Incentives for scientific research participation

An enquiry into which incentives are perceived to work best in motivating people to participate in scientific research.

MSc Thesis – Olaf Schüsler

TU Delft

Incentives for scientific research participation

An enquiry into which incentives are perceived to work best in motivating people to participate in scientific research.

By

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MASTER OF SCIENCE

In Science Communication

Thesis committee:

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Preface

In 2014, during my first year of studying psychology at Tilburg University, credits for some subjects were only awarded if we participated in actual scientific psychological research.

The respondents for these studies consisted mainly of first-year psychology students, who at that time were predominantly female. As the intended population for the studies was Dutch citizens in general, I consulted my statistics professor about the representativeness of these students. In this discussion we addressed the subject of the availability of research participants and how to reach them. This set me on the path of "how to motivate a Dutch citizen in participating in scientific research", which became the subject of my research in the field of science communication.

Acknowledgements

I would like to thank everyone who has supported me during this study. Special thanks to my wife Andrea, who motivated me to complete my studies and for her help and encouragement throughout the project. Also, many thanks to my parents, both of whom read and corrected my thesis many times, were a constant source of support and gave me invaluable advice. Furthermore, many thanks to Christine Catlender for proofreading this thesis. Many thanks also to everyone who supported me during this study but who I have not mentioned by name.

Finally, my sincere gratitude to my committee for supporting my research.

Executive summary

In social sciences, most studies are conducted with the aid of research participants. However, 96% of these studies are conducted with "WEIRDos " (people from western, educated, industrialised, rich and democratic societies; Henrich, Heine, & Norenzayan, 2010). Furthermore, when evaluating samples used in research, it can be seen that many researchers, e.g. in psychology, rely on students. Since these (WEIRD) students usually differ in characteristics from the average citizen conclusions based on their responses might be skewed. To prevent these incorrect conclusions, more representative samples, valid for the intended population of a study, need to be achieved.

One can wonder why non-representative samples are used in the first place. This could be due to the difficulty of having ordinary citizens participate in research. One of the most likely reasons for this is the inability to motivate potential research participants. This study therefore focused on the problem of how to motivate potential participants into participating in scientific research.

However, in order to solve this problem, it first needed to be determined how potential participants can be motivated. This can be done, for example, by external stimuli such as incentives. The goal of this study thus became "to get a better insight into which incentives motivate potential participants best into participating in scientific research". Several research fields already focus on the motivation of citizens; e.g. economics, psychology and sociology. In order to solve this problem, a better understanding, based on theories from these three fields, needs to be gained into which incentives to use when attempting to motivate potential participants in taking part in scientific research. This resulted in the research question that this paper attempted to answer: "Which economical or psychosocial incentives do potential participants perceive as motivating them most in being a participant in citizen science research?"

This research question was furthermore split up in various sub-questions. First, incentives for the various fields of study were researched and answer the sub-question "[w]hich incentives will work best according to scientific research in economics, psychology and sociology?". These incentives were then used in a quasi-experiment which answers "[w]hich incentives do potential participants perceive as being the most motivating?". These sub-questions resulted in "topic of research" and "monetary incentives" as the most prominent incentives, with some remarks.

Methodology: literature study, expert interviews and quasi-experiment

In the present study, triangulation was used in drawing up a list of incentives. Firstly, literature studies were conducted, both to determine which incentives were defined in the fields of economics, psychology and sociology, and also to find a motivational theoretical framework for the given incentives. Secondly, experts from various research fields were interviewed, both on their views on the incentives and on which theoretical framework they considered provides the best description of the incentives. Finally, a quantitative quasi-experiment was conducted. In this experiment a questionnaire was used to determine respondents' basic psychological needs and which incentive they would prefer. For this survey, potential participants from two towns in The Netherlands were invited, in order to obtain a sample that was representative for the Dutch population.

To determine the effects of the various incentives, these incentives were mapped to the different basic psychological needs. At first, this mapping was based on descriptions of the incentives in the respective literature and in which sense these descriptions could be related to the descriptions for the psychological needs. Later, this mapping was analysed by means of the statistical test MANOVA.

Results

As the number of respondents was too low for statistical analyses, no significant results could be found. However, using frequency analyses and descriptive statistics, insights into the preferred incentives could be given. Most participants preferred either a research topic that they found interesting, or monetary incentives. Furthermore, the topics that participants found interesting were qualitatively analysed, with the outcome that the research topic should be relevant for a participant.

Conclusions

Before answering the main research question, both sub-questions need to be addressed. The first sub-question relates to knowledge already present in literature and known to experts about which incentives work best in scientific research. This resulted in a prioritised list of three incentives: monetary incentives, outcome of the study and whether the size of the reward was equal to or more than the size of the request. The second sub-question used this list as input and provided answers as to which incentives potential participants would prefer. Since insufficient participants responded, no significant results could be determined. However, using frequency analyses, a list of preferences could be compiled, which showed research topic and monetary rewards to be the most preferred incentives.

Scientific relevance

This paper offers insights into both incentives and motivation for participating in scientific research in general. Since the goal of this thesis was to provide a list of possible incentives that could motivate potential participants to partake in research, a list of possible incentives from the different research fields was compiled and prioritised based on input from experts. Both lists can be used for a better understanding of participants' preferences in how they can be motivated.

Furthermore, as mentioned before, the incentives were mapped onto the basic psychological needs of the Self-Determination Theory (SDT). Although the effects of the various incentives could not be significantly quantified, these effects could give more insight into the quantification of basic psychological needs. Based on future research, with more power, the hypothesised effects might be a first step to better understanding and quantifying motivation. Higher power would have been achieved with more respondents. However, the limited number of participants in this study might have been due to the setup of the study. For example, the note from an unknown person with a link in it might not inspire trust, and would require the potential participant to act. In further research, this method should be addressed, for example by means of a double-blind study.

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1. Introduction

Psychology students are often confronted with an obligation to participate in research. According to Henrich et al. (2010), a large part of research in Western social studies uses students in order to include enough participants (appendix A). 96% of all studies is conducted with WEIRDos (people from Western, Educated, Industrialised, Rich and Democratic societies). For example, at Tilburg University in 2015, 87% of the first-year psychology students were female, predominantly of Dutch nationality and around 18 years old. Statistics like this primarily raise the question of why this type of sample is used, since the conclusion for research based on these samples can only really be: "Young Dutch females think ..." rather than "Dutch people think ..." or even more generic "People think".

1.1. Necessity for large-scale studies

The practice of primarily inviting students might very well be due to the nature of large-scale, questionnaire-based studies. However, if this is an implicit consequence of methods that rely on large samples, the question could be raised whether different methods would not be better suited for science communication research. The field of science communication however is based on complex psychological constructs (Fischhoff & Scheufele, 2013), which necessitates insight into the human condition, called introspection. For introspection, some form of questionnaires or interviews could be used best, since a combination of several questions should be used to gain the desired insight. Furthermore, large samples are necessary for randomising interhuman variability. However, since interviews can be extremely time consuming, especially when dealing with large groups of participants, questionnaires are usually the method most suited to this type of studies (Marks & Yardley, 2004). Due to difficulties in finding sufficient research participants, this invariably leads to using participants that are easier to reach, in this case psychology students (Henrich et al., 2010).

1.2. Risks of using students as research subjects

Using psychology students as research participants has several downsides (McCray, Bailly, & King, 2005). One of these is that psychology students could pose a risk to the validity of the study because of their relationship with the researcher/teacher (Rosenthal, 1965, p. 2), as they might be more susceptible to various cues from the researcher. One of the risks caused by this susceptibility is a tendency to provide socially desirable responses (SDR; Steenkamp, De Jong, & Baumgartner, 2010). While participants might give socially desirable responses due to their relationship with the researchers, they might also switch between various forms of SDR. These can vary from egoistic response tendency (ERT) - satisfying their need for power, achievement, mastery and control - to moralistic response tendency (MRT) - conforming to social norms and valuation of relationships (Steenkamp et al., 2010). This could mean that results could be either skewed or completely erroneous.

Furthermore, psychology students know what to expect from different types of research. Since students are expected to study both landmark studies and research in general, they generally know how to interpret certain questions. For most academic studies, students attend courses in which they are taught the ins and outs of research in their fields, such as how to formulate questions in order to avoid SDR. This is the same field in which the studies are conducted (Mook, 2001). Personal experience has shown that this way, students can predict the purpose of at least some of the studies that they participate in. This too, can lead to influenced or biased responses, which (partially) invalidate the results (Henrich et al., 2010; Pagan, Eaton, Turkheimer, & Oltmanns, 2006).

Finally, students understand the importance of research and are more willing than the general population to participate in studies. Some individual courses, as well as some universities, even make participating in research programmes compulsory. At Tilburg University for example, all first-year psychology students need to participate for at least twenty hours in psychological research. These students are either self-selected or obliged to participate in research. Volunteers however have different characteristics from the general population, for example in "need for social approval" and "level of education" (Rosenthal, 1965, pp. 10-12), resulting in selection bias. Lönnqvist et al. (2007) furthermore focused on a difference in personality, finding differences on the 'Big Five' personality scale (Barrick & Mount, 1991) (openness to experience, conscientiousness, extraversion, agreeableness and neuroticism). Volunteers primarily differ from non-volunteers in neuroticism and conscientiousness, with the former being lower and the latter higher for volunteers. Another interpretation for the differences between volunteers and non-volunteers can be found in a difference in the need for social approval, on which volunteers score higher. However, this also results in more desirable responses, especially on personality measures.

The responses from compulsory participants might also not reflect their real position. Since accuracy depends highly on availability of cognitive resources (Kenrick, Neuberg, Cialdini, & Cialdini, 2010, p. 125), and compulsory participants might not want to use more cognitive resources than necessary, they might not be accurate. This would result at best in inaccurate answers and in a worst-case scenario in insincere responses.

This form of sampling, convenience sampling - a type of non-probability sampling method where the sample is taken from a group of people who can easily be contacted or reached (Saunders, Lewis, & Thornhill, 2009) -, is in this case only a symptom of a larger problem, namely the inability to find people to participate in scientific research. This problem might lead to using participants that are not representative for the intended population, but just easier to recruit.

1.3. Topicality of the problem

To determine whether this is a recurring problem, nine historical landmark papers, some cited well over 2000 times, which are often mentioned in psychological courses, were reviewed. None of these papers repeated their inclusion and exclusion criteria in the discussion. Although five of the papers (Aronson & Mills, 1959; Cialdini et al., 1975; Darley & Latané, 1968; Festinger & Carlsmith, 1959; Milgram, 1963) only drew their conclusion specifically based on the sample, the other four papers (Buss, Larsen, Westen, & Semmelroth, 1992; Dutton & Aron, 1974; Gilbert & Ebert, 2002; Gilovich, Medvec, & Savitsky, 2000) generalised their conclusion to people (e.g. "the study presented here supports our contention that people tend to...") (Gilovich et al., 2000). It is noticeable that three out of these four papers were written since 1990, while the other six were written between 1957 and 1975, suggesting that using convenience samples might be an upcoming tendency in psychology.

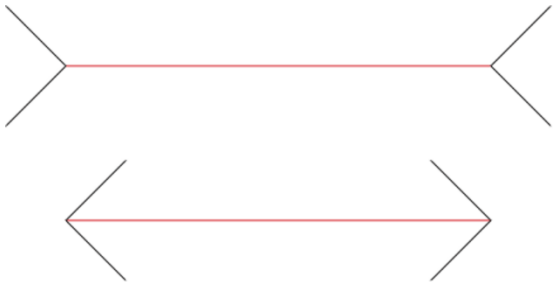

Figure 1: Müller-Lyer illusion. The red lines are the same length, although many people perceive the upper line to be longer

Henrich et al. (2010) finally also state that by selecting only respondents from WEIRD societies, results might become skewed. One of the examples the authors present is the well-known Müller-Lyer illusion (Figure 1). Many studies (Festinger, White, & Allyn, 1968; Judd, 1905) have shown that for various reasons, these lines are perceived to be different in length, even though they are actually the same length. This perception, however, does not seem to be the case in cultures that are not accustomed to the "carpentered world" (Pollnac, 1977), for example South-African miners. This example is rarely researched, even though it has a major impact on how we perceive the human perceptual system, leading to potentially false generalisations, which in turn result in (partially) incorrect scientific conclusions.

1.4. Citizen science

In the research community, both the concept of scientific citizenship (Irwin, 2001) and citizen science (Davies & Horst, 2016) have been making an advance (Newman et al., 2012). Although literature sometimes refer to the two as synonyms (Woolley et al., 2016), they are not. Scientific citizenship is "produced and negotiated within any space in which science is collectively encountered and its governance or direction debated", while "citizen science may also refer to projects that build on public participation and engagement, using techniques taken from deliberation or dialogue to enable laypeople to set priorities for, and directly participate in, the practice and agenda-setting of science" (Davies & Horst, 2016). This means that scientific citizenship can be framed more as scientific democracy (Irwin, 2001) while citizen science can be framed as "involvement of non-scientists in scientific research" (Oberhauser & Solensky, 2004, p. 11). Since this study attempts to determine how to achieve samples that are representative for the intended population by getting non-scientists to participate in scientific research, the term "citizen science" was opted.

Citizen science can be described using a two-axial system (Figure 2). An important aspect is that the role of the citizen can differ, based on who the knowledge producer is (Schäfer & Kieslinger, 2016). This can either be scientists, or citizens, which means that citizens can either take the role of the knowledge producer, or, for example, of data collectors. If the role of knowledge producer is fulfilled by citizens, collaboration with scientists is mostly reduced to a minimum, for example, only for validation. This means that the influence of the public increases when moving up along the y-axis.

Originally, input from the public was geared towards professional scientific research. Nowadays, research is not only geared towards answering scientific questions, but can also focus on socio-ecological questions (Schäfer & Kieslinger, 2016). According to the authors of the model, these questions arise from society, which means that, as with the various roles a citizen can have, citizens can also influence research by addressing their own issues. For example, there are community based projects in which water and air quality or the dispersion of acorns was monitored by citizens (Conrad & Hilchey, 2011; Dickinson et al., 2012). These studies are an example of studies in which citizens participate as data collectors and can be placed either in the action projects in the top right corner, of be set up as a "co-created project" in the centre of the model. Furthermore, as already stated, citizens are also used as participants in research with a focus on answering scientific questions. Examples span from providing data for medical research, for example by taking experimental medicine, and analysing NASA mission data or the folding of proteins, by providing the mathematical power of your PC when idle (Woolley et al., 2016), to staying in a cave for 127 days to research whether circadian cycles are indeed 24 hours, when deprived of any day-night input (Mills, Minors, & Waterhouse, 1974). These researches vary from "volunteer computing" to "contributory projects".

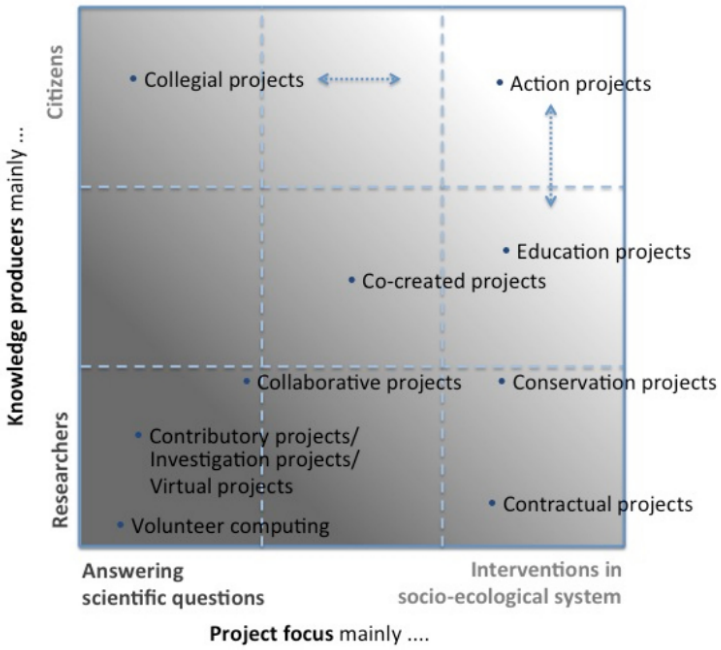

Figure 2: Axial system reflecting types of citizen science projects as defined by Schäfer & Kieslinger (2016).

This study will mainly focus on citizen science, with researchers as the main knowledge producers. Furthermore, the main project focus will be on answering scientific questions, since the problem to be solved is how to motivate citizens to participate in scientific research.

1.5. Reason for convenience sampling

As set out above, in most psychological researches, samples that were not representative for the intended population were used. However, to have a representative sample, citizens from the entire intended population need to participate in the scientific research. This means that citizen science for this population is required. There are several possible reasons why these potential participants cannot be found. Either researchers are looking for an easy solution, or it is difficult to find sufficient participants. For the latter, three different explanations exist: potential participants do not understand the request, do not understand why scientific research should be done in the first place or are not motivated to participate. The latter two explanations both concern motivation of participants, either intrinsic (wanting to participate in research) or extrinsic (being rewarded for participating).

In research, some people will always participate while some will never participate. However, a third group exists, people who sometimes participate and sometimes don't. Assuming that the researcher is not to blame for the use of convenience sampling, one can conclude that this is due to the difficulty of finding sufficient participants, either because of the lack of understanding of the necessity of research, or because of lack of motivation. In the former case, when designing the research, the researcher has to consider the interest in the research topic (or potential lack thereof), as well as the intellectual capacities and views of the potential participants. In the case of a lack of motivation, Hans Hoeken (introduced in section 2.3) states (d.d. 22-07-2015) that there are three aspects that influence motivation:

1. the personal distance from the potential participant to the researcher - the better you know someone, the more likely you are to grant a request -
2. the size of the request - the more someone asks of you, the more reluctant you will become -
3. the size of the reward - the more there is in it for you, the more likely you will agree.

Firstly, according to this model, the highest possible compliancy, via interpersonal distance, can be reached if the researcher primarily asks potential participants that have a close connection to him. However, by doing so, the researcher will again only ask participants who are easy to reach and are quite possibly not a representative sample. By doing so, the research will run the same risk as before. Secondly, maximizing the number of potential participants by downsizing the request might also prove difficult due to the design of the study. The request requires the participant's time or effort, e.g. the time a questionnaire or experiment takes to complete, which is directly related to the research question. For example, when measuring personality traits in communication research, using the NEO-PI-R method (Gosling, Rentfrow, & Swann Jr, 2003), which consists of 300 questions, this takes at least 20 minutes to fill out. This leaves only the question of the reward, which can be used as an incentive, "an external stimulus, such as a condition or an object, that enhances or serves as a motive for behaviour" (VandenBos, 2018), for participating in the study. When researching such (potential) incentives, research from fields that focus on understanding human behaviour, such as economics, psychology or sociology, can be used to determine which conditions might persuade citizens best to participate in scientific research.

1.6. Goal

The goal of this study is therefore to gain a better understanding into which incentives to use when trying to motivate potential participants in participating in scientific research, based on theories from the fields of economics, sociology and psychology. When assessing which incentive works best, one can either measure the objective effectivity of the various incentives - i.e. which percentage of participants participate in a trial when presented with an incentive - or ask the potential participants which incentives, in their opinion, are more favourable. The latter will be used during this study, resulting in the defined goal: "obtaining a better understanding of which economical, psychological or sociological incentives potential participants prefer when being motivated to participate in scientific research".

1.7. Research questions

To gain this better understanding, the following research question needs to be answered: "Which economical or psychosocial incentives do potential participants perceive as motivating them most in being a participant in citizen science research?". However, this question can be broken down into the following sub-questions:

1. Which incentives will work best according to scientific research in economics, psychology and sociology?
2. Which incentives do potential participants perceive as being the most motivating?

1.8. Outlook

These questions will be researched using a questionnaire in which potential participants are asked which incentives they would prefer and which basic psychological needs they experience. The responses will furthermore be analysed by means of MANOVA, frequency analyses and descriptive statistics.

Firstly, in chapter 2, the methodology, briefly discussed above, will be described, ranging from materials used to statistical analyses. In the next chapter (chapter 3), a theoretical framework will be determined, based on interviews with experts, and a literature study into incentives and frameworks. This leads to chapter 4 with the results of the quasi-experiment, about which a conclusion will be drawn in chapter 5.

Finally, chapter 6 will contain a discussion in which the positive and negative aspects of the chosen approach are evaluated, whether this study has contributed to the field of Science Communication, and if so, to what amount, and what future research could potentially focus on.

2. Methodology

In this chapter, the various techniques used in answering the research question are detailed. Firstly, the queries for the literature searches, theoretical framework and incentives, are specified. Secondly, the selection criteria for the interviewees are given, followed by the quasi-experiment. For this experiment, the sample used, materials and statistical analyses are described.

2.1. Theoretical Framework

In order to answer the research question, a conceptual framework was first constructed, followed by a quasi-experiment based on this framework. This framework was based on both a priority list of incentives and a motivational theory. This motivation theory acted as an overall theory for the incentives. For these incentives, another literature study was conducted, listing all possible incentives from the research fields specified above. These incentives were sorted, based on the number of occurrences of the incentive in the literature. Next, the motivational theory was researched. This theory was used to map how the potential participant is motivated by his preferred incentives. After the overall theory was selected, the incentives from the collective list of incentives were mapped to the various aspects of the overall theory. This mapping was first based on theoretical insights, and later quantified, based on the quasi-experiment. This provided more insight in which participant (mostly) prefers which incentive, based on, for example, how motivated he is.

2.2. Literature study

All material for the literature study on incentives was gathered from PsycINFO, with a focus on English language journals and papers. The keywords with which the queries were constructed, are the three fields that were researched - economics, psychology and sociology - in combination with “incentives”. This resulted in, for example, the following query: “economics” AND “incentives”. The results for these queries can be found in Appendix B. Furthermore, the combination of “scientific citizenship” and “incentives” was also researched, however this did not yield any useful papers.

The abstracts of the collected literature were examined first, followed by a more thorough study of the contents of the paper. The incentive(s) described in the various papers were recorded, whether there were significant results in the respective research or not. After selecting an incentive, it was classified as either an economic or psychosocial incentive.

The overall theory for this study was determined, both by examining consolidated literature used in social psychology at Tilburg University, specifically about motivating people, and by consulting experts. Possible motivational theories obtained from both the literature searches and the consultations were combined, from which one theory was selected. This was done by examining whether all incentives from the selected list could reasonably be mapped to concepts of that theory.

2.3. Interviews

After the literature study, experts from relevant research fields were asked to review the list of incentives, whether they agreed on its relevance and which incentive they thought would be most relevant. These experts were selected from the fields relevant to this study: communication science, economics and social psychology. For this selection, a list was drawn up of the universities in the Netherlands that offer studies in at least one of these fields. From these universities, all departments were selected that specialise in one of the areas. Based on the description of the department, it was assessed whether they did enough research on motivation to be included. A list was compiled of the staff members of all these departments and their fields of research/expertise evaluated.

This resulted in an initial list of experts. Due to scheduling issues, not all experts could be interviewed, but replacements were proposed.

- Marcel Zeelenberg, Economical Psychology, Tilburg University
  Marcel Zeelenburg researches the influence of emotions on economic behaviour. Furthermore, he has researched jealousy, envy, guilt, pride, anger, greed and especially regret and disappointment. Currently, he focuses on financial decisions concerning pension and insurances.
- Hans Hoeken, Persuasive Communication, Radboud University Nijmegen
  "Hans Hoeken's research interests cover the broad field of persuasive communication. He has studied the concept of argument quality, addressing the question of what characteristics can make an argument strong. He has also focused on the persuasive effects exemplars may have through the exemplification processes."
- Daniel Balliet, Social Psychology, VU University
  "[Daniel Balliet's] research focuses on cooperation and conflict resolution. To date, [he] has approached the study of these topics by primarily examining the proximate causes of cooperation; including features of both the situation (e.g., communication, incentives, and self regulatory failure) and person (e.g., social value orientation, trust, concern for the future, and gender). [He] also studies forgiveness as an important motivational process in conflict resolution."

Of these three experts, Marcel Zeelenburg and Daniel Balliet were not available. Daniel Balliet was replaced by a PhD student he proposed, Wu Junhui, at the VU University of Amsterdam. Marcel Zeelenberg was replaced by Robert Dur.

- Robert Dur, Behavioural Economics, Erasmus University Rotterdam
  Robert Dur's research interests are in Reciprocity and Incentive pays and the way these influence the behaviour of people.
- Junhui Wu, Social Psychology, VU University
  "[Junhui Wu's] research interests include (a) social value orientation, (b) gossip, reputation and indirect reciprocity, (c) prosociality, trust and cooperation. Under the supervision of Dr. Daniel Balliet and Prof. dr. Paul van Lange, and financially supported by China Scholarship Council (CSC) and VU University Amsterdam, [her] Ph.D project mainly focuses on (a) the social functions of gossip and reputation in promoting trust and cooperation, and the potential mechanisms underlying these effects, (b) how and in what situations gossip can be a more efficient social control system to promote and maintain cooperation."

This resulted in a list of academic researchers whose focus is on the motivation of people based on theories from their fields of expertise. These experts were interviewed individually on their view on the research problem and which incentives they thought would be best suited to motivate people in participating in (recurring) research.

Since all three academic experts were unable to shed light on which incentives will probably work best, another expert's opinion was asked. This expert was selected from research firms who have experience in recruiting research participants and possibly with using incentives for this end. Growth from Knowledge (GfK) is one such, well known, international research company. This company was asked whether they had a researcher or methodologist who could elaborate on the kind of techniques they use in recruiting research participants. The methodologist GfK suggested was Ton Luijten.

- Ton Luijten, methodologist, Growth for Knowledge.

Ton Luijten is a senior methodologist with GfK. His Ph.D was on the effectiveness of sales promotion, which is also the topic he focuses on at GfK.

These experts were presented with a number of questions, geared towards refining the list of incentives distilled from the literature. Firstly, they were this list of incentives and whether they missed any vital ones. Secondly, based on their expert knowledge, they were asked which incentive would most likely show the best results and/or be most favourable to potential participants.

Based on this prioritised list, the experts were asked which theories could support this prioritisation. Finally, they were asked to review the initial theory. Combined, their insight validated the theoretical framework as constructed in the literature study (section 3.4). Transcripts of the final interviews can be found in Appendix E.

2.4. Quasi-experiment

For the second part of this study, a quasi-experiment was conducted in which potential research participants were asked which incentive they regard as most favourable when offered in exchange for participating in that study. In this experiment, inhabitants of both a larger and smaller town, and from parts of town with a high, medium and low SES were selected. A cut-off of 50.000 inhabitants was used for differentiating between small and large towns, with the small town preferably in a rural area. Breda (149.855 inhabitants) and Oosterhout (49.680 inhabitants) were selected for this, since they share many commonalities, due to their proximity. For the selection of low, middle and high SES parts of town JAAP[1], a real estate internet site, was used as this site provides a detailed analysis of income (percentage of low/middle/high income households) in a certain area. In total 1440 participants were approached using a brief letter containing an explanation and a shortened URL. The letter also contained a link for the response to the single question “Why did you not want to participate?”. Of the 1440 potential participants, 50 participants responded to the questionnaire and an additional 2 to the question why they did not want to participate. Respondents were only included if they had filled out the complete questionnaire. Since all respondents adhered to this requirement, all were included in the dataset.

2.5. Materials

The questionnaire that was used for this study (Appendix D) was a combination of a self-designed questionnaire regarding potential incentives, and the validated “Basic Psychological Needs Scale” (Deci & Ryan, 2000) which quantifies the psychological aspects - need for autonomy, competence and relatedness - in the Self Determination Theory (SDT). The first part of the request was an introductory letter, combined with information on informed consent, that was delivered to the home address of potential participants.

The introductory text at the start of the questionnaire asked the participant to imagine filling out a similar questionnaire, with regard to length, topic and complexity, as currently presented, when answering the questions. The first part of the questionnaire contained the list of possible incentives, whether the participant would want to receive this incentive (i.e. “Ik zou de vragenlijst van het onderzoekspanel invullen als ... (meerdere antwoorden mogelijk)” - “ik hier een waardebon voor zou ontvangen”) with ‘yes’ and ‘no’ as possible replies. These questions were followed by questions about the quantity/quality of the respective incentives (i.e. “De waardebon moet minstens ... waard zijn” - “0 - 5 euro”, “5 euro of meer”). The possible answers varied according to the different incentives.

[1] https://www.jaap.nl/

This questionnaire was followed up by a Dutch translation of the Basic Psychological Needs Scale (i.e. “Ik voel me vrij om zelf te bepalen hoe ik mijn leven leef”). These questions were answered using a 7-point Likert scale, ranging from 1 = helemaal mee oneens, to 7 = helemaal mee eens.

The combination of the introductory text and questionnaire were tested by means of a pre-test. Various people that matched the requirements for participants were requested to read the content and explain what they thought was asked of a participant. After that explanation, the actual goal was revealed. The content was tweaked until at least three pre-testers could provide an explanation that aligned with the goal of the documents.

2.6. Statistical analyses

The results of the quasi-experiment were analysed by means of statistical analyses in the statistical program IBM SPSS 26.0. Firstly, a MANOVA was conducted, with autonomy, relatedness and competence as dependent variables and SES (low, medium, or high) and location (Breda or Oosterhout) as independent variables. Based on the outcomes of this MANOVA, simple effects were analysed by means of ANOVA’s, with the relevant dependent variable and either location or SES as independent variable.

Furthermore, t-tests were conducted with the various incentives, participants could choose from as independent variable and the basic psychological needs as dependent variable. Finally, chi square tests were conducted to test whether a dependency existed between aggregated economic and psychosocial incentives, and economic incentives and SES.

3. Conceptual framework

In this chapter, a conceptual framework and a list of incentives was determined. Based on interviews and literature studies, Self Determination Theory was selected as the best fitting motivational theory, since most of the incentives seemed to be related to the basic psychological needs described in the model. A final list of 9 incentives was then drawn up. Firstly, the literature study for the incentives was described, followed by the interviews in which the incentives are refined and a first setup for the framework was drafted. Finally, the final framework was selected based on literature to which the incentives were linked, generating a list of hypotheses.

3.1. Economic vs psychosocial incentives

Both the economic and psycho-sociological disciplines try to define human nature. Economics defines Homo Sapiens as Homo Economicus while psycho-sociology defines him as Homo Sociologicus. Homo Economicus acts based on self-interest and only cares about the reward for someone else if this would influence his own. In contrast, Homo Sociologicus is purely be driven by social norms, without regard for self-interest. According to (Fehr & Gintis, 2007), both views overgeneralise human nature, resulting in the development of the Beliefs, Preferences and Constraints (BPC) approach. This approach is strongly focused on reciprocity, "the behavioural predisposition to cooperate conditionally on another's cooperation and to punish violations of cooperative norms even at a net cost to the punisher".

The BPC approach implies that to ensure participants' cooperation, it will be best to use reciprocity. In the case of a researcher-research participant relationship, this results in the researcher providing external incentives to ensure the participant's participation in the study. It also implies that both the economic and psycho-sociological viewpoint are overgeneralised. Incentives themselves can strictly be separated in these categories, but when used, should not solely be focused on self-interest or social norms. The following incentives will therefore still be categorised in economic and psychosocial incentives.

3.2. Economic Incentives

From an economic viewpoint, several incentives can be used. The most obvious economic incentives are monetary incentives, with participants receiving money for their efforts. Two different kinds of monetary incentives are possible: fixed fees and incentive payment (James Jr, 2005). In the case of fixed fees, the participants received a fixed amount of money after which they were instructed to complete as many tasks as possible. In the case of the incentive payment, the participant receives a fee for participating and an incentive payment for every task he completes. Both the fixed fee and incentive payment can vary in amount, ranging from small to moderate or considerable.

A different monetary incentive is a reward programme. In this programme, the participant receives a coupon or access to a programme as a reward for participating in the study (Lacetera, Macis, & Slonim, 2013), for example a voucher for a free lunch. In social networking research, access to a programme could be a temporary free premium account.

Economic incentives however have several risks. First, offering an economic incentive might result in "motivation crowding out" (Deck & Kimbrough, 2013; Sharp, Pelletier, & Lévesque, 2006). MCO means that, if a participant is intrinsically motivated, offering him an economic incentive may result in the participant losing his intrinsic motivation. If a participant used to participate in research because he felt morally obliged, he may over time become accustomed to being paid for participation and lose this moral obligation. If a researcher does not offer an economic incentive for participation, this

potential participant might therefore refuse to participate due to MCO. This risk however depends on the object of intrinsic motivation and the amount of the incentive. People are more inclined to lose their intrinsic motivation when offered a large sum as reward, than when offered a smaller sum. This however also depends on whether the "duty" is aimed towards a principal or social norm. In the case of duty aimed towards a principal, the height of the total compensation (fixed fee plus incentive) for the behaviour determines MCO. However, when a potential participant experiences pressure due to a social norm the intrinsic motivation will not be crowded out if he is offered an economic incentive.

A second risk with economic incentives is posed when the incentive entails pro-social behaviour that is visible to the public (Deck & Kimbrough, 2013). If the participant is asked to perform pro-social behaviour, while receiving an incentive, this might trigger refusal. The participant may be afraid that others will think he performs the pro-social behaviour because he receives money, and not because it is the right thing to do. This might result in the potential participant declining to participate.

3.3. Psychosocial Incentives

As with economic incentives, these could crowd out intrinsic motivation for participants (Balliet, Mulder, & Van Lange, 2011). Incentives however, that are aimed at increasing the collective interest instead of one's own interest, should be more effective in promoting cooperation and reducing the overall negative effect of incentives. Both rewarding and punishing incentives influence cooperation similarly, but this depends on the cost (to the provider) of the incentives. If the cost of the incentive for the provider is higher, the participant will perceive the provider as more involved and will be more willing to cooperate than if the cost of the incentive is low or free.

From a psychosocial perspective, several concepts influence the participant's motivation. One such incentive is pride. According to Williams and DeSteno (2008), pride can lead to a greater perseverance when doing a job. When the researcher induces pride in the participant, this might increase his or her perseverance in participating in the study. For example, by focusing on social norms, the participant becomes proud of adhering to the social norm and being part of a group. This pride however needs to be more than just a positive mood, or a feeling of success. Pride however also comes with a risk. If the importance of a specific persons opinion is stressed too much, the participant might back down, because "I'm not that important, my opinion wouldn't matter".

Another incentive is that of having a contract (Bruttel & Eisenkopf, 2012). When the participant is part of an incentivised research programme, a reciprocal contract improves the participant's motivation. By having a contract, the participant is ensured of the researcher's position in the prisoner's dilemma (Fehr & Gintis, 2007). The participant knows that he or she will definitely receive the incentive when participating in the study. Having the participant sign a contract, however, might prove to be difficult. The participant may not see the contract as relevant, in which case reciprocity will also fail. Furthermore, the participant might experience too much social pressure, which will ultimately result in him not signing the contract.

Finally, A third psychosocial incentive is focus on social norms. When people experience a social norm, they will tend to try to adhere to this norm. This norm however can have regional variations. People can try to adhere to universal norms, for example for all Dutch citizens, or to norms that are specific to a certain hotel, or even to provincial norms that are specific to one hotel room (Goldstein, Cialdini, & Griskevicius, 2008). The more general the social norm, the less likely people are to adhere to this norm. However, when situations closely match someone's own situation, he will be more likely to also copy the behaviour of people in the similar situation.

3.4. Interviews

Question 1. "In the list above, did you miss an incentive that you think might increase the motivation of possible participants in participating in research?"

Hoeken mentioned letting a person feel important as a possible incentive. By making the participant believe that their assistance is needed for the study, the participant might feel a relationship with the researcher, and participate in the study.

Wu noted two things concerning the list. Firstly, she wanted to differentiate between the different forms of monetary incentives as set out here:

- baseline payment plus additional bonus based on the tasks completed;
- fixed payment for participation;
- advance payment vs. payment after completion of participation;
- payment in terms of coupons or lottery tickets as a bonus, or free access to programmes that have a certain value.

Secondly, she suggested adding the following, alternative incentives:

- topic interest: Whether participants are interested in the survey topic;
- learning opportunity: Whether participants have an opportunity to learn about social science research topics;
- confidentiality and privacy concerns: Guarantee of confidentiality in participants' responses;
- survey simplicity: the survey itself is concise and easy to understand, and does not take too long;
- descriptive norms: convey information about how most people react when invited to take the survey.

Ton Luijten provided a document on GfK's "Golden Standard". In this document, the following incentives were mentioned:

- altruism
- curiosity
- sense of belonging
- reward
- status
- performance

Three incentives can be added to this list, namely: altruism, curiosity and performance. Curiosity as an incentive was also mentioned by Wu. Finally, Dur did not have additional incentives to add to the list.

Question 2. "In an online research system, which three incentives, and in which order, do you consider to be the best in motivating the potential participants?"

Hoeken hypothesized that research should always consider the relationship between researcher and participant and the type of task to be performed. Willingness to participate depends on three aspects (Figure 3): relationship between participant and researcher, reward for participation, and impact of the request. If the researcher has no relationship with the potential participant, does not offer a reward (incentive) for participating in the study, or the request requires too much effort by the participant, the potential participant will most likely refuse to participate.

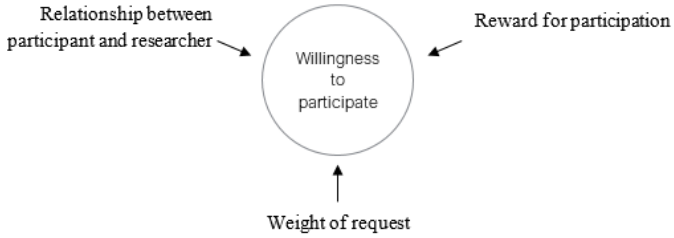

Figure 3: Dependencies for willingness to participate

Concerning the specific incentives, Hoeken did not expect that a contract, provincial social norm or pride would influence the willingness to participate. These incentives would only work in the case of personal relationships. In all other relationships, it would work best if the participant receives a reward for participating in the task. This includes monetary incentives, such as vouchers, a fixed fee or incentive payment per task, or the outcome of the task, such as the efficiency of one's social network. The reason that any of these incentives might work is because they fit in with "reward for participation" described in the model above. For Hoeken, this results in a priority list of:

1. monetary incentives, and
2. outcome of the study

Wu did not provide an extensive explanation, but in her opinion prioritised incentives are:

1. topic interest,
2. effort ≤ anticipated benefits, and
3. benefits (monetary payment, feedback on the survey, etc) should be delivered in time.

Dur was not able to link his priority to literature but sided with Hoeken on the model that influences the willingness to participate. To Dur this means that the participant needs to receive something in return, although this only needs to be a single incentive and not a combination of incentives. For Dur this resulted in the following priority list:

1. monetary incentives,
2. stressing it is a small request, and
3. pointing out it is to increase scientific understanding

Luijten did not provide a priority list for the incentives he mentioned. Also, the list in the GfK Golden Standard document was not prioritised.

Question 3. "Did you base the ordering of incentives on theories, and if so, on which theories did you base this order?"

Hoeken was unable to point out specific literature on which he based his opinion. Wu based her prioritising on the self-determination theory by (Ryan & Deci, 2012):

1. three psychological needs: competence, autonomy, relatedness
2. intrinsic motives (e.g., genuine interest in the topic) vs. extrinsic motives (e.g., monetary and non-monetary compensation)

Dur however pointed out that in economics, theories are not actually used. Formerly, research was combined in large theories such as the Homo Economicus/Rational Economic Man. Nowadays however, thoughts and considerations are researched individually or combined into models which are then tested. This means that he was unable to provide an overarching theory.

The list Luijten provided was based on in-house research by GfK.

Question 4. "For my research, I want to use a theoretical framework which uses the Need-theory (need for achievement, affiliation, power) by McClelland. Do you think this is the best overall theory for this model and do you agree with the general structure of this model?"

According to Hoeken, the link with McClelland's Need-theory is a new approach, but he is of the opinion that I will be able to find sufficient links between the various aspects in the theory and incentives for participation.

Wu: "I do see the point that the incentive of descriptive norms may fulfil the need for affiliation, but there seems to be no rationale in justifying why the need for achievement or power is important in taking part in a survey. In my view, Self-Determination Theory may be a better candidate for your theoretical framework."

Luijten and Dur did not provide insight into whether the Need-theory by McClelland was an appropriate framework or whether there could be a better theoretical framework for these incentives.

3.5. Interpretation

The first question in the interview invited the experts to add incentives that they thought were not in the initial list. This resulted in the following list of incentives:

- reciprocity
- fixed fee
- incentive payment
- reward programme
- pride/status
- (reciprocal) contract
- provincial social norms/descriptive norms/sense of belonging
- ~~topic interest/curiosity~~
- learning opportunities/own performance
- ~~confidentiality and privacy~~
- ~~survey simplicity~~
- altruism

The items that are crossed out were not selected for the final list of incentives, since they are not actually incentives. The fact that research data should be handled with regard for confidentiality and privacy is a prerequisite for all research. Furthermore, research should never exceed the level of complexity for the intended population. It should always be kept as simple as possible, making this item also a prerequisite for scientific research. Finally, the topic is a given for research. When doing research in a certain field of research, the researcher cannot change anything to generate more topic interest.

Since none of the experts, except for Wu, were able to provide theories to substantiate their prioritisation, the prioritisation in itself was discarded. However, the short list per expert was used. The count per item was used to determine a ordering within the total overview of incentives:

1. monetary incentives (HH, RD)
2. outcome of the study (HH, RD)
3. benefits ≥ request (YW, RD)
4. ~~topic interest~~ (YW)

5. ~~benefits should be delivered in time~~ (YW)

Again, the items that are not incentives were crossed out. This resulted in a list of three possible incentives that, according to the experts, would most likely motivate the potential participants.

The third question pertained to theories used to generate the list of incentives and their order. Except for Wu, none of the experts was able to name the theories they used. Wu based her prioritised list on the Self Determination Theory, which was also her response to the last question. Hoeken however did agree on the Need-theory for McClelland, giving two possible frameworks to work with.

Hoeken was unable to provide sufficient references for the model he described. This model however (Figure 3) could be supported by literature. The impact of the size of the request is an important aspect of user participation in the 'Foot in the door technique' (Harkins, Williams, & Burger, 2017). Furthermore, the impact of the size of the reward has often been documented (Matheson, Forrester, Brazil, Doherty, & Affleck, 2012; Mduluza, Midzi, Duruza, & Ndebele, 2013). Also, a relationship between participant and researcher has a clear impact on the willingness to participate, due to the effect, for example, of providing socially desirable responses (Steenkamp et al., 2010).

Finally, due to the responses of experts and the literature study, 'important topic' was added. From the perspective of the literature, this was due to the ambiguity of 'pride' and 'chance to learn'. Both could and did indicate during the study that it also indicated 'pride in participating with this topic' and 'a chance to learn about the topic'.

3.6. Potential motivational theories

Based on both the literature study and the interviews of the experts, a conceptual framework can be constructed. Which motivational theory fits best will be determined by attempting to match the list of incentives to aspects of motivational theories. Several motivational theories could be used for the construction of a theoretical framework and will mostly be drawn from the area of personality psychology (Larsen, Buss, & Wismeijer, 2013). Larsen et al. (2013) list the following theories: McClelland's theory of motivation, Maslow's hierarchy of needs and client centred therapy. However, since client-centred therapy is mostly geared towards a clinical setting, this theory will be omitted. Also, during her interview, Wu mentioned the self-determination theory as a possibility. These theories are constructed around several aspects, on which the incentives from the literature survey can be mapped. This fit will be described below and one theory selected.

McClelland's theory of motivation

The McClelland's theory of motivation is based on three different needs: achievement, affiliation and power. Hoeken stated that it might be important for potential participants to obtain insight in their own skills. This can be reached by providing the participant with the results from their own questionnaire in such a way that it gives this insight, for example how efficient their social networking usage is. Furthermore, Williams & DeSteno (2008) state that pride in participating in scientific research can also be used as an incentive. Both incentives can be described as a need to achieve something.

The need for affiliation is defined by McAdams as the "need to develop close and meaningful interpersonal relationships" (Woods & West, 2010, p. 151). According to Cialdini, people are more willing to participate in programmes when this is in accordance with the provincial social norm. This is because one might feel connected to people that have a resemblance to one's self. Furthermore, according to Hoeken, people are more willing to participate if there is a relationship between the researcher and participant. This can also be seen in the statement by Fehr and Gintis (2007) who claim that both homo sociologicus and economicus are oversimplifications, but people will cooperate in case of reciprocity. These three statements can be linked with a need for affiliation.

Finally, the need for power can be seen as the "need to control or influence the behaviour of others" (Woods & West, 2010, p. 151). This need could be linked to the incentive of the (reciprocal) contract as suggested by Bruttel & Eisenkopf (2012). This contract is meant as a safeguard for the participant, so that he knows that the researcher will also adhere to the arrangement. This way, the participant indirectly influences the behaviour of the researcher, thus adhering to the need for power.

Maslow's hierarchy of needs

In the hierarchy of needs theory, McLeod (2007) distinguishes five different needs that each have to be satisfied before the person can attend to the next need. This means that a participant first must have his physiological needs fulfilled, before he can attend to "safety and security" and so on (e.g.one first needs food before one can worry about securing personal belongings). Regarding the current list of incentives, not every need can be entirely fulfilled by external incentives.

The first two levels consist of physiological needs and a need for safety and security. These entail everything that is needed for the immediate (food, water, air and sleep) and long term (sex) survival of the individual and shelter and security. Although no incentive was found in literature or during the interviews, monetary incentives can make sure that (at least part of) the needs can be fulfilled, like buying food or finding shelter. This way, the first needs can indirectly be provided for.

The three other needs can be addressed by a (sub)set from selected incentives. The need for love and belonging could be fulfilled by Cialdini's (provincial) social norms. By adhering to the specific norms of a group, the participant may have a sense of connection with this group. Furthermore, making a participant feel that he is an important part of the study, as Hoeken mentioned, might make him more engaged with the study.

The next need, self-esteem, can also be fulfilled by incentives mentioned in literature and interviews. As was also the case with "need for achievement" in McClelland's theory, this need can be fulfilled by making the participant proud of his participation in the study and providing feedback on his performance. By making a participant feel proud to be an important part of the study, this participant might feel like a unique individual. By providing feedback based on the study, the participant might receive information showing that he is doing a good job. This in term could increase his confidence and provide a feeling of achievement, thereby increasing his self-esteem.

The final tier, self-actualisation, can be linked to intrinsic motivation or altruism. By focusing on a participant's possible altruistic feelings and emphasizing the importance of this study, the need for meaning and inner potential can be fulfilled. In this sense, the participant can be supported in his search for self-actualisation.

Self-determination theory

The self-determination theory (Ryan & Deci, 2000, 2008), consists of two different levels: psychological needs and a motivation scale. Globally, the theory describes three needs: autonomy, competence and relatedness. These various concepts together span the basic psychological needs of an individual and can influence the motivation this participant feels. Relatedness for example can influence motivation in various ways. Firstly, if the relation with someone is perceived as strict and controlling, this can decrease the motivation. Secondly, if a relation with someone is perceived as bad, and one receives a compliment, this can also decrease motivation. In the same way, the other two components can influence motivation.

Deci and Ryan's scale ranges from lack of motivation, through four different forms of extrinsic motivation, to intrinsic motivation. These levels of motivation can also be described on two different scales: 'autonomy' and 'internalization'. Autonomy describes the amount of autonomy felt under

influence from a given level of motivation and ranges from controlling (low autonomy) to autonomous. Internalization in turn describes how much the recipient of the motivator makes the decision his own, when offered the given motivator and ranges from low internalisation to integrated. The various incentives found in the literature study can be linked to both aspects of SDT, either to the overarching scales of 'autonomy' and 'internalization', or the six categories of motivation.

Regarding the psychological needs as described in this framework, Pittman and Zeigler (2007) classify both autonomy and competence as individual needs, while relatedness is a social group or societal construct. To fulfil the need for relatedness the same incentives as listed for the need for affiliation in McClelland's theory can be used: Cialdini's social norms, Hoeken's relation between researcher and participant and Fehr and Gintis' (Fehr & Gintis, 2007) reciprocity.

The need for autonomy can be fulfilled with both a (reciprocal) contract and the feeling of altruism. By having a contract, the participant has a say not only in his role, but also in what he receives in return, contributing to the feeling of autonomy. If the participant acts on his feeling of altruism, he participates of his own free will, which is also a clear sign of autonomy. Deci and Ryan however state that money can have a negative impact on the need for autonomy, since it is usually used to assert control over someone.

The need for competence concerns the feeling of being effective in interaction with the (social) environment. This need can be fulfilled by inducing pride in the potential participant, or rewarding him with feedback on his own performance, as is the case with the self-esteem need in Maslow's hierarchy.

Best fitting theory

To construct the conceptual framework, the best fitting motivational theory needs to be selected. For this, the fit between the various components and incentives will be analysed.

Regarding the needs theory by McClelland, the three aspects can be fulfilled by the incentives as found in the literature and interviews. The need for affiliation shows a good fit with social norms and having a relation with the researcher. The need for achievement can also be fulfilled by, and has a good fit with, pride and showing the participant his own performance on the construct measured by the study. The need of power however, as also stated by Wu, does not have a good fit with participating in research. Although participants might want to assert influence on the researcher in regard to what they receive in return, participants do not have an influence in the process of the study. In this sense, the final need does not actually fit the scope of the problem.

Maslow's hierarchy of needs shows five steps which an individual ideally traverses, according to the theory. The analogy of a pyramid however, received criticism that the different steps of the theory do not necessarily build on the previous steps of the pyramid. In regard to the top three needs in the hierarchy, a good fit with participating in research can be found in self-esteem, self-actualisation and belongingness. For the basic physiological and security needs a perfect fit cannot be found, although monetary incentive can be perceived as a basis for fulfilling these needs. In this sense, Maslow's theory would be a good candidate, although the hierarchy does not have to be as absolute as stated in the original theory.

The final theory is the Self Determination Theory. In this theory, the three aspects can be fulfilled with the theories as found in the literature and interviews. Also, all three components show a good fit with motivating possible participants for participating in research. Furthermore, the scale also has a good fit with both the situation and the collected theories. This means that self-determination theory is a suitable motivational theory for this conceptual framework.

3.7. Hypotheses

After summing up the positive and negative aspects of the various frameworks, it was concluded that the self-determination theory was found to be the best fitting motivational theory for the given set of incentives. In the research question, this theory was linked to the incentives - which incentive motivates most, using the SDT needs for measuring motivation. Various incentives were thought to have a more prominent influence on a specific need, resulting in a list of hypotheses. This means that specific incentives are hypothesized to have more effect for specific cases. In the subsections below, the various considerations why a specific incentive is hypothesized to influence a need are given.

Need for autonomy

The need for autonomy can be described in two ways, according to Pittman & Zeigler (2007): "When a perceived behavioural freedom is eliminated or threatened with elimination, reactance motivation increases the attractiveness of that freedom and motivates the person to re-establish that freedom". Furthermore, it might also mean: "that individuals need to engage in autonomous self-regulatory activities to a sufficient extent or well-being will suffer".

Altruism. According to the APA, altruism[2] is the "apparently unselfish behaviour that provides benefit to others at some cost to the individual". It might be stated that being altruistic is engaging in autonomous self-regulatory activities. When being altruistic, one performs actions because one wants to, not because external bodies desire those actions.

Contract. By having a contract, the participant can be certain that when participating in research the perceived behavioural freedom will not be threatened with elimination.

Research topic. Participating in research with a topic that the participant perceives as relevant/important to himself, can also be perceived as an autonomous self-regulatory activity. The participant chooses to participate, because he thinks that it is important to do so.

Need for competence

The need for competence as described by Pittman & Zeigler (2007) states that it is the "feeling of being effective in the interaction with the (social) environment".

Pride in participating. According to the APA, pride[3] is "when a goal has been attained and one's achievement has been recognized and approved by others". This clearly states that someone must have had a well-received achievement in the social environment. Therefore, it can be stated that when someone is truly proud, this might (partially) fulfil the need for competence.

Chance to learn. The incentive 'chance to learn' pertains to reflection on one's own performance. For example, when a participant fills out a questionnaire about social networking sites, which rewards the participant with insight in his own social networking skills, this can be seen as providing the participant with the 'chance to learn something'. This can directly be linked to 'feeling effective in an environment'. Thus, when a study rewards a participant with a chance to learn something about his own competence, this might increase or decrease (i.e. when you perform worse than you thought) the need for competence.

Need for relatedness

According to Ryan & Deci (2008), the need for relatedness is defined as : "people need to have a sense of belonging and connectedness with others; each of us needs other people to some degree".

[2] https://dictionary.apa.org/altruism
[3] https://dictionary.apa.org/pride

Furthermore, the need for relatedness can also be satisfied when the individual is a member of a group, loves, cares and is loved and cared for in return (Van den Broeck, Vansteenkiste, De Witte, Soenens, & Lens, 2010).

Social norms. As stated by Goldstein et al. (2008), when someone feels more connected to someone else, and is presented with a certain behaviour by that other person, the greater the chances are, he will mimic that behaviour. This is in line with the need for relatedness.

Economic incentives. As stated by Van den Broeck et al. (2010), the need for relatedness is satisfied when the individual has the feeling of being cared for. When the time spent on the study is sufficiently compensated by the researcher, the participant might get the feeling of being cared for, which might decrease the need for relatedness.

Agreement in participating. When someone undertakes to participate in research, that person enters in a relation or connection with the researcher (depending on the interpersonal distance - is the participant acquainted with the researcher and how did this contact originate?). Should the participant withdraw from the agreement, the connection could be damaged, thereby potentially losing that person as a contact. When agreeing to participate in research, this might contribute to the need for relatedness.

These mappings together can be added to the original figure (Figure 4) depicting the Self Determination Theory. An arrow from one of the incentives towards one of the basic psychological needs denotes a hypothesised effect.

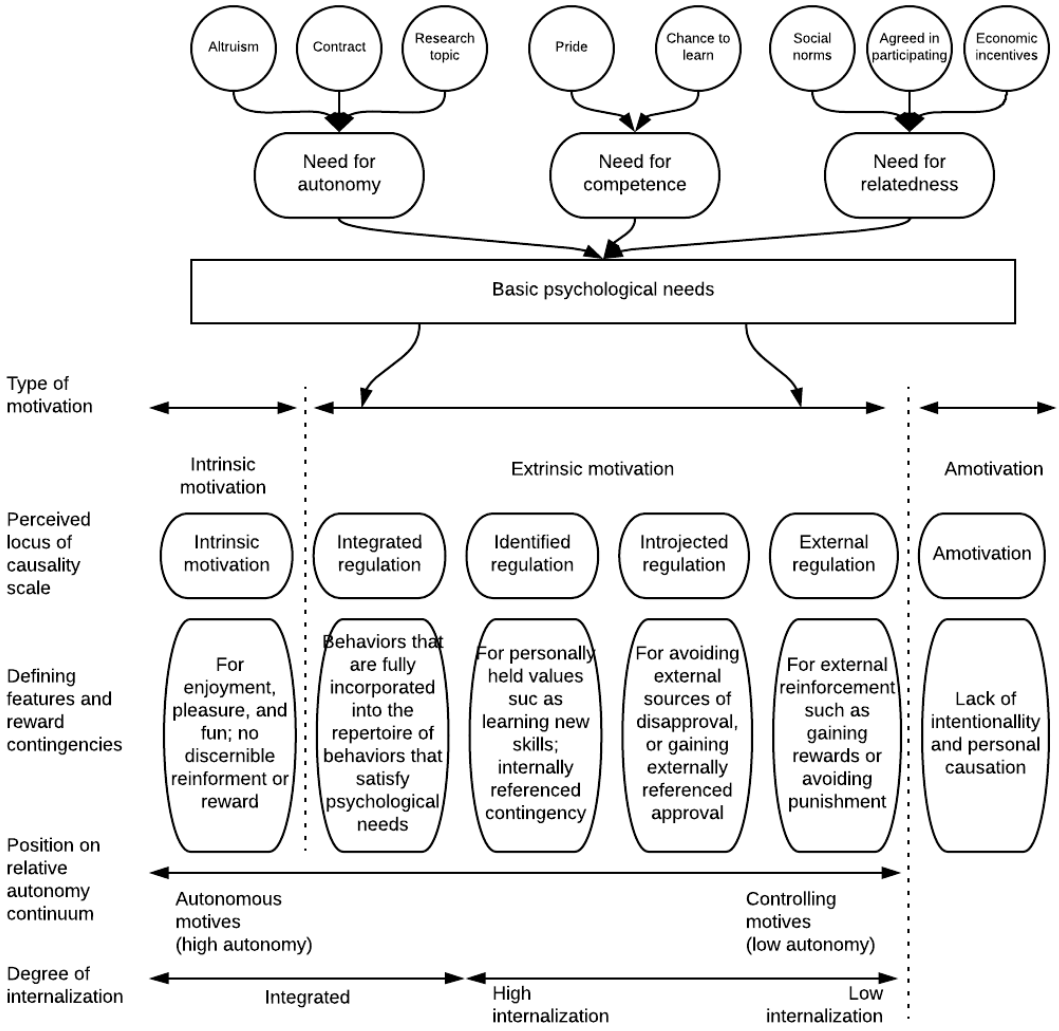

Figure 4: Original model for the Self Determination Theory, combined with the hypothesised mapping of incentives on the basic psychological needs (Ryan & Deci, 2000)

4. Results

In total, 1440 notes with the request to fill out the questionnaire were posted to an equal number of homes. Of these, only 50 people responded by filling out the questionnaire (Table 1), and an additional 2 filled out the questionnaire about why they did not want to participate. It is noticeable that mainly people of a higher SES responded:

Table 1: Distribution of responses

	Rural	City	Total
Low	4	1	5
Medium	9	10	19
High	10	16	26
Total	23	27	50

The first analysis on the dataset was a MANOVA in which the effect of the neighbourhood of the participant - based on the size of the town and the SES of the part of town the participant lives in - on the various aspects of the overall framework was determined. The total amount of participants needed for this analysis, for a power of at least $\beta = 0.80$ and a medium effect size ($f^2 = 0.625$), is $n = 312$. Despite the total number of responders being too low, the MANOVA was still performed, but yielded no significant results. Wilks' lambda for both the interaction effect ($F(6, 62) = 0.62, p = .710$) and the main effects (size: $F(3, 31) = 0.59, p = .624$; SES: $F(2, 21) = 0.98, p = .448$) were not significant. Since power is too low for substantiated claims, and no significant results could be found, the entire MANOVA was discarded.

Furthermore, t-tests could be performed on the different needs, with the various incentives as independent variables. This would result in 27 independent sample two tailed t-tests. To obtain a power of at least $\beta = 0.80$, at least 51 people per group would be necessary. Since only 50 participants responded, this could not be achieved. Furthermore, due to the number of tests and multiple comparisons problem (Abdi, 2007), a Bonferroni correction needs to be added which results in a $\alpha = 0.002$. Due to this exceptionally small level of significance, none of the tests were significant.

Due to the small sample size and problematic power, it was decided to drop statistical tests and further analyse the dataset with descriptive statistics. Respondents' preferred incentives were determined by a frequency analysis. The frequency with which the various incentives were selected is listed in order of preference (Table 2). In the columns marked with 'number of incentives', e.g. column '3', the frequency for that incentive was presented, given that the participant had chosen a total of 3 incentives. For the incentive 'agreed to participate', 5 participants have selected this incentive, given that they chose 3 incentives in total. The total at the bottom of the table, shows the amount of times that that number of incentives was selected, thus, for example, in 17 cases only 1 incentive was chosen. Noticeably, the most frequently opted incentive was the importance of the topic (chosen 31 times), followed by receiving a monetary incentive (both chosen 19 times). Based on these responses, the amount of possible incentives per respondent were calculated. This showed that when people prefer altruism as incentive, they may opt for a single incentive, while in other cases, such as a reward programme or research topic, participants also chose other incentives. This indicates that the number of incentives selected had no real influence on which incentive was preferred, except in the case of altruism.

Table 2: Distribution of incentives

		Number of incentives					
Incentive	Frequency	1	2	3	4	5	6
Fixed and variable fee	19	0	2	5	6	5	1
Reward programme	19	1	4	4	4	5	1
Pride	3	1	0	1	0	1	0
Agreed to participate	17	1	2	5	4	4	1
Contract	3	0	0	0	1	2	0
Social norms	1	1	0	0	0	0	0
Research topic	31	7	5	7	6	5	1
Chance to learn	7	0	2	1	2	1	1
Altruism	12	6	1	1	1	2	1
Total		17	8	8	6	5	1

Furthermore, the answers for the open question for 'Research topic' were qualitatively analysed. This question was answered in 19 of the 31 cases. When grouped together, the following topics emerged (Table 3). Some participants responded with more than one topic, resulting in more than 19 preferred topics. As can be seen, most of the topics pertain to relevant topics for the participant. Only in the case of 'Something that has a large impact', the participant explicitly stated that the large impact had to be for himself, or someone else, as long as the impact was large.

Table 3: Distribution of topic interest

Topic	Frequency
Something that has a large impact	3
Security and safety	4
Environmental protection	4
Health/health care	6
Quality of life	2
Society	6
Education	2
Public transport	1
Total	28

Finally, the incentives were categorised in either economic ('fixed and variable fee', 'reward programme', 'agreed to participate, 'contract') or psycho-social ('pride', 'social norms', 'research topic', 'chance to learn', 'altruism') incentives. The psychosocial incentives were preferred by almost all participants (42 out of 50), while economic incentives were only preferred by half of the participants (29 out of 50). These categories were then checked for dependency by means of a χ^2-test. No significant result was found ($\chi^2(1) = 1.643, p = .200$), suggesting that whether someone

selects a psycho-social incentive does not depend on whether he has also chosen an economical incentive (or vice versa). Neither does choosing an economical incentive depend on someone's SES ($\chi^2(1) = 3.325, p = .190$). This means that the preference for economic incentives does not depend on the SES of the neighbourhood.

Next to the responses from people who were willing to participate in the study, two responses were obtained from people who did not want to participate. These responses were:

- "*Het is natuurlijk een hele mooie gedachte om er achter te komen hoe mensen functioneren, maar daar hoef je volgens mij geen wetenschappelijke onderzoeken naar te doen, want alles zit in de genen en is erfelijk, dat is mij in de loop van mijn leven wel duidelijk geworden. De opvoeding doet er wel een klein beetje aan, maar als ik kijk naar mijn eigen kinderen, dan zie ik er mijn man en mezelf in, ja iets gemengd. De vooruitgang van de techniek doet er natuurlijk ook nog een schepje bovenop. Ik ben geb. 19-11-1931 dus ben geweldig blij met de vooruitgang en de betere leefomstandigheden en dat doet alles in iemands leven. Ook het verstandelijke vermogen om vooruit te kijken lijkt me van belang*"
- "*Als afzender ben je mij te onbekend. Hoewel TU Delft vertrouwenswekkend is, leg je onvoldoende uit waarom je juist bij mij een briefje in de brievenbus hebt gestopt.*"

Although these are only two cases, these responses show that possible reasons for not participating are: not knowing the researcher, or believing research is not/no longer necessary. The first response is in line with the assumption from the introduction (chapter 1) that potential participants do not understand the need for research. The second response could directly be linked to Hoeken's claim that knowing the researcher is important.

5. Conclusion

The question posed in this study was: “Which economical or psychosocial incentives do potential participants perceive as motivating them most in being a participant in citizen science research?” This question was split into two different sub-questions:

- Which incentives will work best according to scientific research in economics, psychology and sociology?
- Which incentives do potential participants perceive motivate them the most?

The first sub-question could be answered with the list as provided in the theoretical framework (chapter 0). It could be concluded that according to literature from the different research fields, the following incentives would work to incentivise potential participants: `reciprocity’, `fixed fee’, `incentive payment’, `reward programme’, `pride/status’, `contract’, `provincial social norms’, `learning opportunities/own performance’ and `being intrinsically motivated’. However, according to the experts, the incentives from this list that would work best are: first `monetary incentives’ (including `fixed fee’, `incentive payment’ and `reward programme’), secondly the outcome of the study (`learning opportunities/own performance’) and finally whether the size of the reward was equal or more than the size of the request.

The second sub-question continued with this list but was unable to provide any significant data regarding the preference of the participants. Frequency analyses however did show that `research topic’ was the most chosen incentive, followed by `fixed and variable fee’ and `reward programme’. Most of the time these incentives were combined with other incentives, for example, people selected both `fixed and variable fee’ AND `a chance to learn’ AND `research topic’. This means that the top three incentives are the most compelling to the general participant, but that they also do accept different incentives.

Although the results were not significant, one may, cautiously, conclude that the research topic and a monetary incentive are best suited to motivate potential participants from the Dutch cities Oosterhout and Breda.

6. Discussion

The data as presented in this study, can be used in two ways. The results not only provide insight into the mapping of incentives on basic psychological needs (i.e. need for autonomy), but they also provide insight into which incentives potential participants, when questioned on the subject, think they prefer.

Firstly, the Self Determination Theory was selected, since it fits the list of incentives. The various incentives were hypothesised to influence one or more of the three basic psychological needs: relatedness, autonomy and competence, which would in turn motivate potential participants to partake in scientific research. Due to the low response rate however, none of the effects of incentives on the hypothesised needs were significant. This means that no statement could be made about the hypotheses.

Secondly, although the results were not significant, insight could be obtained from the descriptive statistics. For example, when a participant participates in research for altruistic reasons, the other incentives are generally not taken into consideration. This would validate the motivation crowding out theory. The participant is not taking part because of the reward that is offered, but when offered one, he might prefer rewards in the future. For all other (external) incentives it holds that the number of incentives to choose from does not influence the participant's preference. This suggests that several incentives could be used, for example the top three with the most overlap, or the incentives that reach a maximum number of people. This top three of most preferred incentives are: "the research topic aligns with my interests" (31 respondents), "either fixed or variable fees" (19 respondents) and "reward programme" (19 respondents). This indicates that people prefer topics most when they matter to themselves. An example of such a research topic is `health care'. It should be noted however, that by motivating potential participants by monetary incentives or research topic, the researcher runs the risk of biasing his research. For monetary incentives, several risks were mentioned in the theoretical framework, i.e. motivation crowding out and not wanting to participate due of social norms. Furthermore, participants might take the money while not filling out the questionnaire seriously. Finally, when selecting a sample based on research topic, this could also lead to a skewed sample. Given a specific topic, only a subset of the intended population might be interested in that topic.

Furthermore, the low response rate itself was an interesting part of this study. Of the 1440 potential participants, only 50 responded. Reflecting on the weaknesses of this study, this low response rate could be due to the difficulty of the request and the fact that the researcher was unknown, as mentioned by Hoeken. What is even more striking is the fact that of these 50, only 5 respondents were from neighbourhoods with low SES. This might due to potential participants with a low SES not having an academic background, and not understanding the necessity of research and impact of the results on their daily lives. This leads to a skewed sample and possibly incorrect generalisations, due to this self-selection bias. For example, if people from low SES neighbourhoods would prefer monetary incentives, while people from high SES would be more interested in the research topic, analyses on the skewed sample would suggest that research topic is more important, which would be an incorrect conclusion. This is in line with the original statement by Rosenthal (1965, pp. 10-12), who claims that non-volunteers might differ in certain aspects from volunteers, for example `level of education' or the above mentioned `SES', which would in the long run result in this incorrect conclusions.

Based on this low response rate, a new sample was created, with similar characteristics to the first sample, with a primary focus on non-response. This group was provided the introductory text and questionnaire and asked whether they would fill out the questionnaire, and if not, why not. They did

not have to fill out the questionnaire however. In this step, responses for an additional 19 participants (size of town: city = 9, rural = 10; SES: high = 4, medium = 13, low = 2) were collected - which again showed the difficulty to gather responses from low SES neighbourhoods. Participants were allowed to give multiple, open, answers. The responses were as categorised below:

Table 4: Reasons for non-response in an additional sample

Response	Frequency
Degene die het verzoek doet is onbekend	9
Link gebruiken is risicovol, mogelijk phishing	9
Onduidelijk waarom het belangrijk is om deel te nemen	3
Briefje in de brievenbus is fraudegevoelig, spyware?	3
Tijdgebrek	4
Niet betrouwbaar	4
Te veel gedoe, het verzoek zou ik weg gooien	2
De manier waarop het verzoek gedaan wordt, nl brievenbus	2
Te weinig betrokkenheid	2
Het kan een grap of reclame zijn	2
Ongevraagd	1
Ongewenste vraag	1
Ongepast	1
Niet voldoende gemotiveerd	1
Het belang van deelname is onvoldoende	1
Link overtypen is zo'n gedoe	1
Wat levert het mij op	1
Het onderwerp spreekt met me niet aan	1
De wijze waarop de data verwerkt worden is niet duidelijk	1
Soms worden aan het einde sneaky (verkoop) vragen toegevoegd	1
Total	50

Finally, the results of this study can be used to reflect on the assumptions as made in the introduction (chapter 1). It was stated that one of the reasons that it was difficult to find potential participants, might be that they were not interested in scientific research, or because they were not rewarded for participation. Both assumptions would appear to be valid, since the primary incentive preferred by participants was that the research topic should be interesting for them. Furthermore, the second most preferred incentives were financial incentives. Finally, based on the responses from the group of non-respondents, it could be concluded that people do not feel involved in the research ("I do not know the person", "reason why I should participate is unclear"). Together, these preferred incentives indicate that the above assumptions on the difficulty of finding suitable and sufficient participants are justified.

Furthermore, when reflecting on the extended study, trust seems to be a major influence on the participation of potential participants. Both the institute (e.g. a university) and researcher should be trusted and methods that people would trust (e.g. hard-copy questionnaires instead of potentially malignant hyperlinks that could be used for phishing) should be used.

6.1. Strengths and limitations

This study's main strength is the use of triangulation. In order to determine which incentives work best, incentives were first listed via a literature study. Secondly, this list was refined by interviewing researchers in different research fields, that were closely linked to motivating people. Furthermore, potential frameworks were also discussed with these researchers. Finally, by means of a quasi-experiment, the incentives were tested in the general public. Although this will never conclusively prove that these are the best incentives, it will add additional layers of assurance that they are sufficient.

Furthermore, the sampling in the quasi-experiment is also one of the strengths. As noted in the introduction, many researches employ convenience sampling. In this study however, citizens from two urban areas of different size (one village and one town) were questioned, while considering differences in SES. This would best reflect the population of the province of North-Brabant, since other characteristics were not deemed of consequence for this study.

However, in order to perform statistical analyses of the answers to our questionnaire, sufficient participants were needed. In this case, only 50 participants filled out the form. This number was too low for various statistical analyses, which lead to insufficient power, which in turn meant that some of the analyses could not be performed. The low number of respondents could be due to one of four distinct reasons, based on the responses from 21 non-respondents:

1. People were invited to participate in the study by a letter addressed to them personally. There are several reasons that might prevent them from filling out the questionnaire:
    - the potential participant might feel that the request was unsolicited.
    - as posed by Hoeken (Figure 3), the distance between the potential participant and researcher might be too great. This is also indicated by one of the respondents who explained that he did not know me and did not fill out the questionnaire because of this reason.
    - the questionnaire was an URL in the note. This was both a shortened URL, which might not inspire trust, and potential participants also had to copy this to their computer, instead of just being able to click on it.
2. The topic of this study was incentives. In this study however, participants were invited to fill out a questionnaire, for someone they did not know, without receiving an incentive. If the participants would have received the hypothesised incentives, this might have increased the number of respondents.
3. The questionnaire was a combination of a questionnaire specifically designed for this study and the `basic psychological needs scale' (BPNS). The transition from one questionnaire to the other was not accompanied by an explanation about what the participant might expect. Since some of the questions for the BPNS might feel intrusive, this might have scared people off.
4. People did not respond because of a more philosophical reason. (de Regt, Dooremalen, & Schouten, 2007) describes the various forms of gaining knowledge, and the role of science in all of this. However, a growing concern is that science is losing this privilege and people no longer think science is the sole contributor of knowledge. This might be because people nowadays have access to vast amount of knowledge and opinions via media (internet, TV and

newspapers), and because of recent cases of fraud (i.e. by Stapel[4]) and mistakes (failing to warn for an earthquake[5]) within the scientific community.

Another limitation of this study was the fact that the researchers were unable to provide theoretical references for their prioritisation of the incentives. The interview part of the triangulation was meant to validate the first step, the literature study. However, since none of the experts provided theoretical substantiation, the list of incentives could not be validated. If this study was to be repeated, experts might be better suited for handles for a literature study, but unless the claims are supported by theories should not be used for actual data collection.

Due to the severe limitations, these conclusions should first be validated and not be accepted on face value. For this validation, sensitive tests that do not rely on participants filling out questionnaires, without the promise of incentives, should be used. However, for now, the results seem to be in line with previous research and will be interpreted during this discussion.

6.2. Relevance

The results from this study have an impact on the scientific field, on the various hierarchical levels, ranging from our notion of incentives to research in general (i.e. incentives → motivation → citizen science → research).

Regarding incentives, this study has provided an overview of incentives from the areas of economics and sociopsychology. These incentives do not only have to be used for motivating potential research participants but could also be used in different situations such as the research theme of responsible innovation - a process that considers effects and potential impacts on the environment and society: "Studying the role of entrepreneurship for responsible innovation is therefore very important. Another important challenge is how to operationalize and incentivize responsible innovation in sociotechnical systems. For example, an intrinsic motivation to take responsibility by making innovations more sustainable might be `crowded out' by economic incentives."[6]. Various incentives that were listed in this study, could be used in this research theme, for example Cialdini's provincial norms. By stating that other, similar, companies behave like *x*, the intended company might be motivated to also change its behaviour.

In this study, the incentives were mapped onto the Self Determination Theory. In the original theory, the three needs were defined as concepts that need fulfilment to become more intrinsically motivated but were not quantified. In this study, effects from the various incentives were hypothesised on individual needs. Due to the low response rate, none of these effects could be validated. However, if, in future research, the turnout is high enough, this could be a step towards quantifying the basic individual needs. This would not only provide science with a better understanding of what people need to be motivated, but could also be used, for example, in working environments. For instance, should someone have a deficiency in the need for autonomy, insights from the mapping of incentives onto the basic psychological needs could be used to make him more intrinsically motivated.

Furthermore, this study is relevant to citizen science. In the introduction, an axial system was introduced, depicting the role of the citizen within the study and the focus of the study. The current study focused on scientists as knowledge producers (and citizens as participants) in a study with a focus on scientific research. The list of preferred incentives can be used for this specific area within

[4] https://nos.nl/artikel/308864-fraude-hoogleraar-stapel-verbijsterend.html
[5] https://www.nrc.nl/nieuws/2012/10/22/italiaanse-wetenschapper-veroordeeld-voor-iets-wat-ze-niet-gedaan-hebben-a1440595
[6] https://www.tudelft.nl/tbm/over-de-faculteit/afdelingen/values-technology-and-innovation/research/

the axial system. The other areas should also be researched, but can already be hypothesised, based on the axial system (Figure 2) and model by Hoeken (Figure 3). Hoeken states that in order to participate, the combination of `relatedness with the researcher', `the size of the request' and `the reward', should be above a certain threshold value. Should one postulate that a citizen considers requests for participating in research with a focus on interventions on socio-ecological systems as less important, by being "closer to home", those with a focus on answering scientific questions would therefore be considered as more important, then larger incentives would be needed the more the study is focused on science. Furthermore, when the citizen just participates in research as one of many participants, the request could also be considered smaller than if the participant is the main knowledge producer. This means, that the incentive should also be larger if the role of the citizen is greater. This would suggest that an increase in size of the required incentive(s) could be expected from the lower right quadrant, to the upper left quadrant (Figure 5).

Finally, this study can have an impact on research in general, more specifically for social sciences. The goal of this study was to obtain a better understanding of how to motivate potential participants to partake in scientific research, in order to obtain more representative samples. This could not just benefit science communication, but all research fields that rely on introspection. In the introduction (chapter 1) it was suggested that many social sciences studies were subject to biased results due to the use of, for example, psychology students as research participants. If more citizens would participate in scientific research, this issue could be addressed, and generalisations would become more reliable.

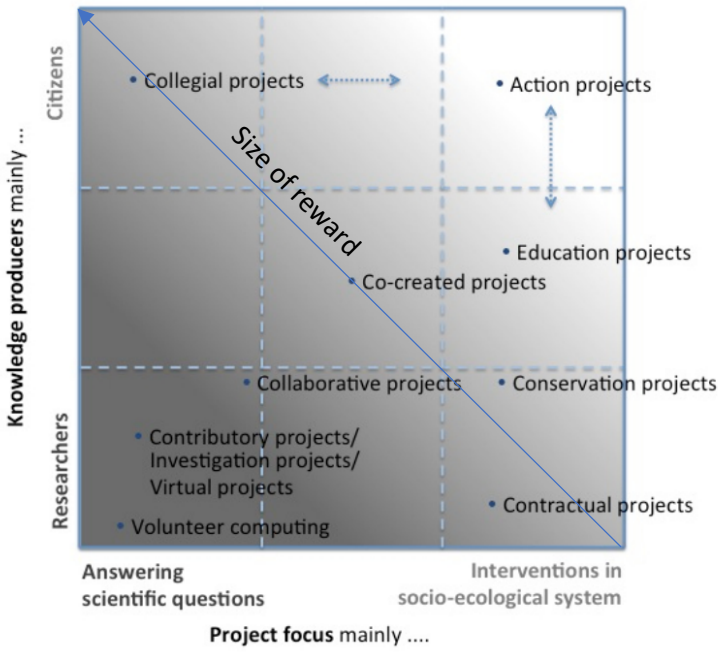

Figure 5: Axial system reflecting types of citizen science projects as defined by Schäfer & Kieslinger (2016), with the hypothesised size of the required incentives

6.3. Future research

Since this study has several limitations, future research is required. Furthermore, this study only focused on the province of North-Brabant and since the goal is to reach a conclusion concerning the whole of the Netherlands, the scope should be expanded. This would result in at least three different lines of future research.

First, the limitations of this study should be addressed. Since this study considered the hypothesis that citizens will not participate if there is no reward, future research should always offer incentives. Furthermore, potential participants should be invited in person, instead of by letter. A proposed research setup could be to contact people at locations that are frequented by a representative sample of the population of the area, for example a shopping mall or railway station. Furthermore, in this study people were asked about their preferred incentives, while in future research, the incentives should be used when asking people to participate in research.

For example, when interviewing people at a train station, this could be done on three separate days (when testing three different incentives). The first day, people are invited if they want to participate in scientific research, and are given incentive A. The second day, the same question is asked, with incentive B, and the third day with incentive C. The frequency of yes and no should be registered, to determine which incentive is more favourable. Furthermore, people could potentially be invited to fill out a questionnaire regarding their basic psychological needs, to determine the mapping of the given incentive onto the needs.

Secondly, as already stated, the study should be replicated in other parts of the Netherlands, as the present research was only conducted in two towns in North-Brabant. However, there are regional variations in the Netherlands regarding the willingness to act for the greater good, as for example can be seen in willingness to donate blood (Bekkers & Veldhuizen, 2008). This means that the willingness to participate in scientific research might also vary per province. In order not to make incorrect generalisations, this should also be researched.

Finally, as stated before, the incentives described in this paper might work for the set of commitment and role that was used for the participants but might vary when different sets are used. The size of the required reward might vary as hypothesised in section ‘relevance’, but this should also be researched. For example, the study should be replicated when asking citizens to either participate or be engaged or involved in monitoring air quality. This should then also be replicated on the commitment axis.

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A. Literature research introduction

Query 1-1: student AND sample AND generalization

- Number of hits: 5
- Filters: -
- Number of hits: 5
- Used: -

Query 1-2: student AND “American focus”

- Number of hits: 5
- Filters: -
- Number of hits: 5
- Used: -

Query 1-3: questionnaire AND college AND “external validity”

- Number of hits: 15.059
- Filters: publication year: 2000-2014, peer reviewed, subject: test-validity
- Number of hits: 262
- Used: -

Query 1-4: questionnaire AND “american focus” AND disproportionately

- Number of hits: 1.118
- Filters: publication year: 2000-2014, peer reviewed
- Number of hits: 777
- Used: -

Query 1-5: questionnaire AND “student sample” AND “external validity”

- Number of hits: 7.637
- Filters: publication year: 2000-2014, peer reviewed, subject: test-validity
- Number of hits: 342
- Used: -

[continued without result]

Query 2-1: citing articles for “the volunteer subject”

- Number of hits: 9
- Filters: -
- Number of hits: 9
- Used: (Lönnqvist et al., 2007; McCray et al., 2005; Pagan et al., 2006; Sharp et al., 2006)

Query 3-1: “disproportionately students sample”

- Number of hits: 2
- Filters: -
- Number of hits: 2
- Used: (Steenkamp et al., 2010)

B. Literature research conceptual framework

Query 1-1: economic AND incentives

Number of hits: 2.090

Filters: publication date: 2004 - 2014; source type: Peer Reviewed Journals; subject: incentives

Number of hits: 79

Used: (Deck & Kimbrough, 2013; Fehr & Gintis, 2007; Gutiérrez, Hilborn, & Defeo, 2011; Gürerk, Irlenbusch, & Rockenbach, 2009; James Jr, 2005; Kuksov, 2007; Lacetera et al., 2013)

Query 1-2: “social psychology” AND incentives

Number of hits: 654

Filters: publication date: 2004 - 2014; source type: Peer Reviewed Journals; subject: incentives

Number of hits: 10

Used: (Balliet et al., 2011; Baumeister, DeWall, Ciarocco, & Twenge, 2005; Bruttel & Eisenkopf, 2012; Fehr & Gintis, 2007; Tasoff, 2014; Williams & DeSteno, 2008)

C. Request for participation

Geachte heer/mevrouw,

In het afgelopen jaar, bent u vast vaker benaderd om een vragenlijst in te vullen. Om meer begrip te krijgen van hoe mensen functioneren, of waarom wij bepaalde keuzes maken, is het belangrijk om onderzoek te blijven doen. Om deze reden onderzoek ik voor mijn scriptie aan de Technische Universiteit Delft wat mensen zou kunnen motiveren om toch mee te doen met wetenschappelijk onderzoek. Hiermee krijgen onderzoekers bijvoorbeeld meer inzicht in wat zij u kunnen bieden, in ruil voor het invullen van een vragenlijst. De totale vragenlijst bestaat uit 35 vragen en kost ongeveer 10 minuten om in te vullen.

Alle gegevens die u tijdens dit onderzoek verstrekt, zullen volledig anoniem gebruikt worden. Verder mag u in de loop van het onderzoek altijd stoppen zonder dat dit voor u gevolgen heeft. Als u mee wilt doen aan dit onderzoek, kunt u naar het onderstaande adres gaan om de vragenlijst in te vullen.

https://goo.gl/wKhXMv

Mocht u niet mee willen werken aan het onderzoek, zou ik u toch graag willen vragen naar het volgende adres te gaan. Hier staat enkel de vraag waarom u niet mee wilt doen.

https://goo.gl/JkkogF

Ik wil u heel hartelijk danken voor het overwegen om mee te doen aan mijn onderzoek.

Olaf Schüsler

Student Wetenschapscommunicatie

Technische Universiteit Delft

D. Questionnaire

Dit onderzoek probeert te achterhalen wat mensen kan motiveren om mee te doen aan vragenlijstonderzoek. Stelt u zich de volgende situatie voor: U hebt zich aangemeld voor het onderzoekspanel van het CBS. Daar krijgt u regelmatig de vraag of u een vragenlijst wilt invullen. Per keer mag u zelf bepalen of u meedoet of niet. Het onderwerp en de lengte van de vragenlijst kan iedere keer anders zijn.

De vragenlijst zoals hij voor u ligt gaat over motivatie, is qua moeilijkheid gemiddeld en bevat 35 vragen. De eerste 14 vragen gaan over het invullen van een vragenlijst. Stelt u zich bij het invullen van deze vragen een vragenlijst voor die vergelijkbaar is aan deze vragenlijst, dus qua onderwerp gaat over motivatie, en niet al te lang en moeilijk is.

1. Ik zou de vragenlijst van het onderzoekspanel invullen als …
    - ik hier geld voor zou ontvangen
    - ik hier een waardebon voor zou ontvangen
    - ik trots kan zijn dat ik de vragenlijst heb ingevuld
    - ik mij aangemeld heb bij het onderzoekspanel
    - hier een contract over de verplichtingen van de onderzoeker tegenover staat
    - ik weet dat mensen die op mij lijken, deze ook hebben ingevuld
    - het over een belangrijk onderwerp gaat
    - ik van de uitkomst over mijzelf kan leren, zoals hoe handig ik ben met sociale media
    - daar niks tegenover staat
2. Voor het invullen zou ik genoegen nemen met:
    - Niets
    - een financieel aardigheidje (tot 5 euro)
    - vergoeding van de tijd dat het invullen van de vragenlijst mij gekost heeft
3. De waardebon moet minstens … waard zijn.
    - 0 - 5 euro
    - 5 euro of meer
4. Ik zou trots zijn als de vragenlijst gaat over …
    - Open question
5. De mensen moeten op mij lijken, qua: (meerdere antwoorden mogelijk)
    - Leeftijd
    - Woonplaats
    - Opleiding
    - Beroep
    - Inkomen
    - Interesses
    - Etniciteit
    - Geloof
6. Een belangrijk onderwerp is voor mij ...
    - Open question

Lees onderstaande stellingen zorgvuldig en vraag u daarbij af hoe het op uw leven van toepassing is. (Schaal van 1 tot 7, met 1 = helemaal mee oneens, 4 = beetje met een eens en 7 = helemaal mee eens).

7. Ik voel me vrij om zelf te bepalen hoe ik mijn leven leef
8. Ik vind de mensen met wie ik omga echt aardig
9. Ik voel me vaak weinig competent
10. Ik voel me onder druk staan in mijn leven
11. De mensen die ik ken zeggen dat ik goed ben in wat ik doe
12. Ik kan goed omgaan met mensen met wie ik in contact kom
13. Ik ben erg op mezelf gericht en heb niet veel sociale contacten
14. Ik voel me gewoonlijk vrij om mijn ideeën en meningen te geven
15. Ik beschouw de mensen met wie ik regelmatig contact heb als mijn vrienden
16. Recent heb ik de gelegenheid gehad interessante nieuwe dingen te leren
17. In het dagelijkse leven wordt mij vaak verteld wat ik moet doen
18. De mensen in mijn leven geven om mij
19. Meestal voel ik tevredenheid over wat ik doe
20. De mensen met wie ik dagelijks te maken heb, houden rekening met mijn gevoelens
21. In mijn leven heb ik niet vaak de mogelijkheid om te laten zien wat ik kan
22. Er zijn niet veel mensen met wie ik erg close ben
23. In dagelijkse situaties kan ik mezelf zijn
24. De mensen met wie ik regelmatig contact heb lijken me niet erg te mogen
25. Vaak voel ik mij niet erg capabel
26. Ik heb niet veel mogelijkheden om voor mezelf te bepalen hoe dingen in het dagelijks leven te doen
27. Normaal gesproken zijn mensen heel aardig tegen mij

E. Interviews

E.1. Hans Hoeken

Date: 22-07-2015

O: de incentives die op het lijstje staan zeggen u allemaal iets?

HH: nee niet allemaal.

HH: wat wil je met die wederkerigheid in het algemeen?

O: ik heb een paper gevonden waarin ze het extreme beeld van de homo economicus zowel als het extreme beeld van de homo sociologicus afschieten en een beeld neerzetten van strong reciprocity. Dus iemand die heel eerlijk is, dan ben jij bereid om ook heel eerlijk te zijn. Drang naar wederkerigheid

HH: is dat wederkerigheid of is dat niet voldoen aan sociale normen?

O: in de paper heet het reciprocity.

HH: kan dat gaan over korter douchen of milieubewuster zijn? Dat lijkt niet direct van toepassing op het doel wat jij wilt bereiken.

O: ik denk het wel, het gaat om het hoger doel voor de mensheid en niet zozeer het individuele doel. Ik wist ook niet zo goed wat ik met die paper aanmoest. Bijvoorbeeld het geven van geld om een VL in te vullen. Het iets doen voor de ander is van groot belang zeggen zij in het artikel. Je kunt je voorstellen dat je iets anders voor iemand doet.

HH: je hebt te maken met een verzoek, dat komt van iemand. 1. Hoe is de relatie tussen degene die het verzoek doet en degene die het verzoek krijgt. 2. Hoe zwaar is het verzoek? 3. Wat krijg ik daarvoor terug (materiële en immaterieel vergoeding), bijvoorbeeld trots dat je hebt meegedaan. Voor HH maakt het uit hoe de totale constellatie is, wat het belangrijkste van deze 3 is.

O: het gaat om de onderzoeker die op straat staat en vraagt aan mensen op straat om mee te doen.

HH: wat speelt dan een rol om mensen te laten deelnemen als zij jou niet kennen? Je geeft mensen het idee dat ze heel bijzonder zijn waarom jij ze vraagt om mee te doen? Je hebt al veel online VLen wat krijgen de cliënten dan terug?

O: vanuit TI idee om systeem te maken waarbij cliënten een incentive krijgen, bijvoorbeeld verslag uit het systeem. Ik wil bijvoorbeeld de straat opgaan met mijn vragenlijst vanuit TI. Die VL ging over social networking sites, die scores is niet interessant voor cliënten.

HH: wat levert het mensen dan op

O: ranking, gamers zijn daar dol op.

HH: daarbij creeer je wel weer meerwaarde voor de respondenten.

O: is betalen de enige manier

HH: of je hebt een relatie met iemand, of je krijgt waardering (daar zijn mensen niet in geïnteresseerd volgens mij), of het is iets wat interessant voor je respondenten. Dan hoef je niet gelijk geld te geven. Mijn moeder van 84 win je daar niet meer mee. Bij inhoudelijke interesse is er gelijk zelfselectie.

O: de andere incentives werken niet denkt u? Social norm, bijvoorbeeld. Van het aantal mensen uit Tilburg heeft zoveel % meegedaan.

HH: dat gaat pas werken als een substantieel percentage heeft meegedaan. Dan moet je beginnen met liegen, want in het begin heb je natuurlijk nog niks.

O: hoe zou Cialdini dat gedaan hebben? Hij heeft het over 56\%.

HH: je hebt geen persoonlijke relatie, het levert je niks op (geen inzicht of kennis), dan lijkt geld het enige dat gaat werken.

O: ik las een paper over contracten, dat is natuurlijk een moeilijker incentive. Faire en unfaire contracten.

HH: als je een contract hebt, dan heb je een relatie. Op de Heuvelstraat gaan staan geeft geen relatie met de mensen.

O: als je het in een systeem gaat stoppen en een pool gaat maken, dan heb je natuurlijk wel een relatie.

HH: maar wat levert het de respondenten dan wel op?

O: geld

HH: geld wordt belangrijker naarmate de respondent er minder uit haalt. Als je mensen bijvoorbeeld tips geeft over de risico's van bijvoorbeeld social networking sites. Volgens mij maakt je het jezelf te moeilijk door te zoeken naar relatie of wederkerigheid, als het verzoek niet te zwaar is, bijvoorbeeld 2 minuten, dan doen respondenten het wel.

O: 2 opties. een systeem waar de respondent profijt van heeft (informatie), geef info terug aan de respondent. Of: als dat niet mogelijk is dan is het heel moeilijk.

HH: Wederkerigheid, de ene student doet het voor de andere omdat hijzelf het op enig moment ook nodig heeft. Representativiteit is een heel lastig onderwerp.

O: volunteer subject van Rosenthal. Wie mee willen doen en wie niet geeft een vertekend beeld. Hoe representatief is het uiteindelijk.

HH: het onderzoek zoals jij het wilt doen is waarschijnlijk alleen geld een incentive. Mechanical turk, daar doen de respondenten het voor geld.

O: doet geld of waardebonnen het beter?

HH: lastig. Ik heb uw reactie nodig voor het onderzoek. Waarom ben ik als respondent zo belangrijk? Als je daar antwoord op hebt, dan helpt dat. Representativiteit is dan ook wel weer lastig.

HH: Ga eens praten bij het Max Planck instituut

O: ik wil zo groot mogelijke representativiteit, niet 83\% blanke 18-jarige vrouwen. Prioritering is er niet helemaal uitgekomen. Welke theorieën liggen eraan ten grondslag.

HH: needs theory, social identity, autonoom, affiliatie. Identiteit bevestigen, dan ben je gevoelig voor die dingen die je identiteit benoemen. Ik wil 5 minuten of 15 of 20 minuten van je tijd dat maakt wat uit. De zwaarte van het verzoek is van groot belang.

O: door in the face techniek.

HH: controle groep. Bij door in the face techniek moet ook onderzoek gedaan zijn naar het invullen van vragenlijsten. Politicologisch onderzoek, Maurice d'Hondt, sociologen hebben daar ook wel onderzoek naar gedaan.

O: ik begrijp dat u zich wel kunt vinden in de needs theory.

HH: dit is vrij nieuw, daar kun je vast wel allerlei dingen van terug vinden.

O: vraag over het experiment. Hoe breng je op de Heuvelstraat onder de aandacht wat je wilt doen.

HH: grote opiniepeilers kun je dan waarschijnlijk het beste vragen. Je mag mij wel vragen, maar waarschijnlijk kunnen zij je beter helpen.

O: het hoeft geen gestratificeerde groep te zijn.

E.2. Robert Dur

Date: 01-09-2015

O: Het onderzoek wordt gedaan op eerste-jaars psychologie studenten, dat kan niet kloppen.

O: Ik wil representatievere steekproef. Eigenlijk zou je iedereen op straat moeten kunnen vragen.

Welke motivatoren zou je kunnen inzetten om een representatievere steekproef te krijgen.

RD: Je hebt ook mijn aanbevelingen voor literatuur gelezen? Was dat ambitieus?

O: dat valt wel mee. Nog een ambitieuzere paper vond ik: De kijk van de econoom en de sociologisch kijk vergeleken in een van de papers. De homo sociologicus doet het altijd omdat het belangrijk is. De homo economicus doet alleen maar mee als er geld gegeven wordt. Theoretische paper, maar ze gaan ook wel de straat op.

RD: In economisch onderzoek wordt de homo economicus niet meer serieus genomen, als je geld meestuurt dan neemt de home economicus het geld uit de envelop en doet niet mee.

O: Hans Hoeken denkt als jij er iets aan hebt, dan doe je mee. Bijvoorbeeld mijn onderzoek over social networking sites.

O: Social norms (Cialdini), hoe meer mensen zich verbonden voelen met anderen des te meer doen mensen mee. Dit is ook een incentive die zou kunnen werken.

O: 3 incentives die zouden kunnen werken. Ik ga op het station staat, ik ga 3 incentives voorleggen aan de mensen op het station, wat zou werken voor u om mee te doen.

RD: zeggen mensen dan niet “Ik doe toch mee!” Hoe verleid je mensen om mee te doen.

O: Dit is voor een online vragenlijst systeem. Uiteindelijk wil je mensen verleiden om deel te nemen aan online onderzoek. De tweede trap is dat ze in een pool komen en meerdere vragenlijsten daarvoor moeten invullen. Welke incentive zou u laten deelnemen.

Olaf gaat dan weer op het station staan. We gaan een online vragenlijst systeem doen, als u mee wilt doen, dan krijgt u: 50 cent en zoveel mensen uit Tilburg doen mee en u krijgt iets aan info terug. Je gaat met mensen praten. iPad meenemen, vragenlijst uit Delft meenemen.

E.3. Junhui Wu

Date: 05-08-2015

Note: the responses from Wu are marked in italic.

The goal of my research is to come up with a list of incentives that can be utilised in online

research questionnaire systems. This online system consists of a pool of research participants, that are rewarded for completing the tasks. This can either be monetary, via the outcome of questionnaires or any other incentive. (So, the goal of your research is to come up with incentives that can increase the response rate of survey participation. Is that correct?)

1. In the literature I found the following list of incentives:
    1. Strong reciprocity in general, meaning that if a participant performs a task for the researcher, the researcher should do something in return. This could be a small task in the case of a smaller research, or one of the following incentives in a research with a smaller sample. *(So, I would frame this as expected (monetary or non-monetary) compensation for survey participation, which conveys the same message.)*
    2. A fixed fee for participating in the research whatever the amount of tasks completed.
    3. Incentives payments for every task completed and a minimal fee for participating in the first place.
    4. A reward program, with either coupons or free access programme.
    5. Pride for participating in the research and adhering to the social norm. *(Are participants really motivated by pride for participation? Besides, what kind of social norm do you mean here? Distinguish two different kinds of social norm: descriptive norm (what everyone else is doing in a given situation) or injunctive norm (what you are supposed to do in a given situation).)*
    6. Offering a reciprocal contract in which the rewards, punishment and tasks are recorded. *(Participation in online survey is completely voluntary. Instead of framing it as reciprocal contract, I would frame it as "Informed Consent Form" with explicit information on the expected reward, tasks and expected duration of the survey.)*
    7. Focussing on (provincial) social norms that match the situation the potential participant is currently in. *(I am not sure how you can apply this incentive to motivate participants to complete the survey, unless you make use of the descriptive norm and tell participants that most people who have received the survey invitation completed the survey, which could be one solution.)*
2. Other experts mentioned the following incentives:
    1. Letting the participant feel special, thus focussing on special characteristics of that participant. *(I am not sure how this incentive works.)*
    2. Providing the participant with a meaningful outcome of the questionnaire. (Do you mean expected meaningful feedback for participants' responses to the questionnaire?)
3. Questions
    1. In the list above, did you miss an incentive that you think might increase the motivation of possible participants in participating in research? *(Combining what you mentioned above, I would like to distinguish the different forms of monetary incentives here:)*
        i. *Baseline payment plus additional bonus based on the tasks completed;*
        ii. *Fixed payment for participation;*
        iii. *Paid in advance vs. later after participation;*

iv. *Payment in terms of coupons or lottery tickets for bonus, or free access to programs that worth a certain value.*

Alternative incentives I could think of:

i. *topic interest: Whether participants are interested in the survey topic;*
ii. *learning opportunity: Whether participants have an opportunity to learn about social science research topics;*
iii. *confidentiality and privacy concerns: Guarantee of confidentiality in participants' responses;*
iv. *survey simplicity: the survey itself is concise and easy to understand, and does not take too long;*
v. *descriptive norms: convey information about how most people react when invited to take the survey. (you mentioned this in terms of social norms, but it was not clear.)*

2. In an online research system, the participants have a relationship with the researchers (are supposed to participate over a longer periode of time) and should the task not be too taxing. Which three incentives, and in which order, do you think are best to motivate the potential participants?
    i. *topic interest*
    ii. *effort >= anticipated benefits*
    iii. *benefits (monetary payment, feedback on the survey, etc) should be delivered in time*
3. Did you base the ordering of incentives on theories, and if so, on which theories did you base this order? *(Self-determination theory (Deci & Ryan, 2012):)*
    i. *Three psychological needs: competence, autonomy, relatedness*
    ii. *intrinsic motives (e.g., genuine interest in the topic) vs. extrinsic motives (e.g., monetary and non-monetary compensation)*
4. For my research, I want to use a theoretical framework which uses the Need-theory (need for achievement, affiliation, power) by McClelland. Do you think this is the best overall theory for this model and do you agree with the general structure of this model? *(I do see the point that the incentive of descriptive norms may fulfill the need for affiliation, but there seems to be no rationale in justifying why the need for achievement or power is important is taking part in a survey. In my view, self-determination theory may be a better candidate for your theoretical framework.)*