Faculteit der Sociale Wetenschappen

The intuitive information processing system and its effects on prosocial behavior.

An experiment investigating the influence of time-pressure and cognitive load on charitable donations.

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1. Abstract

Prosocial behavior, explicitly charitable donations, is very important for charities to achieve their goals. However, obtaining enough donations is not that easy. In the present study we examined whether prosocial behavior can be evoked by System 1, a cognitive information processing system characterized by its automatic and fast processes. We manipulated this by using time-pressure and cognitive load. Kahneman stated that System 1 would reduce prosocial behavior, whereas Rand stated that this would increase prosocial behavior. Both statements were transferred into hypotheses and tested in an experiment. However, neither hypothesis was corroborated by the results. Possibly, methodological inaccuracies contributed to these results. The impact of the direction of the affective motivation may be an influence as well. Moreover, several sceptics criticize the impact of the dual-process theory. Further research should determine to what extent the underlying motivation is an influence and whether the criticism can be proven.

2. Introduction

In the society we live in today, helping each other becomes more important. The world is getting more terrorized by religious wars, earthquakes, epidemics and other disasters that can lead to hunger, sickness even to death. As such, helping each other is necessary, sometimes even to survive. Charity becomes more and more dependent on individual donations since federal support becomes less and less (Sherman & Yoo, 2007). Volunteer organizations and charities try to attract those people that are able and willing to help. Acts of charitable giving come in many shapes: donating money, clothes and food, or help with services as first aid or whatever talent or service is needed. However, attracting donators appears to be not that easy. People are busy, do not have the supplies or money to help or simply do not want to. Nevertheless, charitable actions are the mainspring for voluntary organizations (Murninghan, Kim, & Metzger, 1993).

Helping each other goes far back in time. Although evolution is based on the idea of competition and survival of the fittest, thus should reward selfishness, helping each other is not only pretty common between humans but also between lots of other organisms of the same species (Axelrod & Hamilton, 1981).

A term that is often used to describe behavior where people are helping, is prosocial behavior. Prosocial behavior is described as a category of behavior that is generally beneficial to others (Penner, Dovidio, Piliavin, & Schroeder, 2005). A type of prosocial behavior that is driven by the eagerness to help other human beings, without expecting any benefits for the self, is also referred to as altruism (Lay & Hoppman, 2015; Kinnunen and Windmann, 2013). The evolutionary perspective on altruism states that human beings rather show reciprocal altruism than pure altruism. Brosnan and De Waal (2002) define reciprocal altruism as the exchange of services and/or goods such that individual benefits are being returned to the other individual. Human beings understood that the economics of reciprocal altruism could provide

a system of enduring mutual benefits (Murninghan, Kim, & Metzger, 1993). They shared food and knowledge in order to survive. In this exchange of goods and knowledge, they expected that the exchange would be balanced and fair overtime and that in the end everyone would have given and received approximately the same (Murninghan, Kim, & Metzger, 1993).

To get a clearer view on prosocial behavior, I will elaborate on why and when people tend to help.

2.1. Why would people help?

Why people would engage in prosocial behavior is generally explained by a couple of psychological mechanisms. One of these mechanisms is about social and personal standards (Penner, Dovidio, Piliavin, & Schroeder, 2005). This mechanism explains how norms, such as reciprocity, social responsibility and personal norms influence the tendency to help. Social standards arise in favor of the group. They restrict egoistic impulses to positively influence collective outcomes (Biel & Thøgersen, 2007). Social standards imply that certain behavior is undesirable and other behavior is preferred. Such standards can imply for instance norms about social justice, equality, protecting the environment or helping others (Biel & Thøgersen, 2007). Violations of these standards are often sanctioned. Personal standards are internal and include the feeling of obligation you have when others are in need of help, regardless of what others expect (Biel & Thøgersen, 2007; Schwartz, 2010). Schwartz (2010) explains in his values theory how values, which are included in personal norms, contribute to prosocial behavior. He identified 10 values that are recognizable for all cultures. These values are: conformity, tradition, benevolence (welfare of the ingroup), universalism (welfare of all), self-direction, stimulation, hedonism, achievement, power and security (Schwartz, 2010). The relations that can be formed between those values, can provide motivation for prosocial behavior. However, a value will not influence behavior unless it is activated. The more

accessible a value is, the more likely it will be activated. Schwartz (2010) described four steps in the activation of these values. First, you must be consciously aware that others need help. Then the awareness that viable actions can reduce this need is needed. The third step includes the awareness of perceiving yourself as able to help. The last step in the activation of values is the perception of responsibility to get involved in the helping (Schwartz, 2010).

Schwartz (2010) also mentions arousal and affect as other important motivators to help others. It contains the important emotions that play a role in motivating prosocial behavior. The distress of others can get people empathically aroused and can get people motivated to improve their own welfare (egoistic motivation) or the welfare of others (altruistic motivation). This emphatic concern appears to be an important characteristic of the motivation underlying altruism (Dickert, Sagara and Slovic, 2010; Verhaert & Van den Poel, 2011). This is also explained by the empathy-altruism theory (Basil, Ridgway and Basil, 2008). It argues that empathy motivates people to focus on the well-being of others in need. The greater someone's emphatic concern, the more likely this person will show prosocial behavior (Dickert, Sagara and Slovic, 2010; Dickert, 2008; Verhaert & Van den Poel, 2011). In charity, it can lead to high donations (Verhaert & Van den Poel, 2011, Dickert, 2008).

People can also show prosocial behavior towards others for egoistic or self-focused reasons, as helping others can benefit the self as well. Dunn, Aknin and Norton (2014) found that prosocial spending, which is a type of prosocial behavior where people spend their money for other's happiness, made the spenders themselves also happier.

2.2. When would people help?

Now we know that people can help for own or others interests, it is also important to elaborate on *when* people tend to help. Piliavin and colleagues tried to explain this according to the cost-reward analysis of helping (Piliavin et al, 1981; as described in Penner, Dovidio, Piliavin,

& Schroeder, 2005). This economic view of behavior assumes that people are usually motivated to maximize their own benefits and to minimize their costs. This perspective is rational and concerned about self-interests. Some see helping others as an opportunity to develop themselves. For personal development, they try to increase the possible benefits, decrease the costs of helping and increase the costs of *not* helping. Such costs can contain shame or guilt for inaction (Penner, Dovidio, Piliavin, & Schroeder, 2005). When the overall costs exceed the rewards or gains, helping others becomes an act of unselfishness, also referred as altruism (Hinde & Groebel, 1991).

Psychological research states that information processing can influence the decision to help as well (Dickert, Sagara and Slovic, 2010; Dickert, 2008; Evans, 2003). The dual-process theory distinguishes two information processing systems. System 1 includes an effortless, quick, concrete, automatic and emotional process, while System 2 includes a slower, controlled, abstract, flexible, reflective and effortful process (Kahneman, 2011; Dickert, Sagara and Slovic, 2010). Also, System 1 provides intuitive decisions, while System 2 provides hypothetical thinking that cannot be done by System 1 (Evans, 2003; Rand, Greene and Nowak, 2012). The system a person uses to process information in order to make a decision may also have an influence on whether a person makes egoistic or altruistic choices, and if these choices are intuitive or controlled. Rand, Greene and Nowak (2012) did some research to investigate these differences. They stated that intuition based decisions are automatic and effortless, thus made under System 1. Kahneman (2011) makes a similar point and also states that System 1 includes personal and social norms. System 2 does not create those norms by itself, but adopts the suggestions of System 1 and turns these suggestions into beliefs, without any (or very little) modifications (Kahneman, 2011). A clear overview of the characteristics of the systems is shown in Table 1 (Kahneman & Frederick, 2002). Controlled decisions are decisions that need more deliberative and reflective thinking, and are slower

than intuitive decisions. These kinds of decisions are made under System 2 (Rand, Greene and Nowak, 2012; Kahneman, 2011). The studies of Rand, Greene and Nowak (2012) also showed that when a person makes intuitive decisions, thus under System 1, those decisions are more prosocial. Rand, Dreber, Ellingsen, Fudenberg and Nowak (2009) elaborate in their experiment review on a one-shot public good game (controlled experiment where anonymous individuals need to decide over contributing to public goods) that intuitive, automatic responses include reciprocal cooperation strategies and thereby faster and more cooperative decisions are made. According to these findings, it is likely that people who are making decisions under System 1 are more inclined to help others (Dickert, Sagara and Slovic, 2010; Dickert, 2008).

Table 1. *Overview of the cognitive systems (Kahneman & Frederich, 2002).*

System 1 (Intuitive)	System 2 (Reflective)
Process characteristics	
Automatic	Controlled
Effortless	Effortful
Associative	Deductive
Rapid, parallel	Slow, serial
Process opaque	Self-aware
Skilled action	Rule application
Content on which processes act	
Affective	Neutral
Causal propensities	Statistics
Concrete, specific	Abstract
Prototypes	Sets

As mentioned before, it is more favorable for charity when people make altruistic, prosocial or cooperative decisions. According to Rand, such decisions are intuitive. As such, a way to induce people to make those decisions is to let them make faster decisions, thus under System 1. Rand, Greene and Nowak (2012) proved in their studies that time-pressure can cause suppression of System 2 and thereby induce people to make decisions under System 1. This would mean that their choices are likely to be more intuitive and more altruistic. They manipulated these choices by giving participants only 10 seconds to decide how much money they were prepared to donate to a common pool.

Kahneman (2011) has other ideas about suppressing System 2 and how System 1 affects prosocial behavior. By manipulating someone's cognitive load by making them cognitively busy, he says he can suppress System 2. When a person is cognitively busy, there remains less cognitive space to handle other tasks and therefore the brain is forced to use System 1 for these such tasks. However, Kahneman states, in contrast to Rand, that persons with a high cognitive load tend to make more selfish choices. Kahneman (2011) argues that System 1 takes over in emergencies, hence this system allocates priority to self-protective actions, which dates back to a long evolutionary history (Kahneman, 2011). Besides, Kahneman (2011) argued that helping others takes effort. And when you are cognitively busy increasing effort is not an option.

As such, there is a clear discrepancy between Kahneman's statement and the theory of Rand, Greene and Nowak (2012). Both state that when people are cognitively busy, they have to use System 1 for others tasks. However, according to Kahneman's statement about cognitive load these people will make more selfish decisions, whereas according to Rand they will make more cooperative, prosocial and emphatic decisions. Not only Kahneman, but also Dickert, Sagara and Slovic (2010) proved in their study that cognitive load can restrict system 2. By participants having to remember a 10-letter sequence, they made sure that their cognitive load was high. But, in their study this resulted in more emphatic feelings and charitable giving, which is in line with the statement of Rand. However, this is in contrast to the selfish choices that Kahneman would predict.

2.3. Hypotheses and aims

Considering all of the above, more research about prosocial behavior under System 1 is necessary, because currently there are contrary findings about prosocial behavior under the use of this system. Therefore, the main question is whether the theory of Rand or Kahneman

is right. This will be examined through an experiment concerning donating to charity. The amount of donated money will be used to measure the extent of prosocial behavior. With time-pressure and cognitive load manipulated, participants are forced to use System 1. Based on Rand and Kahneman we can formulate two opposing hypotheses. The first hypothesis is that, based on Rand and his theory about time pressure and altruism, donations will be higher under the use of System 1 (as opposed to System 2). The second hypothesis is that, based on Kahneman and his theory about cognitive load and selfishness, donations will be lower under the use of System 1 (as opposed to System 2).

Since donations are the most important revenue for charities[1], it is important for them to know how to collect them in the most efficient manner. As demonstrated in the introduction, there is not one specific factor that moves people to donate. Therefore collecting donations is a time-consuming task. My results may be of interest for charities to help them choose a working method that moves people to donate the most. In this way, it may be easier and less time-consuming for charities to collect the needed money, and maybe even to achieve their goals.

[1] Consulted 'Goede Doelen Nederland': https://goededoelennederland.nl/system/files/public/Onderzoek/2015FeitenencijfersDEF.pdf

3. Method

3.1. Participants and design

This study is designed and executed in collaboration with Myrthe van der Leegte. All 155 participants (81,9% female) in the study were recruited in the building of Social Sciences of Leiden University or in our own social network. Participants could enroll in the experiment through a website of the university. They could earn money or credits by participating.

The study was approved by the ethics committee of psychology of Leiden University. The experiment was a 2 (no time-pressure – time pressure) x 2 (no cognitive load – cognitive load) design, with four conditions. The first condition was a control condition. In the second condition, only time-pressure was manipulated and in the third condition only cognitive load was manipulated. In the last condition, both time-pressure and cognitive load were manipulated.

Participants were asked to choose how much they were willing to donate to Amnesty International. They had to choose an amount somewhere between €0,00 and €1,50. Amnesty International was chosen as charity used in the experiment through a pilot study.

3.2. Pilot Study

Prior to the actual experiment, we conducted a pilot study in order to choose a charity participants could donate to. In this pilot study participants had to indicate to what extent they were willing to donate to several charities. The 64 participants who participated in this pilot study where friends and family of the researchers (M_{age} = 30.51, 50% man), and could participate through a link on the internet. Charities that were included in the pilot were: De Nederlandse Hartstichting, Nationaal Ouderenfonds, Diabetesfonds, Ronald McDonalds Kinderfonds, Amnesty International, WarChild, Artsen Zonder Grenzen, KNGF Geleidehonden, Hersenstichting, and Het Wereld Natuurfonds. On 9-points Likert scales

participants could indicate to what extent they were willing to donate to each charity. Choosing 1, they indicated that they were not willing to donate at all, whereas choosing 9 they indicated that they were very willing to donate. The charity that scored the most 'neutral', was Amnesty International. A charity scored neutral when participants were not explicitly unwilling to donate, but also not explicitly willing to donate. Most participants (34.4%) chose around the middle of the scale (4, 5 & 6). A small minority (7.8%) was explicitly not willing to donate at all to Amnesty International (1), also a small minority (9.4%) was explicitly willing to donate (9). We concluded that Amnesty International is a relative neutral charity, so in this way the experiment is the least influenced by explicit and strong opinions about the charity participants could donate to. In this way, time-pressure and high cognitive load are expected to be relatively strong influencers in our experiment.

3.3. Manipulation and procedure

This experiment was combined with another experiment. The other experiment was about dividing money and punishment in social groups. First, participants received a small briefing about what was expected from them in both experiments. The researchers showed them the computer where the experiment took place. Each participant sat in a closed room, so participants could not see or influence each other. The other experiment came before ours and was a computer task as well. When the set of experiments started, a few demographic questions were asked first. After completing the first experiment, this experiment followed immediately.

At the start of the experiment, participants were randomly assigned to a condition, with or without manipulation. Participants in the time-pressure condition received a manipulation as in the study of Rand, Green and Nowak (2012). This means that they had to make their decision within 10 seconds. Participants in the cognitive load condition had to

remember the following character sequence: DKZZVHTRKJ. They were asked to reproduce this sequence in the end of the experiment. This is the same manipulation as in the study of Dickert, Sagara and Slovic (2010; Dickert, 2008).

After they were assigned to a condition and some of them received their manipulation, they were asked to donate to Amnesty International. Participants could set a slider at an amount somewhere between €0,00 and €1,50. The amount that was left over of the €1,50, thus not donated, would be given to the participants to keep for themselves. So, when participants chose to donate €0,00, they would receive €1,50 for themselves. When they chose to donate €0,50, they would receive €1,00 for themselves, and so on.

When participants were done with their questions, they received the amount they decided not to donate in the experiment. The donated amount was collected by the researchers.

The donations from all participants were added up and donated to Amnesty International. In total, Amnesty International received €105,60.

4. Results

4.1. Exclusion of participants

In the condition where we manipulated time pressure, some of the participants took more time for their decision than the given 10 seconds. This may have happened because some of them did not understand they had to click to the next question themselves, or because they simply needed more time to make their decision. I made a new condition for time-pressure were I filtered out the participants who took longer than 10 seconds for their decision, because for those people I cannot be sure our manipulation did work properly. Of the 155 participants who originally participated in our research, 131 (84,7 % female) of them were taken into my calculations.

4.2. Statistical analysis and results

To test the research question and both hypotheses, I performed an independent two-way ANOVA with use of the statistical programme SPSS. The dependent variable ‘donation’ was used to examine the amount of donations. An independent variable for time-pressure was used to test the hypothesis about System 1, based on the theory of Rand. An independent variable for cognitive load was used to test the hypothesis about System 1 based on the theory of Kahneman. Before the ANOVA was performed, several assumption checks were done, which showed that all the assumptions were met.

In order to test the effect for time-pressure, 55 participants received the time-pressure manipulation and 76 participant did not receive the manipulation. The main effect of time-pressure on donation appeared to be non-significant ($F(1,27) = 1.156$, $p > .284$). This means that I did not find a main effect for time-pressure and that the hypothesis based on Rand was not corroborated by the data.

In order to test the effect for cognitive load, 68 participants were assigned to have the manipulation and 63 did not undergo the load manipulation. The main effect of cognitive load on donation appeared to be non-significant ($F(1,127) = .117$, $p = .733$). This means I did not find a main effect for cognitive load as well and that the hypothesis based on the theory of Kahneman is not proven in this experiment.

Table 2. *Means of donations in eurocents of the different groups.*

	Time-pressure	**No Time-pressure**	**Marginals**
Cognitive Load	75.17 (*n = 29)*	76.67 (*n* = 39)	76.03 (*n* = 68)
No Cognitive Load	84.23 (*n* = 26)	60.54 (*n* = 37)	70.32 (*n* = 63)
Marginals	79.45 (*n* = 55)	68.81 (*n* = 76)	73.28 (*n* = 131)

Table 2 summarizes my findings. Although both main effects were non-significant, I also look at the means of the donations to get a better understanding of the donating behavior amongst the different groups. The overall average ($M = 73.28$, $SD = 58.21$) is relatively low.

The group who donated the least, was the group that did not receive a manipulation at all ($M = 60.54$, $SD = 53.43$). The group who donated the highest ($M = 84.23$, $SD = 60.01$) where the ones that only received time-pressure as manipulation, and no cognitive load. Even though it is not significant, this donation behavior resembles to be similar to what Rand predicted.

If I only look at the means of cognitive load and the theory of Kahneman, I see something happening that resembles the opposite of what Kahneman would predict. According to his theory, he predicts that once a person is cognitively busy, he would donate less. If I compare the amount of donations under cognitive load ($M = 76.03$, $SD = 59.60$) with the donations with no manipulation at all ($M = 60.54$, $SD = 53.43$), the donations under

cognitive load still are higher. This result seems to be more similar to results of the study of Dickert (2008; Dickert, Sagara & Slovic, 2010), where donations made under high cognitive load were also higher than donations made under low cognitive load.

Although I did not have a hypothesis for an interaction effect, I did find a result that resembles an interaction. Figure 1 shows this interaction ($F(1,127) = 1.49$, $p = 0.225$) between cognitive load and time- pressure. Once you add time-pressure to cognitive load, thus participants receive a double manipulation, the donations become less than the donations of the participants who only receive the cognitive load manipulation.

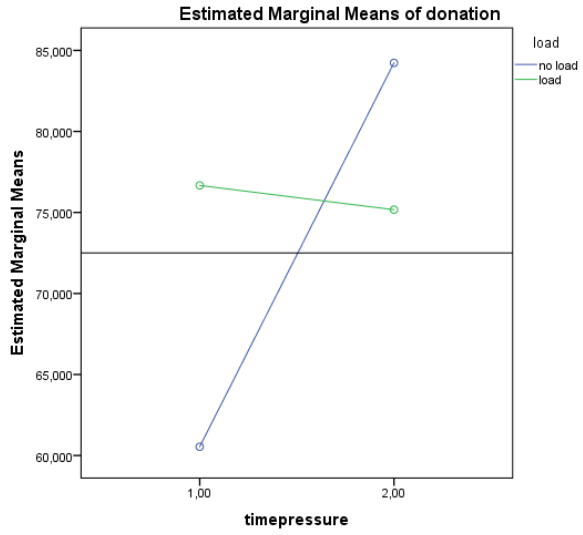

Figure 1. Interaction between cognitive load and time-pressure.

5. Discussion

5.1. Findings

The main goal of this experiment was to examine whether the theory of Rand or the theory of Kahneman held true. To test this question, two hypotheses were formulated. The first hypothesis was based on the theory of Rand: donations will be higher under the use of System 1. The second hypothesis was based on the theory of Kahneman: donations will be lower under the use of System 1. System 1 was manipulated using cognitive load and time-pressure. Results of the independent two-way ANOVA showed that both my hypotheses were not supported. This means that I had to search for explanations why all of my results were non-significant, on which I will elaborate below.

5.2. Theoretical explanations

An important thing that has to be mentioned, is that the origin of the ideas of Kahneman are hard to verify. Supporting experiments were not found and the exact theories where Kahneman based his ideas on, were not clearly mentioned in both his books and articles. Based on the available literature of Kahneman and his ideas of the effect of System 1 on prosocial decisions, it is plausible that his ideas are only based on evolutionary ideas. Dickert, Sagara and Slovic (2010; Dickert, 2008) conducted an experiment based on Kahneman's idea that System 2 can be suppressed by making someone cognitively busy, which we replicated, and they could not support the idea of Kahneman that it makes a person more selfish either. In fact, they found that people made higher donations under high cognitive load than under low cognitive load. Although my results were not significant, the behavior of the participants seemed to be more into the direction of the results that Dickert, Sagara and Slovic (2010; Dickert, 2008) found than what Kahneman would predict. This makes it questionable how sustainable the ideas of Kahneman are.

The theories discussed in the introduction supported my hypotheses, but neglected the influence of participants' prior donating behavior. The effect of decision routines describes the influence of previously decided behavior in similar cases (Betsch, Fiedler & Brinkmann, 1998). It aims that once a person had to decide over a similar situation in the past, he or she figured out a working solution that becomes a behavioral routine which will be used later on as well. The routine serves as first guess in many situations and is superior over other strategies. It is likely that this strategy can be used under System 1, because System 1 is not equipped to doubt (Kahneman, 2011). If this was the case with some of our participants, they may have not made their decision at the moment we asked them to, because they already knew what to do.

According to Dickert (2008), the effects of cognitive load on the emotional processing within System 1 are not that straight-forward. He states that these effects depend partly on the type of involved decisions and emotions. Dickert (2008) did some more research on donating decisions and the underlying mechanisms of affective reactions, especially in case of where these affective reactions guide the amount of donations. Affective reactions (in the specific case of donations) are in their turn guided by the identification of victims and the number of victims. He concludes that the amount of donations rise when a person is able to identify one victim, so the person can exclusively attend to him or her. The entitativity and a vivid mental image of that victim generates high affective reactions, which leads to higher donations. System 1 becomes less engaged when the victims are numerically represented and thus difficult to identify. In that case System 2 becomes relatively more important (Dickert, 2008). Important note is that this is only the case for people who have a prosocial intention with donating. It does not apply for people who have more egoistic reasons for helping and are thus more self-focused. It is possible though to manipulate a shift of the focus on the self to others by affective priming. Dickert (2008) suggest to do that by asking participants to evaluate

objects and people in an affective manner prior to the donation task. However, his suggestion is not based on data collected by his experiment, so further research is necessary.

5.2.1. Criticism on the dual-process theory

Lately there has been much criticism on the dual-process theory, on which my hypotheses are based. The theory is criticized on the limited explanation of how System 1 and System 2 may interact (Dhami and Thomson, 2012). One of these skeptics is Evans (2008). A point that he makes is that emotions are set in System 1, but have a more slow and deliberative cognitive basis. Emotions are fundamental for decision making, especially in charity. According to Evans (2008), this would mean that System 2 was at the basis of the decision that was made in our experiment.

Skeptics also state that System 1 is not one particular system with one particular evolutionary history. They state that there is a single conscious working memory system (System 2), which they find to be the only firm foundation of the dual-process theory, and that there is 'everything else' of the information processing which cannot be categorized. Kahneman refers to this as System 1 (Evans, 2008). Evans (2008) came to this statement by the arguments that there are many forms of implicit processing (System 1) and that there are multiple learning and memory systems (Carruthers, 2006; as described in Evans, 2008). Some of these processes are evolutionary old and shared with animals, while others are more modern and recent and particular for humans (think of language and the theory of mind). If it is true that there are many different systems within the bigger System 1, which is probable according to most skeptics, I cannot just assume that time-pressure and cognitive load influence System 1 as a whole, like Kahneman and Rand state, but that they would only influence parts of the system. More research should be done on the idea of the existence of all

the different systems, before I generalize the ideas of the systems Kahneman and Rand investigated on all the other possible systems.

5.2.2. The cognitive continuum theory

Given all the criticism on the dual-process theory, the cognitive continuum theory of Hammond (Evans, 2008) might be a better fit. Hammond states that the information processing system is rather a continuum than two distinct processes. He describes a continuum range with two ends: intuition and analysis, with quasi-rationality in the central region. Hammond (1975; as described in Cader, Campbell & Watson, 2005) is also taking situational influences into account within his theory. The dual-process theory where Kahneman and Rand encounter on draws on processing information in general and loses little on the way people eventually make decisions in particular situations.

There are some methodological inaccuracies that imply that at some points my manipulations may have lost influence, which will be discussed below. When I look at the means, I see that there has been a difference in donating behavior under both manipulations into the direction of what Rand predicted, but it is not significant. This could mean that these participants may have made their decision more intuitive than the participants without any manipulation, but they did not move enough into the intuition part of the scale to make the difference big enough for significance. In this case the dual-process theory may be oversimplified and the cognitive continuum theory may be a better fit.

5.3. Methodological inaccuracies

Participants could have been a 'victim' of social proof (Cialdini, 2007; Shearman & Yoo, 2007) and followed the actions of others. At a few points in the research, more participants wanted to sign in at the same moment that previous participants were done with the

experiment. I cannot guarantee that none of the participants who were signing in, did not see the amount of money which the previous participants decided to keep, since I had to hand over the amount. It is possible that the waiting participants followed the norm set by the previous ones. In this case, our manipulation may have lost its influence.

Before taking part in our experiment, participants had the idea that they would get the full €5 afterwards. During the experiment and before the manipulation took place, they were told that the amount of money they would donate, would be subtracted from their final compensation for participating. This means that before they thought about whether to donate to charity under our manipulations, they already could have decided to keep the full amount of money, because beforehand they assumed they would get that money. Thereby, people perceive outcomes in terms of the value function of the prospect theory (Kahneman & Tversky, 1979, as described in Thaler, 1999). It is possible been that the participants felt like losing money if they donated, because they already counted on the money and thereby decided not to donate. Due to this procedure our manipulation may have become less influential, due to the interference of the effect of the prospect theory (Rand, Greene and Nowak, 2012; Kahneman, 2011).

5.3.1. Effects of income and age

Several studies show that income is associated with donations. All of our participants were students in the Netherlands and the income of students is generally lower than the income of other adults (Maguire, Taylor & Gurmu, 2003; NIBUD, 2015[2]). Pharoah & Tanner (1997) suggest that this lower income explains why they donate less. Donations and income are positively correlated, so they rise when income rises as well (Pharoah & Tanner, 1997; Hood,

[2] Consulted NIBUD, National Institution for Budget Education: https://www.nibud.nl/wp-content/uploads/Nibud-Studentenonderzoek-2015.pdf

Martin & Osberg, 1977; Bussell & Forbes, 2002). Our database shows that 28.4% decided to keep all the money for themselves, perhaps due to their low student income.

Besides that, our participants had an average age of 20.9. According to (Pharoah & Tanner, 1997), only 10 per cent of people aged 18-24 give to charity. Pharoah and Tanner (1997) even found a trend that younger households not only donate less than older households, but young households now also donate less than the older households did when they were younger. This could explain why the average donation in this experiment is relatively low (*M* = 73.28 eurocents, *SD* = 58.21) and that more than one-quarter did not donate at all.

The total amount that our participants could donate was only €1,50. This is a relatively small amount, given that the total monthly income of students in the Netherlands is €768[3]. Laboratory experiments show that participants report more happiness when they gain a small amount of money, than they report unhappiness when they had to imagine 'losing' (in our experiment this would be donating) the same small amount (Harinck, Van Dijk, Van Beest & Mersmann, 2007). According to the hedonic principle, people try to maximize their pleasure (Harinck, Van Dijk, Van Beest & Mersmann, 2007). This might explain why 59.4% of our participants chose to keep a bigger amount of money than what they donated.

5.4. Recommendations for further research

It would be interesting to have a closer look at the underlying motivations of people for donating when testing the influence of System 1 on donations. As mentioned before, there are several reasons why people donate. They can be divided into self-focused motivation or other-focused motivation. According to Dickert (2008), the amount of donations will vary among those types of motivations, even under the influence of System 1. When this will be studied in

[3] Consulted NIBUD, National Institution for Budget Education: https://www.nibud.nl/wp-content/uploads/Nibud-Studentenonderzoek-2015.pdf

combination with replicating this study, a more varied sample of the Dutch population is needed, given the effects of income and age on donation.

Given the criticism on the dual-process theory, it will be very interesting to test whether the cognitive continuum is applicable for explaining prosocial behavior. Till now, this theory is mostly literary studied in medical and managerial environments. Future research should also focus on this theory in prosocial decision making and behavioral contexts.

5.5. Conclusion

Neither the theory of Rand nor the theory of Kahneman have been corroborated in this experiment. Having the previous discussed criticism on the dual-process theory in mind, it is probable that these processing systems do not operate in a black and white manner as Kahneman and Rand predict. It is possible that in a perfect isolated situation those systems indeed operate as Kahneman and Rand argue, but those isolated situations do not occur in everyday life, so it would be difficult to eliminate System 2 completely in prosocial decision making. Further research on the criticism and the cognitive continuum theory is necessary before I make hard statements about this theory and prosocial behavior. Results can be very interesting for charities to increase their collected donations. The trend that Pharoah and Tanner (1997) mentioned, as described in the introduction, has to become reversed again so that younger households in the future will spend more on donations again.

6. Reference list

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