Framing of Social Moral Dilemmas

Authors

Annamaya Halskov-Jensen (*annamayahj@gmail.com*)

Amalie L. Andersen (*amalieandersen_95@hotmail.com*)

Cognition and Communication, 1st Semester

Cognitive Science, University of Aarhus

Abstract

This study seeks to examine the effects of framing on decision making in social moral dilemmas. Based upon previous research (Cushman, Young, & Hauser, 2006; Greene, Sommerville, Nystrom, Darley, & Cohen, 2001; Greene et al., 2009) it was hypothesized that social scenarios (degree of closeness) would have an effect on participants' decision making and that reaction time (as a measure of difficulty) would be significantly different across framings and scenarios. A single independent-measures experiment was conducted on 38 participants equally distributed between two conditions; a positively framed condition and a negatively framed condition. Both conditions consisted of six trials, three 'impersonal' moral dilemmas and three 'personal' moral dilemmas. A logistic regression model found a significant interaction effect between framing and scenario on participants' response in moral dilemmas. There was found no significant interaction effect between framing and scenario on reaction time in moral dilemmas.

Keywords: Framing, moral dilemmas, moral reasoning, decision making

Introduction (ALA)[1]

Moral dilemmas, and the underlying processes have been - and are - greatly discussed within the field of cognitive psychology (Kahneman & Tversky, 1981) E.g. Kahneman & Tversky, 1981). Can one mould other people's' minds and have their perception altered in a manner one sees fit? This is a question that has been given the term *framing*, which now puts the question as to what extent one can manipulate perception and thus even actions. When we live in a society that today revolves around mass communication, with omnipresent social media and news platforms just as well as advertisements, one should be aware of the effect framing has. It has a tremendous effect on how we live our lives, consciously or not, and thus is a matter worth continuous inspection.

One well known case of framing is the tendency to give different answers in the *Asian Disease Problem* originally created by Tversky and Kahneman in 1981, where framing sets off different processes, causing the same problem to be shed in different lights. This scrutiny has led to many contributions on different influential factors, where we in this paper focus on framing effects within social moral dilemmas.

What is framing? (ALA)

In Tversky and Kahneman (1981) framing effects are described in combination with the term *Decision Frame*. The grand perception the decision maker has of a given choice is a decision frame, and it has a three folded base: "*[the term is described as] the conception of the acts, outcomes, and contingencies associated with a particular choice*" (Tversky & Kahneman, 1981), p. 453). Everyone has individual decision frames, and these are composed partly by one's personal traits and previous experiences, and how any given problem/dilemma is presented, i.e. framed.

[1] *This study is divided into sections where it is specified who of the two authors is responsible in parentheses. If not specified in the subsection, the person responsible is the one stated in the section above. The authors are referenced by initials.*

In the same study they found that when one chooses a positive or negative outcome it is determined by the manipulating factor of framing in the respective order. An example of this can be seen in the Asian Disease problem where two programmes of combating an outbreak of a disease in Asia is introduced to participants;

(i) Programme A accentuates lives saved,

(ii) Programme B accentuates lives lost (Tversky & Kahneman, 1981).

Each programme has a risk averse and a risk taking option. They found that in Programme A where lives saved are emphasised, the majority of participants were effectively risk averse, and therefore were reluctant in setting people at risk that they have been presented with as saved lives. Contrary to Programme A, the results of answers in Programme B showed that participants were risk taking when the lives of Asians were stressed on how many were lost - that is, the lives were questionable anyway.

This effect is closely related to one of the bases of *decision frames*; the outcome. Framing in this instance determines how a problem and its risks are presented, and this is expressed in the *Prospect theory*, which examines one's expected utility of solutions to a given problem (Tversky & Kahneman, 1981). It ultimately describes the findings of the Asian Disease problem and presents it in a diagram where the subjective utility is visualised in an S-shaped function (where it's concave in risk aversive, positively framed conditions, and convex in risk taking and negatively framed conditions (Levin, Schneider, & Gaeth, 1998).

Levin et al. (1998) researched the area of framing effects, and in their study gathered results of all relevant, previous research done within the topic. They have come to distinguish between three types of framing effects, all under the umbrella

term *Valence Framing Effect* (either positively or negatively framed infor- mation).

Firstly introduced is the *Risky Choice Framing*, which finds an effect of framing in decision making when the different choices vary in level of risks. The previously mentioned Asian Disease problem is an example of risky choice framing, as the presentations of risks are changed in each condition.

Secondly proposed is the *Attribute Framing*, where framing is focused on specific attributes/events in trying to entice the subjective to change perception of the problem at hand.

Lastly *Goal Framing* is presented, where the subject of framing is a goal of a behaviour or an action. Each of the different types of framing offer different foci of manipulating as well as different effects (see figure 1 for specification).

Type of framing	**What is framed**	**What is affected**
Risky choice	Options with different levels of risk	Preference of risk
Attribute	Attributes & qualities of objects or events	Item evaluation
Goal	Consequence of behaviour or decision	Impact of persuasion

Fig. 1: Overview of three framing theories (Levin et al., 1998)

Where the subject and type of framing have a large effect on the perception and final decision regarding a problem, regret too plays a significant role (Levin et al., 1998).

For most people the prospect of regretting an action done is greater than that of passivity (Kahneman & Tversky, 1981). Several explanations of this discovery have been done, including that of actions being perceived to be more outstanding and prominent than non-actions (Landman, 1987), and therefore the effect of said action has a larger impact on the subject. If a decision maker is stuck between an undesirable outcome of both acting and non-acting in a given situation, then the

negative impact of the action will affect the subject more than the non-action will.

This effect is in Ross (1977) explained to be due to the fact that passivity, or non-occurrences, rarely are as cognitively available as are proper actions including the engagement. It is stated though, that the mere semantic details of actions provide better ground for cognitive availability, which in its nature is not as readily accessible in non-actions, and as a result "(...) *recognition, storage, retrieval and interpretation all become less likely*" (Ross, 1977, p. 197). An example of this is that the lack of eye contact could be interpreted as avoidance, although that might not be the intention (Ross, 1977).

Moral reasoning (ALA + AHJ)

When decision makers are faced with a dilemma they tend to construct a reason - a basis on which to make their decision that enables them to justify it to themselves and others. A typical method of judgement is the reason-based analysis; an intuitive approach that seeks to identify arguments that may influence a decision and tip the scale in order for a subject to select an option (Shafir, Simonson, & Tversky, 1993).

Many theories have been set to answer the question of how the processes behind moral reasoning are carried out, where a primary influencer is moral propositions (Bucciarelli, Khemlani, & Johnson-Laird, 2008). In order to clarify this, one must introduce the concept of deontic propositions first. These focus on what a subject should or should not do in terms of what is morally correct (Bucciarelli et al., 2008). But what is morally correct in a given situation? When one asks this question, one is most likely searching for guidance, and when in such a situation, Bucciarelli et al., 2008 proposed that there are four assumptions individuals try to fulfil when making moral evaluations (The following principles are all from Bucciarelli et al., 2008):

(i) Principle of moral indefinability. This first step is about recognising the nature of the given problem. No principle exists to tell apart a proposition of deontic nature from a moral issue. This matters as there are different mechanisms for reasoning in all deontic matters and for moral matters only - essentially how one identifies a situation and acts accordingly.

(ii) Principle of independent systems. Deontic evaluations and emotions are operated within different independent systems, both of which have an influence on how we perceive the problem.

Different scenarios elicit a different response of these systems - whether emotions, deontic evaluations, or both, are dominating our reasoning process.

(iii) Principle of deontic reasoning. This principle states that moral reasoning is directly dependent on inferences, which at times can be a conscious process. This adds another separate system of reasoning, conscious reasoning, to the two independent systems described in principle ii.

(iv) Principle of moral inconsistency. This last principle states that moral dimensions are not consistent across individuals; an example of this is the question of eating meat is a moral issue, as for some (e.g. vegetarians) it is, and for others it is not.

This theory, consisting of the four principles that Bucciarelli et al. (2008) has presented, proclaims an information processing approach, of which moral reasoning relies on several mechanisms independent of each other, where one's evaluations and appertaining actions are dependent on "*unconscious intuitions or on conscious reasoning" (Bucciarelli et al., 2008)*, p. 137).

Studies making use of moral dilemmas often rely on two classic examples, the trolley dilemma (Foot, 1978; Thomson 1985) and the footbridge dilemma (Cushman, Young, & Hauser, 2006; Greene et al., 2001);

In the trolley dilemma, the subject is standing by a set of railway tracks. A run-

away trolley is coming down the tracks. Up ahead there are five people tied to the tracks, and if the trolley continues its current course they will die. The subject is standing next to a lever that can divert the trolley onto a side track. However, there is one person tied up on the alternate track. The decision maker thus must decide whether or not to pull the lever, and effectively choose who is to live.

The footbridge dilemma that has become the counterpart of the trolley dilemma in many studies (Greene et al., 2001; Shiv et al., 2005; Valdesolo & DeSteno, 2006) features the same principle. The only difference is that the subject is no longer standing by a lever, but on a footbridge above the tracks. In this case the subject can decide to push a large stranger down from the bridge and onto the tracks to stop the trolley and save the five people tied to the tracks. Although different on the surface, the two dilemmas have almost identical deep structures.

Interestingly, several studies have shown (Greene et al., 2009) that most people agree to kill one person to save five people in the trolley dilemma, but not in the footbridge dilemma. This has raised the important question as to which features cause a decision maker to treat the two cases differently. The following sections will review different propositions containing a series of possibly influential factors that attempt to answer this question.

Emotions and moral judgement (AHJ)

An fMRI study by Greene et al (2001) compared *moral-impersonal* dilemmas with *moral- personal* dilemmas, and found a correlation between neural activity in brain areas related to emotion and specific features of moral dilemmas.

The moral-impersonal dilemmas included for instance a version of the trolley dilemma and a dilemma involving money from a lost wallet. The moral-personal

dilemmas included for instance a version of the footbridge dilemma and a dilemma involving stealing organs from one person to save five others. Both types were compared to a non-moral category.

The study found that a series of brain areas, e.g. BA9 (medial frontal gyrus), that have been associated with emotion (Lane et al., 1997) were significantly more active in the moral-personal condition compared to the other two. They claim that the main difference between the two types of dilemmas is that the footbridge dilemma engages an emotional response in a manner that the trolley dilemma does not, and this affects judgement, causing participants to treat the cases differently. Regarding that, the study also found that *emotionally incongruent* responses - e.g. answering that it's appropriate to push the stranger in the footbridge dilemma - elicited significantly slower reaction time than the emotionally *congruent* responses within the moral- personal condition because of emotional interference.

Moral reasoning and rules (AHJ)

There are other plausible explanations as to what causes the disparity between the two types of dilemmas. Cushman, Young, & Hauser (2006) investigated three principles that seem to influence moral reasoning, and therefore can explain differences in moral dilemmas:

(i) *The action principle*: It is morally worse to cause harm by action than to cause harm by in-action. This principle is consistent with the finding in Kahneman & Tversky (1981)[2].

(ii) *The intention principle*: It is morally worse to cause harm when the intention is the means to a goal, than when said harm is foreseen as a side effect to a goal.

(iii) *The contact principle:* It is morally worse to cause harm using physi-

[2] See p. 5

cal contact than to cause harm with no physical contact.

The latter offers an initial explanation to the difference between the trolley dilemma and the footbridge dilemma, although it raises another question, namely which processes causes the differences in perception when harm is physically and non-physically effectuated.

In contrast to the emotion-based explanation there's a 'rule-based', deontologist approach. Based on a series of recent experiments, Nichols & Mallon (2006) argue that the emotion-based theories have thus far failed to consider the impact of moral rules might have on reasoning about this type of dilemmas. Instead, they argue that emotions, rules and cost/benefit-assessments are all considered when responding to moral dilemmas. According to Nichols & Mallon (2006), traditional rule-based accounts of morality judge an action as impermissible if the decision maker has embraced a moral rule against it. Thus, these approaches explain moral intuitions about the footbridge and trolley based upon what the rules permit or forbid.

In a series of experiments, they tested the emotion-based accounts by comparing the footbridge and trolley dilemmas to impersonal analogues involving teacups. They found that the same asymmetry between the two types of dilemmas exists in the impersonal cases, suggesting that the explanation goes beyond emotional interference.

Conscious reasoning (AHJ + ALA)

Thus far none of the reviewed findings contradict Bucciarelli et al. (2008) in their second principle, the *Principle of Independent Systems*. In order to investigate how subjects, make their decision when faced with a moral dilemma, especially when involving framing, it is also relevant to attempt to determine whether reasons are selected or constructed consciously.

The findings of Cushman, Young, & Hauser (2006) are consistent with the

third principle of Bucciarelli et al. (2008) in the sense that both suggest that moral judgements can be, but aren't always, made by conscious reasoning. However, Cushman et al. (2006) argue that some moral principles seem to be captured better by a more intuitionist explanation.

Cognitive investigations of moral judgement contribute to this understanding (Greene et al., 2001), where Valdesolo & DeSteno (2006) have gathered the information to conclude the following. One class of brain processes (i) is responsible for responses of social stimuli that make sure we are adapting socially, where the other class (ii) consists of "*more domain-general, effortful processes that underlie abilities for abstract reasoning, simulation, and cognitive control*" (Valdesolo & DeSteno, 2006), p. 476). These two classes exist side by side, and instead of each completely taking over a task, they often act in unity and gather the sub-goals of each to form one that is both socially malleable, and strives to comply with one's moral principles. Some moral dilemmas however test the limits of these two classes working in unison, when the sub-goals are contradicting each other.

Framing and communication (ALA)

So why is framing, including decision making and moral reasoning, an important area to investigate and keep exploring?

The topics we have hitherto introduced in this paper are essential for communication, as they are tools in which to alter our perception of reality, and thus moulding reality in manner that one sees fit. Areas in which framing should be scrutinised methodically and treated with caution is when it's used by somebody in a position of power - e.g. governments, journalists and scientists. It is a method which can be used as a weapon when used by the wrong hands. This paper strives to spread knowledge about this issue, which consequently can put focus on it.

We have thus far introduced theories all relating to framing, decision making and moral reasoning, which have formed the basis of our study. This study seeks to further investigate this field by focusing on how framing effects are manifested in combination with decision making in moral dilemmas and moral reasoning.

Previous research (Greene et al., 2009) has found a disparity in judgement of different types of moral dilemmas and that the extent to which a dilemma is personal can have an effect how a subject is reasoning, and thus affects the final decision made (Greene et al., 2001).

Furthermore, previous studies have shown participants to have a significantly slower reaction time when giving emotionally incongruent responses to moral dilemmas.

This study seeks to examine the following main hypothesis: Framing affects human decision making in social moral dilemmas. In answering this we have posed two theories, which focus on different aspects of moral dilemmas.

The first sub-hypothesis is that social scenarios have an effect on decision making within social moral dilemmas. That is, do we see a larger effect of framing when the stimuli is of a personal character, than when it's of an impersonal character?

The second sub-hypothesis is that difficulty, measured by reaction time, is significantly different across scenarios and conditions. Our prediction was that in the personal scenarios in the negative condition, the reaction time would be longer. We base this prediction on the finding of the study by Greene et al (2001) of that slower reaction time was elicited within dilemmas with emotionally incongruent response.

Materials and methods (AHJ + ALA)

Participants

The experiment was conducted on 38 participants, 19 in each condition. Participants ranged in age from 19 to 67, the mean age being 28 with a standard deviation of 12 (*figure 2*). There was a preponderance of female participants (71 % - See figure 3). The majority of participants were native Danes, all with a decent level of fluency in English.

Min age	Max age	Mean age	SD of age
19	67	28	12

Fig. 2: Age matrix

Males	11	29 %
Females	27	71 %

Fig. 3: Gender matrix

Materials/stimuli

The main study was an independent measures design consisting of two conditions, (i) a positively framed condition and (ii) a negatively framed condition. Each of the conditions featured six trials with the same six moral dilemmas. The sole difference between the conditions were the phrasing of the question following their respective dilemmas, and all participants were therefore exposed to the same dilemmas.

In the positive condition the question would emphasise positive aspects of a certain action - e.g. who would be saved or what would be gained - where the questions featured in the negative condition would emphasise the negative consequences of the same action, e.g. who would die or what would be lost.

The dilemmas were heavily based on integrated moral dilemmas (Clayton, 2014), which we have altered to fit our study. The six moral dilemmas were furthermore aggregated into two scenarios (personal and impersonal), where each participant was presented with three of each. As all dilemmas were social, we

made an effort to create moral dilemmas that had a substantial impact on other human beings. In the personal scenario, we brought a personal character universally relatable into play (e.g. a spouse and close friend), which was exposed to the consequences of the dilemma. In the impersonal scenario, the characters in the moral dilemma were mere strangers that the participant were to have no immediate connection with. As stated previously, both scenarios involved other human beings, and the only thing differing was the level of how close the relation was to the decision-maker.

Two representative examples are visualised below (fig. 4 + 5).

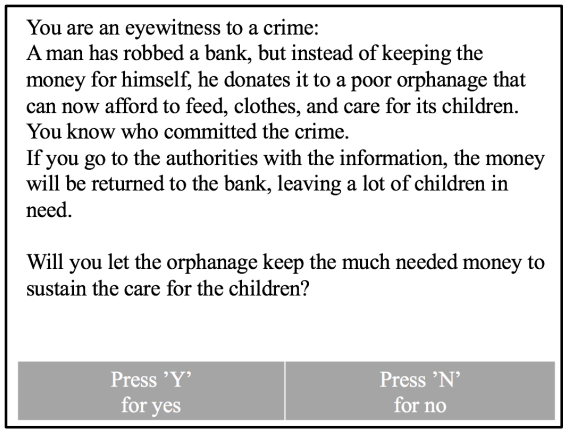

Fig. 4: Impersonal & positive moral dilemma

In figure 4 above, a trial is shown of impersonal scenario and with a positively framed question. If our predictions and hypotheses were followed, the framing of the question would in this case cause the participant to answer "Yes".

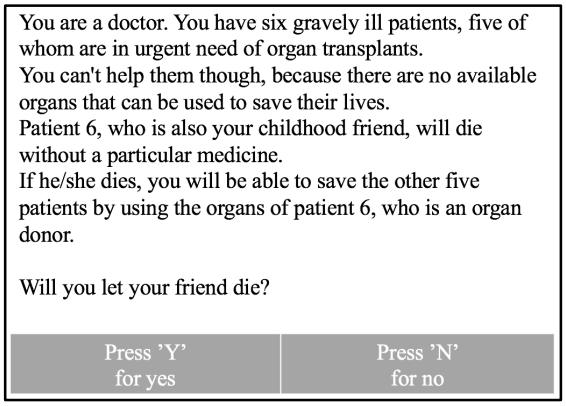

Fig. 5: Personal & negative moral dilemma

Figure 5 above is a visualisation of a personal dilemma with a negatively framed question. Our claim was that the participant would answer "No", as well as spend longer time to process the dilemma and decide upon an answer in comparison to impersonal, positive dilemmas.

Procedure

Upon beginning the experiment, the participants were asked to sit in front of a computer and read through an on-screen instruction run on the programme PsychoPy2. The instructions consisted of a brief explanation of the controls and a short reminder not to get distracted while doing the experiment. Participants were encouraged to make sure they understood the instructions and to ask any questions they might have before starting. The experimenter would allow the participant privacy, but stay in the vicinity to assist with any technical difficulties that might occur. By pressing a key to start, the participant would go through six randomised trials for one condition. For each trial in their given condition, the participant would read a moral dilemma followed by a framed question and then select their choice of action by pressing the Y-key for 'Yes' or N-key for 'No'.

The programme would automatically thank the participant and close after the completion of the sixth trial. We recorded answers and reaction time automatically for each participant pr. trial.

In addition to the main experiment we also created and ran a questionnaire on Google Forms in which participants' different opinions on the value of individuals was investigated. We had 150 participants (63 % female, 36 % male, 1 % other), with ages ranging from 14-68, where 51 % were within 20-23 years of age.

We had 2 representatives of 2 categories of people set up against each other, and the participant was asked to choose which of the two should live, where the other in consequence would die.

The baseline category consisted of:

Your friend, Your close friend, Your best friend, Your spouse

The second category consisted of:

1 stranger, 2 strangers, 5 strangers, 1 child

In a randomised order, the participants were asked to consider a total of 16 questions, where each instance of the baseline category was contrasted with each instance the second category. An example can be seen below.

Who should live?

- *Your friend*
- *1 stranger*

Analysis (ALA + AHJ)

We conducted the experiment in the programme PsychoPy2 which recorded which stimuli was shown, participants' selections and reaction time. The data was uploaded into RStudio for data analysis. Two log files were omitted due to technical errors. No other pre-processing was done prior to analysis.

We used two models to analyse our data, (i) a logistic regression model and (ii) a linear regression model.

To answer the first sub-hypothesis we formulated initially, we constructed a logistic regression model predicting participants' responses from an interaction effect between framing and scenario. We used model comparisons to compare the model with interaction effect to two other models, one using only framing as predictor and one using framing and scenario with no interaction effect. The best model at describing the data is the one specified in model 1, where the interaction effect is present between the two predictors; framing and scenario.

Choice ~ Framing * Scenario + (1 | ID)

Model 1: Function used in analysis of hypothesis 1

To recapitulate, model 1 above seeks to predict the choice of participants from an interaction effect between framing and scenario. ID is represented as a random intercept to account for personal differences.

To answer the second sub-hypothesis, we constructed a linear regression model equivalent to the first model, but here predicting reaction time from an interaction effect between framing and scenario (see model 2). In addition to ID as random intercept, we have added trial to accommodate for the difference in sequence of the dilemmas as well as the length of the different dilemmas and questions posed in the different framings.

Reaction Time ~ Framing * Scenario + (1 | ID) + (1 | Trial)

Model 2: Function used in analysis of hypothesis 2

Once more we used model comparisons to test if the model with interaction effect to three other models; One using only framing as predictor, another using only scenario as predictor, and a last one using framing and scenario as predictors, but with no interaction effect.

When comparing the different models with each other, it was clear that the original model (interaction effect) was a poor fit of the data. However, the model that best describes was the one specified in model 3 where the only predictor is scenario.

Reaction Time ~ Scenario + (1 | ID) + (1 | Trial)

Model 3: Function used in analysis of hypothesis 2

Model 3 shows the other function we used where the only predictor was type of scenario.

In regard to the questionnaire performed remotely on Google Forms, no analysis was conducted as it automatically provided diagrams of the distribution of answers.

Results (ALA + AHJ)

There was a significant interaction effect between framing and scenario on participants' response in moral dilemmas, b = 1.18 (SE = 0.6), z = 1.98, $p < .05$.

A post hoc test revealed that the difference seems mainly to be driven by the differences in scenarios in the positively framed condition.

We found no significant interaction effect between framing and scenario on reaction time in moral dilemmas, b = -1.59 (SE = 8.97), t = -0.29, $p > .05$. We did however find a close to significant effect of only scenario on reaction time, b = 8.95 (SE = 4.26), t = 2.1, $p = 0.06$.

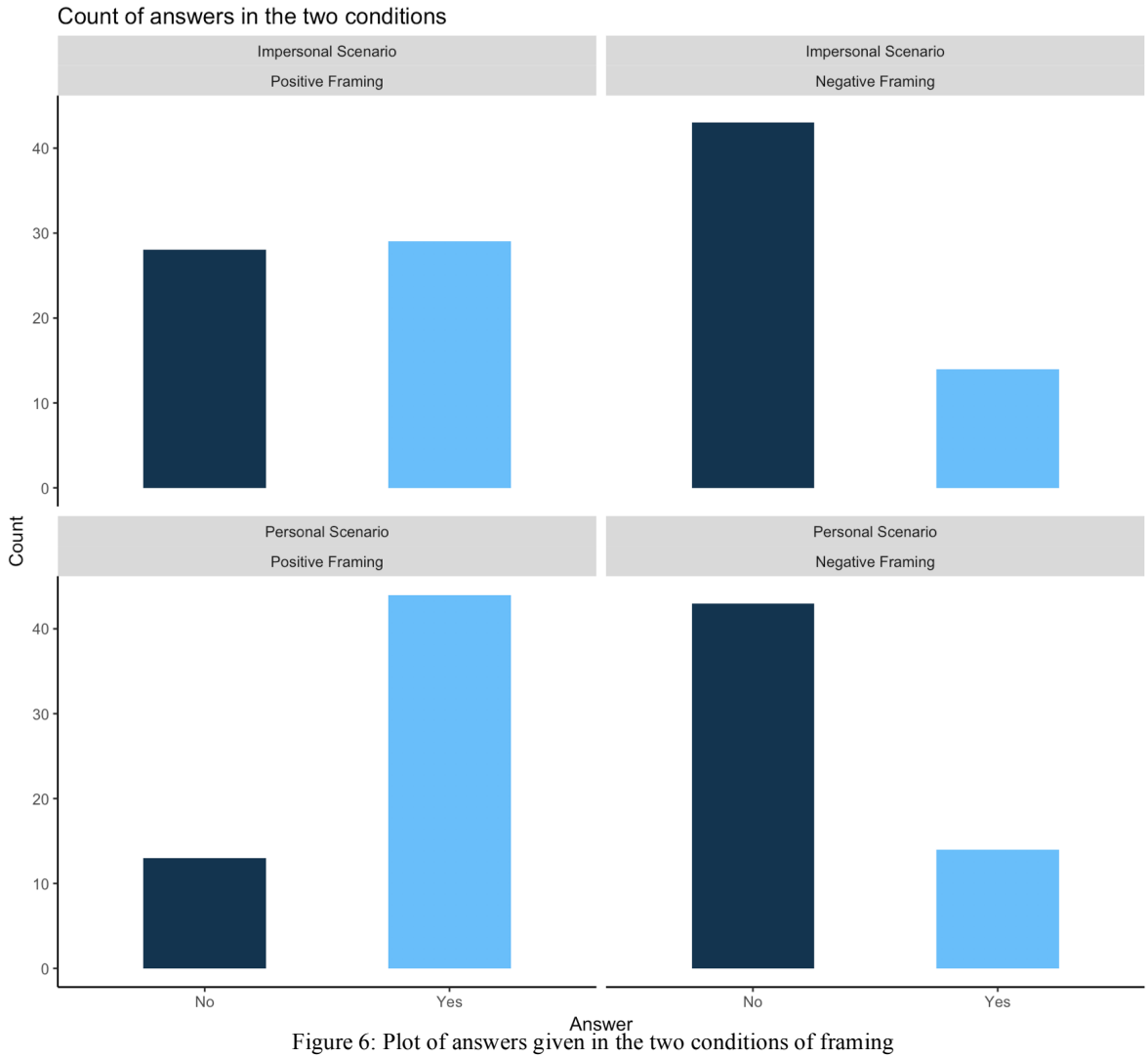

Figure 6: Plot of answers given in the two conditions of framing
(positive - left hand side. Negative - right hand side)

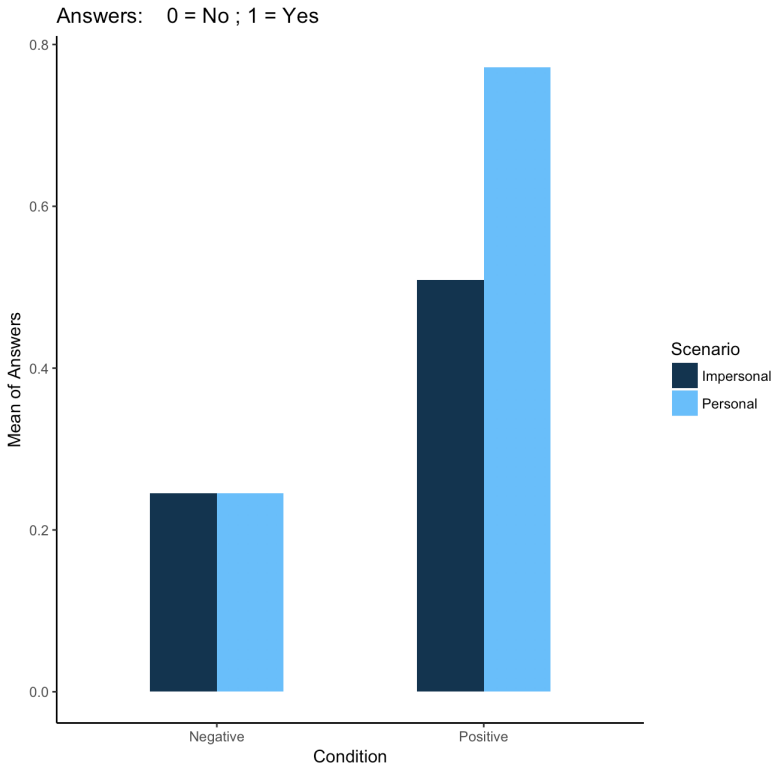

Fig. 7: Plot of answers given. Divided by framing, and subdivided by scenario. The Y-axis is the mean of answers given, where 0 is "No" and 1 is "Yes", i.e. the higher the graph, the more affirmative answers were given.

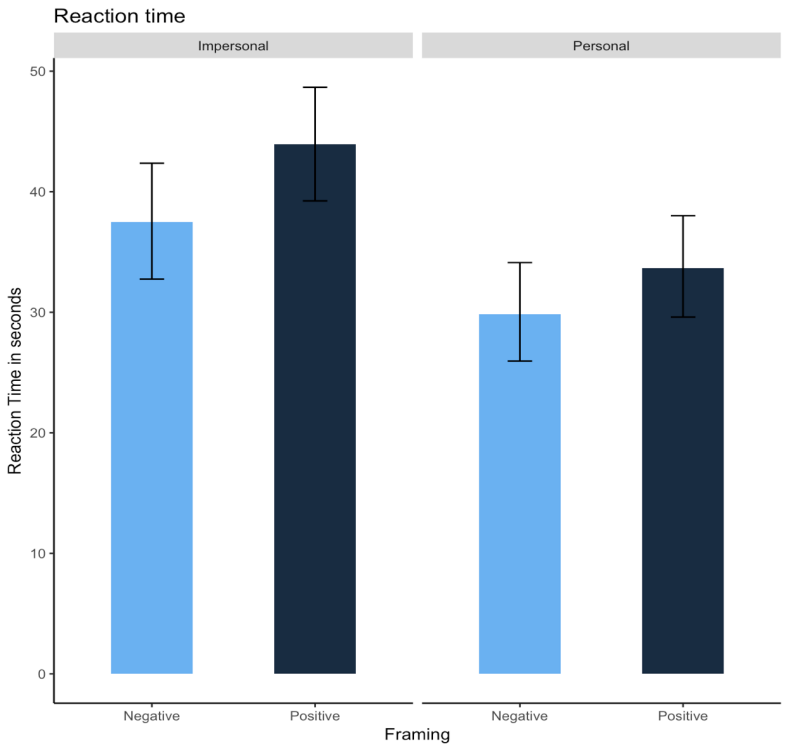

Fig. 8. Reaction time (in sec) divided into the two scenarios and subdivided into type of framing. Impersonal scenarios on the left, and personal scenarios on the right

Discussion (ALA + AHJ)

Through analysis it has become evident that framing does indeed affect decision making within social moral dilemmas, and the degree of personal relation, scenario, does affect decision making too.

The analysis of the first sub-hypothesis revealed that when the framing is changed from positive to negative and the scenario is changed from impersonal to personal, the probability of participants selecting 'No' is increased with 77%. This means that there is a larger probability of answering 'No' when the question is framed negatively and the dilemma had a personal dimension.

This interpretation is also evident when looking at figure 7, which shows a clear difference of amount of affirmative answers given when the question posed was positively framed, rather than negatively. Scenario had a larger effect on the positively framed conditions, and as the figure shows, it showed little to no effect on scenario in the negatively framed condition.

Figure 6 shows a classic interaction effect within personal dilemmas (the two lower plots), where framing is effectively reversed. This tells us that framing was largely successful in the personal scenarios - an effect of which was not as substantial in the impersonal scenarios.

When analysing the results of the second sub-hypothesis we found that framing and scenario had no inter-relational impact on reaction time when giving an answer to social moral dilemmas.

However, further analysis did reveal that choice of scenario alone had a quasi-significant effect on reaction time. This effect can be read of the plot in figure 8, although the insignificance could be perused at the slightly overlapping error bars, thus consequently no argument could be made based on this finding.

Further scrutiny of the plot in figure 8 reveals that there was a tendency for reaction time to be longer in the positively framed conditions (the darker bars are longer than the lighter bars), but again the case here is that the error bars just overlap, making the difference insignificant, and consequently an argument unfit for theory.

We predicted that personal scenarios framed negatively would have a longer reaction time. This prediction was based upon the results of Greene et al. (2001) in which emotionally incongruent responses were given after significantly longer response time. We predicted that this would mainly occur in those of our trials that were personal scenarios that were more inclined to involve deeper of emotions, and in the negatively framed condition due to possible interference from being made scapegoat. This prediction could not be proved as no significant effect was found, but further research could investigate the suggested trend for longer reaction time in negatively framed trials.

If we return to the construction of a basis of choice, our results seem extensively consistent with the emotion based accounts of Greene et al. (2001). What we refer to as personal scenarios are widely comparable (although not equivalent) to the moral-personal dilemmas featured in Greene et al. (2001). However, our results indicate an additional tendency, namely the interaction between positive framing and effects of scenario. The findings of our study could suggest that emotional influence varies in degree according to context, content, sentiment and, in our case, framing.

Be that as it may, we have no intention of disregarding other possible factors that might influence a decision maker.

A closer look at the results of the individual dilemmas reveal that some trials have tended to elicit more consistent responses than others. One such case is the dilemma presented in figure 5 where the participant is asked to either kill their childhood friend to save five other patients

or treat their friend while letting the five other patients die. A distinguishing feature of this dilemma could be that it places its subject in the role of a doctor. This is a role that many might expect to be honourable and ethical - characteristics that participants consequently might take upon themselves when making a decision. Furthermore, and perhaps more importantly, there are implemented rules to guide you in this dilemma. As a doctor, it would be indisputable to deny a patient life-saving medicine even if their death could save five other lives, as it's not up to them to decide who lives and who dies. Our results show that participants are prone to answer 'No' to this question in the positive framing as well, thus giving medicine to their friend. This corresponds to the proposals of Nichols & Mallon (2006) as it suggests that participants' decisions are not made solely based upon personal emotion in this case. It is also a matter of taking a life to save lives, where most similar dilemmas are matters of saving one or the other group. This creates a new dimension to the dilemma, as an extra incentive to keep the one alive.

In the Google Forms questionnaire, we found that in all cases where 1 and 2 strangers were contrasted with the varying degrees of personal relationships, participants overwhelmingly chose to save the person with whom they had a relationship. As the personal relation became closer, there was a stronger effect of this. This effect is less strong, although still present on the cases of 5 strangers contrasted with the personal relations.

Where the child was contrasted with varying degrees of personal relationships there was a tendency for participants to choose the personal relationship as the intimacy of the personal relationship grew stronger. It was roughly split in half when the decision was between a friend and a child, but when the decision was between a spouse and a child, only 25 % chose the child.

When comparing the "worth" of 5 strangers and a child to that of a spouse, a resemblance was found: 25 % chose a child over a spouse, where 29 % chose 5 strangers to live. It can therefore be argued that participants consider personal relations to be of more value than strangers.

This questionnaire has served to examine the influence of the characters presented in the moral dilemmas. The relationship, to what degree it was personal, has proven to be more influential than what we have paid regards to when constructing the dilemmas.

Furthermore, a child was a lot more valuable than 5 strangers in the cases where they were contrasted with "Your friend" (52 % chose the child, 29 % chose the 5 strangers). In some of our dilemmas we introduce children as victims in order to give more incentive, but without realising the impact children caused, e.g. compared to a number of strangers.

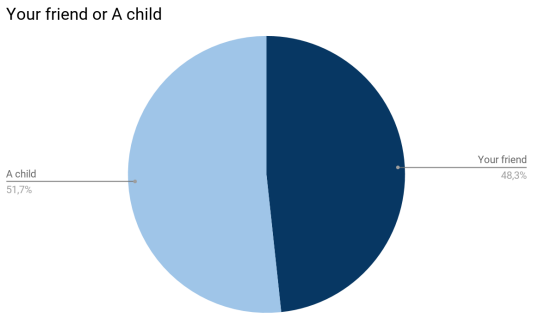

Figure 9. Who should live? Your friend (right) or a child (left)

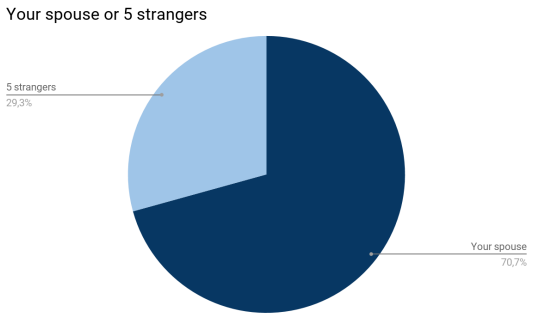

Figure 10. Who should live? Your spouse (right) or 5 strangers (left)

When selecting and adapting the moral dilemmas for the purpose of our study, it was of fundamental importance to attentively mould the questions for the dilemmas in a thoughtful manner. We have mainly focused our framing on attribute framing, where we have manipulated the questions to focus either on something desirable or undesirable in the options and consequences thereof. In doing this we have impacted the evaluation of the options in the dilemmas, and thus en-

hanced the view that should cause the participant to choose the option which we wanted them to choose. This is done in the negative framing by only mentioning the negative consequences of said action, and the reverse is done in the positive framing, where we have focused on the elements gained. An example of attribute framing is to be seen in figure 4, where the question in the dilemma focuses on the orphanage, and thus emphasises the issue of the orphanage and children, the softer values, than the other issue, the illegal act of robbery which in this case would be permitted.

Not all of the dilemmas included elements of risk, which effectually inhibited the use of risky choice framing. Two dilemmas, one in each scenario, were however mainly built up around the element of risk, with an additional two (one in each scenario) with minor foci on risk. In these particular instances, risky choice framing could have induced a better framing effect than the attribute framing. Therefore, additional research could consider investigating the same effects whilst changing the types of framing.

Feelings of regret brought by the decision made in risky dilemmas, and especially social ones with such an earnest character as life/death, are often inevitable, and as previously stated, is something that significantly affects the final decision. The dilemmas must be regarded with Kahneman & Tversky's (1981) finding that the prospect of regretting an action done is greater than that of passivity. We have taken this effect into account in each of the dilemmas, and in all cases we have tried to make sure that the feeling of regret, besides action/inaction is level in each of the options. In the case of the dilemma in figure 4: If the level of regret were to make the scales tip to one of the two options, the participants should have chosen to let the orphanage keep the money, essentially doing nothing, rather than calling the police and setting a series of events in com-

motion that might not be worth it in comparison to what is gained in the end.

Another point worth making in this case is that of anarchy: if one were to do nothing about the robbery in this case, what sets the boundary of sanctions for other illegal actions? This appeals to the feeling of regret too, where it in this case could be argued that the pros and cons are level.

Limitations (ALA)

This study had 38 participants with an uneven distribution of gender and age. In order to infer conclusions which could be applied to a larger population these assumptions should be met.

As previously stated, the participants of this study were mainly native Danes with a decent level of fluency in English. This assumption was difficult to measure, and we experienced a few participants asking us for minor translations. The level of English in the dilemmas was therefore not a perfect fit for the level of English the participants had, which could have influenced several key factors of our analysis; choice of answer and reaction time being the most important ones.

In sub-hypothesis 2 we used reaction time as a quasi-measure of difficulty in the different dilemmas. This assumption should be used with caution when drawing conclusions from it, as several key factors are not taken into account. These include: (i) Different word count of dilemmas, (ii) Different word count of corresponding questions to the dilemmas, (iii) Different levels of English naturally influence reading time, and (iv) People at different ages read at a different pace, with elder people typically at a slower pace than the younger generations.

We have taken measures to account for these factors; our models used trials and ID (participant number) as random intercepts. This measure does not entirely make sure that the assumption is met though,

The process of choosing and adapting moral dilemmas for the purpose of our study was a difficult task, as a series of parameters must be met in order for them to be used in a research report. In this study, we have put our focus on shift in scenario and shift in framing, and how these influence the choice made by participants, and these parameters were therefore where the main emphasis was held. Due to our focus being solely on social moral dilemmas, it followed that the distinction between personal and impersonal scenarios were not as clear cut as previous studies have done, when opposing social scenarios with mathematical ones.

As well as framing and scenario there was a further sub-distinction of the moral dilemmas; an extra dimension of social norms and laws, where the participants were given an extra incentive to act in a certain direction. As previously mentioned, an example of these can be seen in figure 5 which showed the doctor's dilemma. Alongside with the moral decision to choose between 5 lives of strangers and 1 one of your childhood friend, the participant was given an extra incentive to choose the 5 strangers to live, as the opposite option really is an illegal act - to defy the Hippocratic oath that every doctor must pledge to. Thus, this extra dimension did not provide a neutral baseline of which the participant could be manipulated in either direction, and hereby provides bias in the end result.

Figure 6 shows interesting results in the impersonal scenario, positive condition, as no framing effect is to be detected whatsoever. Additionally, there is a large framing effect in the impersonal, negative condition. This pattern could be explained by one obstinate dilemma, which proved difficult to frame as the decision maker might be predetermined about the option, and therefore is not as susceptible to framing. Having this in mind, we had a second look at our data, which showed that the positive framing of the impersonal dilemma shown

in figure 11 (below) had no effect at all - all participants went against the framing, and chose to answer "No" in this instance. This dilemma has therefore had a big impact on the effects of our framings - both improved the negative framing, and reduced the framing effect in the positive condition.

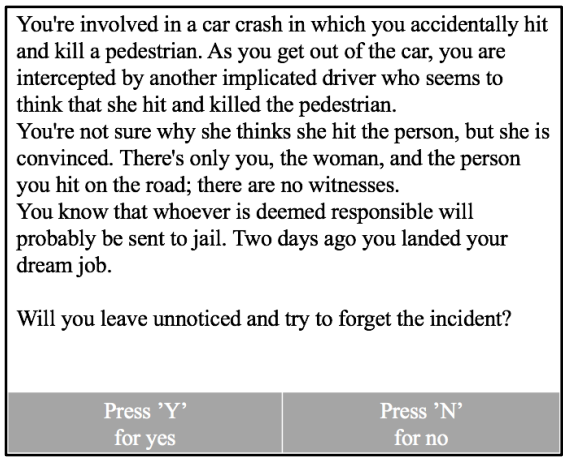

Figure 11. Impersonal - Positive dilemma

As this study did have elemental limitations, one must be careful in inferring conclusions and relate these to the general population. Furthermore, as is the case of studies investigating moral dilemmas, it's questionable whether what the participants chose to do, were what they actually would choose to do if they were in such a situation. It is however difficult to simulate situations like ours in a way that seems real, without raising a potential ethical issue. Therefore, a subject for further research could include exploring the answers given in moral dilemmas that are presented in a modular fashion closer to reality, and find if they would provide different susceptibility to framing, than moral dilemmas presented on a computer screen.

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