

## **REVIEW**

by Associate Professor Penka Yordanova Hristova, PhD  
New Bulgarian University, Department of Cognitive Science and Psychology  
Professional field 3.2. Psychology

for the degree of Doctor of Science in the professional field  
3.2. Psychology (General Psychology)  
with candidate Veselina Hristova Kadreva

for her dissertation on " Moral judgment and emotions: biosignal based research"

### **SIGNIFICANCE OF THE RESEARCH PROBLEM IN SCIENTIFIC AND APPLIED TERMS**

The dual-process theory of moral judgment is tested, whereby deontological judgments are the result of a fast emotional reaction which is then rationalised. Therefore, contrary to normative theories of moral reasoning, the so-called “commonsense” moral reasoning should be based on emotions that arise spontaneously in moral situations, rather than on a cognitively demanding pursuit of the “right” action. This thesis explores specifically the role of emotions in the context of moral dilemmas under strict control of factors related to the dilemma content (i.e., physical directness, inevitability of death, and instrumentality of harm) and the dilemma-relevant information encoded, and within a sample of neurologically normal volunteers. Thus, the methodological problems in previous research that support the dual-process theory are addressed in the attempt to find a conclusive answer to the role of emotions in moral judgments.

### **AIMS AND OBJECTIVES OF THE DISSERTATION**

The main goal of the research reported in this dissertation is a methodologically sound test of the Greene’s (Greene et al., 2001; Greene, 2008) dual-process theory of moral judgments. Dilemmas of one type have been selected and carefully controlled in terms of content, length, and procedure of presentation in different experimental conditions so as to examine the various factors that exert influence on moral judgments. Emotional state is monitored by skin conductance during moral reasoning or manipulated as irrelevant-to-the-moral-reasoning context. An increase in physiological performance due to the emotion that arises from the utilitarian decision and a corresponding delay in responses are sought only for the first-person moral dilemmas. In addition, a specific profile of moral judgments is expected according to the valence of the emotional context induced prior to moral reasoning. If emotion is part of

moral reasoning it should accompany utilitarian judgments and be repressed or reinforced in emotional contexts with positive and, respectively, negative valence.

#### DEGREE OF KNOWLEDGE OF THE STATE OF THE PROBLEM AND CONSISTENCY OF THE LITERATURE USED

The theoretical review clearly presents Greene's dual process theory (Greene et al., 2001), the evidence on the role of emotions in moral judgments, and the methodological problems that prevent a clear interpretation of the supporting data. The focus is entirely on empirical issues in the study of emotions in moral judgments. No attention is paid to the equally important conceptual problems of the dual-process theory of moral reasoning (e.g. De Neys, 2022) or other attempts to challenge it on the basis of cognitive load, inclinations to moral reasoning (i.e., the deontological and utilitarian), the necessity of conflict/dilemma, and others. It seems to me that this literature has its place in the dissertation, especially in the discussion of the results obtained.

#### AVAILABILITY OF WELL DEVELOPED THEORETICAL MODEL OF THE STUDY

The theoretical review provides a clear rationale for the aims of the study and the need to investigate the role of emotions in moral reasoning with well-controlled stimuli. Factors that can alter moral judgment are clearly inferred from previous research. Several key variables, such as physical directness, the inevitability of death, the instrumentality of harm and first- or third-person judgment, were isolated and carefully manipulated, other things being equal and where possible in a within-group design, in the first two studies of this dissertation. Particularly important to Greene's (2008) theory are personal dilemmas in which participants make a utilitarian first-person decision, and it is compared to the other factors in separate experimental conditions. Although emotion in the first two experiments was measured with skin conductance, there is no detailed presentation of previous research with physiological measures, including in moral judgments, that clarifies how skin conductance data tend to be analyzed and interpreted in moral judgments. Also of great interest is the attempt to explain the emergence of the emotional reaction that is central to Greene's (2008) account and which is supposed to precede moral reasoning and give rise to rationalization. Experiment 3 takes a radically different approach and induces rather than passively measures emotional state in moral reasoning. It looks for an interaction between the valence of the emotional context and the negative emotion generated by the utilitarian decision. Dilemmas are again well controlled and additional factors such as imageability and guilt are accounted for.

### **CORRECT CITATION OF A REPRESENTATIVE NUMBER OF AUTHORS**

There are 145 sources cited, mainly in English. The references are correct and according to the standards. The main findings on moral judgments and emotions are carefully presented and adequately referenced.

The 48-page abstract, excluding references cited, corresponds exactly to the dissertation content.

### **CONSISTENCY OF THE CHOSEN METHODOLOGY AND RESEARCH METHODOLOGY WITH THE STATED AIMS AND OBJECTIVES OF THE THESIS**

This dissertation looks for support for the role of emotions in moral reasoning in well-controlled content dilemmas. They are of the same type, and the utilitarian solution is carefully formulated to explore three factors relevant to moral judgment, such as physical contact, the inevitability of death, and the instrumentality of the harm. In the first two experiments of the dissertation, the intensity of the emotional response is measured by skin conductance during the reading of the utilitarian judgment and during the first- and third-person response to its permissibility. It is unclear why an increase in skin conductance would be expected as a signal of a more intense emotional state and what the control condition is to infer an increase. Is there a correlation between skin conductance and the utilitarian decision permissibility score in Experiment 1? Also, the "permissible" and "non-permissible" response times (RT) are averaged together, not separately, whereas a direct test of the two-process theory would require analysis of only the utilitarian response times (i.e., only the "yes" responses), because that is where the fast emotional response should be suppressed. Finally, it is not clear whether all responses in a condition are averaged in skin conductance analyses, or whether responses in the condition with impersonal instrumental dilemmas are compared separately once with personal instrumental dilemmas and once with impersonal incidental dilemmas. The former approach would have resulted in unequal numbers of measurements across the conditions being compared due to the inability to fully cross all manipulated factors and, in particular, to formulate dilemmas with incidental harm and physical contact. Potentially, this could lead to a difference in skin conductance that is increased upon recognition of a familiar stimulus and thus could explain the reported result of higher skin conductance in dilemmas without physical contact, which are more.

In the latter experiment, the role of emotions in moral reasoning was investigated by first inducing emotions specific in valence and content (i.e., amusement, disgust, fear, and sadness). The valence, rather than the intensity, of the emotion is expected to alter moral

reasoning by interacting with the emotion induced by the utilitarian decision. Specifically, „amusement" should dampen and negative emotions should further enhance the emotion generated by the moral dilemma. The alternative explanation that emotions alter the encoding of information finds no support in the data from the eye-tracking equipment synchronized with the procedure of the actual experiment. The question remains, why would amusement dampen emotion if disgust and sadness add absolutely nothing, and guilt and imagery ratings are stable across emotion conditions? The emotions-as-information hypothesis would predict the same thing, but without necessarily implying an interaction between the induced and utilitarian decision-induced emotional state, since amusement as a positive emotion would signal that all is well and there is no need to revise the current/dominant mental strategy. Thus, without any emotion generated by the moral dilemma, the obtained results can be accounted for.

#### **AVAILABILITY OF OWN INPUT IN THE COLLECTION AND ANALYSIS OF EMPIRICAL DATA**

The data in all three experiments required extensive and time-consuming analyses. The studies used Biopac to measure skin conductance and eye-tracking equipment, which are time-consuming to calibrate, record, and analyze. In total, 431 people participated in all experiments of this PhD. The resulting dataset must be additionally filtered by various criteria before analysis. The conduct procedure is also difficult and time-consuming as the studies are individual, and the tasks are difficult and require thinking. The involved equipment further prolongs the study for each participant. This is really a tremendous amount of work that has been done within this PhD.

#### **CONTRIBUTIONS**

The study has indisputable contributions related to the close control of incentives on factors important for moral judgments such as first- and third-person perspective, physical contact, inevitability of death, and instrumentality of harm inflicted. All of these varied unsystematically across previous studies and hindered the unambiguous interpretation of the data on the role of emotions in studies that support the two-process theory of moral judgments. For the purposes of this PhD, three different endings to each of the four moral dilemmas (the trolley, the boat, the mine, the tall building) have been formulated, and these are comparable in length and content, allowing them to be used in studies with more precise presentations of the dilemmas in terms of text and exposure time. In the eye-tracking study, it is evident that total reading time and fixations on the utilitarian decision differ between

conditions with and without physical contact. Interestingly, participants paid more attention to decisions in which they could save people by sacrificing one person without physical contact than with physical contact. It was these decisions that correlated with increased skin conductance in the first two experiments. Thus, on the one hand, the research in this dissertation supports the importance of physical contact as a factor in moral reasoning under well-controlled conditions, and on the other hand, it adds information about how physical contact alters cognitive and physiological processes in moral reasoning. These are undoubtedly important contributions of this thesis. It also appears that the inevitability of death correlates with a physiological response along with physical contact, and therefore the previous evidence in support of the dual-process theory of moral judgments should be carefully reconsidered. Experiment 3 clears up one criticism of research on moral judgment, that induced emotions can alter the coding of dilemmas rather than the decision itself, and replicates the effect of „amusement" on moral judgments. I fully accept the contributions of the dissertation as formulated by the PhD student, although I have concerns regarding the theoretical contribution due to the lack of a control condition allowing arguing for an increase in skin conductance at all. However, I am aware of the difficulty of choosing a good starting point in the face of moral dilemmas, and I recognize this shortcoming as a problem for most studies in the field, not just those presented in Veselina Kudreva's PhD.

### IMPACT

There are two independent articles by Veselina Kudreva on the dissertation in Bulgarian language sources. This is undoubtedly good because it presents her work to the Bulgarian psychological community and makes the research issues on the dual-process theory of moral judgments more accessible to students and non-English speakers. Separately, I counted six co-authored articles on the topic of the PhD, most of which are in English and two of which appear in SCOPUS-indexed journals and have already been cited by other authors.

### PERSONAL QUALITIES OF THE AUTHOR

Veselina Kudreva has a unique interdisciplinary profile that allows her to combine biology and psychology in her work. This is evident from the research in her PhD thesis, which analyses physiological indicators and eye movements, along with the standard cognitive psychology response types and RT. The SCOPUS reference already shows 15 papers

published in journals with an impact factor, which is a huge achievement for a young researcher, and this is on the background of intensive teaching and participation in international and national research projects. This far exceeds the minimal national requirements for the PhD degree, shows a high personal standard of the PhD candidate and promises strong research work. In my observation, more and more good students are looking to work with Veselina Kudreva, which also testifies to her qualities as a teacher, a researcher and a person. As a colleague, she is warm-hearted and sincere, which makes her a preferred collaborator and a delightful friend.

### **OPINIONS, RECOMMENDATIONS AND COMMENTS**

I have written my specific criticisms and comments in the text of this review. Here are my specific recommendations for this work in the future:

- To find a control condition for the physiological marker experiments;
- To simplify the designs so that there are more and counterbalanced measurements across conditions;
- To plan a preregistered study with a sample size calculated in advance, in which to look for larger effects, especially for emotion indicators;
- To look for explanations of the results beyond the dual-process theory. At this stage, such are lacking in at least two places in the thesis, namely in the interpretation of increased skin conductance in the no physical contact condition and in the influence of the emotion „amusement“.

### **CONCLUSION**

There were 3 well-designed and time-consuming studies with well-controlled narratives of moral dilemmas. The dissertation focuses on the role of emotions in the two-process theory of moral judgments and adds new insights to the understanding of moral reasoning, but also to the methodology of testing it.

I propose to the honorable colleagues of the scientific jury that we award the degree of PhD in in the professional field 3.2. Psychology to Veselina Kadreva for her dissertation entitled " Moral judgment and emotions: research using biomarkers ".

Date: 7.08.2023

Signature .....

(Assoc. Prof. Penka Hristova)