. J27 is a good example from this category; he mentions several times that he has read a lot about the biobin. He is not affected by the myths as such, but the overall communication does not impress him. This is not his main reason for not sorting, but the impressions indirectly contribute to him not sorting.

Another important example is the myth of the biowaste being mixed with other types of waste, which demotivates; *“It has probably something to do with these myths we’ve heard, and then I just feel a little like ‘what’s the point’ and it’s probably a political statement all of it”* as expressed by L26. This is connected to the subcategory of doubts and distrust, where J25 for example says; *“I am in doubt whether the biowaste in Copenhagen municipality is the most environmentally friendly/efficient solution”*.

A recurring theme regarding knowledge is that new knowledge (for example about the benefits of sorting biowaste) takes time to sink in and must first of all be gained, sought after, processed or even re-gained. Lastly, little, incorrect or no knowledge about biowaste’s later processing also influences the respondents. This is a finding that will be further unfolded in section 5.5. later.

For the second category, environmental concerns, two subcategories emerged. First, the fact that biowaste is relatable to the environment was frequently mentioned. Connections to the environment were apparent both as a political issue, a resource issue, local potentials and either directly or indirectly or somehow locally, nationally or internationally. For example, one respondent mentions *“it’s good for the environment if they can transform the trash to something useful, then it is good. Not for me maybe directly, but indirectly”*. A different report is from Z32 who states *“[I]f [sorting biowaste] is really good for the environment and if it is really good for us [...] there’s this cyclic thinking, that I find beautiful somehow”*. Second, for biowaste transportation, concerns about CO₂ emissions from transportation was worrying and creates doubts about environmental gains, as S27

explains *“We also thought that somehow it was slightly a double standard if you make a small effort in your everyday life, but you’re using a lot of gasoline to drive around with these [bio] bags”*.

In the last category, news and media, three separate households mentioned negative media coverage as influencing their perception on the biowaste sorting scheme’s credibility. This was connected to the transportation of the waste mentioned above, which has been debated in the media and news. Especially two households had rational arguments for not sorting waste. For Z32, his non-sorting practice is linked to a lack of knowledge when the biobin was implemented. Differently, two brothers living together stopped sorting biowaste after one of them read a scientific article criticising the scheme’s environmental inefficiency due to transport.

This section has portrayed three types of arguments stemming from accounts by respondents across all interviews. It included aspects from all three spheres of the social world, namely experiences related to (non)sorting practice, arguments advanced for not sorting and was attentive to relevant objects such as the biobin and biowaste.

The next section unfolds findings regarding individual households’ factors contributing to non-sorting practice in order to get a more complete as opposed to a comprehensive picture of why some people do not sort biowaste.

5.2 Individual households’ most influential factors contributing to their non-sorting practices

This section respond the second research question: *“What factors contribute to individual household’s non-sorting practices and which are most influential?”*.

When analysing the material, it became clear that the arguments and factors described by the respondents do not exist in isolation. In other words, it is many factors and arguments that together contribute to and reinforce the individual households’ non-sorting practice. To display this, Figure 7 below was created.

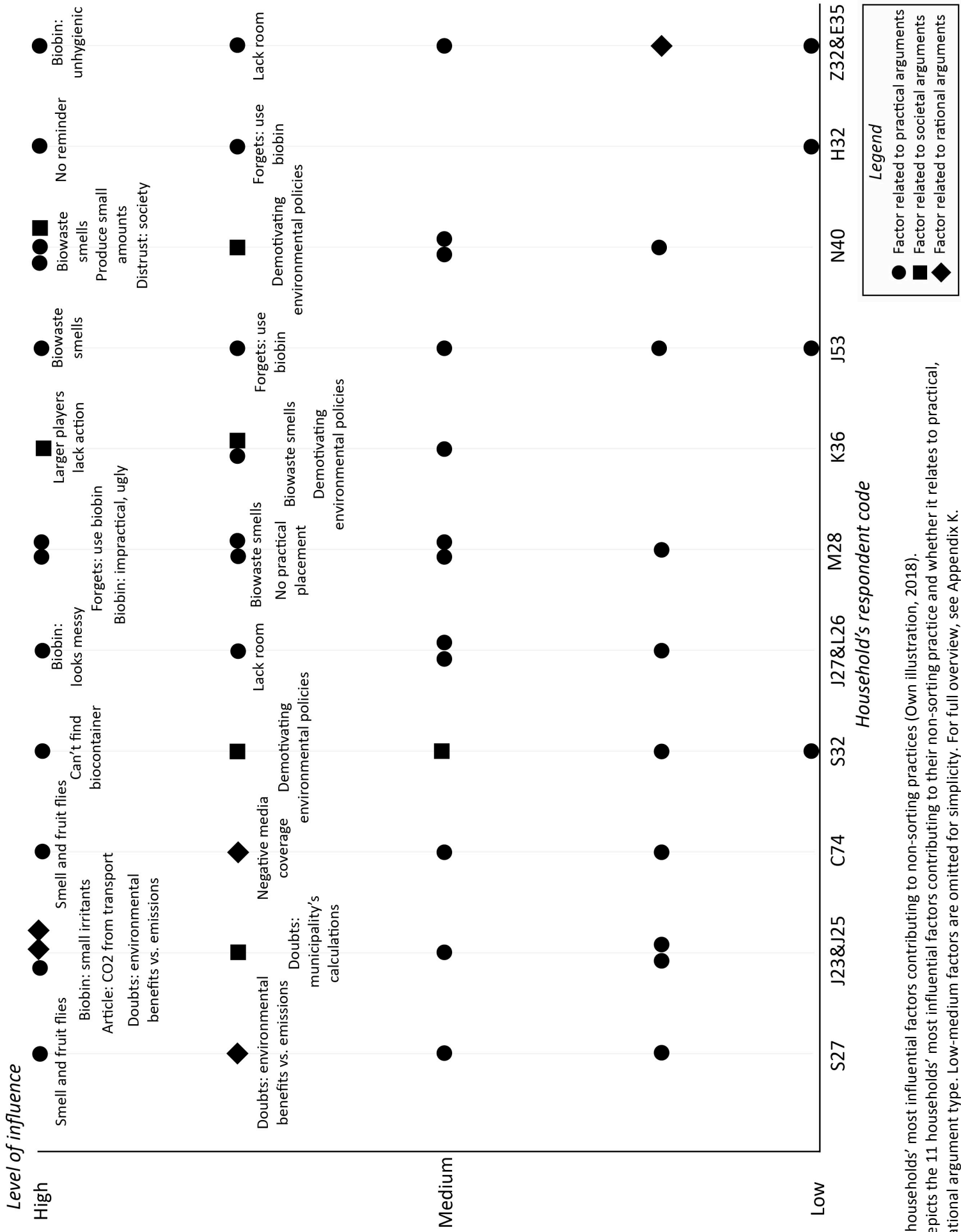


Figure 7. 11 households' most influential factors contributing to non-sorting practices (Own illustration, 2018). The figure depicts the 11 households' most influential factors contributing to their non-sorting practice and whether it relates to practical, societal or rational argument type. Low-medium factors are omitted for simplicity. For full overview, see Appendix K.

Figure 7 shows the 11 households' most influential factors contributing to their non-sorting practice and whether it relates to the practical, societal or rational argument type. It also shows the most influential factors related to practical arguments specifically concerning biowaste itself are predominantly linked to smell and fruit flies. Other practically related factors are small irritants about the biobin, that it looks messy and is unhygienic and in general impractical. Moreover, the lack of a suitable sorting system, room in kitchen and that respondents forget to use the bin are highly influential.

The most influential factors related to societal arguments are the demotivating environmental policies; distrust towards society and that larger players should take action. These are similar to the most influential factors related to rational arguments, where doubts about the environmental benefits of sorting biowaste versus the emissions from transportation and the highly influential negative media coverage are also linked.

Remarkably, looking across all the factors in Figure 7, 44 of the total 56 are related to practical arguments, while societal and rational arguments cover respectively seven and five. Nevertheless, when concentrating only on the most influential (i.e. above medium) as Figure 7 does, a different representation appears. Even though the two latter types of arguments are minorities in terms of number, six of the seven societal related factors and four of the five rational related factors are placed in the most influential half of the Figure. This suggests that despite not being that prominent, when present, these types of arguments are highly influential.

It is useful to distinguish the individual households' most influential factors because, despite internal complexities and numerous factors, Figure 7 shows potential for the most effective interventions. While Table 1 gave an overall and comprehensive picture of arguments and factors, Figure 7 can enable stakeholders and decision makers to make a more prioritised effort. Having this more specific knowledge can help prioritise possible interventions to increase biowaste sorting. These points of intervention are compiled in a list of recommendations in section 5.6.

Drawing this section to the end, the findings from the empirical material have been presented in two parts. The first presented arguments and factors contributing to non-sorting practices and this last section have unfolded the numerous factors' level of influence, corresponding to the sub-research questions. Relating back to the overarching research question "What influences people to not sort biowaste in Copenhagen?" the findings show that three types of arguments influence the respondents across the interviews. Furthermore, when looking at individual households' factors it is

evident that practically related factors are predominant, but despite small in numbers, certain factors related to societal and rational arguments are also highly influential.

5.3 Sorters/non-sorters – an erroneous dichotomy

While the two previous sections of findings focussed on answering the research questions, the following section will devote attention to problematising additional findings.

The findings of this thesis supports previous studies (Bolius, 2016; Rådgivende Sociologer, 2017) which suggests that a sharp sorting/not sorting dichotomy is somewhat erroneous. When looking at statements from four households you can especially see that declaring to sort a waste type might not mean that one does it 100%. A quote from J25 exemplifies this point *“The sorting I cross off here [on the background information paper] is not always 100%”*. Another household also only sorts *“some”* paper for example. Explicitly concerning biowaste, during several interviews, it came up that some respondents had sorted but stopped. One example was one who had had problems with fruit flies and smell. After this, he had a long break and now sorts sometimes, but *“inconsistently”* as he puts it.

In general, a surprising finding was that five of the 11 households had in fact started sorting biowaste when they first received the bin, but had stopped for various reasons, as depicted in Figure 8 below.

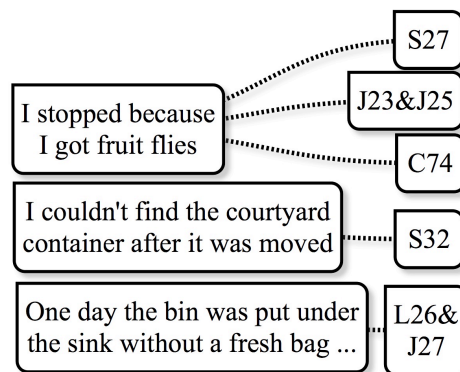


Figure 8. Reasons why people stopped sorting biowaste (Own illustration, 2018)

The figure depicts three main reasons (left) why five households stopped sorting biowaste, these are “I stopped because I got fruit flies”, “I couldn’t find the courtyard container after it was moved” and “one day the bin was put under the sink without a fresh bag”.

On the contrary, six households stated that they never started sorting, but even from this group, three households are interesting cases of “almost sorters”. One, for example, regularly uses the biobags for food scrapes when she makes juice. Thus, she sorts (some type of) biowaste but she throws the biobag in the “regular” bin since she finds the biobag sticky and (perceives) that the biowaste would start smelling before emptying it. Another respondent, who, as mentioned earlier

does not sort due to distrust in society, bought a used biobin online and even put a biobag in it. However, he intentionally had not used it¹² for the two reasons depicted in Figure 9 below, namely small amounts so cannot fill the biobag before it starts smelling. However, as Figure 7 taught us, his mistrust in society is also highly influential. Lastly, one respondent sorts biowaste in her summer house but not at home. She does not sort biowaste in her apartment due to experiences of disgust with the biowaste container in her summerhouse that becomes “alive” and “starts crawling” as she puts it. These three are all examples of “almost sorters” and depicts the drawback of having a dichotomous understanding of sorters/non-sorters.

Hence, Figure 9 below should be seen in the light of this nuanced understanding of non-sorters.

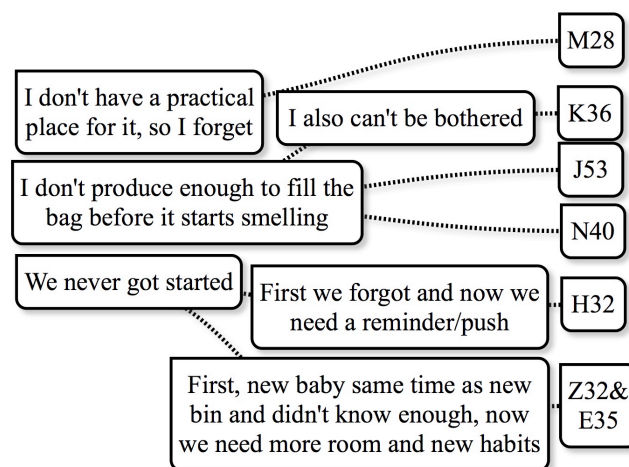


Figure 9. Reasons of what held people back from sorting biowaste (Own illustration, 2018).

The figure depicts three main reasons (left) of what have held people back from sorting biowaste, these are “I don’t have a practical place for it, so I forget”, “I don’t produce enough to fill the bag before it starts smelling” and “we never got started”. Also more specific reasons related to the main reason are illustrated.

Despite the reservations just mentioned, Figure 9 shows six households who never started sorting.

K36 does not think he produces enough; he cannot be bothered as well as other factors elaborated earlier. H32 wants to start sorting but never got started because she was busy and forgot when they first got the bin. Z32 and E35 had a baby around the same time as biowaste sorting was implemented so they were occupied with this.

Both from the interviews and from informal conversations before and after the interviews (especially when completing the background information sheet, Appendix B1) it became clear that certain recycling fractions (especially deposit bottles, paper and glass) are “black-boxed” (Latour, 1999) and barely regarded as waste sorting. When a practice is “black-boxed”, its deep anchoring in the

¹² N40 had had the new biobin for weeks, at the time of the interview and in text correspondence a month later, he still had not started sorting.

mundane and one's habits, makes it invisible to individuals and close to impossible to reflect on (Latour, 1999). In other words, these practices have become so deeply integrated in people's everyday lives that the individuals might not even consider it waste sorting. This again underlines the importance of including the aspects of experience related to (non)sorting practice since these "so implicit in our life processes that we fail to recognise it" (Brinkmann, 2012, p. 35) as explained in section 3.2.

In sum, as knowledge from local grey literature show and this thesis' findings support, having a dichotomous understanding of sorters/non-sorters is not always neither accurate nor useful. This insight is related to the section 5.5. in this chapter that basically states that just because people do not sort today it does not mean that they never will.

5.4 Fear of freeriding challenges recycling's altruistic potential

As presented in the section on societal arguments, comparisons to questions of scale, larger impacts and policy implications make household waste sorting seem like "a drop in the ocean". Thus, when faced with large negative impacts seen every day at work, on the news, in supermarkets', these impressions negatively influence the respondents since they seem counterproductive to their own (non)practice. This is a common issue in sustainability scientific research, namely the idea of free riders (Evans, 2012).

Freeriding refers to the idea where some individuals put in an effort for the benefit of everyone, where others – the free riders – do not put in the same effort, but still profits from the effort of others. This idea can discourage the former since it seems unfair and demotivating, eventually leading these to also not wanting to put an effort in either (Evans, 2012).

Potential positive environmental impacts of one's recycling get questioned by respondents. For example, if one does not fill the bag, the environmental production costs of the biobag are wasted. Additionally, referrals to the question of transportation of biowaste and the general efficiency of the sorting system's actual impact influence some respondents, as represented in Figure 7.

Despite the fact that K36 is the only respondent who said that he could not be bothered to sort, when examining his statements in more detail, this question of scale is related to worries of free riding, for example by supermarkets, became apparent. K36 explains, "*I could easily [sort biowaste], I just can't be bothered*" but when answering why, he then prioritised it as "less important", K36 answers:

Well yes, because I do actually, well, if there are others who set a good example for us the citizens. Then I actually would be bothered. But I can't be bothered as long as it's a sloppy, loose attitude [from the supermarkets e.g.] because they throw away much more than we do, right

As shown in Table 1 and explained in the sections on societal as well as rational arguments (5.1.2 and 5.1.3), respondents frequently related biowaste sorting to environmental matters and concerns. According to Nielsen and Hopper (1991), if waste sorting is considered in terms of the environment, there is a larger chance that people will adapt to a less environmentally destructive behaviour (Nielsen & Hopper, 1991). This thesis' findings point towards the fact that the relationship between waste sorting and the environment either works as a motivation (for example the cyclist thinking mentioned by Z32) or as a barrier (e.g. doubts due to transportation issues or wasting bags). Regardless, Nielsen and Hopper (1991) argue that it should be considered positive and constructive that the relationship is present since it opens up for framing biowaste sorting and other recycling in terms of altruism and positive environmental benefits. However, these need to be highlighted and the barriers actively addressed (for this, see section 5.6).

Another interesting potential to be considered is the concept of "large numbers, small payoff" as presented by Carlson (2001). What is meant by "large numbers, small pay-off" is "'small" with respect to the payoff individuals experience from helping resolve a collective action problem of this sort. The payoff to the collectivity as a whole could be quite large" (Carlson, 2001, p. 1234). Carlson (2001) explicitly mentions issues related to environmental problems as being particularly "illustrative" (p.1235). The concept can contribute to informing considerations about for example the doubts and distrust that the scheme is currently affected by (see Table 1). It can also inform considerations about environmental concerns and support information giving in regards to questions of scale.

This section have not only shown how waste sorting as an everyday practice is connected to a larger MWS system as depicted in the theory section, but how it is embedded in greater discursive spheres through societal arguments.

5.5 Looking forward: non-sorters who care, know and are willing

This thesis' findings do not support the portrayal of non-sorters as being "indifferent", "unwilling", "unknowing" or basically incapable of sorting biowaste as mentioned in the introduction. In fact, the findings show rather the contrary.

None of the respondents stated that they do not care about biowaste or biowaste sorting, rather, the opposite. Some good examples are for example N40 who, despite his distrust, still states, "*I'm not against sorting [biowaste], but more also has to be done*" or S32 when reflecting:

[T]here's this element where, hmm [...] Well, where I don't support the interventions that I actually think are good because I do think that the biobin is good. And I can also see it in as s educational element in having a green consciousness and the pedagogical aspect that everyone has got one. [...] I actually think that this biowaste thing matters. I think it makes a difference.

As the quote explains, despite barriers, M32 cares and believes in biowaste. This indicates that below the initial barriers, there is a potential for M32 to start sorting one day.

Again contrary to previous studies (Danish Waste Association, 2013; Rådgivende Sociologer, 2017; Thomsen & Andersen, 2017), the findings show that issues of knowledge is less about waste sorting per se and more about a lack of knowledge and/or distrust regarding the benefits of biowaste sorting or the later processing phase. As one respondent exemplifies: "*I have no idea how [biowaste] is being used and how much there is, and I also don't know it's being driven to actually.*" Another had talked to her partner about how not knowing what happens with the biowaste is demotivating.

Relating to the findings for rational arguments that suggested new knowledge about biowaste sorting, its environmental benefits and so on takes time to sink in and get accustomed to, the timing of this thesis, approximately six months after the implementation is suitable. The knowledge accumulated herein can inform policymakers and key stakeholders working with biowaste sorting in Copenhagen. This could improve the scheme and eventually secure more biowaste sorting; not only to fulfil the municipal and national waste goals, but as part of a larger resource awareness and more importantly, resource recovery. Some indicative quotes to support this statement are for example from one of the respondents who tell "*that biowaste is something different, that, I am aware, is something that I need to get used to thinking*". Another account is, "*if I had known all the thing I know now, then we probably would have started*" and continues, "*we are able to [sort biowaste]. We*

sort everything else". What this household requires is a smarter solution to break the everyday barriers that reinforce their non-sorting practice.

Surprisingly only one directly stated that s/he could not be bothered to sort, namely K36. However, as the findings has showed, this statement is connected to his societal argumentation:

Well that I'm too lazy, with this I'm a little bit, you know, because I do have knowledge about what happens [...] If I got something in return, then I feel that instead of only giving, providing something that goes to someone else, then I get something for the work I'm putting into it.

As this quote suggests, this is a rather reflective stance, far from the indifferent and unknowledgeable picture presented by the "indifferent persona".

A last statement that this thesis' findings challenge is the notion that non-sorters lack willingness to sort or start sorting. In fact, it was frequently stated otherwise. A household for example discuss "[J27] *it's not because we don't want to [L26] No not at all [J27] or that we don't feel like it or can't see the point with it [...] we can actually really see that it makes sense*". They even state that they are willing to pay (up to 300-400 DKK) for a new biobin if they saw one that fitted their kitchen. Another respondent also states, "*I actually want to use [the biobin], but then there's just, you know, sometimes forgetfulness, right*". Lastly, statements such as: "*because we want to do it, but it's just, we don't have the starting point*" show willingness.

Some respondents had good intentions at start: "*I would say that I actually think about [biowaste] quite a lot and it was also our intention to use the biobin [...] I thought that it was mega nice to get that [bio]bin and I, we, were really looking forward to use it*". What made them stop were fruit flies and smell. Similarly, J53 who describes: "*Well, I had good intentions about [sorting biowaste] in the beginning because I have a summer house where we have sorted biowaste all along [...] I do want to sort but, [...]*". This respondent then explains how small amounts make it seem like a big effort for some small environmental gains. Lastly, another respondent who shows willingness, but is hindered by rational arguments: "*yes, I would say that if there was clearer evidence that [sorting biowaste] is much, much better [than incineration] then I could accept [the biobin] to stand on the kitchen table*".

As this last chapter has problematised, it is insufficient to regard sorters and non-sorters as two distinct categories. Moreover, it was unfolded that not sorting is not a static state either. Additionally, the previous section's insights point towards citizens who care, know and are willing to sort. Therefore, from a solution oriented standpoint, they are "on the edge" of sorting, or rather,

interventions directly aimed at these people's arguments and factors contributing to not sorting could push for increased sorting. A list of recommendations and considerations has been made to compile the intervention points uncovered by the findings.

5.6 Lessons learned and suggestions for a way forward

The previous chapter exposed a large number of challenges that influence non-sorters' practice. However, as described in this last section (5.5), a promising attitude towards biowaste exists. From this information and paired with knowledge of the most influential factors, a list of recommendations for potential approaches to address key issues was created. The approaches are both of practical, information-based and suggestive character.

For key issues relating to biowaste (smell, fruit flies, decay) and the biobin (small irritants, placement, aesthetics, hygiene, forget) the following approaches are suggested:

- Inform citizens that they can buy or get another biobin themselves
- Recommend the household's to consider their needs regarding size, aesthetics, lid and hygiene.
- Recommendations for design include that the biobin should be sealed somehow and/or airtight.
- Furthermore, it should be clean and/or pretty enough to stand on kitchen table (see Appendix L).
- The lid should be possible to take off to limit contact. Alternatively, bins with a foot-tilt could be an idea or a supported lid could help.

To address the issues regarding the biobag (greasy, breaks, "fill-the-bag-mentality")

- Provide smaller bags or in general offer a wider range of bag sizes for different household compositions and needs.
- Remind that air ventilation in new biobin is needed to avoid bag-decay (see Appendix L).
- Consider and utilise potentials from "large numbers, small payoff" (see section 5.4).

Potential approaches and considerations accommodating the environmental concerns, doubts and distrust are as follows:

- Consider and utilise potentials embedded in recycling as altruistic behaviour, cf. section 5.4.
- Consider that some citizens see their own effort in as part of a larger context and relates it larger scales.
- Continue informing that CO₂ emissions from transportation do not counteract the environmental gains from bio-gasification.
- Inform that environmental gains are not lost despite half-full bag.

- Inform about plans of bio-gasification plant near Copenhagen.
- Tell the “cyclic” story of recirculation of nutrients (possibly as information material for children – and their parents).
- Use convincing, scientific material for some citizens.

Lack of knowledge is prominent in two ways, firstly as issues of little, incorrect or no knowledge about biowaste’s later processing. A potential approach to address this is:

- Continue informing and telling the story of what happens to the biowaste after sorting (transport and later processing and use of by-product).
- Tell the “cyclic” story of recirculation of nutrients.

Secondly, for those who do not know whether sorting biowaste is the norm

- Continue telling how much biowaste is being collected (both in tons but also in per cent, i.e. that the majority sorts).
- Consider and utilise potentials from “large numbers, small payoff” (see section 5.4).
- Inform about the large potential households’ biowaste have (compared to other sectors and larger scales).
- Inform about measures in other sectors and how much is being done there.
- Consider that new knowledge and habits takes time – reiterations of information can remind and push people “on the edge”.

Lastly, the two respondents who had waste shafts both supported the closure of these to “nudge” them down to the courtyard, which is the last suggested approach supported by this thesis’ findings.

As indicated early in this thesis, an important element in sustainability scientific research is its effort to seek practical solutions and being solution-oriented (Clark & Dickson, 2003; Wiek et al., 2012). In this context knowledge gained from this study and supported by knowledge from structuration (section 3.1), understanding existing shortcomings of the current system can improve it and possibly increase the amount of biowaste sorters.

6 Conclusion

This thesis set out to examine influences that contribute to and/or reinforce non-sorting practices among apartment building residents in Copenhagen. The main, empirically grounded, findings exhibit three types of arguments for not sorting – practical, societal and rational. These are further elaborated by displaying a large number of factors that constitute these arguments and thus contribute to or reinforce the non-sorting practices. What influence respondents to not sort are neither simple within individual households nor across. Despite this, examining the individual households' factors contributing to non-sorting practices in detail shows intervention points that, if addressed, could reduce these barriers. This potential for intervention is supported by the finding that respondents are neither indifferent towards, unwilling to, nor incapable of sorting biowaste. On the contrary, insights from non-sorters interviewed for this thesis show citizens who care, know and are willing to start sorting biowaste. From this knowledge, a list of recommendations is provided.

The findings challenge the existing knowledge about non-sorters, which represents them as the “indifferent persona”, having character traits such as being unwilling and unknowing as highlighted above. However, rather than criticising this understanding, this thesis considers the accumulated knowledge as an addition, which can contribute to decision-making and communication within the realm of waste management in the Copenhagen council or similar cities. Utilising this knowledge could not only help increase recycling and reach the recycling goals put forward by the EU, the Danish state and Copenhagen Municipality; increasing biowaste sorting would also contribute to a recirculation of valuable nutrients contained in the biowaste. This is considered a measure to counteract a resource depletion of phosphorous, which is needed since it is most vital for the survival of both plants and humans.

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8 Appendices

Appendix A. Table of interviews

The table shows information about when the interviews were held, where, who and recruitment method.

Table 2. Table of Interviews (Own illustration, 2018)

Date (all 2018)	Time and interview duration	Location	Respondent first letter, gender, age	Respondent code	1 or 2 households	Recruitment method
11. March	14.00-15.00 55 min.	Meeting room, workplace of N	N, M, 40 S, M, 32	N40 S32	2	Snowball
12. March	15.15-16.00 30 min.	Christian's Harbour, respondent's home	J, F, 53	J53	1	Snowball
14. March	15.00-15.45 30 min.	Meeting room, Respondent's workplace	H, F, 32 (Eng.)	H32	1	Snowball
14. March	16.00-16.45 40 min.	Meeting room, Respondents' workplace	S, F, 27 M, F, 28	S27 M28	2	Snowball
14. March	19.15-20.00 50 min.	Community room, close to respondents' home	C, M, 74 K, M, 36	C74 K36	2	Nomination
16. March	17.00-18.00 40 min.	Islands Brygge, Respondents' home	Z, M, 32 E, F, 35 (Dan./Eng.)	Z32 E35	1	Nomination
17. March	11.00-12.00 45 min	Nørrebro, Respondents' home	J, M, 27 L, F, 26	J27 L26	1	Snowball
19. March	16.30-17.30 45 min	Nordvest, Respondents' home	J, M, 23 J, M, 25	J23 J25	1	Snowball
<i>Total</i>			<i>14 respondents</i>		<i>11 households</i>	

Note. The table depicts an overview over the interview's date, time and duration, location and the respondents' first letter, gender, age, the respondent code used throughout the thesis, the amount of household represented in each interview and the recruitment method.

Appendix B1. Background information

Please note that gender is not pre-printed. The researcher asked all individuals which gender they identified with and marked it. The information obtained from the background information can be found in Appendix B2

BACKGROUND INFORMATION

General

Age _____

Ethnicity and birthplace (country) _____ and _____

Apartment floor (mark w. a ring) _____
G.F., 1 2 3 4 5 6 7 8
Other (fill in) _____

Is there an elevator? (mark w. a ring) _____
Yes / No

Is there a waste shaft? (mark w. a ring) _____
Yes / No

Apartment type (mark w. a ring) _____
Rental, rent a room, part-ownership, owner
Other (fill in) _____

Highest completed education (mark w. a ring) _____
Primary school, grade 10, high school, short upper
secondary, middle long secondary,
long upper secondary school
Other (fill in) _____

Main occupation (mark w. a ring) _____
Student, self-employed, employee, homemaker,
unemployed, sick-leave, retired
Other (fill in) _____

Work space name and title (fill in) _____ and _____

The household's composition

Civil status (mark w. a ring) _____
Single, girl/boyfriend, engaged, married, registered partnership, divorced,
widowed
Other (fill in) _____

Cohabiting status (mark w. a ring if applicable) _____
Partners, roommates, collective
Other (fill in) _____

Amount of people in household *total* (1, 2, 3 ...) _____
(Fill in) _____

Amount of *children* in household under 18 (0, 1, 2, 3 ...) _____
(Fill in) _____

Waste sorting

Do you sort any type of waste (mark w. a ring) _____
Deposit bottles, paper, cardboard, metal, glass, hard plastic, soft plastic, biowaste,
Batteries, hazardous waste, bulbs, large-item waste, garden waste
Other (fill in) _____

Appendix B2. Background information

Table 3. Background information

Structured and summarized information about the respondents obtained by completed background information documents.

CATEGORY	OPTIONS	TOTAL	
Age		23, 25 26, 27, 27, 28, 32,32, 32, 35, 36, 40, 53, 74 (14 total) Average: 35	
Ethnicity/birthplace		11 DK/DK 1 viet/viet 1 Tyrk/DK	1 Cauc./USA (14 Total)
Apartment floor	G.F.,1,2,3,4,5,6,7,8	1x GF 3x1 3x2 2x3	1x4 1x4+5 (based on household)
Elevator	Y/N	11 No (based on household)	
Shaft	Y/N	2xY 9xN	(based on household)
Apartment type	Rental, rent a room, part-ownership, owner	5xRental 5xpart-ownership	1x rent a room (based on household)
Highest completed education	Primary school, grade 10, high school, short upper secondary, middle long secondary, long upper secondary school	1 Primary school, grade 10 1 high school 2 short upper	5 middle upper 5 long upper (14 total)
Main occupation	Student, self-employed, employee, homemaker, unemployed, sick-leave, retired	1 writer 5 student	7 employee 1 retired
Work space name/title		Everyone employed or full-time student, also students with jobs	
Household's composition			
Civil status	Single, girl/boyfriend, engaged, married, registered partnership, divorced, widowed	7 single 4 girl/boyfriend 1 married	2 engaged (14 total)
Cohabiting status	Partners, roommates, collective	5 N/A (living alone) 5 partners 2 brothers	1 part time son 1 roommates (Total)
Amount of people in household total		5x2 people 4 living alone 1x3 people	1x4 people (based on household)
Amount of children in household under 18		9x0 1x1	1x2
Waste sorting			
Do you sort any type of waste	Deposit bottles, paper, cardboard, metal, glass, hard plastic, soft plastic, biowaste, Batteries, hazardous waste, bulbs, large-item waste, garden waste	11x deposit bottles 11x batteries 10x paper 9x cardboard 9x glass 7x metal 7x large item waste 6x hard plastic 5x Hazardous waste	5x bulbs 3x soft plastic 1x biowaste 1x garden waste 1 scavenger 1 dumpster dive 1 works waste (based on household)
Gender (asked every individual)		8 Male 6 Female (14 Total)	

Appendix C. Interview guide.

Questions are italic. Regular texts are notes about the content.

Before every interview, the following information and guidelines were provided: the purpose of my thesis is about people who do not sort waste and their arguments for not doing so. It is not my aim to make to change your actions or opinions. There are no right or wrong answers and both positive and negative views are welcome. The interview is recorded for note-purposes only. If more than one respondent, also: every, and everyone's answers are right and important. You do not have to agree, but please respect each other and try to avoid interrupting one another.

1. Please tell about how you live and your household

2. How do you see biowaste in relation to other types of waste?

3. Have you at any time sorted biowaste?

As a child/at home/somewhere else you have lived?

4. Have you at any time considered starting sorting biowaste?

What have held you back?

5. Was there a specific event that caused you not to start/stopped sorting biowaste?

6. Hand out pre-printed bullet-point paper.

Try to think of all the reasons for why you do not sort your biowaste (incl. the ones already discussed)

After the 2 minutes read out what they've written

Can you give some examples of ____

Can you elaborate what you mean with ____

6.1. Prioritise the list (no 1 is the most important reason, no 2 the second most important and so on).

Wait until they finish.

What did you write as number 1?

Why? Why is this one more important than the others?

Why are the others less important?

7. Hand out 22 statements. Please pile into three (agree, disagree, neutral)

How are these statements similar to or differ from the ones on your paper/the ones discussed earlier?

What are differences between the statements in your disagree and neutral pile?

Which did you disagree with? Why? Can you give a few important examples and elaborate?

7.1 Take your "agree" pile. Hand out the most-important-less-important paper. Place your agree pile on the paper.

Do you need to add your reasons from your list?

7.2 Which one did you place as the most important reason? Why did you choose this one?

7.3 Why did you place the others where you did?

8. *What would it take for you to start sorting?*

9. Small summary of the main points discussed in the meeting and verify by asking

Is this a suitable summary of the main points? Is there anything I missed

Appendix D. Pre-printed for respondents to fill

*Try to think of **all** the reasons for why you do not sort your biowaste (including the ones mentioned already)*

Make a list in bullet points of all the reasons why you do not sort biowaste. Please write using full sentences and not just one word

Name: _____ **[voluntary]**

Appendix E. List of statements for not sorting biowaste

The table on the following page displays the 22 statements from others (see references in the right column) about why people do not sort biowaste. The statements were presented to the respondents as part of the interview. The 22 statements provided opportunity to discuss other reasons that the respondent either agreed or disagreed with. The statements were discussed and the “agree” ones prioritised in the “Most-important-less-important matrix” (see Appendix F).

The letter in marked in the right column (Ref.) correspond to the references below. The references are not listed alphabetically but according to the appearance of the statement.

Dansk	English	Ref.
1. Jeg ved ikke/ved ikke nok om, <i>hvorfor</i> jeg skal sortere	1. I don't know/know enough about <i>why</i> I need to sort	1: A, B
2. Jeg sorterer ikke fordi, at bio-affald lugter/lugter mere end andet affald	2. I don't sort because biowaste smells/smells more than other waste	2: B
3. Jeg har ikke plads til bio-spanden i mit køkken	3. I don't have room for the biobin in my kitchen	3: C
4. Jeg synes, at bio-spanden er for stor/lille	4. I think that the biobin is too big/small	4: D
5. Jeg kan ikke sortere pga. en fysisk tilstand eller en funktionsnedsættelse	5. I can't sort due to a physical condition or a disability	5: E
6. Jeg synes, der er for langt til containerne til at kunne håndtere flere typer affald	6. I think the containers are too far away to be able to handle several types of waste	6: A, B
7. Der er ikke nogen økonomisk gevinst i det for mig	7. There's no economical gain in it for me	7: A
8. Jeg sorterer ikke fordi der er ikke nogen lovgivning/sanktioner på området	8. I don't sort because there are no laws/penalties	8: A, E
9. Det tager for lang tid at sortere flere typer affald	9. It's too time consuming to sort several types of waste	9: A
10. Jeg gider ikke/er for doven	10. I do not want to/too lazy	,B,D
11. Det har ingen/ikke nok betydning for miljøet	11. It has no/not enough significance for the environment	10: B, D 11: A, F
12. Det er et spørgsmål om manglende rutine/vane	12. It's a question of lack of routine/habit	12
13. Rodet ved containerne er umotiverede	13. The mess by the containers is demotivating	D,E,G
14. Genbrugscontainerne bliver brugt forkert, hvilket vil sige, at <i>andre</i> er ligeglade	14. The recycling containers are being used wrongly, which means <i>others</i> don't care	13: H
15. Genbrugscontainerne bliver brugt forkert, hvilket vil sige, at <i>andre</i> at <i>min</i> indsats er ligegyldig	15. The recycling containers are being used wrongly, which means <i>my</i> effort is indifferent	14: A
16. Jeg ved ikke nok om affaldssortering til at gøre det	16. I don't know enough about waste sorting to do it	15: A, B
17. Jeg sorterer ikke bio-affald, for det er ikke normen	17. I don't sort biowaste because it isn't the norm	16: B, D
18. Jeg mangler viden om lokal gevinst af min bio-affaldssortering	18. I need knowledge about local benefits of my biowaste sorting	17: A, F
19. Jeg vil ikke sortere affald, for jeg tror, at det bliver blandet sammen alligevel	19. I won't sort waste because I believe that it gets mixed anyway	18: I
20. Man får for lidt miljø for pengene med denne løsning	20. One gets too little environment for the money with this solution	19: E
21. Jeg har set noget i medierne/nyhederne/sociale medier, der har gjort, at jeg ikke sorterer bio-affald	21. I've seen something in the media/news/social media that has made me not sort biowaste	20: J 21: D, I
22. Jeg har ikke et passende sorteringssystem i min lejlighed	22. I don't have a suitable sorting system in my apartment	22: B, C, E

A: Kirakozian, A. (2016). The determinants of household recycling: social influence, Public policies and environmental preferences. *Applied Economics*, 48(16), 1481–1503.

B: Martinho, M. D. G. M., & Vitor, F. M. C. B. S. (2009). Factors Influencing Households' Participation in Organic Waste Separation.

C: Thomsen, R., & Andersen, E. S. (2017). *Succesfuld udrulning af bioaffaldsordning [Successful implementation of biowaste solution]*. Copenhagen.

D: Toftegård, N. Personal communication. February 8. 2018.

E: Rådgivende Sociologer. (2017). *Affaldssortering i Københavns Kommune Den sociale norms betydning for affaldssortering*.

F: Nielsen, J. M., & Hopper, J. R. (1991). Recycling as Altruistic Behavior: Normative and Behavioral Strategies to Expand Participation in a Community Recycling Program. *Environment and Behavior*, 2(23:2), 195–220.

G: Danish Waste Association. (2013). *Danskernes affaldshåndtering: holdninger og værdier. [The Danes' Waste Sorting: Opinions and Values]*. Copenhagen.

H: A. Kollerup. Personal communication. January 24. 2018.

I: Vicente, P., & Reis, E. (2008). Factors influencing households' participation in recycling. *Waste Management and Research*, 26(2),

J: <https://kapitalenslakajer.blogs.berlingske.dk/2017/11/01/naarbaeredygtighedsfanatismenskademi-ljoet/>

Appendix F. Most-important-less-important matrix

Most important		
Place one statement here		
Important		
Place several statements here	Place several statements here	Place several statements here
Less important		
Place several statements here	Place several statements here	Place several statements here
Neutral		
Place several statements here	Place several statements here	Place several statements here

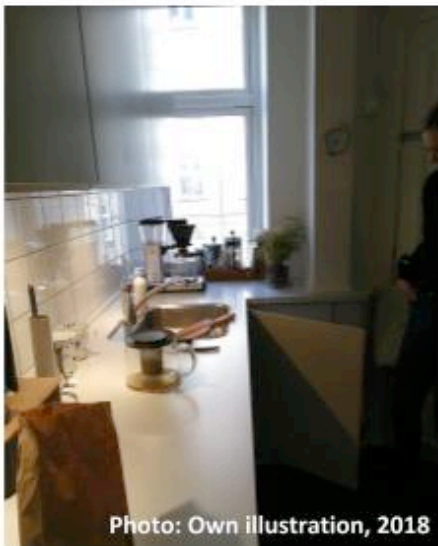


Photo: Own illustration, 2018

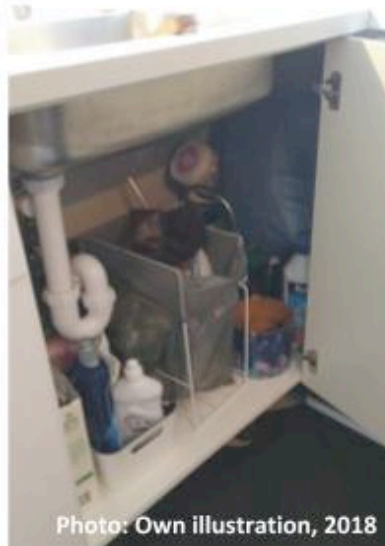


Photo: Own illustration, 2018

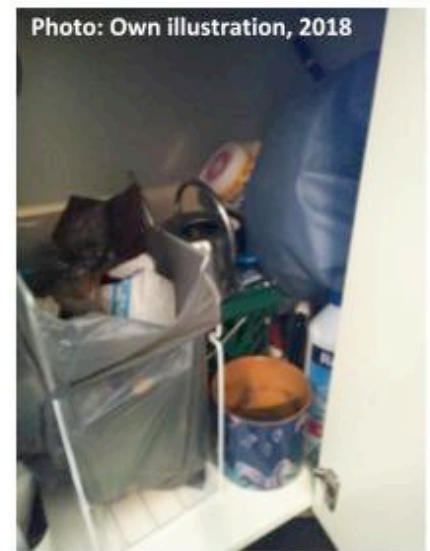


Photo: Own illustration, 2018

The pictures show the kitchen table on the left and the current residual waste bin in the middle and to the right you can just see the delivered biobin behind the clutter. It was used for some weeks, more or less in this place, but one day they did not put a new bag in and now it ended here.

E35&Z32



Photo: Own illustration, 2018

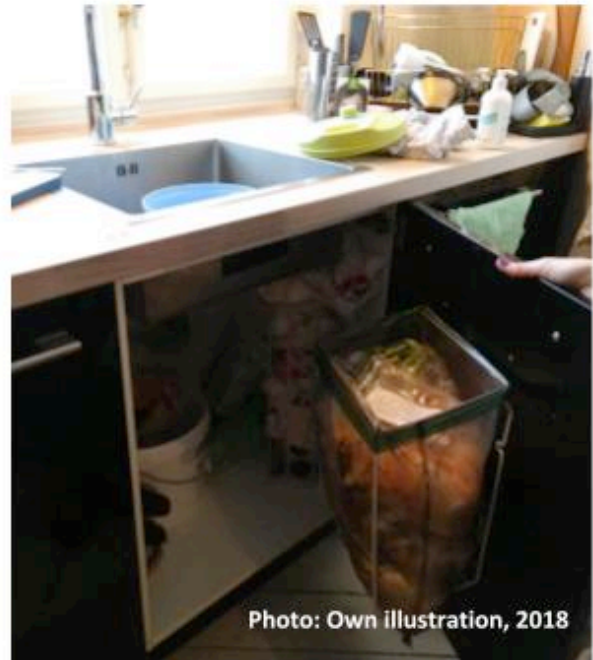


Photo: Own illustration, 2018

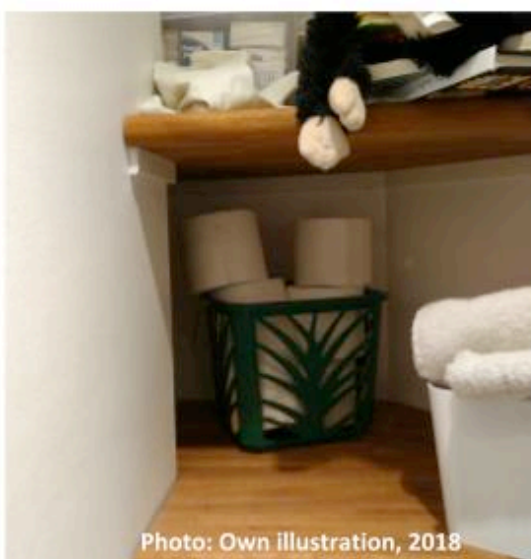


Photo: Own illustration, 2018



Photo: Own illustration, 2018

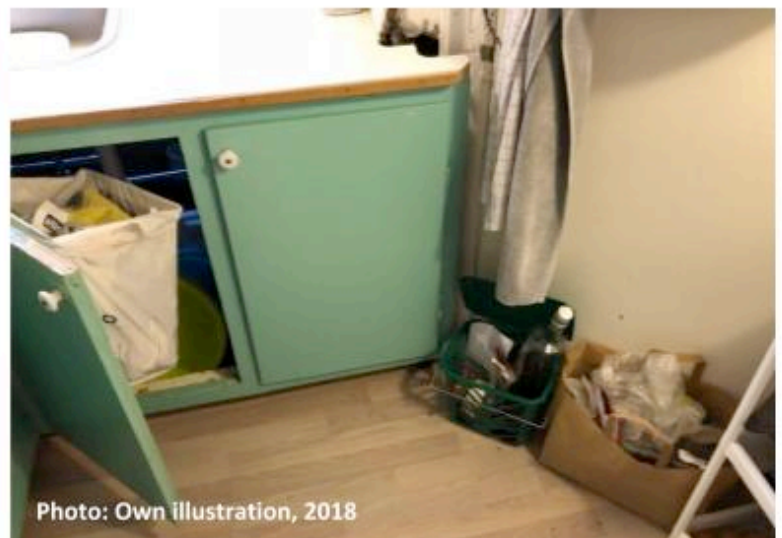
The top left picture show part of the kitchen table and how the sink is being used as preliminary bin. Top left depict the residual bin, bottom right the other sorting systems than biowaste. The bottom left picture show the biobin

M32



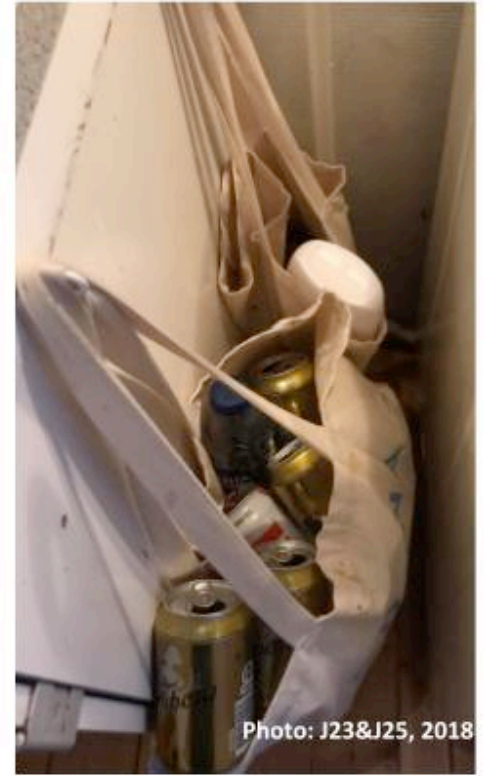
On the top left the width of the kitchen and the kitchen table is depicted. Top right shows the residual bin. Bottom left shows sorting system for hard plastic, glass and deposit bottles, and on the picture bottom right, paper is sorted.

J53



The pictures show J53's kitchen. On the left you see more or less the whole kitchen. This is a rather classical kitchen size in Copenhagen - as you also see on the other pictures. To the right, the residual bin is depicted and to the right you can actually see the biobin again being used for alternate purposes, this time for small glass items. Plastic, paper and cardboard is sorted in the paper bag next to the biobin.

J23&J25



The pictures all show J23 and J25's household. On the top left, the kitchen table, sink, and stove is on the left. The top right picture depicts their sorting system for deposit bottles, plastic - placed in the gap between the kitchen table and stove. The middle picture to the right show the residual bin and the bottom left show the kitchen cupboard next to it where plastic bags are kept and one can vaguely see the space underneath. Lastly, on the bottom right picture, the biobin's placement; unused on the main staircase. It is thus the first thing you see when entering their household.



N40



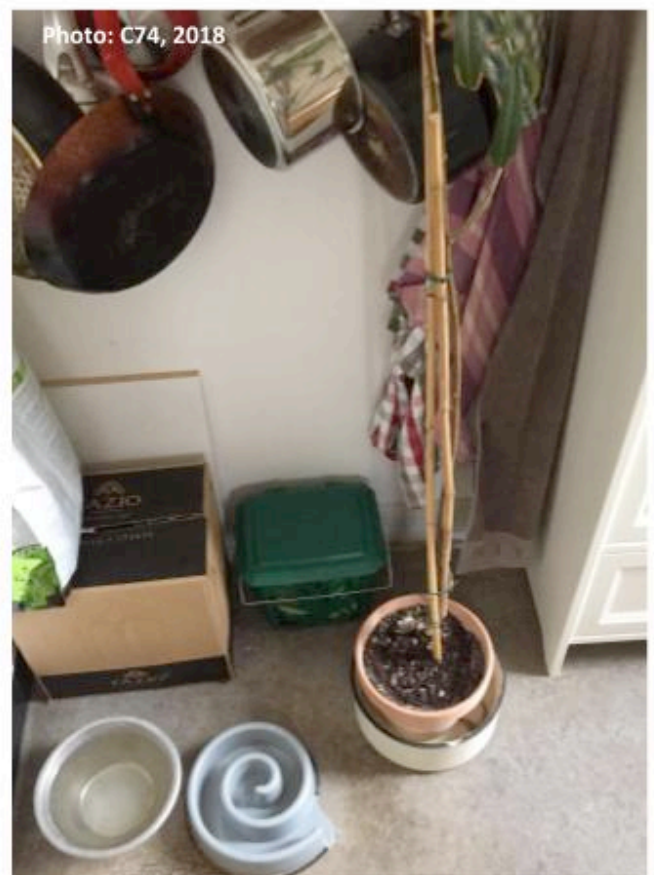
The picture shows N40s residual bin. He also sorts other types of waste, but this is unfortunately not depicted. N40 bought a used VIPP bin and have put a biobag in it, but seize to use it due to reasons described in the findings.

C74

Photo: C74, 2018



The pictures show C74's residual bin to the left. Bottom left, deposit bottles and glass are sorted. Bottom right shows sorted paper and cardboard and the delivered biobin's placement in plain sight on the floor. When C74 "inconsistently" sorts biowaste he uses the biobags without a bin and then empty is right awa. The latter is not regarded a problem since he has to go out and walk his dog several times a day anyway.



Appendix H. Narrative structuration

11 summaries of 1 page were made using narrative meaning structuration as suggested by Kvale (1997).

The summaries compile information from a number of data materials: a. the background information, b. the respondents' prioritised bullet-point list, c. the two piles (neutral, disagree) from the 22 statements, and d. the prioritised most-important matrix from agree pile.

The purpose of this document is to structure and clarify the data as part of the ad hoc analysis (Kvale, 1997). The following format falls under a narrative meaning structuration (Kvale, 1997). Here the analyst summarises and compiles information and experiences presented during the interview in small, condensed text bites. This makes it easier to comprehend and analyse various or even contradictory arguments from the respondents. This enables more context attentive analysis than e.g. categorisation or meaning condensation, that tends to isolate statements (Kvale, 1997). However, through combining these different methods of analysis, the findings become more verified since they are backed up by analyses by different methods. Also, the understanding of the findings tends to be deeper due to multiple methods.

The following information is provided for each respondent and its household:

- i: background information: ethnicity/birthplace, gender, age, civil status, household composition (total amount in household, cohabiting status,), apartment type, floor, waste shaft), highest completed education, main occupation. Other waste sorting.
- ii: View on BW
- iii: own list, prioritised
- iv: disagree statements/other from the piling exercise
- v: agree matrix
- vi: overall discussions, consistency between statements 1,2,3/agree-matrix, arguments raised regarding societal factors, relationship between factors and other argumentations (practical/societal/knowledge).

N40

N40 is a Danish man, born in Denmark, he is 40 years old, single and lives alone in his rental apartment on the second floor with waste shaft. He sorts deposit bottles, paper, cardboard, glass, batteries and bulbs. He also uses Craig's list, recycled clothes, builds his own furniture and have made his work place sort deposit bottles, batteries and bulbs. N40 has bought a new (used) VIPP bin and even put a biobag in it but **intentionally does not use it due to the negative publicity that demotivates him** (even a month after the interview¹³, See appendix G.)

He does not see biowaste as a resource or as any different than other waste, but recognises that he needs to start doing that.

He states **three reasons** for not sorting biowaste that in prioritised order are 1. Do not **produce enough biowaste to fill the biobin before it starts smelling** in the whole apartment, 2. Trust in whether it [the biowaste] even ends in a bio-gas plant, 3. Lack of motivation and confidence and trust to society.

He **disagrees** with statements like "laziness", "economic gain", "economy for money", any "logistics" to/from the courtyard container and "too time consuming". There are no statements he is neutral towards, but he does not understand the "knowledge" and "local knowledge".

The **most important reason for why he does not sort biowaste is that it smells**. This is connected to the fact that the bin is too large for his needs. He also agrees that wrong use of courtyard containers messes with *his* contribution, that he does not have a suitable sorting system and that he lacks routine/habit, but they are less important. Also he agrees with environmental impact, the mixing and space in kitchen, but these are prioritised "neutral" in the matrix.

He does not think that the problem lies in sorting or not sorting waste in our everyday, since he thinks that **there are way bigger problems in the world and out society**. Sorting waste gives a disillusioned idea of helping society and doing good, which, in N40s opinion stems from a hyper-capitalistic structure, where the "conscious consumer" can make a difference. He strongly disagrees with the latter.

He is **consistent in the factors contributing for him not sorting (smell, bin-size, takes him too long to fill the bag and then it starts smelling) and his lack of confidence and trust in society both contributes to and reinforce his non-sorting practice. Despite this, the low-practical factors are not that present in his overall argumentation for not sorting biowaste. What demotivate are national environmental policies that should not counter-act one's everyday actions**. Here the large structures (global inequality and capitalism), the big polluters and a "fucked up, desert-like" Danish agriculture sector and nature is the real issue.

The thought of global phosphorous cycles and the possibility [for Copenhagen] to be a good example for mega-cities motivates him. Still, he finds even these arguments naïve because he finds that if only one out of 100 kg of needed phosphorous come from sorting biowaste the 99% weigh more.

He would not mind if his waste shaft was closed and he recons that that would heighten the chance for him to start sorting biowaste.

¹³ knowledge obtained via text correspondence in connection with photos from his home. N sent links to two recent articles regarding food waste which reinforced his non-sorting practice, even though he was "SO close to start sorting" (personal correspondence)

J53

J53 is a Danish woman, born in Denmark, she is 53 years old, single and lives with her son every second week in her co-owned apartment on the third floor without waste shaft. She sorts deposit bottles, paper, glass, hard plastic, batteries, bulbs, and large-item waste. She sorts biowaste in her summerhouse.

She does not see biowaste differently than other types of waste, but she knows that there is a difference and that it can be used for other purposes.

She states four reasons for not sorting biowaste that in prioritised order are, 1. Requires a daily trip by the courtyard container, 2. Needs to be a lot of space for the many different waste bins, 3. The biobags breaks if it contains moist contents, 4. Do not have a lot of biowaste.

She does not disagree with any of the 22 statements, but she says disagree with the “indifferent” and “my effort” statement, she is neutral towards e.g. economical gains and distance to courtyard container (since it is the same place).

The **most important reason for why she does not sort biowaste is that it smells**. She has tried to use the biobin but then forgotten the full bag, so it started smelling. She connects her biobin to the disgusting, smelling, living container in her summerhouse that comes “crawling”. Also important are statements like a suitable sorting solution, room in kitchen and a physical condition since she has suffered from pain in arms and wrists. Less important is time spent by courtyard containers.

Overall, the interview discussions were connected to **low-practical reasons** for not sorting biowaste. She is **really inconsistent** in her reasoning and prioritisation. She mixes arguments like: room in kitchen, bin placement, the holes in the bin, amount of biowaste produced, smell and disgust. However, when carefully analysing her argumentation the following logic becomes clear: she does not produce enough biowaste to fill the biobin before it starts smelling or she forgets that she used it, she relates biowaste to the “living” container in her summerhouse, which she thinks smells and is disgusting, she therefore thinks that using the bin would require a daily emptying, which, in turn, is too cumbersome. A smarter sorting system in general (all fractions concerned) would facilitate sorting and remind her. She makes no relations to society or larger structures. She had good intentions about sorting biowaste and thinks that a biobin that was air-tight would help motivate her.

J53 states several times that she does not have room for the biobin in her kitchen and that she does not have a suitable sorting system, but observations in her kitchen showed that the biobin stood in plain sight on the kitchen floor – used for small recyclable glass items (see Appendix G)

C74

C74 is a Danish man, born in Denmark, he is 74 years old, single and lives alone (with his dog) in his co-owned apartment on the first floor without waste shaft. He sorts deposit bottles, paper, cardboard, metal, glass, hard plastic, soft plastic, biowaste, batteries, hazardous waste, bulbs, large-item waste, garden waste. **C74 actually sorts biowaste, but is not consistent with it. He stopped because he got fruit flies in the summer and it smells. The daily trips out with his dog helps him to take biowaste immediately.** However, his small amounts of produced biowaste means that it is often not enough to fill a bin before it starts smelling.

C74 sees biowaste as something that can be recycled somehow and it is different due to the end product of this recycling. He does not consider biowaste as different per se, because waste is waste, but some waste is “placed into different piles”. He was not brought up with any sort of waste sorting but relates it to a recycling trend that started with large festivals that started many years ago.

C74 states three reasons for not sorting biowaste, which prioritised are: 1. [Lack] habit from upbringing, 2. smell on warm days, and 3. fruit flies in periods.

He disagrees with statements like knowledge and mixture, laziness, personal economical gains, laws/sanctions, accessibility, bucket-size. He does not think biowaste sorting is the norm and clearly connects to close surrounding neighbourhoods where he has examples of non-sorting buildings.

The **most important reason for why he does not sort biowaste is that it smells.** Also important is negative media coverage and environment-for-value statement. Room in kitchen, suitable sorting system and habit/routine is less important.

He is relatively **consistent in his prioritised arguments, where biowaste’s smell is the most important reason for why he does not sort as well as the fruit flies that made him stop completely.** Also, negative media coverage and knowledge about local non-sorter buildings contributes to his non-sorting practice.

He thinks habits and knowledge about reason for sorting would make people do it as well as reducing negative stories.

K36

K36 is a Danish man, born in Denmark, he is 36 years old, single and lives alone (with his dog) in his co-owned apartment on the second floor without waste shaft. He sorts deposit bottles, paper, cardboard, metal, glass, hard plastic, soft plastic, batteries, hazardous waste, bulbs and large-item waste. He remembers biowaste sorting from his childhood compost and seeing the direct purpose from it back then, albeit it was mostly his mother's responsibility. He often gives his dog leftovers or food scrapes; he seldom cook so he does not produce much biowaste

He sees biowaste as something that can be utilised for a purpose – just like all other types of waste.

He states three reasons for not sorting biowaste, which in prioritised order are, 1. it starts smelling, 2. can't be bothered, 3. cumbersome to get new bags.

He disagrees with statements like "knowledge" because he has that, also laws/sanctions are "their own problem", also time, others' effort, mixing, design, room, suitable sorting system and economy and economical gains, despite he would like to have some sort of incentive, he does not like to do something and then not get something out of it or having someone else harvesting his effort. He does not find it cumbersome because he sorts other types anyway. He is neutral towards the physical condition and habit/routine where he states that he could easily do it, he just cannot be bothered.

The most important reason for not sorting biowaste is that it smells. Less important is it that he cannot be bothered to do so.

He is consistent in his arguments for not sorting, where the smell is the most important reason, followed by cannot be bothered. Yet, the societal factors definitely contribute to and reinforce his arguments, namely the fact that policies within agriculture and fishing are not serious enough and secondly, that the larger players, such as canteens and supermarket needs to join in on the biowaste collecting effort before he can be asked to do so.

Even though he has never sorted, he finds that it smells and that it is cumbersome to get new bags. It seems that the logic in his argumentation of smell and cannot be bothered is very closely connected to his small amounts of biowaste and thus the perceived time before the bin is full. If he were to go down with it before it starts smelling, it would be more often than all other types of waste and that makes it unmanageable – again related to his small amounts and weighing the effort. This is continuously paired with an annoyance towards the lack of effort from the "big players" and destructive policies when it comes to agriculture, fishing and the Danish nature in general.

The bin is placed in full sight on his kitchen floor, he sees it every day.

He states that he is neither indifferent nor unknowledgeable about biowaste and waste sorting, but he cannot be bothered to start before the big players also contribute.

He thinks that an incentive (not necessarily economical) would help motivate, he suggests swapping somehow for fresh vegetables.

M28

M28 is a Danish woman, born in Denmark, she is 28 years old, single and lives alone in her co-owned apartment on the first floor without waste shaft. She sorts deposit bottles, paper, cardboard, metal, glass, hard plastic, batteries, hazardous waste, bulbs and large-item waste.

M25 has tried sorting one type of biowaste (food scrapes after using her juicer) in the biobag, but then it still ended together with the other waste. This is partly because the courtyard container is not in the waste room she normally uses, but elsewhere.

She is aware that it is different but **in her everyday life she does not consider it.**

She remembers composting from her childhood, where they had a biobin, but it was further under the sink than the normal bin so it was mostly her mother who used it.

She states six reasons that contribute to her non-sorting practice, which prioritised are **1. Forgets to use it**, 2. Do not have a practical place to put the biobin, 3 can give unpleasant smells if one does not go down with it [the biobin-bag] in time, 4. laziness/feels impractical in the everyday, 5. the lid is impractical, 6. the bin is not nice to have standing in plain sight

She disagrees with statements like mess by courtyard container and others' use because she finds the garbage room nice and tidy and easily available, which is also why she does sort other types of waste. Also, she finds laws/sanctions is an odd statement, maybe it would help some, but it is definitely not why she does not sort, she also disagrees with the economical gains which she finds odd.

The most important reason for not sorting biowaste is that she forgets to use it. Also important are room in kitchen, unpractical/ugly bin, lack of routine/habit, smell, not a suitable sorting system, laziness. Less important are statements like time-use, knowledge and local knowledge.

Overall, M28 is consistent in her argumentation for why she does not sort biowaste, namely that she forgets, but in context, this is tied to the fact that the biobin cannot **stand anywhere practical in her designer kitchen.** She wants to use the biobin but simply forget.

She had not thought about it but she agrees that it would start to smell before she can fill the biobag since she does not produce a lot of biowaste and when she does, she forgets to use it or to empty it and then it gets sticky and smelly and "mvdr".

M28 finds that **waste sorting (as part a larger environmental awareness) is the norm** – especially in Copenhagen. She feels **guilty** when she sees other doing more for the environment and feels guilty over her laziness.

S32

S32 is a Danish man, born in Denmark, he is 32 years old, has a girlfriend but lives with a friend in his rental apartment on the ground floor *with* a waste shaft. He sorts deposit bottles, paper, batteries, dumpster dives and scavenger. S has tried to sort biowaste at home a few times, but then ended up throwing it into the general waste because he could not find the courtyard bio-container after it has been moved. He admits that he also have not really looked, since biowaste is not something close to his heart.

S32 sees biowaste as something organic, but also a bit unsure. Further, since he dumpster dives, he feels as if he has already saved the food he eats (and throws out) once.

He states three reasons for not sorting, prioritized they are **1. Cannot find it** [the courtyard bio-container], 2. lack of structure and surplus in my everyday life, 3. lack of motivation and spirit regarding the biobin.

He disagrees with statements like laws/sanctions because he thinks it is not sufficient to make environmental politic on a municipal level (e.g. sorting biowaste) when the national agricultural policies are not sufficient. He also does not think that it has that big of an impact on the environment. Statements like time, mixing, knowledge, laziness, media or norm do not affect him.

The most important reason why he does not sort biowaste is that he cannot find the courtyard container and since it has been moved it is too far away.

He also likes the idea of economical gain (he loves the deposit bottle) and explains that that helped him through a difficult time financially.

S is consistent in his factors that contribute to him not sorting: **cannot find the courtyard container**, lack of engagement in the biobin project and lack of structure/surplus in his everyday. Overall there are **two different levels in S32's argumentation. Firstly, there is the low practical, everyday level**, which he gives specific examples of (container availability, lack personal surplus and no connection to biowaste). Secondly, there is the larger political interest, capitalism critique and distrust for the system. These latter **societal arguments do contribute to his non-sorting practice, but does not reinforce them because S32 recognises the differentiation in levels and his low practical barriers.** S32 likes the biowaste sorting and sympathise with the project, albeit being critical towards the "conscious consumer" (meaning sorting global/national problems on individual level) is a capitalistic construct that he does not empathise with at all. He agrees with N40 that solving global and national problems on a municipal level seems pointless when you see all "the fucked up" things that happens nationally and internationally. That thought demotivates him a lot, but it is not the reason why S32 does not sort. **He is not indifferent about the subject at all, he is not indifferent about the local implications (his 5C bio-bus) but he is not impressed with the effort when you compare it to the larger picture.**

If he were to see some serious political action for the environment he would sort waste for the rest of his life.

S27

S27 is a Danish woman, born in Denmark, she is 27 years old, has a boyfriend with whom she lives with in their rental apartment on the second floor without waste shaft. Her household sorts deposit bottles, paper, cardboard, metal, glass, hard plastic and batteries. Her household has sorted biowaste when they first got it and was very excited about it – until they got fruit flies.

She sees biowaste as food products and as something very different than other types of waste. Her household would like to sort it, but the challenges made them stop.

She states five reasons for why her household does not sort, prioritised, **1. fruit flies surrounding the biobin** and inside it, 2. unpleasant smells before the biobag is completely full, 3. the lid is unpractical, 4. wondering about the fact that when you are trying to do something good for the environment and then the waste is driven far away to be burnt and the petrol being used, 5. the biobags smell

She disagrees with statements like the economical gain, local knowledge or knowledge, despite the fact that she has not sought after this either, but lacks a bigger perspective than her waste bin. She very much disagree that it is not the norm. Also, time, distance to courtyard container, routine/habit, laws/sanctions and room are not issues for her.

The most important reason for not sorting biowaste is that they get fruit flies when using the biobin. Also important is smell, doubt whether one gets enough environment for money with this solution (petrol use for transport) and that the lid is impractical. Less important is it that the bin is ugly and impractical and that the household does not have a suitable sorting system.

She is very **consistent in her argumentation regarding fruit flies as being the primary reason** as to why her household does not sort biowaste. She admits that it could connected to the relatively small amounts they produce and thus it takes long time before emptying and that is what makes it smell and attract fruit flies. She **distrusts what happens after she has sorted, which is mainly linked to the transportation of the waste** but also partly regarding lack of knowledge regarding later treatment.

She finds that the **municipality should brand the biobin differently**, marketing-wise, and use the fact that is it trendy and “super modern” to be environmentally friendly (inspiration Rains rainwear).

Aesthetics and design of another biobin would be a nice feature but that is not the reason as to why her household does not sort, it is because of the fruit flies and the smell.

H32

H32 is a Vietnamese woman, she is 32 years old and she is married and lives with her husband and her sister in their rental apartment on the fourth floor without waste shaft. Her household sorts deposit bottles, paper, cardboard, metal, glass, hard plastic and batteries. It is always her husband who takes out the trash.

She sees biowaste as ingredients and leftovers and something she has a lot of and produces every day since she cooks at home and eats with her family every day.

She states three reasons for not sorting biowaste, which in prioritised order are, **1. no warning/announcement in the building entrance to remind**, 2. lack someone to push, and 3. busy then forget.

She disagrees with statements like “time use” because it takes no effort, economical gain is wrong, that it is not good for the environment because she thinks so (albeit only to her indirectly), distance to courtyard container is the same, not smell because they produce so much it would be emptied often, she has not heard anything bad on news/media, she believes the municipality and waste workers are doing their job well, so she does not think that it gets mixed. Also, environment-for-value is wrong because all new innovations and investments cost in the beginning.

She is neutral towards whether it is the norm because she does not know if it is the case, also laws/penalties because she considers it her responsibility as well, the municipality has done their part, now it is up to her. Also, neither laziness nor lack room in kitchen since she already has a (messy) system for the other types of waste.

The most important reason for not sorting biowaste is that she lacks habit and routine. Also important is that there is no warning/announcement in the building entrance to remind. Less important is local knowledge and being busy, and she calls the latter a bad excuse.

Overall, H32 really wants to sort biowaste, she just needs a habit/routine that she thinks would come from a reminder/push, preferably from someone close, like a janitor. Even knowledge about her neighbours’ effort would motivate her. She is very consistent in her arguments since all she needs is “a simple push” and once she gets started, all the factors, reasons and arguments will become unimportant, because then she would sort and it will be a habit. She has no societal concerns, almost contrary since she has a lot of trust in the system and believes everyone is doing a good job – she just needs a push.

Z32&E35

Z32&E35 are a Turkish man, born in Denmark and an American woman, she (E) is 35 and he (Z) is 32 years old, they are engaged and live together in their co-owned apartment together with their two daughters who are one and two years old, they live on the fourth and fifth floor without waste shaft. Their household sorts deposit bottles, paper, cardboard, metal, glass, hard plastic, soft plastic, batteries, hazardous waste and large-item waste. They have never sorted biowaste because the biobin's arrival coincided with the birth of their second child.

E35 sees biowaste as food and leftovers. Z32 has never regarded biowaste as a separate waste type before but now he is starting to see its value as e.g. fertiliser and he is starting to see it as a resource and that it has value.

E35 states four reasons for why she does not sort, which prioritised are **1. one more thing to think about**, 2. cleanliness (germs and bacteria), 3. extra bags to transport down (tiny stairs), 4. don't like the biobin (openness).

Z32 states four reasons for why he does not sort, which prioritised are **1. room in kitchen both the bags and the biobin**, 2. when the solution was introduced, I did not know why it is good to sort biowaste, 3. when the solution was introduced, we had just had our second baby so we did not have so much surplus, 4. I like a tidy kitchen table (both as tidiness as such and also for example for rolling out a dough) and we do not have room in our kitchen cupboard.

Z32 disagrees with statements like lack of the solution's meaning for environment because he is more knowable now, also economical gains because that is not why he would do it in the first place, also laws/sanction because he thinks that would be counterproductive, he does not believe in prohibition but in engagement.

Z32's most important reason for not sorting biowaste is that he did not have enough knowledge about why it was good and important when it was first introduced. Also important are local knowledge, no suitable sorting system, no room in kitchen, laziness and that they got a child when it was introduced.

Overall, Z32 was quite inconsistent in his argumentation, which were both related to lack of knowledge (when the solution was introduced) but also room in kitchen and then the timing with the baby. He distinguishes between why they did not start and why he does not sort today – which are different reasons. He is very interested in the stories surrounding the biobin and he has become more and more convinced during the last year despite some negative media. He is extremely positive about the cyclic idea and he finds it “beautiful to think about” the fact that what you do comes back to you (e.g. as energy) and if you do not do something, then it will not return.

He is not dismissive for starting to sort, but it would take some practical changes as well as habitual ones.

J23&J25

J&J are two Danish men, both born in Denmark, one 23 and the other is 25 years old, they are brothers who live together in a rental apartment on the third floor without waste shaft. Their household sorts deposit bottles, paper, cardboard, metal, glass, batteries, large-item waste – all of it not 100%. J&J did sort biowaste for a few weeks when it first got introduced, but after J23 read an article describing the CO₂ emission related to the biowaste transport and after getting fruit flies, they stopped. J25 admits that he was “easily persuaded”.

J23 sees biowaste as something degradable and smelly. J25 agrees and adds naturally degradable. J25 has never (until the biobin was implemented) thought about biowaste as being different than other waste. He also does not feel bad about throwing it in the same bin as the rest because he know “he already gets something out of it”, by which he means heat via the incineration.

J23 states three reasons why he does not sort biowaste that prioritised are **1. there are no biowaste plants in Copenhagen.** The transport of waste out of Copenhagen emits more CO₂ than the savings. Therefore, it is better to drive it to Amager [the nearest incineration], 2. lack of space to hide the biobin, 3. do not produce enough biowaste to fill the bin before it starts smelling.

J25 states four reasons why he does not sort biowaste that prioritised are **1. small irritants regarding the biobin**, 2. doubts whether the municipality of Copenhagen’s biowaste sorting system is the most environmentally friendly/efficient solution, 3. Did not use it enough for it to be full fast enough so we got fruit flies, 4. no room to place it other than on the kitchen table

J23 disagrees with statements like laziness because he has to go down with the trash anyway, distance is also not a problem, economical gain because he does not think there should be. He is neutral towards statements like local knowledge, lack of routine/habit, enough for the environment J25 disagrees with the statements mixed, other’s effort, laws/sanctions, the norm, physical condition, economical gains. He is indifferent about time use, knowledge, distance.

J23’s **most important reason for not sorting biowaste is that one gets too little environment for money with this solution. Also important are no room in kitchen, not a suitable system, bin size and smell.** He agrees with “knowledge” and “get mixed” because he feels that this is the “story” that is told with this sorting system.

J25’s **most important reason for not sorting biowaste is that he does not have a suitable sorting system. Also important is it the bin size, environment-for-value, enough for the environment, local knowledge, room in kitchen.** Less important are media, routine/habit and smell. He also agrees that he might be a bit lazy sometimes.

The brothers are consistent in their argumentation for why they do not sort, but where J23 insist on the knowledge and environment-for-value, J25 is more concerned about the low practical elements (irritants and room). Overall, discussions revolved a lot about this one article regarding the CO₂ emissions contra the environmental benefit from sorting biowaste. The brothers relies a lot on (scientific) knowledge and in general distrust the current calculations and numbers (presented by the municipality).

They seem not to care that much, but they still agree that if they were convinced (by scientific arguments) they could live with the bin on their table. This points towards a rational based argumentation (with a hint of low practicality).

L26&J27

L&J are a Danish woman and man, both born in Denmark, she (L) is 26 and he (J) is 27 years old, they are a couple who live together in a rental apartment on the first floor without waste shaft. Their household sorts deposit bottles, paper, cardboard, metal, glass, hard plastic, soft plastic, batteries, hazardous waste, large-item waste – some of it only half (especially paper and cardboard). They used the bin for a few weeks in the beginning, but when it one day was placed back under the sink without a new bag, it have not been used since.

L26 sees biowaste as food or leftovers, but also knows that it can be many other things (coffee filters etc.) from the information pamphlet. She can see a huge difference between regular and biowaste when she reflects upon it, but normally she sees the two as the same thing. J27 sees biowaste as something that is often sticky. They **do not think that they produce that much biowaste**. They felt it was a **“waste of bag” if it was not filled**.

L26 states five reasons for why their household does not sort waste, prioritised they are 1. I do not want the biobin to stand out in plain sight because it **smells + looks messy**, 2. lack of room in relation to the bin’s placement, 3. because I have “build” a practice when I cut vegetables, 4. the provided bin is not very tall so one cannot “dump” the waste into it as with “the normal” waste-bin, 5. ... I actually perceive biowaste as regular waste

J27 states two reasons which are 1. **lack of room** for the little green bin in the kitchen, 2. the biobin’s shape and design – especially the lid.

L26 disagrees with the statements about biowaste sorting not being good for the environment, laws/sanctions, and others’ use. She does not care about statements like laziness, economical gains, environment-for-value, distance to courtyard container. Also, the “myths” (media) has maybe affected her

J27 disagrees with statements like time, economical gain, environment-for-value, laws/sanctions, norm (has never thought about a waste norm). He also has a pile that “might be right” but that are not his reasons for not sorting, these are smell, a bit lazy

L26’s **most important reason for not sorting biowaste is that she lacks habit and routine. Also important are smell, knowledge (needs myth-busting), no room in kitchen, not a suitable sorting system**. Less important are mess by containers, time use, bin size. Agrees, but neutral, are laziness, mixed, local knowledge.

J27’s **most important reason for not sorting biowaste is that he does not have room in his kitchen. Also important is no suitable sorting system, and lack of routine/habit**. Less important is the bin’s shape and design.

They are both relatively consistent in their argumentation for why they do not sort biowaste. For L26 it is a bit more about the smell and habit, but they both agree that they do not have room for the bin in their kitchen because it looks messy and it is disgusting to have waste on the table. **There are a few mentioning of “myths” about the waste (gets mixed, long transportation) but they do not seem to contribute to their non-sorting practice. The non-sorting practice here is neither straightforward nor causal, however, affected by a mixture of aesthetic, everyday practice and practicalities (mostly room)**.

J&L are not indifferent towards biowaste sorting, on the contrary, they state directly that it is not because they do not want to, there are just a number of aesthetic and practical factors (the lid, the size, room, placement) with the current biobin that does not fit into their kitchen. Both agree that information about a different (prettier, cleaner) biobin could make them sort.

Appendix I. Consent form

The consent form was provided prior to all interviews and confirmed orally.

Orientation and consent to interview about waste sorting

The study's aim

The interview is a part of my thesis in Environmental Studies and Sustainability Science at Lund University, which deals with arguments from people who do not sort biowaste. The study aims at providing insights from your arguments to give a more accurate, nuanced and detailed picture of your decisions. Insights from the study can provide useful knowledge to stakeholders, knowledge institutions or parts of the municipality who work with waste management

Good to know

Why have you been chosen?

Because you have interesting insights and important knowledge about the subject matter; you have first hand experience about not sorting biowaste. You have further been chosen because you live in an apartment building in the capital region.

Confidentiality, anonymity and publication

I guarantee full confidentiality with personal information and confidential treatment with insights provided during the interviews. The material is treated anonymously and no data or insights will be traceable to individuals. Raw data is not distributed to third parties. It is volunteer to participate in the interview and there are no risk connected with participation. This is exclusively a scientific study without any commercial interests or obligations.

The interview is tape recorded for note purposes only. The recordings are treated with confidentiality.

The thesis will be published.

Consent

Oral confirmation that you agree with the above.

If you have any questions or comments are you welcome to contact me on [telephone number removed in publication] or [mail address removed for publication].

Thank you for your time!

Kind regards,

Stephanie Touveneau Petersen

Stud. MSc. Environmental Studies and Sustainability Science, Lunds Universitet



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Appendix J. Table of personal communication with stakeholders

Table 4. Table of personal communication with stakeholders

Person	Title and organisation	Relevance for thesis	Form of communication
Ane Kollerup Nielsen	Project leader, Waste and Recycling, City Development, TMF	Project leader on and ordered reports regarding biowaste sorting.	Mail correspondence
Jens Borregaard	Project leader, Waste and Recycling, City Management, TMF	Provided key knowledge on latest numbers on percentage of Copenhagen biowaste non-sorters.	Mail correspondence
Anders Kiil	Contract responsible, Waste and Recycling, City Management, TMF. Now Vestforbrændingen	Personal communication informed key elements for research interest. Helped connect to other stakeholders.	Mail correspondence and interview
Emilie Müller	Project leader, Resource team and AC-technician, Circular Economy and Waste, Miljøstyrelsen	Attempted to get information on the group of non-sorters, but all she had was the report with the personas.	Mail correspondence
Niels Toftegaard	Communication consultant, Danish Waste Association	Danish Waste Association is an interest organisation representing xx households on a national scale. They work with knowledge production and communication on the waste sector for its members as well as the general public.	Mail correspondence and interview
Karin Storkholm	Waste coordinator, Waste/Recycling, Vejle Municipality	Vejle has sorted biowaste for over 30 years and are often mentioned as “best case” example. They helped with some information, but since they mostly have houses, the numbers’ relevance were limited.	Mail correspondence
Emilie Stuhr Andersen	Project leader, Is It A Bird	Author of a report that was ordered by TMF and contained valuable information for the thesis.	Mail correspondence
Annelise Ryberg	Co-founder, Trashypeople	Author of a report that was ordered by TMF and contained valuable information for the thesis.	Mail correspondence

Note. Teknik og Miljøforvaltningen (Copenhagen Municipality’s Administration for Technology and Environment) is abbreviated TMF in the table. Miljøstyrelsen is the Danish Environmental Agency.

Appendix K. 11 households' most influential factors contributing to non-sorting practices

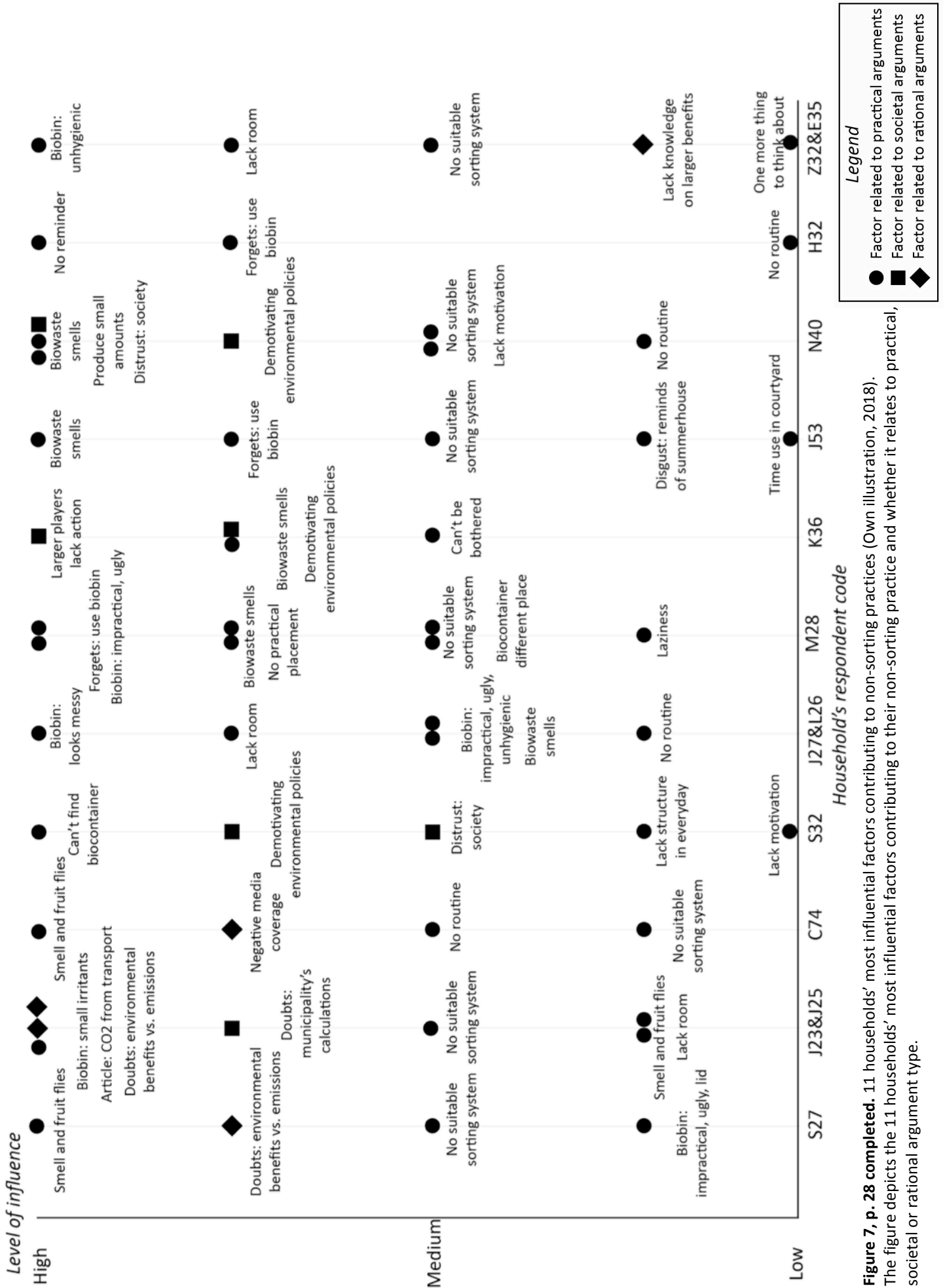


Figure 7, p. 28 completed. 11 households' most influential factors contributing to non-sorting practices (Own illustration, 2018). The figure depicts the 11 households' most influential factors contributing to their non-sorting practice and whether it relates to practical, societal or rational argument type.

Appendix L. Terracotta bio waste container



Photos: Amazon.com, 2018

Here, an example of a differently designed biobin is shown. It is naturally debatable whether it is aesthetic and it is very subjective whether citizens would find this to fit into their kitchen, but it does suggest an alternative. This design, however, fulfils several of the design requirements put forward in the list of recommendations: it is sealed and air-tight which makes it seem more hygienic; it can stand on the kitchen table; you cannot see the biobag; you can take the lid off; there is ventilation enough to avoid bag-decay. Lastly, but importantly, the air filter in the lid is designed to reduce smell and fruit flies.



Photo: Own illustration, 2017

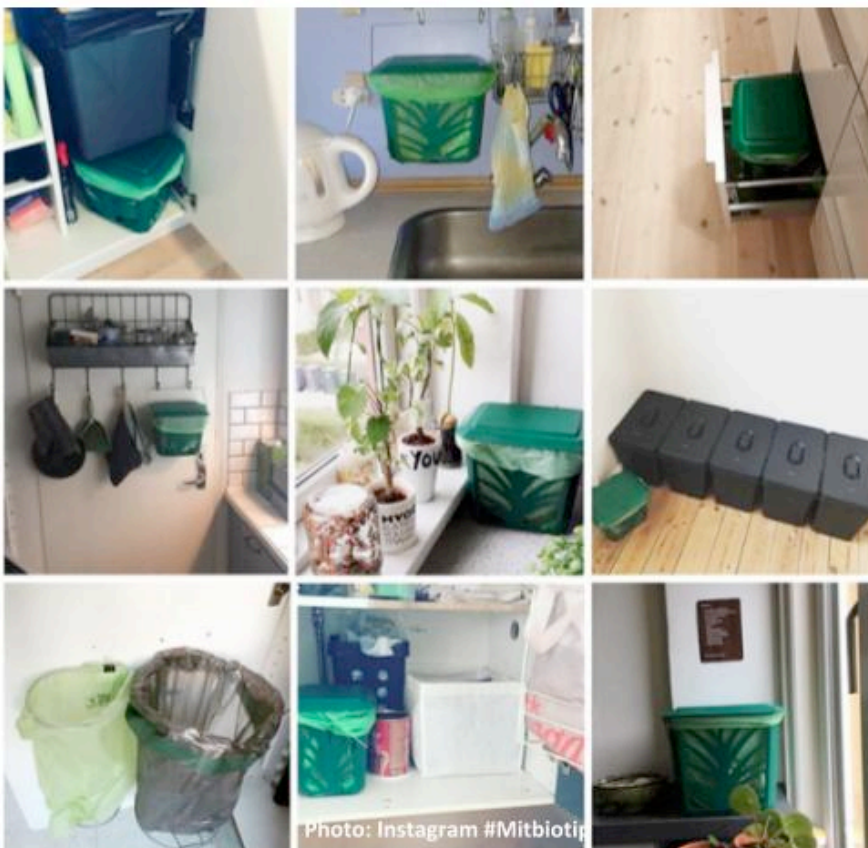


Photo: Own illustration, 2017

Alternative uses of the biobag and ideas placement of biobin on Instagram at #Mitbiotip

The pictures show further alternatives for biobins. The two top pictures, however, do not live up to most of the design requirements mentioned on the page above.

The bottom picture shows pictures of placements of the biobin as part of Copenhagen Municipality social media profile on Instagram with the hashtag "my bio tip" (#mitbiotip).



koebenhavnskommune • Følger
Copenhagen, Denmark

koebenhavnskommune TAK, for jeres sjove, smarte og gode bio-tips! 🌱 Skal du være den heldige vinder af et års forbrug af frugt og grønt? 🍏🍎🍇 Post et billede af hvor du har placeret din grønne bio-kurv og brug hashtagget #mitbiotip. Vi har forlænget konkurrencen til d. 27. november, så endnu flere kan være med 🍀

Indlæs flere kommentarer

koebenhavnskommune [redacted] e Tjek evt. udrulningsplan på kk.dk. Vi ruller ud så hurtigt som muligt 🍀

koebenhavnskommune [redacted] Tjek evt. udrulningsplan på kk.dk. Vi ruller ud så hurtigt som muligt 🍀

[redacted]

[redacted] lidt vaede ind du prøver at åbne dem

🍀 🔍 📌

340 Synes godt om

12. OKTOBER 2017

Tilføj en kommentar ...