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Are Social Preferences Skin Deep? Dictators under Cognitive Load

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Abstract

We study the impact of cognitive load in dictator games to test two conflicting views of moral behavior. Are social preferences skin-deep in the sense that they are the result of humans' cognitive reasoning while the natural instinct is selfish, or is rather the natural instinct to share fairly while our cognitive capacities are able to adjust moral principles in a self-serving manner? Some previous studies in more complex settings give conflicting answers, and to disentangle different possible mechanisms we use simple games. We study both charitable giving and the behavior of dictators under high and low cognitive load, where high cognitive load is assumed to reduce the impact of cognitive processes on behavior. In the dictator game we use both a give frame, where the dictator is given an amount and may share some or all of it to a partner, and a take frame, where dictators may take from an amount initially allocated to the partner. The results from four different studies indicate that the effect of cognitive load is small if at all existing.

Keywords: Social Preferences, experiments, dictator game, cognitive load

JEL Classification: C91

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Introduction

Are social preferences, or unselfishness more generally, the result of the current organization of society or more deeply rooted in human nature? A popular view is that pro-social behavior is a thin veneer of civilization above the selfish animal within, i.e. that social preferences are skin deep; this position is well summarized by biologist Michael Ghiselin (1974: 247): "Scratch an 'altruist' and watch a 'hypocrite' bleed." Others such as De Waal (1996, 2006) strongly reject this notion. He argues that basic social preferences are much more fundamental and that they can be clearly observed also in certain non-human primates such as bonobos, a close primate relative of the chimpanzee. Relatedly, are social preferences primarily the result of cognitive reasoning or of emotional processes? One way to shed some light on these issues, and which is used in the present paper, is to reduce people's cognitive capacity by exposing them to cognitive load. A natural question follows: Will this increase or decrease pro-social behavior?

In dual process theory (e.g. Evans, 2008; Kahneman, 2003, Petty & Wegener, 1999) the cognitive and affective processes are commonly seen as coexisting and being more or less active and parallel processes. A number of factors, such as situation, type of decision, type of information, and mood can, according to these theories, influence whether the cognitive or the affective processing comes to dominate a decision (Moskowitz, Skurnik & Galinsky, 1999; Stanovich & West, 2000; Tversky & Kahneman, 1974). Neuropsychological research (Camerer, Loewenstein, & Prelec, 2003) and parts of the existing management-theoretical and organizational-behavior literature supports that this approach can be applied also to economic decisions (Blackman, 1999; Nonaka & Takeuchi, 1995). In some situations affection dominates cognition and leads e.g. to irrational use of rules of thumb and shortsightedness. However, since emotions often convey important information it is not always rational to disregard affective reactions (Schwarz & Clore, 2003), and humans clearly make use of both these types of processing.

Such reasoning has also been applied to moral issues. Haidt (2001) distinguishes between intuitionistic versus rationalistic moral theory. The rationalist position argues that moral knowledge and moral judgments are reached primarily by a process of reasoning and reflection (Kohlberg, 1969). Such reasoning is well known from texts that are thousands of years old and the discussion is still running. The intuitionist approach, on the other hand, argues that moral evaluations are intuitively driven by effortless processes, and that we later produce verbal justifications, more like a lawyer defending the intuitive judgment than a judge deciding on right or wrong. Haidt et al (2000) asked subjects to evaluate a story of a pair of siblings making love, where most subjects found such behavior morally wrong. The information provided in the story however, is such that most arguments for why it is wrong for siblings to make love fail, but in spite of being unable to provide a verbal justification the subjects still stick to their initial judgment.

In biology we find similar discussions. Although morality poses a fundamental challenge to old-fashioned Darwinism, nowadays, for instance Dawkins (1989, 1991), argues that while a single gene is "selfish" and "blind", in the sense that it has no agenda or motive other than to replicate itself, there may still exist a genetic base for cooperation and caring for others as long as such behaviors increase the probability of the gene replicating itself and making it to the next generation. de Waal (1996, 200#) furthermore argues that we can observe the predecessor of morality in primates and discusses the evolution of morality, reflecting a view that morality is not simply an accidental by-product of cognitive capacity.

Economic decisions have traditionally been seen and modeled as guided by rationality. An individual is thus expected to use reasoning rather than affection when he or she is deciding how to distribute a resource, for example a sum of money, between him- or herself and other people. However, we find the dual processing reasoning also in some recent economics literature. For example, van Winden (2007) argues that emotions are more important than cognition in individual enforcement of norms like fairness, whereas More and Loewenstein (2004) consider self-interested behavior as automatic and viscerally tempting while the concern for others is more cognitive in nature.

Several brain studies have tried to map which parts of the brain are involved in moral questions. According to Loewenstein et al (2007) the neuro evidence regarding whether cognitive or emotional parts of the brain are in charge of moral decisions, is mixed. Sanfey et al (2003) find correlations between activity in brain areas known to be related to emotions (anterior insula) and rejections of unfair offers, and correlations between activity in brain areas known to be responsible for more cognitive tasks (right dorsolateral prefrontal cortex, RDPC) and acceptance of unfair offers. On the other hand, Knoch et al (2006) found that subjects whos RDPC was temporarily disrupted were more willing to accept unfair offers. While Sanfey's results support that social preferences are emotional, the results of Knoch et al support the notion of skin deep social preferences, as their results suggest that the cognitive brain area RDPC, is active in reducing selfish behavior.

In order to study whether cognitive or emotional processes are the main force behind morality in general, and more specifically generosity towards others, we have chosen simple experimental games; charitable giving and dictator games, where pure generosity is isolated and not disturbed by other elements, such as strategic considerations. If cognitive capacity is limited, performing cognitive tasks reduce the remaining capacity and thus reduces the impact of cognitive processes on behavior. In order to reduce the available cognitive resources of our subjects, we have chosen a well-used method; memorizing strings of numbers, which we will refer to as cognitive load (e.g. Shiv and Fedorikin 1999). As we wish to reduce the available cognitive capacity and study how this changes behavior, we compare the behavior of subjects under high and low cognitive load. If cognitive load leads to less generous behavior, our results will support that emotional instincts urge for selfishness, and thus support the notion of skin deep social preferences. If cognitive load on the other hand leads to more generous behavior, our results will suggest that social preferences are more emotional and therefore more fundamental. We will not only test whether behavior in terms of actual contribution differs between treatment with and without a cognitive load; we will also test whether there are emotional differences between the treatments. In follow-up questions we will in addition ask about subjects' perceived use of cognitive and emotional resources when making the allocative decisions.

Moreover, there is much evidence generally that 'framing' matters for experimental behavior (Tversky and Kahneman 1981), in the sense that behavior tends to change if subjects are confronted with alternative wordings for the same objective outcome. One may then conjecture that effects of cognitive load may also be different depending on framing. In particular, we are interested in how initial perceived ownership matters, since that may affect the perceived moral character of the problem. In the conventional *give treatment*, the individual decides how to split a certain amount of money that is given to him/her with an anonymous co-player, whereas in a *take treatment* the task is the same except for the fact that the money is initially given to the coplayer.[2] Therefore, we will test

[2] Several studies based on repeated public good games have concluded that people tend to contribute more in the give treatment compared to the take treatment (Andreoni 1995; Cookson 2000; Park 2000; Sonnemans et

for effects of cognitive load in our dictator experiments based on give and take treatments separately.
Before giving the details of our study we will first, in the next section, provide a short review of previous studies that have utilized cognitive load experimentally.

1. Previous Studies on Cognitive Load

Various forms of cognitive load have been used to investigate issues of which many are not the focus of the present paper. Nevertheless, we will briefly look at what kind of cognitive load has been used. Liebermann et al (2001) let subjects count the occurrence of a tone, while Gilbert and Krull (1988) let subjects watch letters flashing by on a screen, where subjects under high cognitive load must press a button each time they see the letters R, S and T, subjects under medium cognitive load must press a button each time they see the letter A, while subjects under low cognitive load only observe the screen without pressing a button. The most used method of giving subjects cognitive load, is to our knowledge making subjects memorize strings of numbers (Swann et al (1990), Gilbert et al (1995), Trope and Alfieri (1997), Shiv and Fedorikhin (1999) and Shiv and Nowlis (2004)). In psychological experiments, it is more common than in economic experiments, to camouflage that the memorizing of numbers is part of the experiment. It can for instance be done by the subjects receiving an urgent phone call to the experimenter with the request that the subject tells the experimenter to call back to a certain phone number. As the subject does not have the possibility of writing down the phone number, it must be memorized (ref).

In a relatively early study by Shiv and Fedorikin (1999), people's possibility for self-control was studied under cognitive load. Subjects were found to be more likely to choose a cake over a fruit salad when their cognitive ability was suppressed, indicating that cognitive reasoning is necessary for self-restraint. In this experiment, subjects under high cognitive load memorized 7 digits, while subjects under low cognitive load memorized 2 digits. We are particularly interested in the effect of generosity or social preferences under cognitive load. Some previous studies on social preferences and cognitive load find large and statistically significant effects, while others find small and insignificant effects. Moreover, and somewhat disturbingly, among the studies that have found significant effects, the effects in these studies do not go in the same direction.

Roch et al. (2000) undertook a variant of the public good game experiment, where subjects could withdraw resources from a common pool. In their experiment, subjects were told that they were in a group consisting of eight participants who each in turn could withdraw resources from the pool. Each subject was further told that s/he was the first person in that group to choose how much to withdraw. Roch et al (2000) find that subjects take half as much from the common pool under high cognitive load as under low cognitive load, which suggests that cognitive load leads to more generous behavior, or that generous behavior is instinctive or driven my emotions. On the other hand Crelley et al (2008) find the opposite result in a more complex common pool experiment, using what they call ego depletion, which is similar to that of cognitive load, to deplete the cognitive capacity of self control. In their experiment, all subjects are asked to imagine that they walk through a zoo, and their task is to register each time they think of a white bear. Subjects under ego depletion are explicitly told that they should not think of a white bear. In their common resource experiment,

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al. 1998; Willinger & Ziegelmeyer 1999). However, the one-shot public good games reported by Brandts and Schwieren (2007) and Cubitt et al. (2008) do not find any significant framing effects.

there are several periods, and the remaining of the resource after each period grows at a 10% rate. They find that after ego depletion, withdrawal from the resource is more than twice as fast, and the resource lasts about 10 rounds whereas it lasts for more than 25 rounds with no ego-depletion. Their results thus suggest that ego depletion leads to more selfish behavior, in other words cognition overrides the selfishness of the emotional processes. The study closest to ours is Benjamin et at (2008), who conduct a dictator game on a small sample (37) of people, where dictators are also recipients, like in our experiment 2. They find that dictators are slightly less generous under cognitive load, but the difference is insignificant. Cappelletti (2008) study the effect of cognitive load in an ultimatum game, and also they find no effect on behavior.

Few studies have looked at the relation between emotions and behavior in allocation decisions. One exception is a study by Pillutla and Murnighan (1996) where anger was found to explain rejections in ultimatum games, another a study by Johansson et al. (in press) where it was shown that especially negative emotions mediated managers aversion against unfairness. In economics, some experiments look into response times for decisions. If instinctive choices are made faster while deliberating using cognitive processes is more time consuming, response time of different choices might give information about instinctive versus cognitive preferences. Piovesan and Wengström (2008) measures response time in a dictator game, and find that selfish choices are made faster than generous choices. This might point in the direction of social preferences being skin deep, but other explanations also exist. The previous studies leave open several questions. Both Roch et al (2000) and Crelley et al (2008) find huge effects of cognitive load and ego depletion, but for a start they generate results in opposite directions. Secondly, except for Benjamin et al (2008) all the studies mentioned above involve strategic elements in the decision task. For example, in Roch et al (2000) where each subject is the first of eight to withdraw resources from the common pool, the uncertainty concerning how much the following group members will take might provide a justification for withdrawing more than the fair 1/8 of the resource. Such strategic reasoning may be easier under low cognitive load, inducing higher withdrawals. The experiment used by Crelley et al (2008) includes a strong intertemporal element since participants are saving resources for future rounds. This requires both computational abilities in calculating the consequences of early withdrawal and patience to wait for future rounds. The results can thus be explained without any references to social preferences. To test our hypotheses we have chosen to use a similar design as Benjamin (2008). In short, across all experiments we use a simple dictator game where strategic elements are non-existent.

2. The experiments

We will present the experiments in the order of appearance over time, and we will also explain the changes in design between each of the experiments. In section 3.5 the design and results of the four experiments will be compared.

3.1 Experiment 1

The purpose of the experiment is to examine the effect of cognitive load on other-regarding behavior, more specifically the willingness to donate money to a charity, where the design largely followed that used by Shiv and Fedorikin (1999). In the experiment, cognitive load is varied between high and low, giving a 2 factor design, and behavior is compared between subjects.

52 subjects were recruited from the Stockholm School of Economics in April 2008, and randomly divided between the 2 treatments. At the beginning of the experiment, all subjects met in a common room where instructions were read out loud. Subjects were informed that part of the experiment would take place in a different room, and that they therefore would be asked to go to another room during the experiment. They were told that they would be given a choice of payment for participating in the experiment. Further, they were told that they would be asked to memorize some numbers, and that later in the experiment, they would be asked to report the numbers which they had memorized. Reporting it correctly increased their total payoff by SEK 50. In addition all subjects received a show-up fee of SEK 50.[3]

Subjects were called up one by one. Each subject was shown a card with 7 numbers to memorize in private, and told that they could take their time to memorize it. In the low cognitive load task the 7 numbers were easy to memorize (9999999 or 1234567), while in the high cognitive load task, the 7 digits were more difficult to remember (9824672 or 1642753). Memorizing the more difficult numbers presumably requires much more of our cognitive resources than memorizing the simple numbers. Every second subject was shown the easy memory task whereas every other subject was presented with the difficult memory task. After memorizing the numbers, each subject left the first room and proceeded to a booth that was situated in the hallway between the two rooms. On the wall in the booth, there was a poster informing subjects that their choice was to divide SEK 100 between themselves and the Red Cross. The SEK 100 could be divided in intervals of SEK 20. On a table inside the booth there were several paper slips, one for each of the 6 alternatives. Subjects were informed that they should pick the paper slip that indicated their choice, and hand it over at their arrival in the second room.

At arrival in the second room, each subject delivered the paper slip indicating his chosen payoff, reported the memorized numbers, and accordingly received payment in cash. Each subject then received a questionnaire, which he or she completed in privacy. When the questionnaire was completed, the experiment was finished and the subject could leave.

The results from the experiment are reported in table 1 below. As each subject represents one observation, there are 25 observations of subjects under low cognitive load and 27 observations of subjects under high cognitive load. All subjects in the low cognitive load task remembered the seven numbers correctly, while all but one in the high cognitive load task did so. The difference is clearly not significant (p-value 0.34). The average donation under low load is SEK 30.4, while it is SEK 29.6 under high load. Subjects under high cognitive load thus on average donate less to the Red Cross, but the difference is not significant according to a t-test (p-value 0.94). The median donation is 20 both under high and low cognitive load.

3.2 Experiment 2

Since we found virtually no effect of cognitive load in experiment 1, and given previous mixed findings, we decided that it might be wise to simplify the settings to a well established experimental setup. We therefore chose to examine the effect of cognitive load on behavior in a simple dictator

[3] One USD was equivalent to roughly SEK 7 at the time of the experiment.

game. In addition, we decided to increase the level of difficulty of the cognitive load task from a 7 digits to a combination of 7 digits and letters, as most subjects succeeded in the memory task in experiment 1. In the experiment, cognitive load is varied between high and low, giving a 2 factor design, and behavior is compared between subjects.

The experiment was conducted in june 2008, and 28 subjects were recruited from the University of Oslo. The experiment was run simultaneously in two classrooms, with half of the subjects in each room. At the beginning of the experiment, the same instructions were read out loud in both classrooms. Subjects were informed that the experiment consisted of two parts, where the subjects in each part would be asked to memorize a combination of 7 letters and digits, and make a payoff relevant decision. Only the decision in one of the parts were paid out, which one was determined by a dice. Subjects were also informed that each subject would be paid NOK 50 as a show-up fee, and NOK 50 for succeeding with the memory task.[4]

The procedure of the experiment was as follows: A string of 7 letters and numbers was shown on a screen for 15 seconds, giving subjects the possibility of memorizing the combination. When the 15 seconds had passed, instructions for a dictator game were read out loud, after which each subject made an allocation decision. When all subjects had finished the dictator game, a pen and a sheet of paper was handed out to each subject, who then could report the memorized string of letters and numbers. Then a new string of letters and numbers were shown, and after 15 new seconds instructions for a second dictator game were read out load, whereby each subject made their choice according to the same procedure.

In one of the rooms, subjects were asked to memorize a difficult string of 7 letters and numbers (QK9F273 and 4P78CE3), while in the other room subjects were asked to memorize an easy string (AAAA111 and BBBB111).

In the first dictator game, each subject received a large envelope with two smaller envelopes inside, one was marked “For me” and the other “For my partner”. In the envelope marked “For me”, there were 10 paper slips each with the text “kr 10”, hence worth NOK 100 in total. Each subject was allowed to move as many paper slips as he or she wanted to the other envelope. The second task was equivalent to the first, but this time the 10 paper slips were placed in the envelope marked “For my partner”. Each subject was allowed to move as many paper slips from this envelope to his or her own envelope.

After the second task was done, each subject completed a questionnaire before leaving the experiment. Payments were transferred to each of the subject’s bank account subsequently.

This experiment gave 28 observation, 14 under high and 14 under low cognitive load.

All subjects under low cognitive load remembered both the first and second string of letters and numbers correctly, while 8 of 14 (57%) of the subjects under high cognitive load managed the first task, while 13 of 14 (93%) managed the second task.

[4] One USD was equivalent of roughly NOK 6.50 at the time of the experiment.

In the give-frame, dictators under low cognitive load on average gave NOK 42.9 to receivers, while dictators under high cognitive load on average gave NOK 26.4, but the difference is not statistically significant (p-value 0.1712). The median gift to receivers was NOK 40 under low load and NOK 35 under high load.

3.3 Experiment 3

122 students from the University of Oslo participated in Experiment 3 in October 2008. Half were assigned the role as dictators and the other half as recipients.

All participants in each session were first gathered in a common room where the initial instructions were read out loud, informing them that their payoff would depend on decisions made by half of the subjects present, in addition to an individual memory task. When entering the room, all subjects drew a number indicating their seat number. After the initial instructions were given, all participants who had drawn an uneven number were asked to go to a second room. If there was an excess of odd numbers, those with the largest odd number moved to the closest available even number and vice versa for excess of even numbers..

All subjects who remained in the first room were assigned as dictators, while all the subjects who left for the second room were assigned receivers. The seating in the initial common room was such that those who became dictators most likely sat next to a person who became a recipient.

In both rooms, the same sequence of 7 numbers and letters was shown on a screen for 15 seconds. Under high cognitive load, the sequences were randomly generated (1GT6N58 and 3H4BS92), while under low load the sequences were simple ones (AAAA111 and BBBB111). While keeping the numbers in mind, all subjects did another task; dictators a dictator choice as described below and receivers answered a question. After finishing their respective tasks, all subjects were given the choice between receiving their payoff today, or to receive 33.3% more if opting to be paid in one month from the time of the experiment. As the cognitive system is also believed to be responsible for the self-control required to choose delayed benefits, subjects under high cognitive load should according to this be less able to perform the self-control needed to delay their received payoff. If self control for patience and generosity has a common capacity, interactions between the ability to choose delayed payment and the extent of generosity might occur as well. In particular, receivers then should be more able to choose delayed payments.

After completing these tasks, subjects were given a sheet of paper and a pen to report the memorized sequence. The procedure was then repeated, this time without the choice of the delayed payment; first a sequence of 7 digits and letters was shown on the screen for 15 seconds, then each subject completed the second task, before each subject was given a sheet of paper and a pen to report the memorized sequence.

The dictators' task, was simply a dictator game decision. Each dictator was given two envelopes, one marked "To me" containing 10 small sheets of paper each worth 30 kr (about 5$) and an empty envelope marked "To my partner". They were instructed that they were free to move whatever amount they wanted over to the other envelope. The second dictator choice was similar as the first, except that this time the envelope marked "To my partner" contained 10 small sheets of paper each

worth 30 kr, while the envelope market “To me” was empty. Again the dictators were free to move whatever amount they wanted between the envelopes.

When dictators made their first dictator choice, receivers were asked what they considered to be the morally right distribution of NOK 300 between themselves and another anonymous person, while they completed a hypothetical dictator choice while the dictators made their second dictator choice.

Only one of the rounds was actually paid out, and a dice roll determined which of the two rounds would be paid out. After determining which round was to be paid out, receivers received the envelope marked “To my partner” from their partner in the corresponding round. All payoffs were transferred to each of the subject’s bank account either the day of the experiment, or one month later according to each of the subject’s wish.

Again, we find small effects of cognitive load. Subjects under high cognitive load are slightly more selfish than those under low cognitive load, but the difference is not statistically significant. The results are presented in Table 1 below.

All subjects finally completed some follow-up questions, In all four sessions subjects rated on a five-point scale ranging from 1 (“very slightly or not at all”) to 5 (“extremely”) to what extent they experienced a particular feeling when making the allocation decision. These feelings were captured by 18 different emotions corresponding in part to emotion clusters described in the PANAS X instrument (ref). These clusters were: General Positive Emotion, from here on denoted GPE (containing the items alert, active, proud, enthusiastic, and determined), General Negative Emotion, from here on denoted GNE (containing the items irritable, upset, guilty, nervous, and ashamed), Guilt (containing the items disgusted with self, guilty, ashamed, angry at self, blameworthy, and dissatisfied with self), and Serenity, from here on denoted SER (containing the items relaxed, calm, and at ease). Furthermore, the subjects feelings of confidence were captured by a single item from here on denoted CON.

They also rated to what extent their decisions were governed by their thoughts and feelings, whether their decisions were deliberate, impulsive, rational, and emotional, as well as whether they experienced stress, regret, and satisfaction when making the decisions . They furthermore stated the sum of money they thought it would be morally right to give to their partner. Finally, they answered some background questions about their age, gender and main university subject. All subjects were paid SEK 50 as a show-up fee, entailing that each subject in total could earn between SEK 50 and SEK 260.

3.4 Experiment 4

Experiment 4 was ran as a simple dictator game. Altogether 146 students from Gothenburg University participated in the experiment, conducted in December 2008 and March 2009.

Students were first contacted via e-mail, asking them whether they were interested in participating in an experiment conducted at the university. Those being interested were randomly allocated into

four groups of subjects and were accordingly each given a time and place where the experiment were due to take place. Altogether four sessions were ran (with an identical design in December and March), conducted subsequently to each other as class-room experiments on two different occasions.

Two different manipulations were introduced in the experiment: give versus take scenario in the dictator game, and high versus low cognitive load. Subjects in the first session were assigned as dictators. First they were informed about the general procedures of the experiment, after which they were presented with a simple 7 digit number, in this case AAAAAAA (low load). They were given 15 seconds to memorize this sequence, and if they remembered it correctly at the end of the experiment they were paid SEK 50.

They where then instructed about the dictator game, and where given two envelopes, one marked 'To me' and the other 'To my partner'. They were told that the partner was a randomly selected individual participating in a later session the same day, and who conducted a similar task as the dictator. For half of the subjects the envelope marked 'To me' contained 8 SEK 20 notes, that is, in total SEK 160, whereas the envelope marked 'To my partner' was empty (give scenario). The subject could then move as many SEK 20 notes he or she wished to the partner's envelope. For the remaining subjects the envelope marked 'To my partner' contained 8 SEK 20 notes whereas the envelope marked 'to me' was empty (take scenario), whereby the subject could move as many SEK 20 notes as he or she wished between the envelopes. They were finally told to keep the envelope marked 'To me', and leave the envelope 'To my partner' at the desk in front of them, which was later collected by us.

Subjects in the next session were similarly assigned as dictators according to the same procedure, either in a give or a take scenario, but were presented with a more difficult sequence of 7 digits and letters to remember while carrying out their task. Here subjects were shown the sequence 8Z3QC9S for 15 seconds prior to the dictator game (high load), and were equally paid SEK 50 if remembering this at the end of the experiment. All else in the experiment was identical to the first session.

The remaining two sessions included subjects assigned as recipients, who conducted a hypothetical dictator game with fake SEK 20 notes. They were instructed to make an allocation decision as if the notes were real, either in a give or a take scenario. Similar to the first two sessions they were also presented the same sequence of letters, either inducing high (8Z3QC9S) or low (AAAAAAA) cognitive load, and were given SEK 50 if remembering this sequence. At the very end of the experiment they were given an envelope with real SEK 20 notes according to the decision made by a randomly paired dictator in one of the previous sessions.

All subjects finally completed some follow-up questions. In all four sessions subjects rated on a five-point scale ranging from 1 ("very slightly or not at all") to 5 ("extremely") to what extent they experienced a particular feeling when making the allocation decision. These feelings were captured by 14 different emotion words corresponding in part to emotion clusters described in the PANAS X instrument (ref). Similar to Experiment 3 these clusters were: General Positive Emotion (GPE), General Negative Emotion (GNE), and Guilt. They also rated to what extent their decisions were governed by their feelings or rational thoughts, whether they considered their choices to be morally correct, and whether they experienced stress when making the decisions (See Table 2). They furthermore stated the sum of money they thought it would be morally right to give to their partner.

Finally, they answered some background questions about their age, gender and main university subject. All subjects were paid SEK 50 as a show-up fee, entailing that each subject in total could earn between SEK 50 and SEK 260.

Table 1 below summarizes the results of Experiment 4. As may be seen, there are very small differences between high and load cognitive load across all treatments, neither of which is statistically significant. It turned out that all participants remembered the easy sequence (low cognitive load), whereas 42.1 and 66.7% remembered the difficult sequence (high cognitive load) correctly among dictators and recipients, respectively.

2.5 Summary. Comparing the experiments

Before summing up the results of the experiments, we will go through the main differences in the design of the four experiments. First of all, in experiment 1 subjects received an endowment which they could share with a charity, while the remaining experiments were dictator games where dictators either received an endowment and could give to another subject (give frame), or dictators were allowed to take an amount from another subject's endowment (take frame). In experiment 2 all subjects were both dictators and receivers, while in experiment 3 and 4 subjects were either dictators or receivers. In experiment 2 and 3, all dictators made two dictator choices, first one dictator choice with the give frame, then one with the take frame, while in experiment 4 dictators only made one dictator choice, either the give or the take frame. In experiment 3 all subjects first met in the same room, before half of the subjects left the room and became receivers, while in the other dictator game experiments, receivers and dictators were in separate rooms throughout the entire experiment.

The level of cognitive load also differed somewhat between the experiments. In experiment 1, subjects memorized 7 digits, and 96% succeeded in reporting correctly, while in the other three experiments, subjects memorized a combination of 7 digits and letters, and the success rate of memorizing varied between 42% and 93%.

The subject pool also varies between the experiments. In experiment 1, subjects are students at Stockholm School of Economics, in experiment 2 and 3, subjects are students at the University of Oslo, while subjects in experiment 4 are students at the University of Gothenburg.

Table 1 summarizes the results of the four experiments. As the endowment varies between experiments, all results are reported in percentages in the table to ease the comparison. As table 1 illustrates, subjects in the first three experiments were on average more selfish under high cognitive load than subjects under low cognitive load, even though the difference was not significant in any of the three experiments. In experiment 4, the effect of cognitive load goes in the opposite direction, subjects under high cognitive load are less selfish, while the difference still is insignificant. Moreover, we found no significant differences between allocation decision in give and take framings in any of the experiments.

Comparing the average percentage given to receivers in the four experiments, we see that there is considerable variation. In particular, the donations to the Red Cross in experiment 1 are particularly low compared to the dictator allocations in other experiments, and dictator allocations are particularly high in experiment 3. One possible explanation for the low donations in the first

experiment, is the subjects pool. The subjects in experiment 1 are students at Stockholm School of Economics, while the three last experiments use university students as subjects. Previous experiments using business school students as subjects also report lower percentage allocations than university subjects (ref). The high dictator allocations in experiment 3 might be caused by the fact that receivers and dictators sat in a common room at the beginning of the experiment.

2.6 Measured Emotions and Follow-up Questions

Experiment 3. On average subjects experienced relatively high levels of Serenity (M = 3.33, SD = .79) and Confidence (M = 3.60, SD = .89), medium levels of General Positive Emotions (M = 2.99, SD = .65), and relatively low levels of General Negative Emotion (M = 1.57, SD = .48), and Guilt (M = 1.38, SD = .65) while making their decision.

As may be seen in Table X, in the give-condition the sum of money that subjects kept did not correlate significantly with any of the questions, nor with any of the emotion clusters. However, in the take-condition the sum of money that subjects took correlated negatively with both the questions "My decision was guided by my feelings" and "My decision was rational". The sum taken also correlated positively with the emotion cluster Guilt. The most important emotion here was ashamed (r =.37, p < .01). Although the experienced level of stress did not correlate significantly with any of the dependent measures stress was, as expected, correlated positively with GNE and Guilt and negatively with SER and CON. In a similar fashion, "regret" correlated positively with GNE and Guilt and negatively with SER and CON. Mirroring this, "satisfaction" correlated negatively with GNE and Guilt and positively with GPE, SER, and CON.

Apparently, in the take-condition subjects on average kept less money for themselves the more their decisions were guided by feelings in general. Since this question correlated positively with GPE, "feelings" seem in this context to be interpreted by subjects as positive emotions. Decisions were also considered to be more rational the less money the subjects took from their partners. The positive correlation that was found between Guilt and money taken furthermore suggests that these decisions are associated also with negative emotions. In line with previous research, a plausible interpretation of these data is that fair allocations are associated with positive emotions and unfair allocations with negative emotions (Johansson et al., in press).

In other words, from the subjects' point of view it is thus rational to be fair and avoid feelings of guilt. In addition to this and somewhat surprisingly, the ratings of the degree to which the decisions were guided by thoughts correlated negatively with rationality. The subjects seem not to associate rationality with "thinking" in this particular context.

Moreover, between-group comparisons showed, that dictators (M = 4.48, SD = .67), were more guided by thoughts than recipients (M = 4.10, SD = .75), (t(119) = 2.89, p < .01). Dictators' decisions (M = 2.10, SD = 1.15) were also less emotional than recipients (M = 2.75, SD = 1.31), (t(120) = -2.94, p < .005).

Furthermore, the subjects in the low cognitive load group rated themselves as more guided by their thoughts (M = 4.45, SD = .66) than those in the high cognitive load group (M = 4.15, SD =.77), (t(119) = 2.30, p < .05), less impulsive (M = 1.82, SD = 1.11) than those in the high cognitive load group (M = 2.26, SD = 1.21), (t(120) = -2.06, p < .05), less stressed (M = 1.86, SD = 1.00) than those in the high

cognitive load group (*M* = 2.42, *SD* = 1.34), (*t*(120) = -2.62, *p* < .05), and less regretful (*M* = 1.32, *SD* = .61) than those in the high cognitive load group (*M* = 1.79, *SD* = 1.14), (*t*(120) = -2.74, *p* < .01).

Finally, and perhaps most importantly, subjects in the low cognitive load group scored significantly lower on Guilt (*M* = 1.15, *SD* = .35) than those in the high cognitive load group (*M* = 1.30, *SD* =.40), (*t*(120) = -2.18, *p* < .05), higher on SER (*M* = 3.51, *SD* =.81) than those in the high cognitive load group (*M* = 3.19, *SD* = .74), (*t*(120) = 2.27, *p* < .05), and higher on CON (*M* = 3.80, *SD* = .90) than those in the high cognitive load group (*M* = 3.42, *SD* =.84), (*t*(120) = 2.40, *p* < .05).

In sum, these ratings show that subjects were both cognitively and emotionally affected by cognitive load. High-load subjects were, according to themselves, less thinking and more impulsive than low-load subjects. They also experienced more stress and decision regret than low-load subjects. When asked about specific emotions they reported more guilt but less serenity and confidence than low-load subjects. Since subjects experienced higher levels of guilt the more money that they took from the partner guilt seems, in this experiment, to be the most important emotion at least in explaining actual allocation behavior.

Experiment 4. As may be seen in Table 2, the sum of money that was given to the partner correlated positively with the extent to which the decision was guided by feelings and the extent to which the decision was considered morally right. The emotion clusters GNE and Guilt were negatively correlated with the amount given to the partner. The most important emotions here were shame (*r* = -.36, *p* < .01) and pride (*r* = .38, *p* < .01). Those who gave more to their partner in other words felt better, at least in terms of lower levels of negative emotions.

Moreover, between-group comparisons showed that dictators (*M* = 1.71, *SD* = .67), who made real allocations of money, experienced higher levels of GNE than recipients (*M* = 1.46, *SD* = .50), who made hypothetical allocations, (*t*(142) = 2.47, *p* < .05). Dictators were also more stressed (*M* = 2.57, *SD* = 1.38) than recipients (*M* = 2.06, *SD* = 1.19), (*t*(142) = 2.40, *p* < .05). Furthermore, subjects in the take-group rated themselves as significantly more determined (*M* = 3.54, *SD* = 1.24) than in the give-group (*M* = 3.11, *SD* = 1.19), (*t*(142) = -2.11, *p* < .05).

Finally, subjects in the low cognitive load group rated themselves as more guided by their thoughts (*M* = 4.22, *SD* = .85) than those in the high cognitive load group (*M* = 3.88, *SD* =.96), (*t*(144) = 2.24, *p* < .05). This is of course in line with expectation. Moreover, subjects in the high cognitive load group reported that they were more guided by their feelings (*M* = 3.55, *SD* = 1.21) than those in the low cognitive load group (*M* = 3.08, *SD* = 1.25), (*t*(144) = -2.32, *p* < .05). Thus, the cognitive load per se seems to have worked as expected, by reducing cognitive abilities and by increasing the relative role of emotions in the decision making process. No significant effects of cognitive load could however be found in the emotion ratings.

A moderate interpretation of these data is that in general the subjects´ allocation behavior may have been partly driven by aversion against negative emotions, such as guilt, that was believed to follow from making immoral decisions.

3. Summary and Conclusion

The results from our four studies taken together, as summarized in Table 1 above, suggest that the effect of cognitive load on dictator behavior is small if at all existing. If social preferences are indeed skin deep, reducing the available cognitive capacities by introducing cognitive load should lead to more selfish behavior, as the instinctive emotions then should have a greater influence on behavior due to the reduction in cognitive capacity. In three of our four experiments, the dictator behavior indeed becomes more selfish due to cognitive load, while in the fourth experiment dictator behavior becomes less selfish. In none of the four experiments are the effects of cognitive load on dictator behavior significant. Our results thus neither support the notion that moral behavior is primarily cognitive, nor primarily emotional.

Cappelletti et al (2008), who find no effect in ultimatum games, suggest that the fact that they incentivised the cognitive load task may explain why they find no effect of cognitive load. As we incentivised this task too, our result is consistent with that claim.

Charity donations and the dictator game experiments was chosen due to their simplicity in order to isolate the effect of cognitive load on social preferences, and thus avoid possible impacts from other factors. One may claim that the simplicity of the tasks the subjects were asked to do in the experiments, perhaps meant that the cognitive capacity needed to fulfill the tasks were minor. For such simple tasks, the cognitive load task might therefore have been too easy to at all give the reduction in cognitive capacity we seeked. On the other hand, our follow-up question reveals a significant effect in terms of their perceived use of cognitive reasoning and emotions, in the expected direction, when making their decision. Rather than concluding that the role of cognition is less important for social preferences, we conclude that both cognition and emotions are important, and that our results indicate that they might be of about equal importance for the simple distribution tasks as is undertaken in a dictator game.

Still, we recommend future research to investigate the effect of much stronger cognitive load than used in the present studies. While our study does not find an effect of cognitive load on social preferences, some other studies have found large effects. The main difference between the present studies and Roch et al (2000) and Crelley et al (2008) who indeed find large effects, allthoug in opposite directions, is the complexity of the decision tasks. While our studies are simple allocations, their studies involve either strategic elements such as multiple players and/or a time dimension. Our results thus suggest that the large effects found in Roch et al (2000) and Crelley et al (2008) are primarily being driven by other factors than pure social preferences. The fact that these two studies find opposing effects further supports this conclusion.

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