

THE UNIVERSITY OF CHICAGO

A Critical Review of Dual Process Theories  
and How the Lack of Human Empathy  
Influences Utilitarian Decision-making

By

Liuyi Chen

May 2021

A paper submitted in partial fulfillment of the requirements for the Master  
of Arts degree in the  
Master of Arts Program in the Social Sciences

Faculty Advisor: Dr. Jean Decety

Preceptor: Resney Gugwor

## Abstract

This paper reviews the current literature in the field of moral judgment, specifically, dual process theories, utilitarian decision-making, and human empathy with its multiple facets. The debate in the field of moral research has never been stopped since competing findings that challenge preexisting knowledge are consistently on the scene. This review paper provides an overview of multiple aspects of current moral judgment research, incorporating behavioral economics, moral philosophy, neuroscience, and social psychology theories that shape moral research in the most recent twenty years. Various theoretical frameworks and empirical evidence against each other are discussed in this paper. Based on existing debates, this review paper emphasizes two main ideas: the first is to uphold and call for a revision and reconciliation of the “dual system” model in current moral decision research; and the second is to note a complex relationship between empathy and utilitarian decision-making, rather than stressing a simple negative association as previously believed. Possible development for moral judgment research can be raised in the future on the foundation of the literature and competing theoretical frameworks.

## **Introduction**

The curiosity towards the essence of humanity, specifically empathy and altruistic behavior, is pushing human morality forward during intellectual history. The moral judgment study of human beings in the current field of psychology is always combined with multiple disciplines, including cognitive science, philosophy, neuroscience, and many fields outside psychology like economics. Here, empathy is regarded as an inseparable part that influences our moral judgment (Decety & Cowell, 2014). Looking back to the history of western philosophy, the initial questions regarding morality were largely discussed by the works of Hume, Kant, Mill, and many other moral philosophers. The perception of morality was constantly changing with contradictory views from different aspects throughout human history. With the development of empiricism in philosophy, neuroscience and behavioral research have become a common way in the contemporary world to explore the definition and essence of morality. Therefore, scientists nowadays are trying to observe human morality by incorporating various fields of science and philosophy. As the debate between whether the human moral judgment is based on emotions or logical reasoning becomes a lasting issue on the foundation of philosophy, social neuroscience research provides us a way to investigate these questions of morality with scientific tools. From an economic perspective, utilitarianist views of moral behavior have been widely examined in moral psychology research. Utilitarianism means that the basic idea behind all the ethical actions is to maximize utility (defined in terms of well-being or happiness) in the largest population. Utilitarianism has been one of the most important philosophical theories that direct psychologists to study moral decision-making. Many studies in social psychology have given contradictory findings that humans can make moral decisions about what is right and wrong with either logical

reasoning or emotion. Such an idea makes morality fundamental to the human condition and also shapes the theoretical development in philosophy itself.

What this paper intends to emphasize are (1) the call for a revision and reconciliation of the dual process theories in moral decision research; and (2) the complex relationship between empathy and utilitarian decision-making, rather than a simple negative association between them. To unfold the first statement, this paper talks about recent studies in moral judgment and illustrates how dual process theories are applied and disputed. This paper wants to point out an oversimplifying tendency of the dualistic division in moral judgment research. For the second point being emphasized, the present review sheds light on human empathy as an essential factor in the utilitarian decision-making process and addresses the complexity of their relationship. This includes comprehending current discovered theories in empathy and utilitarian decision-making and providing evidence for both the dark sides and the bright sides of empathy and utilitarianism to illustrate their relationship. To sum up, relevant research in moral judgment, its “dual-system” theoretical framework that needs in-depth scrutiny and review, and the influence of human empathy into utilitarian decision-making are reviewed in this article. What has been discovered from previous research and what questions are waiting for further exploration? In the literature being examined, this review paper provides an overview of current studies including articles using different methodologies within this field. Both neuroscience and behavioral studies are included to review how empathy, utilitarian decision-making, and moral judgment interconnect with each other in moral psychology.

## **Method**

This paper reviews previous literature in the field of moral decision making with consideration of the research question being mentioned above. Most of the literature in this field

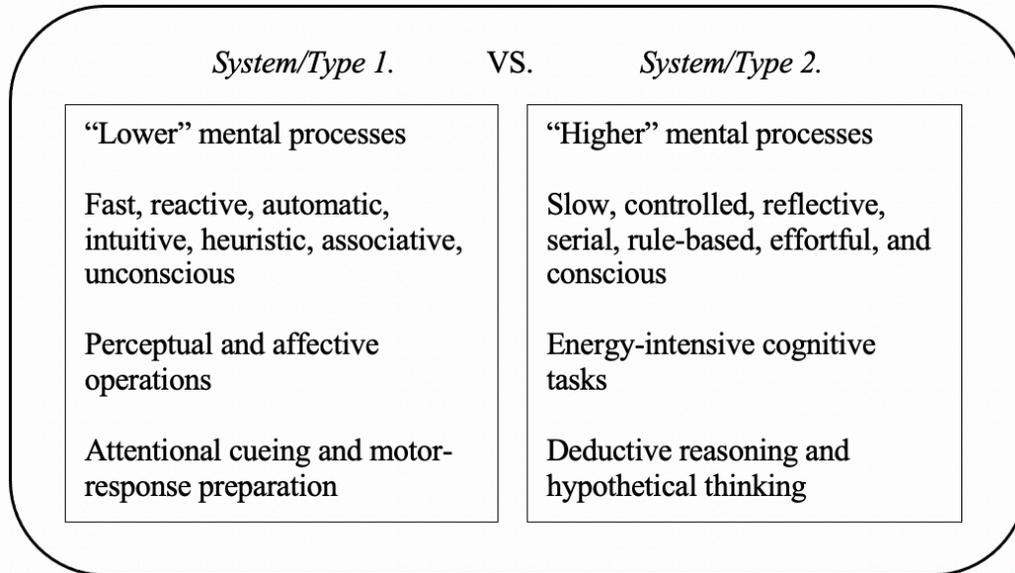
include research conducted with behavioral and neuroscientific methods from psychological journals. Since philosophy and economics play an important role as the background of this topic, philosophical and economic articles are also reviewed and discussed in this thesis paper. An electronic literature search is conducted using PsycINFO, Google Scholar, Wiley Online Library, Science Direct, and ProQuest Dissertations & Theses. The search terms used mainly are “utilitarian judgment” OR “utilitarianism” AND “empathy” OR “empathic concern” AND “moral judgment” OR “moral decision-making.” The period of each search is between January 2010 and January 2021, specifically, articles published within these recent ten years are examined and reviewed. Otherwise, no other restrictions will be implemented.

### **Moral Judgment and Dual Process Theories**

Morality, by definition, is the norm that is weighed by individuals and societies of how humans should treat one another (Decety and Cowell, 2014). Moral judgment – sometimes is used interchangeably with moral reasoning and moral decision-making – refers to the judgment that a person makes about a situation or an action to determine its rightness or wrongness based on moral norms. Moral judgments can also be regarded as a kind of mental state subjectively, that is, whether a judgment is moral in nature depends on the intentions or beliefs of the person who makes that judgment (Sinnott-Armstrong and Wheatley, 2014). As the literature of moral judgment prospers and the topic becomes a lasting forum for discussion in philosophy and psychology, neuroscience gives us a lens to look for the answers to these questions of morality by looking at brain activities.

There are various aspects of theories explaining and studying moral judgments. Commonly, a dual-process model is suggested in moral decision-making, which is a theory of decision-making process that posits two systems that support moral decision-making (Greene et

al., 2004). This model is also called the dual process theory of decision-making research in behavioral economics and neuroeconomics, which serves as a crucial foundation in the study of judgment and decision-making. Various dualistic models are existing in the economic and psychological literature that apply the same dichotomic structure. For example, Sanfey et al. (2003) suggest a “cognition vs. emotion” model, and Loewenstein and O’Donoghue (2005) suggest a “deliberative system vs. affective system” model. According to Greene et al. (2001), the two models are (a) an automatic and emotionally grounded system that favors deontological decisions; (b) a deliberative reasoning system that supports utilitarian decisions. Except for the two models raised by Greene et al. above, a contrast model – emotional versus cognitive processes – plays a significant role in moral judgment research, while a simple System 1 and 2 distinction (also called “Type 1” and “Type 2”) is also applied widely in decision research (Cushman, 2013). The different types of “dual systems” in moral decision-making research are widely practiced in constructing theoretical foundations and designing research methods of moral judgment research (Grayot, 2019) (See Figure 1). The dual-process framework regarding sentimentalist and rationalist accounts of moral judgment has been adopted in research both in theories and in experiments (Craigie, 2011). For instance, an experiment measuring people’s judgment in a moral dilemma, supports the concept of the conscious versus unconscious division by concluding that unconscious thought can lead to more utilitarian moral decisions compared to unconscious thought (Ham & van den Bos, 2010). The dual process theories are widely applied in decision-making studies and are extended to moral judgment research.



*Figure 1.* Differences between System/Type 1 and System/Type 2.

Nevertheless, criticisms against dual process theories challenge the commonly adopted framework. For instance, a recent noteworthy article argues for a more sophisticated revision of the dual system dichotomy from a behavioral economic perspective (Grayot, 2019). Grayot criticizes the dual system division by arguing that mental process systems are not discrete, and that intersystem interactions are not sufficient in empirical evidence. Other than these criticisms, the complexity of morality itself also reminds us to consider further development of this simple dualistic division. Therefore, although the dual process theories of moral judgment largely shape the current field of moral psychology, it is also conceivable to consider revising or restating the arbitrary binary systems as another promising way of framing moral decision-making research. The dual system theories of moral judgment as common frameworks have their limitations are sometimes not comprehensive enough to study moral judgment involving complicated mental processes. As argued by Sauer (2012), both the automaticity and rationality of moral judgment can be seen as true while can be reconciled. According to Sauer, conscious reasoning

(rationality) does not primarily mediate the relationship between moral judgment and moral reasoning, but so does the acquisition, formation, and maintenance (i.e., acquired through education) of our moral intuitions (automaticity), and rationality and automaticity are reconcilable in this case. Moreover, the dual system of emotion versus cognition is challenged by cognitive neuroscience findings. In the field of philosophy, it is recently argued that moral judgments are caused by a complex interplay of psychological mechanisms that are both cognitive and affective, and that neither reason nor emotion can contribute to the decision-making process independently (Saunders, 2016). The potential of reconciling the dual systems in decision-making research is further discussed in the next section along with the utilitarian theory.

The frontal lobe is found to be mostly involved with moral judgment, and three regions are especially noteworthy, including the ventromedial prefrontal cortex (vmPFC), the orbitofrontal cortex (OFC), and the anterior cingulate cortex (ACC). Recent studies have found that damage to the ventromedial prefrontal cortex is associated with impairments in both spontaneous and deliberative moral judgments (Cameron, Reber, Spring, and Tranel, 2018; Ciaramelli, Braghittoni, and di Pellegrino, 2012). The orbitofrontal cortex (OFC) has been implicated in the on-line representation of reward and punishment (Shenhav and Greene, 2010). The anterior cingulate cortex (ACC) is activated when subjects generate a utilitarian response (Young, Koenigs, and Adolphs et al., 2007).

### **Utilitarian Decision-Making and Dual Process Theories**

As discussed in the last section, in moral judgment research, it is common to see that the distinction between the “emotional” and “rational/cognitive” process is made when studying moral decisions. Therefore, such binary distinction is always applied to research about utilitarian

decision-making as well. Greene et al. (2007) traced back the utilitarian moral judgment to Kant's philosophy in his article, saying that emotional-based intuitions associated with nonutilitarian moral judgment help explain the origins of deontological philosophical theories. Then he suggested that utilitarian moral judgment is associated with cognitive control and reasoning, which explains consequentialist philosophical theories promoted by Bentham and Mill. Deontological decisions' processes are automatic, affective, and resource-independent, while the process underlying utilitarian responses is deliberate, cognitive, and effortful. Cushman (2013) argues that connecting deontological judgments with model-free learning compresses past experience into a simple representation of a policy that tends to maximize reward, therefore model-free value representations can be connected to rule utilitarianism.

Recently, Kahane et al. (2018)'s article suggests that utilitarian thinking can be distinguished with individual differences into the 'negative' (permissive attitude toward instrumental harm) and 'positive' (impartial concern for the greater good) dimensions (by refining a method called the *Oxford Utilitarianism Scale*). It was also suggested that empathic concern was positively associated with impartial beneficence but negatively associated with instrumental harm. A new study that incorporated 8 studies using self-report, behavioral performance, and neuroanatomical measures shows that individual differences in reasoning ability and cognitive style of thinking are positively associated with a preference for utilitarian solutions but no relationship to harm-relevant concerns (Patil et al., 2021). Greene and Haidt's (2002) study mentioned another comprehensive model – the social intuitionist model – which suggests that moral judgment much more depends on the instant feeling of approval or disapproval. And the feelings appear suddenly and effortlessly with an affective valence, but without that many logical reasoning processes involved. It was said that moral reasoning is

typically one-sided efforts in support of pre-ordained conclusions. The idea that people are using a more intuition-based strategy to make moral decisions makes a great contribution to the present study, that it is speculated that for future relevant studies, we will be able to find a similar pattern as what the model suggests because the social intuitionist model can be partially viewed as an integration of different types of social decisions, including moral decisions as well. It has also been found that utilitarian decisions are seen as more morally permissible in today's younger generation, indicating the possibility that the preference for utilitarian decisions might be also influenced by other societal factors (Hannikainen, Machery, and Cushman, 2018).

Similar to the criticisms against the dualistic model itself, it is argued by Cushman (2013) that the simple division between “cognitive” and “emotional” processes is inadequate in utilitarian decision-making research as well. Cushman's argument explains the inadequacy is because both processes must involve affective content. Cognitive reasoning not only processes information itself but also rates the motivation behind the information being processed. The role of the effective and emotional process is emphasized, as a later article studied the role of empathy in altruistic behavior under an economic context also supports this view indirectly (Klimecki et al., 2016). Therefore, Cushman raises a theory when studying utilitarian decision-making process that uses the model-free versus model-based models, and both the model involves affective content. Meanwhile, research has shown that the personal aversion to performing harmful action strongly predicted nonutilitarian moral judgment (R. Miller, Hannikainan, & Cushman, 2013). A recent study validates the new model and the previous finding from a neuroscience perspective, showing that model-free neural signals in the thalamus/caudate are observed when people learning to avoid harming others compared to themselves (Lockwood et al., 2020). Cushman's theory emphasized the role that model-free

mechanisms may play in selecting nonutilitarian options while model-based mechanisms play a role in utilitarian choices. Competing results to Cushman's theory can also be found in Ham & van den Bos (2010)'s research, which implies a model-free (unconscious) model in more utilitarian decisions.

Although the new model has been successfully adopted by lots of literature, challenging voices against the dual-system differentiation are still necessary to be taken into account. Ayars (2016) points out three objections to the model-free versus model-based model in utilitarian decision making. He argues that model-free learning alone is not enough to explain moral judgments that humans find aversive but are not morally wrong in all cases. While the differences in learned experience also led to different individual moral judgments. Ayars also noteworthy emphasizes that the various "dual system" distinctions are still arbitrary and calls for a reconciliation of decision-making systems. Meanwhile, Gürçay and Baron (2017) conducted an experiment to test Greene's dual system theory and reached a similar conclusion as Ayars. They found that people change their minds in moral dilemmas and their utilitarian moral judgments cannot be predicted by the conditions designed based on the dual system, suggesting an opposite possibility to reconcile the system in behavioral tests. A more dynamic, instead of the arbitrary dual systems distinction, is also upheld through investigating complex neural dynamics, social dynamics, and temporal dynamics (Van Bavel, FeldmanHall, and Mende-Siedlecki, 2015). Brain regions are interconnected when facing moral dilemmas, that dlPFC, vmPFC, vlPFC, ACC, and TPJ all interact with moral cognition.

From the neuroscience perspective, utilitarian judgment is associated with activation in the brain regions that enable controlled, attentive processing in the dorsolateral prefrontal cortex. The controlled processes are supported by the evidence from functional neuroimaging (Cushman

et al., 2012; Greene et al., 2004), cognitive load manipulations (Greene, Morelli, Lowenberg, Nystrom, & Cohen, 2008; Trémolière et al., 2012). There are also studies that found that under cognitive load, utilitarian judgment is slowed (Greene et al., 2008; Conway & Gawronski, 2013), which indicates an effort-based explanation of the utilitarian judgment process, contrary to the Ham & van den Bos (2010) study.

### **Empathy and Utilitarian Moral Decision Making – A Complex Relationship**

Empathy as an inseparable factor when considering utilitarian judgment is fundamental to the human condition and also shapes the theoretical development of morality. By definition, empathy is the ability to take another's perspective and communicate emotional states from one to another (Decety, in press). The lack of empathy can be viewed biologically and behaviorally in the current field of literature, and it closely intertwines with utilitarian moral judgment. In addition, research of empathy is also largely shaped by the automatic/unconscious vs. effortful/conscious distinction (Decety, in press). In general, scientific results suggest that empathy goes against utilitarian decisions. Utilitarian judgments are representations of egocentric attitudes and the lack of concern in humanity and diminished empathic concern (Kahane, et al., 2015; Choe and Min, 2011; Crockett et al., 2010; Patil & Silani, 2014). In economic interactions, empathy promotes altruistic behavior. The degree of empathy experienced towards a specific person motivates altruistic behavior in a study using the Dictator Game (Klimecki et al., 2016). Gleichgerrcht and Young (2013) and Sarlo et al.'s (2014) research also found a relationship between utilitarian judgment and empathic concern, that utilitarian participants showed significantly reduced empathic concern on an independent empathy measure. While the study in the same year shows the personal aversion to harmful outcomes correlates well with empathic concern (R. Miller, Hannikainen, & Cushman, 2013). It might be

explained that utilitarian judgment involves a riskier mindset to choose outcomes that maximize gain but bring harm. Similarly, in a study that investigates how empathy acts in sacrificial dilemmas of performing a harmful action onto the victim, it has been found that lower empathy experienced in the dilemma situation was related to the utilitarian decision, and this was specific to reduced empathic concern for the victim (Takamatsu, 2018). Another study of Takamatsu and Takai (2017) with a Japanese sample holds the same result and also applies the dual process theory of moral judgment as an explanation. A study with a Korean sample also supports the negative relationship between utilitarian judgment and empathy, while pointing out negative emotions like trait anger correlates positively with utilitarian judgment (Choe & Min, 2011). Meanwhile, biological evidence has also been found that bilateral damage to the vmPFC increases utilitarian choices in moral dilemmas, supporting the significance of cognitive and emotional mechanisms directed by neural structures (Moll & de Oliveira-Souza, 2007; Koenigs, Young, Adolphs, et al. 2007). However, another study by Koenigs and Tranel (2007) does not support this finding, showing that vmPFC patients tended to reject unfair offers (make an “emotional” decision) than the healthy controls. Considering the contradictory results, it can be explained that a non-utilitarian decision involves complex feelings that emerge from integration between emotional and cognitive mechanisms. Such explanation that empathic concern requires the engagement of limbic-mediated emotional states with mechanisms mediated by the FPC, implies the similar idea of considering complex neural dynamics in decision-making research as Van Bavel, FeldmanHall, and Mende-Siedlecki (2015) proposed later on. All these findings support the relationship between diminished empathic concern and utilitarian moral judges while supporting the view of revising the dualistic model as their theoretical background.

Nonetheless, it is worth noting that a study found that genuine other-oriented moralized concern (empathic concern) for others' well-being contributes to both utilitarian and deontological response tendencies (Reynolds & Conway, 2018). The experiment shows that people tended to prefer upholding deontology over accepting harm to maximize outcomes (uphold utilitarianism). The finding does not directly reach the largely supported conclusion as Kahane et al. (2015) and other relevant research proposed but reveals a more complex relationship between empathy and utilitarian decision. For instance, Kahane et al. argue that utilitarian judgments also represent concerns for impartially maximizing aggregate welfares, and greater empathic concern perhaps contributes to such proto-utilitarian decisions. While it has been argued in recent years that empathy has its dark sides, like rendering the decision subject to bias and motivating cruelty and aggression (Bloom, 2017; Prinz, 2011), a result that is contrary to existing opinions is also found in Cecchetto et al. (2017), showing that empathy can shape emotional reactions towards moral dilemma but does not bias moral choices. Meanwhile, in a meta-analysis study, vmPFC is not found involved in emotional reactions under moral decision-making tasks but only in moral evaluation tasks (Garrigan et al., 2016). The role of emotional reactions in the moral decision, instead of moral evaluations, should obtain more attention in empathy and decision-making research, and the relationship between utilitarian decision-making and empathy should not be simply concluded as a negative association. Therefore, for future research, it is critical to distinguish among the different facets of empathy (emotional sharing, empathic concern, perspective-taking, etc.), as each uniquely influences moral cognition and predicts differential outcomes in moral behavior (Decety & Cowell, 2014; Decety & Jackson 2004; Decety & Svetlova, 2012). A general overview of the empirical studies related to empathy and utilitarian decision-making referred to in this section is shown in Table 1 (see Appendix).

## Conclusion

Incorporating the research findings and theoretical frameworks of moral judgment and human empathy, this review paper has argued for the two aims as initially proposed: (1) call for a revision and reconciliation of the dual process theories in moral decision research; and (2) illustrate the complex relationship between empathy and utilitarian decision-making, rather than a simple negative association between them. Revisiting the theories and empirical findings that contribute to the current field of literature, we still need to further explore how to improve and modify the theoretical framework we are using with careful examination. The dual process theory is still valuable as it is the bedrock of decision-making research, while more sophisticated models are necessary to be taken into consideration due to the limitations being discussed. Secondly, as evidence for empathy goes against utilitarian decisions emerges, we should not ignore the interplay of both the positive and the negative parts of empathy and utilitarian decision-making. Utilitarianism can also be empathy-driven if considering the goal is to maximize the aggregate welfare. Moreover, instead of simply appropriating the popular meaning of these terms, the definition of utilitarian decisions and the construct of “empathy” should be explained carefully to build clearer understanding to prevent oversimplification in scientific research, as Decety and Cowell (2014) argued. Multiple dimensions of empathy need to be clarified since multifaceted complexity has been shown in different empathy constructs (See Table1).

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Study	Method	Population	Dual Process Theory Applied?	Behavioral Task/Measures	Brain Regions Involved	Empathy's Influence on Utilitarian Decision	
						Supporting conclusion	Addition
(Moll & de Oliveira-Souza, 2007)	fMRI	6 patients with bilateral vmPFC damage	Yes	Participants judge moral and non-moral scenarios pertained to four main classes	vmPFC, dlPFC, FPC	vmPFC patients prefer utilitarian choices	
(Koenigs, Young, Adolphs, et al. 2007)	fMRI	6 patients with focal bilateral vmPFC damage	Yes	Participants made judgements on a series of 50 hypothetical moral or non-moral scenarios	vmPFC	Individuals with VMPC lesions exhibit a high rate of utilitarian judgements	
(Crockett et al., 2010)	Citalopram (SSRI) intake; Questionnaire	30 healthy subjects	Yes	Participants made judgments on a series of hypothetical moral or non-moral scenarios; Ultimatum game	Not Measured; vmPFC (theoretically)	Individuals high in trait empathy showed stronger effects of citalopram on harm aversion	
(Sarlo et al., 2014)	EEG	37 healthy undergraduates	Yes	Participants made judgments on 30 Footbridge-type dilemmas		Dispositional empathy is associated with a reduced number of utilitarian responses to Footbridge-type dilemmas	Only the personal distress dimension of empathy proved to significantly reduce utilitarian responses, not the empathic concern dimension
(Kahane et al., 2015)	Questionnaire	283 US participants	No	Complete a questionnaire of two parts: the first part consisting of four moral dilemmas, and the second of individual differences measures		Utilitarian judgment was positively correlated with primary psychopathy and reduced empathic concern	Utilitarianism has a positive side: <i>impartially</i> maximizing aggregate well-being; Greater empathic concern may attract those who are utilitarian as well
(Cecchetto et al., 2017)	Self-report and physiological measures (skin conductance and heart rate)	41 healthy Italian adults	Yes	Participants made judgments on 46 dilemmas of the 4CONFiDE moral set		Empathy influenced people's emotional reactions to moral decisions	Empathy is not significant predictor of moral choices

(Reynolds & Conway, 2018)	Questionnaire	262 American participants for Study 1; 296 for Study 2	Yes	<p><u>Study 1</u>: Participants indicated how upset they would be on a scale in response to action aversion items, outcome aversion items, and 10 dilemmas.</p> <p><u>Study 2</u>: added measures of psychopathy and empathic concern</p>	Both action and outcome aversion reflect high empathic concern	Empathic concern positively predicted the deontological but not utilitarian parameter
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*Table 1.* Empathy and Utilitarian Moral Decision-making research overview  
*Note.* The articles are ranked by year being published.