1. Introduction

Morality is a constant force in our society, driving everyday social interactions, from the choices we make in our friendships and romantic relationships to the voting decisions we make when we decide who we want as our next president. Yet sometimes, what we say we believe in and the actions we take may not always align with our true, inner moral values. Individuals may report being in favor of gay marriage when they truly (and secretly) oppose it, people might hold unconscious biases that cause them to hire one job candidate over another, and perhaps more extremely, psychopaths may lack implicit moral beliefs at all. Overall, these implicit moral attitudes can be unknown, and therefore inaccessible, to the individual, or the individual may be aware of the implicit moral bias they possess, but fail to report them. No matter the nature of these implicit moral attitudes, it is clear that in order to understand their effects on moral judgments, we must develop tools to be able to identify and measure them.

1. Current Tools for Measuring Implicit Moral Attitudes

Currently, a number of tools have been designed by researchers to specifically study implicit moral attitudes, including implicit judgment tasks, fMRI, and eye-tracking tools. Implicit judgment tasks work to uncover implicit moral attitudes through the lens of automatic processes, identifying the relationships between stimuli or the effect of a prime stimulus on a given target stimulus. One type of implicit judgment task, the Implicit Association Test, or IAT, looks at the association between concepts, with participants sorting each concept into a given category as instructed (Greenwald, 1998). Generally, the IAT assumes that subjects will more quickly sort two highly associated items together and more slowly and incorrectly sort two less-associated items (Strohminger et al, 2014). The IAT has been applied to implicit moral attitudes, such as investigating the relative strength of associations for subjects when sorting ethical business decisions such as “cutting costs” and “donating drugs” (to people in developing countries) with the categories of “moral” and “immoral” (Marquardt & Hoeger, 2008). While the IAT uses associations between concepts to understand implicit moral attitudes, the Affect Misattribution Procedure (AMP) makes use of emotions to study implicit moral attitudes. In this task, participants are quickly shown a prime stimulus which they are told to ignore, and then presented with an ambiguous Chinese character, which they are asked to judge as either pleasant or unpleasant. Generally, subjects’ emotions regarding the prime stimulus influence their judgment of the pleasantness of the Chinese symbol, judging one as more pleasant if the prime stimulus elicited more positive feelings. While the AMP has not directly assessed moral judgments, it has been shown to demonstrate implicit prejudices, especially relating to voting behavior. In one study that utilized the Affect Misattribution Procedure, researchers found that after presenting White and Black faces as the prime stimuli before the ambiguous Chinese characters, subjects responded more positively to the characters when primed with a White face than a Black face, which could have implications for decisions such as voting behavior (Payne et al, 2010). A final implicit judgment task is known as the PDP, or Process Dissociation Procedure. This task measures the distinct influences of automatic and controlled processes on moral judgments, presenting subjects with a prime word and a target word in succession, both of which may be morally wrong or neutral in valence. In the PDP, subjects are asked to ignore the prime stimulus and judge if the presented target word is morally wrong or not, with researchers finding that individuals are more likely to judge neutral targets as morally wrong in the influence of an immoral prime stimulus. In terms of real-world implicit moral attitudes, the PDP has been used to look at attitudes surrounding gay marriage and voting behavior. In participants who voted in favor of a ban on gay marriage, researchers found that when they saw “gay marriage” or “same-sex marriage” as the prime stimulus, these participants were more likely to judge neutral targets as morally wrong (Cameron et al, 2017). In addition to these implicit judgment tasks, both fMRI and eye tracking studies have been used to look at the information processing behind moral judgments. In one study, participants viewed scenarios showing intentional and accidental harm to both people and objects while inside an MRI scanner, with eye-tracking also used to measure gaze fixations and pupil dilations. Researchers found that subjects gazed longer at the victims rather than the perpetrators of harmful actions, subjects showed increased pupil dilation for intentional rather than accidental harm, and that a subject’s perception of intentional harm was correlated with increased brain signal in the amygdala and ventromedial prefrontal cortex, among other areas (Decety, 2012).

1. Approach-Avoidance Tendencies: Method Types

While these pre-existing tools are important in determining associations between, emotions related to, and brain activity in response to stimuli with moral content, there is another tool that looks at a different part of human cognition - implicit motivation. This experimental approach has been guided towards measuring approach-avoidance tendencies (AAT), and has been used to show motivated approach and avoidance action biases towards a variety of nonmoral stimuli. These approach and avoidance action tendencies towards appetitive and aversive stimuli have been shown to be evolutionarily adaptive and benefit our chances of survival even in everyday situations (Phaf et al, 2014). As a result, the adaptation of tools that measure Approach-Avoidance Tendencies to use for stimuli with moral content may be an important and more predictive method, as well as one that cannot be faked, through which we can identify and measure implicit moral attitudes.

The Approach-Avoidance Tendencies method works to examine motivated behaviors and implicit attitudes by presenting subjects with stimuli of a given theme and measuring the time it takes for individuals to approach and/or avoid such stimuli as instructed. The first approach-avoidance task was done in 1960 by Solarz and colleagues, in which the researchers used stimulus cards containing words on a stage, instructing the participants to approach and avoid the cards by pulling and pushing on a hand lever. As a result, this application of the Approach-Avoidance Tendencies approach utilizes a physical distance between the subject and the stimuli, which they increase or decrease based on the researcher’s instruction and the valence of the stimuli (Solarz, 1960). The next development of the AAT involved the introduction of the joystick, where researchers transitioned the stimulus presentation to a computer screen but maintained the physical pushing and pulling motions through a joystick, positioned halfway between the subject and the screen. To measure approach and avoidance tendencies using the joystick method, subjects are instructed to push or pull the joystick based on the content of the presented stimuli. When subjects pull the joystick towards themselves, the stimulus on the computer screen is replaced by a larger version of the same stimulus, simulating a zooming-in effect and representing a real-world approach action. Alternatively, when subjects push the joystick, the stimulus is replaced with a smaller version of itself, therefore shrinking and simulating the result of an avoidance (Rinck & Becker, 2007). The action of pulling and pushing the joystick coupled with the zooming in and out of the stimulus categorizes this task as the feedback-joystick task, and ensures that pulling of the joystick is associated with approach and pushing with avoidance. Yet another measure of approach-avoidance tendencies is known as the manikin task, and uses a computer and a keyboard, therefore eliminating the arm flexion (physical pushing and pulling) used in the previous approaches. In the manikin task, participants use keys on the computer’s keyboard in order to move a simulated manikin on the screen towards or away from a stimulus (De Houwer et al, 2001). While the manikin task produces larger effect sizes than the feedback-joystick task on the same experiments, it may not be as predictive of real-world behaviors, putting the approach and avoidance actions in the manikin’s perspective, rather than the subjects’ perspective (Krieglmeyer & Deutsch, 2009). Both the feedback-joystick and the manikin tasks use a virtual distance change to simulate the approach and avoidance of a given stimulus, yet the feedback-joystick task uses stationary hardware that requires a subject to come in to the lab to participate, and the manikin task lacks the personal approach and avoidance needed to reflect behavior outside of the experimental lab setting. As an emphasis on easy-to-use, online studies that can be done at home continues to grow, researchers have developed a smartphone-based, mobile approach-avoidance task. In this method, subjects download and run an AAT app, in which they pull their phone towards themselves (approach) and push it away from themselves (avoid) in response to the presented stimuli. Researchers believe this mobile AAT task might be a more sensitive measure of approach-avoidance action tendency biases, finding a larger effect with the mobile method than the feedback-joystick method on the same task (Zech et al, 2020). With this mobile AAT comes a return of the physical distance change between the subject and stimuli, now combined with the ability to conduct the studies outside of the lab setting. A final AAT tool, known as the Online-VAAST (Visual Approach/Avoidance by the Self Task), has been developed as a free, online method in which stimuli are presented on a computer screen. When a subject presses a given key on the keyboard, the stimulus zooms in or out to expand or shrink, respectively, and simulate approach and avoidance to the subject. This tool presents a reliable, short, and effective way to measure approach-avoidance tendencies, in a manner that can easily be done online. Further, the Online-VAAST allows researchers to utilize a variety of stimuli and greatly increase sample sizes, all while capturing similar effect sizes as tasks completed in the lab (Aubé et al, 2019).

1. Approach-Avoidance Tendencies: Existing Findings

While there are many AAT methods available to researchers, none have applied the approach to moral stimuli. Yet, approach-avoidance biases have been found using the many AAT methods outlined above, in a variety of contexts. In the first Approach-Avoidance Tendencies study using the physical stimulus cards, which depicted pleasant and unpleasant words, researchers found an approach-avoidance action tendency bias such that participants more quickly approached positive words and more quickly avoided negative words (Solarz, 1960). Other studies have utilized images for stimuli rather than words, with one group of researchers presenting pictures of spiders, butterflies, and gray control images to children with varying degrees of fear towards spiders. Klein and colleagues found that children showed an automatic avoidance tendency towards pictures of spiders, but not towards pictures of butterflies or a gray image. Further, they showed that female children, but not male, with a greater reported fear of spiders and more anxious behavior showed the greatest avoidance tendency bias (Klein et al, 2010). Even more studies have examined the approach-avoidance tendencies of experimental groups with a given condition or status versus control groups towards stimuli relating to such status. In a study on approach and avoidance bias towards erotic stimuli, researchers found that female heterosexual students who used pornography are faster to approach erotic stimuli than to avoid it, with a similar pattern shown in male undergraduates who regularly use pornography (Sklenarik et al, 2020). Another study looked at the approach-avoidance tendencies of socially-anxious individuals (as compared to non-socially-anxious subjects) in response to pictures depicting smiling, angry, and neutral facial expressions. Here, researchers found that socially-anxious individuals pushed angry faces away more quickly than they approached them and showed a strong avoidance tendency towards smiling faces as well, all while showing neither approach nor avoidance tendencies towards neutral faces (Heuer et al, 2007). Finally, researchers investigated the approach-avoidance tendencies towards cannabis and neutral images in both heavy cannabis users and controls, finding that heavy cannabis users demonstrate an approach bias towards cannabis-related images. Interestingly, this approach bias was correlated with changes in future cannabis use, with stronger approach-biases predictive of increases in weekly cannabis use after six months (Cousijn et al, 2011). With the variety of approach and avoidance biases shown through these AAT experiments, this method may be a promising tool to uncover moral approach-avoidance tendencies, shining light on individuals’ implicit moral biases. The use of Approach-Avoidance tendency tasks offers the opportunity to look at implicit moral attitudes through the lens of motivation, which may prove to be more useful and predictive of our behaviors in real-world situations.

1. Present Study

To view implicit moral attitudes through the lens of implicit motivation, this study aims to use the Approach-Avoidance Tendencies method, building on the outlined studies and applying the tool to moral stimuli. While each AAT method offers distinct benefits, the Online-VAAST allows the opportunity to easily and effectively present a variety of stimuli (moral, neutral, and immoral phrases and images) to a large sample size in an online format, an important consideration in a post-COVID, often-virtual world.

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