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Overriding Moral Intuitions – Does It Make Us Immoral? Dual-Process Theory of Higher Cognition Account for Moral Reasoning

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***Abstract*—**Moral decisions are considered as an intuitive process, while conscious reasoning is mostly used only to justify those intuitions. This problem is described in few different dual-process theories of mind, that are being developed e.g. by Frederick and Kahneman, Stanovich and Evans. Those theories recently evolved into tri-process theories with a proposed process that makes ultimate decision or allows to paraformal processing with focal bias.. Presented experiment compares the decision patterns to the implications of those models.

In presented study participants (n=179) considered different aspects of trolley dilemma or its footbridge version and decided after that.

Results show that in the control group 70% of people decided to use the lever to change tracks for the running trolley, and 20% chose to push the fat man down the tracks. In contrast, after experimental manipulation almost no one decided to act. Also the decision time difference between dilemmas disappeared after experimental manipulation.

The result supports the idea of three co-working processes: intuitive (TASS), paraformal (reflective mind) and algorithmic process.

***Keywords*—**Moral reasoning, moral decision, reflection, trolley problem, dual-process theory of reasoning, tri-process theory of cognition.

I. Dual-Processing in Moral Reasoning

MORAL decisions are the topic for debate since long time. In last 20 years the discussion is refurbished anew thanks to empirical study of those. Classical approach to moral judgments requires people to think consciously about the dilemma in order to say its decision was moral. If they don't consider any other option than the chosen one, than how could they be moral?

Philosophers while describing morality are proposing that every moral decision has its reasons and motives [1]. The argument „I stole the bread because I was hungry" explains only the motive of breaking the rule, but doesn't give a reason to do so, thus the action is understandable, still morally unacceptable. This view makes a moral judgment a process, in which reasons and motives have to be considered in respect to some rules. This makes moral judgment a conscious process, based on some formal rules and procedures.

In opposition, psychologists in their recent empirical studies are more interested in description of decision made by people. One of examples of this descriptive approach to morality is Haidt`s Social Intuitionist Model (SIM; [2] – [3]), in which moral judgment is predominantly intuitive, driven primarily by automatic emotional responses that are effortless and produced by unconscious processes. According to the SIM, reflection and reasoning typically serve to rationalize moral judgments that were previously made intuitively.

So, if moral decision is mostly based of intuition, how does the reflection operate? Plenty of experimental data was collected to answer this question. First of all, the more time we have the more utilitarian our decisions are. Hertwig and Sutter [4] argued, that more time allows us to override intuitive responses instead of relying just on them. Paxton, Ungar and Green [5] increased utilitarian responding by inducing subjects to be more reflective by completing the Cognitive Reflection Test (CRT) prior to responding to moral dilemmas.

Framing can also be a crucial issue as well for moral decisions. Others [6] stated that that the most accessible rule influences willingness to intervene within moral dilemmas.

In summary, people can undo their intuitive responses with conscious and effortful processing. They just don't use it all the time in standard situations.

II. Moral Dilemmas

For last 30 years a dual-process concept of mind is being developed. In this view mind consists of two independent, but cooperating minds – old mind that is fast, automatic, high processing capable and low effortful and new mind that is slow, controlled, has limited capacity and is effortful. In this view old mind operates mostly by process Type 1, and new mind by Type 2 processes. Moral decisions in this view can be done in two ways: (1) fast, intuitive judgment that bases on moral rules (deontic) and (2) slow, effortful decisions, based on Type 2 processing (more utilitarian).

The simple models of 70-90`s of dual process theory are recently evaluated as too simple (see: [7]-[10]), and require to be more complex. The main problems with those theories is, that experiments show, that there are only few mental operations that base on only Type 1 or Type 2 processes and most of decisions and conclusions are a combination of both (e.g. belief bias, [11]).

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This inspired Evans to proposing a third process, responsible for evaluation of other processes. Now, the fast Type 1 processing is evaluated by Type 3 process that uses some criteria that can be formal. Slow, Type 2 processes have its origins in explicit knowledge, language and perception [8]. This explains why most of human cognition shows characteristic of both types of processing.

Most complex and discussed concept of the tri-process theory is presented in Stanovich recent papers [9], [10]. He proposes replacement of new mind with TASS – autonomic set of systems, which consists inter alia from: intuitions, beliefs, linguistic cueing, learned habits [12]. These all share features such as: independency from working memory, operating parallel and unconsciously. They differ to the character and origins, and not all are shared with animals (e.g. beliefs are typical only for humans). Working together with TASS is: (A) reflective mind that defines goals and preferable operations that should be done to achieve them; and (B) algorithmic mind that operates on formal procedures.

Taking into account efficiency of cognition Stanovich postulates 3 cognitive miser rules in reasoning: 1) default to TASS whenever possible; 2) when analytic cognition is needed default to serial associative cognition with focal bias; 3) start cognitive simulation. Only the third type of moral judgment is accepted by normative approach as true moral reasoning, because only then people can justify their moral decisions and are aware of rules they used to choose between alternative options of behavior.

III. Questions and Hypothesis

In order to compare both theories we have chosen classical moral dilemmas: (1) the trolley problem [13], where one has to decide whether he should use a switch and kill one person in order to save 5 other lives, and (2) the footbridge dilemma, described by [14]. Here one has to throw down on the tracks a fat man, whose weight can stop the trolley from crushing five other people. The main difference between those dilemmas is the way one has to sacrifice others life –impersonal, with a lever (group 1) or personal, pushing the fat man (group 2). Plenty of research shows, that people tend to save five people only in the first described version of dilemma (broadly two times more often in 1st scenario, see [15], [16]).

Both dilemmas are identic in their structure – one has to kill one person in order to save several others. The main difference is the way people are forced to act: direct or indirect. The asymmetry between switch and pushing scenarios has been used as an effective tool for developing and evaluating theories of moral judgment (e.g., [17]).

This result can be explained by the doctrine of double effect, which differentiates between harm caused as means and harm caused as a side effect. Harm as means, such as when the actor uses the body of a single victim to prevent the death several people, is unacceptable. Harm as a side effect, however, such as when the trolley kills the single victim after redirected on the side-track, is accepted more often [15]. Other explanations are recently proposed: distinctions between direct and indirect harm [18], and intervention on the victim versus intervention on the harmful object [19].

All those explanations are consistent with SIM theory, where people are using reasoning to justify their intuitions – and it is done easier in trolley problem. So, if tri-process theory of mind is right, there is a way people can handle the problem - they should be able to consciously consider both dilemmas, and after comparison of its structure, the difference between dilemmas should disappear. As the problem is always "1 vs. 5 lives", the decision should be same in both dilemmas. In order to achieve it, we stimulated reflection by asking specific questions about the dilemmas. This should make algorithmic processing available for use and lead to the preference of more utilitarian choice.

If Evans tri-process model is true, we expect people to change their preferences of evaluation (Type 3 processing) and in result focus more on Type 2 processing. This should result in more time spent on judgment and more utilitarian decisions in reflexive group in both versions of dilemma. Trolley dilemma, usually solved utilitarian (in favor of Type 2 process) should remain the same while the footbridge dilemma should be solved different – more usage of T2 processing should result in more time spent on thinking and more utilitarian responses.

In Stanovich view, forced reflection can result in changes in third process – reflective mind, which usually allows TASS to operate in footbridge dilemma and overrides it in trolley dilemma. After priming analytic processing we expect a third type of reaction, other than the two types (fast and deontic, Type 1 and slow and pragmatic, Type 2). In this situation, all dilemmas should be decoupled and analyzed by analytic mind, and differ in time and results from the TASS (intuitive decision) and reflective mind ones (overridden TASS responses). In other words – both versions should be directly sent to analytic mind and handled same way.

As suggested forced reflection could debias human decision making and those implications were tested in described below experiment.

IV. Study

A. Participants

The participants were 189 volunteers recruited on internet forum or from business students. They differed by age (M=23.73; SD=7.7). Most of them are male (only 25 females).

B. Materials

One group of participants (n=116) had to solve one of classic moral dilemmas, trolley problem and footbridge problem. In addition to dilemma participants had to fill a questionnaire, taken from [15], in which they were asked four questions, concerning pragmatic and moral aspects of the dilemma.

[Question 1] Under these circumstances, is it morally obligatory for the passer-by to take described action?

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[Question 2] Under these circumstances, is it morally acceptable for the passer-by to take described action?

[Question 3] If the passer-by does not take described action, is he intentionally killing five people?

[Question 4] If the passer-by take described action, is he intentionally killing one person?

The decision that participants had to make was presented in third person – they had to decide whether some person called Peter should pull the lever or push the fat man down the tracks. This should make the decision less harmful for participants and prevent the experiment from floor effect that could possibly occur in footbridge dilemma.

C. Procedure

Experiment was done by use online platform. Participants logged in to the platform giving their nickname, age and sex. Bigger part of them did it from home (n=117), rest from the university computer lab. No significant differences were observed between groups, and they were analyzed together.

Participants were informed that they will have to solve a moral dilemma and their decisions and reactions time will be saved. After that they were randomly assigned to one of four experimental groups. One half of participants had to solve the trolley problem, other half the footbridge problem. Half of each group answered the questionnaire first and then decided if Peter should act or not, other half first decided if he should take the action and later answered the questionnaire.

After they read the dilemma participants had to push "I have read the above problem" button, then the decision form showed, and the time started to count. Thanks to that, no matter how long participants have read the dilemma, the registered time measured always time spent on consideration of dilemma.

D. Results

Results of experiment are shown in table 1. As expected, people usually acted utilitarian more often in trolley problem (39%) than in footbridge problem dilemma (14%).

The results of questionnaire were compared between groups, that answered on it first and decided first (dependent: mode) and between trolley problem and footbridge problem (dependent: version). Results showed no differences for dependent mode, and several differences between versions of task. People tended to claim, that taking action in the trolley version is morally obligatory (58% vs. 26%; $\chi 2=10.921$, $p<0.001$), morally acceptable (54.6% vs. 35.1%; $\chi 2=7.13$, $p<0.01$) and not taking action is more often described as intentionally killing 5 people (60.5% vs. 23.4%; $\chi 2=25.818$, $p<0.001$). This is consistent with the citied experiments, where people have chosen pulling the lever more often – here we can see they did some justifications for it. The decision rate is shown in table 1. Please note, that every groups has different number of participants, because of random assignment to experimental groups.

TABLE I
RATE OF PARTICIPANTS DECLARING, THEY WOULD SACRIFICE ONE HUMAN IN ORDER TO SAVE 5 HUMANS LIVES

	Decision first (control group)	Questionnaire first (experimental group)
Trolley dilemma	62% (71)*	4,2% (48)
Footbridge dilemma	22,2% (45)	0% (25)

*Brackets show the number of participants assigned to this experimental group

We can observe form the table 1 and above data, that people, despite having the same opinion about moral and pragmatic aspects of dilemma differed by the willingness to act between modes of experiment. When forced to analyze the dilemma and filling the questionnaire people decided not to sacrifice one man (only 2 out of 73 participants have chosen the utilitarian option). Moreover solving the trolley problem took more time (m=11.52 sec; SD=7.31) than the footbridge problem (m=8.92 sec., SD=6.99; $F(1,181)=5.525$, $p<0.05$, $\eta 2=0.03$). This supports the view, that in order to act utilitarian one has to override its intuitions. Overall utilitarian decision took in general more time (12.39 sec; SD=8.05) than deontic one (9.79sec; SD=6.82; $F(1,181)=4.991$; $p<0.05$; $\eta 2=0.027$).

When participants had to fill the questionnaire first, they spent the same time on both dilemmas, but when they had to make the decision first, they needed even more time to solve the trolley problem and less time to solve footbridge problem. The interaction between independent variables (mode and version) on dependent variable reaction time is significant $F(1,181)=4.49$, $p<0.05$, $\eta 2=0.024$. The reaction times are shown on Fig. 1.

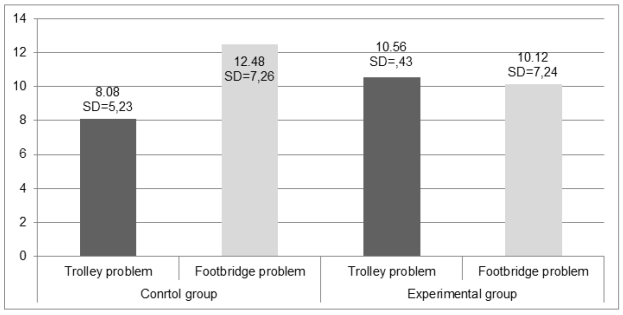


Fig. 1 Average time spent on solving dilemmas (in seconds)

V. SUMMARY AND DISCUSSION

As shown in experiment, in standard case people behave as described in SIM theory, that is infer intuitive judgments whenever possible – like in footbridge problem. This means, when a situation fits to the best example of breaking particular rule they immediately judge the action as immoral and abstain from taking action. But when the problem isn`t a good example of breaking a rule, people are using a more effortful process to evaluate their options. The time spent on judging this type of problem is the longest, and in result people act

utilitarian (44 out of 71 people switched the lever). This fits well to the proposed functions of reflective mind and its rationalization functions.

People that were encouraged to analyze moral and pragmatic aspects of were solving both versions of dilemma the same time, and give the same answers. Surprisingly, they didn't seem to act utilitarian as expected. Instead their deontic approach was the strongest, even less people acted utilitarian than in non-primed standard footbridge dilemma. It seems that the priming for refection made people act in third way, other than relying on intuition or overriding it with reflective process.

How are those results significant for tri-process theories evaluation?

In Evans model, we expected that priming would set Type 3 process for choosing the algorithmic process (Type 2) over intuitive reactions (Type 1). This should result in solving both dilemmas same way, as in non-primed trolley dilemma. This dilemma is usually solved with Type 2 processing and leads to more utilitarian choices. This was not the case here – in this experiment people were less utilitarian and needed less time to make decision, than in standard trolley problem.

In Stanovich model, we expected TASS to handle footbridge dilemma, reflective mind to override it in trolley dilemma and algorithmic mind to take control, after being primed for use. This is the result of 3 rules of efficient operations stated as cognitive miser rules.

The collected data fits well to those assumptions, and supports the tri-process approach. We are sure, that despite only little experimental data this theory should be further developed and popularized, as it better than previous, dual process ones.

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