# MEASURING THE ACCESSIBILITY OF MORAL INTUITIONS: A VALIDATION STUDY OF THE MORAL FOUNDATIONS-AFFECT MISATTRIBUTION PROCEDURE (MF-AMP)

By

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#### ABSTRACT

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It is important to study morality given its varied influences on our lives. Haidt and Joseph (2007) have traced morality to its instinctive roots. They have identified five mental systems (moral intuitions) that guide moral judgment: care, fairness, loyalty, authority and purity. This dissertation attempted to create and test an implicit instrument, known as Moral Foundations-Affect Misattribution Procedure (MF-AMP), to gauge the accessibility of these moral intuitions. Three studies were designed in order to validate the MF-AMP as a trait and state measure of moral intuitions. Results show that the MF-AMP can serve as a useful state measure of moral intuitions, and can serve as an accompaniment to the Moral Foundations Questionnaire (Graham et al., 2011) as a trait measure of moral intuitions.

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#### **INTRODUCTION**

Morality and moral values influence our lives in varied and extensive ways. The rules of righteous conduct that constitute morality not only guide our own behavior but also influence appraisals of all social behavior that we encounter. Moral codes give sanction to and encourage pro-social behavior such as helping behavior, respect for the law, and honesty, and inhibit comparable forms of anti-social behavior. On a societal level, moral codes can influence collective notions of social good as well as the social taboos and moral boundaries that form the basis for laws and social regulations. Given their significance, morality and its constituting mechanisms warrant considerable attention and study.

Recent theorizing by Haidt and Joseph (2007) has traced morality to its instinctive roots. Moral Foundations Theory (MFT) proposes that all moral judgments are the result of at least five different mental systems termed care, fairness, loyalty, authority, and purity. Each of these systems can produce gut reactions to a distinct class of social behavior. For example, the mental system related to care (the *care* intuition) produces positive affect in individuals that encourages them to protect others, and negative affect that inhibits tolerance of others experiencing pain/danger. The five mental systems, referred to in this research as the five *moral intuitions*, are considered to be the foundations of all moral judgment and behavior. Given their significance it is important to have an instrument to measure the strength of moral intuitions in individuals as they could predict a range of outcomes related to morality. Graham, Haidt and Nosek (2009) developed a self-report instrument (Moral Foundations Questionnaire; MFQ) to measure the strength of moral foundations in individuals. Although it has been useful in predicting outcomes such as political orientations, one limitation of the MFQ is that is relies on conscious processing of information to gauge the strength of pre-conscious, gut level instincts. This research proposes a new implicit instrument, the moral foundations-affect misattribution procedure (MF-AMP), to gauge the strength of moral intuitions in individuals without the need for conscious reflection.

Three studies were designed to test the validity of the MF-AMP as a trait and state measure of the accessibility of moral intuitions. In the first study, participants recruited online through the Mechanical Turk platform first completed the MF-AMP and then completed a battery of measures expected to be correlated with MF-AMP scores. In the second study, college students completed the MF-AMP twice, one week apart. This was used to gauge the instrument's test-retest reliability. In the third study, college students watched a media clip focusing on one specific moral intuition and then completed the MF-AMP. The results of all three studies broadly support the validity of the MF-AMP as a trait and state measure of moral intuitions. The implications of the results along with a discussion of anomalous findings, study limitations and future directions are presented. An overview of all three studies can be found in Table 1.

Study	Purpose	Procedure
Study 1	To establish the validity of the MF- AMP as a trait measure of moral intuitions	Participants complete the MF-AMP followed by a battery of measures that are correlated to the MF-AMP
Study 2	To assess the test-retest reliability of the MF-AMP	Participants complete the MF-AMP twice, one week apart
Study 3	To establish the validity of the MF- AMP as a state measure of moral intuitions	Participants watch a media clip focusing on one of the intuitions (or a control clip) immediately after which they complete the MF-AMP

#### MORAL FOUNDATIONS-AFFECT MISATTRIBUTION PROCEDURE (MF-AMP)

The Moral Foundations-Affect Misattribution Procedure (MF-AMP) is an implicit instrument that purports to measure the accessibility of moral intuitions outlined in moral foundations theory (Haidt & Joseph, 2007). Derived from the affect misattribution procedure (AMP; Payne, Cheng, Govorun and Stewart, 2005), this instrument gauges the preconscious accessibility of the moral intuitions without participants' explicit knowledge. The instrument can be used both as a state and trait measure of moral intuitions.

#### Moral foundations theory

Moral reasoning has traditionally been described as a rational process which involves conscious deliberation and reflection (Kohlberg, 1984). In contrast, moral foundations theory (MFT, Haidt & Joseph, 2007) proposes that moral judgments are usually the product of automatic, preconscious gut instincts, which have developed in human beings through the process of natural selection. While the theory states that conscious deliberation is involved in moral reasoning, it argues that such deliberation occurs mainly as a means to justify moral judgments that have already been formed due to the influence of gut instincts. MFT identifies five mental systems (referred to as *moral intuitions*) each of which produces a cognitive/behavioral response that either facilitates an evolutionarily beneficial action or inhibits an evolutionarily harmful action. The five intuitions are: (a) care (pertaining to empathy, and tending to the needs of other entities); (b) fairness (which deals with reciprocity, and even distribution of resources); c) ingroup loyalty (which drives commitment to one's ingroup, and suspiciousness of one's outgroup); d) authority (pertains to respect for dominant entities, and in a broader sense respect for hierarchical structures); and, e) purity (related to the spiritual concern of leading an elevated life, and accompanying disgust towards carnal behaviors that can be toxic to effective societal function). Although MFT acknowledges the possibility that other moral

intuitions may exist, evidence to date provides convincing support only for Haidt and Joseph's (2007) typology of these five altruistic intuitions (MoralFoundations.org, n.d.) As such, only these five mental systems are incorporated as the moral intuitions considered for this research.

#### **Moral Domains and Moral Intuitions**

MFT describes each moral intuition as having developed in humans as an evolutionary advantage. As described by the theory, each intuition facilitates the survival of humans by encouraging them to perform actions that promote mutual well-being. For example, the care intuition drives humans to be concerned for the well-being of others which leads to the overall benefit of the human species. Each moral intuition essentially serves an adaptive function and manifests as a sensitivity to one specific domain of social behavior. For example the care intuition, which serves the adaptive function of protecting young and vulnerable individuals from danger, is manifests as sensitivity towards the domain of behaviors related to the pain and harm of other individuals. This pain-sensitivity prompts human beings to thwart harm and pain to others. The domain of all positive as well as negative social behavior related to recognizing and preventing pain and harm in others (such as helping, harming, hurting, etc.), constitutes the care domain. A moral domain refers to the set of all social behaviors related to a specific adaptive function. For example, the moral domain for fairness consists of positive/negative behaviors related to reciprocity such as equal distribution, cheating, etc., and the authority domain consists of behaviors such as obedience, subordination, etc.

While a moral domain refers to a specific set of behaviors relevant to an adaptive function, a moral intuition refers to the cognitive mechanism that causes humans to respond to behaviors in that domain. For example, the care intuition is an evolutionarily-developed cognitive mechanism that promotes humans to care for needy individuals, and is automatically activated in humans when they see any positive or negative behavior in the care domain. So for example, the care

intuition in a man is responsible for facilitating positive behavior in the care domain (such as caring for his children) and thwarting negative behavior, which violates the adaptive function, in the care domain (such as prompting him to stop his baby from crying). As such, moral intuitions could be considered to be *affective mechanisms*, which produce positive affect in response to or anticipation of behaviors that uphold their respective moral domains (thus facilitating such behaviors) and negative affect in response to or anticipation of behaviors, thus thwarting such behaviors in humans.

#### **Accessibility of Moral Intuitions**

While moral foundations theory claims that all moral intuitions are present and active in every human, it also claims that the strength and potency of these intuitions differs across individuals. Some moral intuitions are more consistently and readily activated in specific individuals over others. For example, a person who is always very concerned with and responds to fairness related issues may have a greater sensitivity to the fairness intuition, as compared to another person in whom the same intuition is weaker. This variance in strength/potency of intuitions could be due to constitutional differences in psychological make-up that are dependent on biological (more specifically genetic) factors. It could also be due to environmental differences between people, such as variance in the frequency with which some intuitions are emphasized, which could make those intuitions stronger in individuals. Aside from differences between individuals, the accessibility of intuitions can also vary within an individual over time. For example, an intuition that has been activated frequently may become chronically more accessible, while one activated recently may become more accessible for a short time afterwards.

Accessibility as a function of consistency of activation. As described earlier, the manner in which a more accessible intuition is distinguished from a less accessible one is a function of the consistency of its activation. Moral intuitions that are more accessible are sensitive to

observation of even the most subtle behaviors relevant to their respective domains, while less accessible moral intuitions lie in a more dormant state, only occasionally activated in the presence of domain-relevant behaviors. For example, a person in whom the authority intuition is accessible would be consistently affected by even the smallest instances of disobedience or insubordination in comparison to a person in whom the authority intuition is not as strong, who may not mind some instances of insubordination. The person in whom authority is stronger is consistently able to *access* the authority intuition. As such, this research characterizes the strength of an intuition, manifested in terms of how consistently it is activated, as the *accessibility* of an intuition. In the above case, because the first person is able to consistently access the authority of that intuition is considered to be higher in that person.

Understanding differences in intuition accessibility within or across individuals can have considerable value, as the accessibility of these intuitions is thought to have a great impact on the manner in which people process and respond to their environment (Tamborini, 2013). Concepts tied to various real-world issues, ideologies, and associated organizations or interest groups are strongly linked to specific intuitions. For example, the concept of vegetarianism may be rooted in the care intuition and associated sensitivity toward harming animals. Similarly, the concept of racial equality may be rooted in a sensitivity toward fairness violations. In other instances, conflict between or among multiple intuitions linked to the same issue may lead to discord. For instance, the debate over restricting immigration is controversial issue that may put different intuitions in opposition to each other. While opponents of the issue stress that immigrants should be given similar opportunities as locals (a sentiment likely driven at least in part by the fairness intuition), supporters are suspicious of outsiders and want to keep them away (likely a driven by the ingroup loyalty intuition). Thus, one could expect a person in whom ingroup loyalty is highly

accessible to be a supporter of restrictive immigration reform, whereas a person in whom fairness is highly accessible to be its opponent.

In today's world, various ideologies and causes (each associated with distinct sets of intuitions) compete for the attention. Tied to this, the accessibility of different intuitions in humans plays a strong role in determining which ideologies or causes they pay attention to and subsequently adopt. When considered at an aggregate level, the accessibility of intuitions of large numbers of people in a society could, over time, determine the broad socio-political trends of that society. In a similar manner, the accessibility of these intuitions is thought to play a major role in shaping the way people respond to their media environment.

The MIME (Tamborini, 2013) suggests that both individual and group differences in intuition accessibility will shape media exposure and appeal. For example, people in whom fairness is highly accessible might find justice-centered courtroom dramas more appealing, while those high in purity might be turned off by pornography. As such, the accessibility of these intuitions has broad implications for understanding both media and non-media related behavior.

Measuring the accessibility of the intuitive motivations. Previous research attempting to gauge the strength of intuitions has typically used self-report measures (Greenwald & Banaji, 1995). Notable in this regard is the Moral Foundations Questionnaire (MFQ; Graham et al., 2011). Such self-report measures involve administering questionnaires to subjects asked to indicate their level of agreement with statements affirming or violating the adaptive function relevant to an intuition. Such a self-report measure has two limitations. First, a measure such as the MFQ poses strong statements such as: "It can never be right to kill a human being" and asks respondents whether they agree with the statement. Such statements likely activate the intuition in the participants, with the resulting response being a product of the intensity of affect generated by the statement. While such a concrete measure may be well suited to gauge a respondent's

basal intuition strength, it can be problematic in situations where the researcher wants to detect if an intuition has *already* been activated in participants. This is because the statements in the MFQ themselves likely activate intuitions to some extent, and this could override any subtle effect of a preceding prime.

Secondly, participants' responses on such scales are likely to be influenced by their attitudes towards the specific objects mentioned in the items. For example, in order to gauge the strength of the care intuition, the MFQ asks participants to indicate their agreement with the following statement: "It can never be right to hurt a defenseless animal." Yet the response given by participants to such a question may reflect not only their sensitivity to the violation of care, but their attitude towards animals. Although the accessibility of an intuition (which is pre-conscious) and one's attitude towards objects associated with that intuition (which may or may not be conscious) are likely to be positively correlated, and may even influence each other, they are not the same construct. Traditional self-report measures that rely on such statements may confound affect associated with attitudes toward specific objects (which may vary from one person to another) with affect stemming from intuitions (which should be universally shared). For example, consider two people who are equally sensitive toward violations of care: One is an animal lover and the other is frightened by them. Though both are equally caring, we might not expect them to respond similarly to an item stating that "It can never be right to hurt a defenseless animal." These types of problems suggest that self-report measures, especially those that rely on attitude statements, may not be well suited for measuring intuition accessibility.

The approach examined in the present study builds on the belief that the accessibility of intuitions may be better gauged through *implicit measures* which first activate pre-conscious automatic processes and then record both the response and the latency with which these responses occur. One of the most popular implicit measures used in the social sciences is the

implicit association test (IAT, Greenwald, Mcghee & Schwartz, 1998), which is an instrument designed to measure the strength of association between two different concepts. For example, the IAT would measure the association between race and intelligence by asking people to respond to items pairing exemplars from both concepts together, and measuring associated latencies. Such an instrument is ideally suited to detect subconscious associations between semantic concepts, but may not be well suited to measure the accessibility of intuitions. The ideal measure of intuition accessibility would involve detecting the frequency with which positive or negative responses might be produced in response to intuition-specific stimuli. To address this concern Fazio, Powell and Williams (1989) developed the affective priming task, which involves the brief presentation of a prime (a positively or negatively valenced word), followed by a neutral target word, which subjects are asked to evaluate as pleasant or unpleasant. A more recent development in measurement, known as the affect misattribution procedure (AMP), replaced the use of neutral target words with Chinese characters which the target is asked to evaluate. These characters were used in expectation that they would be unfamiliar to non-Chinese respondents.

#### The Moral Foundations-Affect Misattribution Procedure (MF-AMP)

The studies in this dissertation use an adaptation of the affect misattribution procedure (AMP). The AMP developed by Payne, Cheng, Govorun and Stewart (2005) used images as primes in six studies measuring attitudes across several political and social domains. A semantic variant of the AMP, developed by Sava et al. (2012), used words as primes in a study designed to measure the big five personality traits. Similar to Sava et al. (2012), the moral foundations-affect misattribution procedure (MF-AMP) uses words representing the intuitions as the primes and Chinese characters as the neutral evaluation targets. The word representing the intuition can either be a positively-valenced word upholding an intuition (like *cruel*). The words upholding an intuition are expected

to produce positive affect (and accordingly lead to pleasant judgments of the Chinese character), while the words violating an intuition are expected to produce negative affect and lead to unpleasant judgments of the following Chinese character.

Moral intuitions are affective mechanisms that can attach positive or negative affect to objects or concepts. Concepts that are frequently laced with positive or negative affect by the intuition are often stored in long-term memory with their affective connotations intact. For example, it is difficult to think of the word "Killing" without at least partially accessing the negative affect that is frequently attached to the word. Affective concepts that are associated with the same intuition should be linked together in a network, and might be made at least partially more accessible when the central intuition is activated. This is evident in the fact that activation of a moral intuition not only leads to a specific judgment or behavior in most instances, but also frequently leads us to reflect on related beliefs and ideas. For example, if we were to witness one person hurting another, we might not only oppose that action, but also begin to consider that heartless and inconsiderate behavior is wrong. The activation of an intuition often increases the accessibility of positive affect related to concepts upholding the intuition, or negative affect related to concepts violating the intuition. Accordingly, the MF-AMP is a non-intrusive, implicit measure that attempts to examine if an intuition has been activated recently, simply by measuring the accessibility of affect associated with concepts related the intuition. The MF-AMP works under the premise that the more accessible an intuition is in its audiences, the more consistently the positive/negative word-primes representing the intuition will generate the expected positive/negative affect. Similar to a traditional AMP, the MF-AMP indicates that an intuition is not accessible in participants if (a) words upholding the intuition are not consistently followed by pleasant judgments, and (b) words violating the intuition are not consistently followed by unpleasant judgments. Thus, the MF-AMP serves as a quick, non-intrusive method

to detect recent activation of an intuition based on the assumption that recent activation of an intuition must also have made related affect more accessible. Previous studies suggest the utility of the MF-AMP for measuring the accessibility of moral intuitions (Prabhu, Tamborini, Idzik, Hahn, Grizzard, & Wang, 2014; Tamborini, Lewis, Prabhu, Grizzard, Hahn, & Wang, 2016; Tamborini, Prabhu, Lewis, Grizzard, & Eden, 2016; Tamborini, Prabhu, Hahn, Idzik, & Wang, 2014). This study intends to formally test both the internal and external validity of the MF-AMP in its capacity as both a trait and state measure.

#### **Developing the MF-AMP**

The MF-AMP procedure consists of a word representing the moral intuition being flashed on screen for 75 ms, followed by a random Chinese character for 100 ms, after which participants judge the Chinese character they briefly viewed as pleasant (by pressing the I button on the keyboard) or unpleasant (by pressing the E button). Though the participants think that they are judging the pleasantness of an ambiguous Chinese character that they viewed for just 100 ms, that judgment is presumed to be influenced by the preceding word that they have been asked to ignore.

The MF-AMP used in this study used words representing all five moral intuitions. It also consisted of 8 control words used to estimate and control for baseline affect in the participant. An extensive post hoc analysis was undertaken to identify the words representing the moral intuitions in the instrument. Data from 24 studies consisting of 5376 participants was used in the post hoc analysis. All studies in the post hoc analysis used a previous version of the MF-AMP each consisting of a unique set of words. Some of these studies were conducted with students from a Midwestern American University. The remaining studies were carried out on Mechanical Turk as pilot studies undertaken to develop the MF-AMP. Participants completed the MF-AMP in all studies; however, a different set of words was used in each instance. In all but one study,

participants also completed the Moral Foundations Questionnaire (MFQ). In total, 163 words representing the five intuitions were used in various versions of the MF-AMP across the 24 studies.

In order to narrow the list down to a smaller number of words, two criteria were considered: a) internal validity: the extent to which each word correlated with other words representing the same domain and not with words representing other intuitions in each study, and b) external validity: the extent to which each word correlated with the MFQ score of its own intuition, and not with MFQ scores of other intuitions in each study. In every study, a discrimination score was calculated for each word both for internal and external validity.

A procedure was adopted to calculate the discrimination scores for both internal and external validity for each word in each separate study. The procedure is detailed in the method section. In short, the procedure for calculating the internal validity discrimination score comprised the following: (i) five composites were created for the five intuitions by averaging the scores for all words representing each intuition (ii) the word was correlated to all five composites (iii) the correlation between the word and the composite of its own intuition was subtracted from the sum of the four correlations between the word and each of the other four composites. A similar discrimination score was calculated for each word in each study for external validity using the correlations between each word and the five composite MFQ scores for the five intuitions. Confirmatory factor analyses could not be used to calculate the discrimination score for the words because a CFA only provides factor loadings which indicate the extent to which each word is correlated with other words representing the same intuition, but does not provide any statistics which indicates the extent to which each word is not correlated with words representing other intuitions. Exploratory factor analyses could not be used because it is difficult to aggregate

factor loadings in EFAs across different studies. A different factor structure might emerge in the EFA of each study, thus making it impossible to aggregate factor loadings across studies.

The discrimination score for internal and external validity for every word was averaged across all studies in which it was used. A weighting procedure was used wherein the discrimination score for the word (for internal and external validity separately) was weighted on two separate factors: a) the sample size of the study, and b) the internal consistency (Cronbach's Alpha) of the word's intuition in the study. Based on this procedure, the pool was reduced to around 12 words per intuition, each of which showed an acceptable level of internal as well as external validity (in terms of their correlation to MFQ). To be more precise, 14 words representing care, 12 words representing fairness, 14 loyalty words, 11 authority words, and 12 words representing purity were included in the version of MF-AMP used in the studies related to this dissertation. More than 12 words were chosen for care and loyalty because of a three way tie in the ranks of the internal and external validity scores of words used for these intuitions (see Table 1 and 3). Eventually, this pool of words was further reduced to around 8 words per domain based on the results of the confirmatory factor analysis in Study 1 of this dissertation (see Results section for more details). The list of all 162 words used in the post hoc analysis along with their internal and external validity discrimination scores can be found in Tables 2, 3, 4, 5 and 6. It must be noted that some words have a high rank for the internal validity discrimination score and low rank for the external validity discrimination score, and vice versa. In order to understand this, we must note that the MIME describes the moral intuitions as having two components: an affective component and a semantic component. Some words may be semantically strongly linked to their intuition, thus ensuring a high correlation with other words representing the intuition, and a higher internal validity discrimination score. Other words may not be as strongly semantically linked to their intuition, but may still have strong affective linkages to concepts associated with

the intuition thus accounting for a higher correlation to the MFQ score of the relevant intuition and higher external validity discrimination score.

Word	Internal validity discrimination score (Rank)	External validity discrimination score (Rank)	Average rank of internal and external validity	Retained/ Not retained
Sympathize	0.216(4)	0.074(2)	3	Retained
Kindness	0.231(1)	0.02(6)	3.5	Retained
Sensitivity	0.204(6)	0.041(4)	5	Retained
Torture	0.217(3)	0.007(10)	6.5	Retained
Helping Others	0.194(7)	0.012(7)	7	Retained
Vicious	0.177(13)	0.042(3)	8	Retained
Charity	0.19(9)	0.012(8)	8.5	Retained
Killing	0.192(8)	0.01(9)	8.5	Retained
Caring	0.184(10)	-0.001(13)	11.5	Retained
Insensitive	0.172(15)	0.003(12)	13.5	Retained
Cold hearted	0.145(22)	0.035(5)	13.5	Retained
Helpful	0.182(11)	-0.008(17)	14	Retained
Heartless	0.164(17)	0.006(11)	14	Retained
Benevolence	0.137(27)	0.106(1)	14	Retained
Nurse	0.23(2)	-0.067(32)	17	Not Retained
Guidance	0.207(5)	-0.056(30)	17.5	Not Retained
Empathy	0.149(21)	-0.004(15)	18	Not Retained
Compassion	0.176(14)	-0.015(22)	18	Not Retained
Brutal	0.154(20)	-0.004(16)	18	Not Retained
Assistance	0.156(19)	-0.009(18)	18.5	Not Retained
Suffer	0.178(12)	-0.027(25)	18.5	Not Retained
Barbaric	0.144(23)	-0.009(19)	21	Not Retained
Violence	0.164(17)	-0.031(26)	21.5	Not Retained
Cruel	0.168(16)	-0.039(28)	22	Not Retained
Abuse	0.115(32)	-0.002(14)	23	Not Retained
Savage	0.142(24)	-0.021(24)	24	Not Retained
Inhuman	0.132(30)	-0.01(20)	25	Not Retained
Malevolent	0.137(28)	-0.018(23)	25.5	Not Retained
Generosity	0.125(31)	-0.011(21)	26	Not Retained
Nurture	0.133(29)	-0.035(27)	28	Not Retained
Large hearted	0.141(25)	-0.061(31)	28	Not Retained
Considerate	0.137(26)	-0.069(33)	29.5	Not Retained

Table 2. Discrimination scores for care words in post hoc analysis.

Note. The ranks presented represent the rank-ordering within care-related words only

	Internal validity	External validity	Average rank of	Retained/
Word	score (Rank)	score (Rank)	external validity	Not retained
Honesty	0.217(2)	0.003(10)	6	Retained
Discrimination	0.199(6)	0.02(9)	7.5	Retained
Intolerance	0.209(3)	-0.021(15)	9	Retained
Equality	0.198(7)	-0.004(13)	10	Retained
Fraudulent	0.194(9)	0.003(11)	10	Retained
Deceitful	0.175(17)	0.051(4)	10.5	Retained
Corruption	0.166(21)	0.068(1)	11	Retained
Justice	0.177(15)	0.026(7)	11	Retained
Compensation	0.169(19)	0.054(3)	11	Retained
Racism	0.174(18)	0.035(5)	11.5	Retained
Hypocrisy	0.176(16)	0.02(8)	12	Retained
Falsehood	0.159(23)	0.064(2)	12.5	Retained
Fairness	0.197(8)	-0.037(18)	13	Not Retained
Truthful	0.191(11)	-0.025(16)	13.5	Not Retained
Cheating	0.182(14)	-0.018(14)	14	Not Retained
Unfair	0.203(4)	-0.06(24)	14	Not Retained
Dishonest	0.194(9)	-0.042(21)	15	Not Retained
Mutual exchange	e 0.183(13)	-0.029(17)	15	Not Retained
Bigotry	0.26(1)	-0.12(30)	15.5	Not Retained
Integrity	0.2(5)	-0.076(26)	15.5	Not Retained
Telling a lie	0.186(12)	-0.042(20)	16	Not Retained
Intolerance	0.062(29)	0.032(6)	17.5	Not Retained
Prejudice	0.166(20)	-0.05(22)	21	Not Retained
Partiality	0.02(31)	-0.001(12)	21.5	Not Retained
Injustice	0.115(28)	-0.039(19)	23.5	Not Retained
Fraud	0.123(27)	-0.06(23)	25	Not Retained
Conscience	0.161(22)	-0.122(31)	26.5	Not Retained
Inequality	0.133(26)	-0.116(28)	27	Not Retained
Lying	0.139(25)	-0.117(29)	27	Not Retained
Upright person	0.021(30)	-0.071(25)	27.5	Not Retained
Reciprocity	0.15(24)	-0.192(32)	28	Not Retained
Impartial	-0.035(32)	-0.1(27)	29.5	Not Retained

Table 3. Discrimination scores for fairness words in post hoc analysis.

Note. The ranks presented represent the rank-ordering within fairness-related words only

	Internal validity	Extornal validity	Average reply of	
	discrimination	discrimination	internal and	Patainad/
Word	score (Rank)	score (Rank)	external validity	Not retained
Lovalist	0.185(6)	0.02(3)	4.5	Retained
Betray	0.217(2)	-0.009(14)	8	Retained
Family ties	0.217(2) 0.166(9)	0.005(11)	9	Retained
Group unity	0.100(7) 0.185(7)	-0.000(2)	9.5	Retained
Enemy	0.103(7)	-0.002(12)	10	Retained
Team	0.137(10) 0.143(15)	0.003(10)	10 5	Retained
Attachmont	0.143(13) 0.144(14)	0.009(0)	10.5	Retained
Desertion	0.144(14) 0.127(19)	0.008(8)	11	Retained Datained
Devotion	0.13/(18)	0.013(4)	11	Retained
Treason	0.138(17)	0.011(5)		Retained
Outsider	0.194(4)	-0.027(22)	13	Retained
Commitment	0.106(24)	0.022(2)	13	Retained
Together	0.133(20)	0.008(7)	13.5	Retained
Undivided	0.094(26)	0.026(1)	13.5	Retained
Disloyal	0.2(3)	-0.028(24)	13.5	Retained
Patriot	0.152(12)	-0.018(19)	15.5	Not Retained
Connection	0.157(11)	-0.019(20)	15.5	Not Retained
Loyalty	0.142(16)	-0.013(15)	15.5	Not Retained
Faithful	0.171(8)	-0.029(25)	16.5	Not Retained
Relatives	0.26(1)	-0.088(32)	16.5	Not Retained
Traitor	0.194(5)	-0.036(28)	16.5	Not Retained
Unfaithful	0.145(13)	-0.026(21)	17	Not Retained
Ardent follower	0.102(25)	0.004(11)	18	Not Retained
Trustworthy	0.123(23)	-0.013(16)	19.5	Not Retained
Cohort	0.092(27)	-0.005(13)	20	Not Retained
Solidarity	0.131(22)	-0.018(18)	20	Not Retained
Unity	0.133(21)	-0.027(23)	22	Not Retained
Alien	0.134(19)	-0.034(27)	23	Not Retained
Consensus	0.031(32)	-0.014(17)	25	Not Retained
Dival	0.031(32)	-0.014(17) 0.033(26)	24.5	Not Retained
Foreigner	0.071(30)	-0.033(20)	20	Not Retained
Internal an	0.072(20)	-0.042(30)	27 20	Not Detained
Intruder	0.088(29)	-0.039(29)	29	Not Ketained
Challenger	0.044(31)	-0.05(31)	31	Not Retained

Table 4. Discrimination scores for loyalty words in post hoc analysis.

Note. The ranks presented represent the rank-ordering within loyalty-related words only

	Internal	ionty words in post	Average rank	
	validity	External validity	of internal	
	discrimination	discrimination	and external	Retained/
Word	score (Rank)	score (Rank)	validity	Not retained
Rebellious	0.245(1)	0.004(6)	3.5	Retained
Disobedience	0.24(2)	0.003(7)	4.5	Retained
Government	0.199(6)	0.016(3)	4.5	Retained
Respect	0.182(12)	0.043(1)	6.5	Retained
Commander	0.187(9)	0.006(5)	7	Retained
Supervisor	0.214(5)	0.002(10)	7.5	Retained
Reverence	0.175(14)	0.017(2)	8	Retained
Follow the leader	0.222(4)	-0.005(14)	9	Retained
Chaos	0.186(10)	0.003(8)	9	Retained
Duty	0.188(8)	0.001(11)	9.5	Retained
Heritage	0.172(16)	0.012(4)	10	Retained
Leader	0.146(21)	0.002(9)	15	Not Retained
Insubordinate	0.173(15)	-0.006(15)	15	Not Retained
Revolt	0.183(11)	-0.027(22)	16.5	Not Retained
You're not my boss	0.228(3)	-0.101(32)	17.5	Not Retained
Authority	0.165(19)	-0.02(18)	18.5	Not Retained
Defiant	0.151(20)	-0.022(20)	20	Not Retained
Discipline	0.197(7)	-0.123(33)	20	Not Retained
Obedience	0.17(17)	-0.038(24)	20.5	Not Retained
Tradition	0.142(23)	-0.021(19)	21	Not Retained
Disrespect	0.178(13)	-0.071(29)	21	Not Retained
Leave me alone	0.167(18)	-0.04(25)	21.5	Not Retained
Unrest	0.113(31)	-0.001(12)	21.5	Not Retained
The Law	0.133(24)	-0.024(21)	22.5	Not Retained
Mutiny	0.015(34)	-0.003(13)	23.5	Not Retained
Swearing	0.113(30)	-0.014(17)	23.5	Not Retained
Police	0.094(32)	-0.011(16)	24	Not Retained
You can't make me	0.143(22)	-0.062(27)	24.5	Not Retained
Disorder	0.12(27)	-0.029(23)	25	Not Retained
Mockery	0.129(25)	-0.05(26)	25.5	Not Retained
Sacrilege	0.126(26)	-0.066(28)	27	Not Retained
Blasphemy	0.116(28)	-0.078(31)	29.5	Not Retained
Breaking the Law	0.083(33)	-0.132(34)	33.5	Not Retained

Table 5. Discrimination scores for authority words in post hoc analysis.

*Note.* The ranks presented represent the rank-ordering within authority-related words only

		ior purity words	Average	
	Internal	External	rank of	
	validity	validity	internal and	
	discrimination	discrimination	external	Retained/
Word	score (Rank)	score (Rank)	validity	Not retained
Prostitute	0.222(4)	0.03(2)	3	Retained
Obscenity	0.219(5)	0.016(8)	6.5	Retained
Filth	0.24(3)	0.006(11)	7	Retained
God-like	0.204(8)	0.024(6)	7	Retained
Unnatural	0.185(14)	0.064(1)	7.5	Retained
Holy	0.21(7)	0.006(10)	8.5	Retained
Beastly	0.185(15)	0.024(3)	9	Retained
Polluted	0.191(10)	0.016(9)	9.5	Retained
Devil	0.185(15)	0.024(5)	10	Retained
Pornography	0.189(11)	0.004(12)	11.5	Retained
Elevated	0.174(20)	0.024(4)	12	Retained
Divine	0.184(17)	0.018(7)	12	Retained
Scum	0.189(11)	-0.014(15)	13	Not Retained
Pure	0.255(2)	-0.041(24)	13	Not Retained
Diseased	0.187(13)	-0.01(13)	13	Not Retained
Clean	0.216(6)	-0.037(22)	14	Not Retained
Vulgar	0.202(9)	-0.027(19)	14	Not Retained
Sacred	0.293(1)	-0.13(30)	15.5	Not Retained
Virginity	0.176(19)	-0.017(16)	17.5	Not Retained
Whore	0.183(18)	-0.029(20)	19	Not Retained
Incest	0.164(22)	-0.022(17)	19.5	Not Retained
Repulsive	0.169(21)	-0.025(18)	19.5	Not Retained
Virtuous	0.124(27)	-0.012(14)	20.5	Not Retained
Noble	0.134(26)	-0.035(21)	23.5	Not Retained
Slime	0.16(23)	-0.042(25)	24	Not Retained
Innocence	0.074(29)	-0.041(23)	26	Not Retained
Your body				
is a temple	0.153(25)	-0.076(28)	26.5	Not Retained
Wholesome	0.097(28)	-0.075(27)	27.5	Not Retained
Pious	0.154(24)	-0.357(31)	27.5	Not Retained
Immaculate	0.025(30)	-0.053(26)	28	Not Retained
Chastity	-0.02(31)	-0.128(29)	30	Not Retained

Table 6. Discrimination scores for purity words in post hoc analysis.

*Note.* The ranks presented represent the rank-ordering within purity-related words only

#### **METHOD**

#### **Procedure overview**

Three studies were carried out to test the reliability and validity of the MF-AMP. While MFT characterizes the strength of moral intuitions as a relatively stable disposition which determines socio-political leanings, the MIME (Tamborini, 2013) claims that the accessibility of moral intuitions can also vary intermittently within the same individual. The MF-AMP can measure both the lasting and temporary dimensions of moral intuition accessibility, and hence serve both as a *trait* measure which can measure the lasting and stable potency of moral intuitions in individuals, and *state* measure which can measure smaller temporary fluctuations in the accessibility of moral intuitions. Accordingly, the first two studies were designed to test the internal validity of the MF-AMP as well as the scale's external validity as a trait measure of moral intuitions, and the third study was designed to test the external validity of MF-AMP as a state measure of moral intuitions.

#### Study 1: Validating the MF-AMP as a trait measure of moral intuitions

This study recruited participants on the online platform Mechanical Turk. Participants first completed the MF-AMP followed by a set of other measures which were correlated to the MF-AMP. The MF-AMP data collected from this study was used to test for internal validity (Cronbach's Alpha, CFA) as well as for criterion validity, wherein the MF-AMP scores were used to predict scores on the subsequent measures.

**Participants.** Mechanical Turk is an online platform in which workers are recruited to perform small tasks in exchange for a sum of money. While these minor tasks include tagging images and transcribing speeches, workers are also frequently recruited as subjects for research (Mason & Suri, 2011). Mechanical Turk is well-suited for research, given that it provides a relatively cheap means to gather data from participants representing a broad range of

demographics (Iperotis, 2010). An invitation on the website requested participants to complete a few rating tasks and then answer some questions for a payment of \$3.00. Participants were told that the procedure would last for about 45 minutes. Because the MF-AMP uses Chinese characters as ambiguous stimuli, it is important that participants are not able to read and understand the Chinese script. In order to exclude participants who could read and understand Chinese, the invitation told that they had to complete a qualification test before they could start the procedure. The qualification test had just one question which asked participants whether they could read and understand the Chinese script. While answering the question, participants did not know how their response would influence their qualification prospects. Participants who answered that they could understand the Chinese script were disqualified and did not do the subsequent task. 526 participants ( $n_{females} = 248$ ,  $M_{age} = 35.93$ ,  $SD_{age} = 11.38$ ) completed the task. The sample was diverse not only in terms of gender and age, but also in terms of ethnicity (77% white, 23% non-white) and self-reported education (59% with college degree, and 41% without).

**Procedure.** Participants first completed the MF-AMP followed by a list of measures which were correlated to the MF-AMP. These included a procedure in which they indicated their like/dislike for social groups representing the five moral domains. After this, they indicated their like/dislike for hypothetical characters upholding/violating the different moral domains. After this, they completed a series of self-report measures associated with the five moral domains.

**MF-AMP**. Participants first completed the MF-AMP. The MF-AMP (Tamborini, Lewis et al., 2016) adapts the Affect Misattribution Procedure (AMP; Payne, et al., 2005) to assess immediate affective reactions toward stimuli representing moral intuitions. The MF-AMP works under the assumption that an increase in the salience of a moral intuition will be associated with an increase in the accessibility of the positive (or negative) affect associated with stimuli congruent (or incongruent) with that intuition's adaptive goals. For example, if the care intuition is

activated, it should increase the production of positive affect in response to a word such as caring, and negative affect in response to a word such as killing.

The MF-AMP considers deviation from random responses to be a function of the accessibility of affect associated with the target stimuli. Just like the conventional AMP, the MF-AMP restricts responses to being either pleasant or unpleasant. If the target stimulus does not produce any affect, the participant will still be forced to choose an option. Hence, when no affect toward the target stimuli can be accessed, the participant still has to choose pleasant or unpleasant. In this case, responses should veer towards randomness. When affect toward a particular concept is accessible, the responses move away from randomness towards a more distinct positive or negative direction. Returning to the previous example, if the care intuition is accessible, then participants should respond more positively to words upholding care, and more negatively to words violating care. After reverse-scoring the responses to negatively valenced stimuli and combining them with responses to the positively valenced stimuli, the salience of the care intuition should be discernible. However, if this intuition is inaccessible, responses will remain more or less random.

In the MF-AMP, a target word is presented on a computer monitor for 75 ms, followed by a blank screen for 125 ms, followed by a Chinese character for 100 ms, followed by a white noise mask, which remains on the screen until the participant responds. Participants are instructed to categorize the Chinese character as pleasant by pressing the I key, or as unpleasant by pressing the E key. Participants are explicitly instructed to try their best to not let the target words bias their judgments of the Chinese characters (Payne et al., 2005).

The MF-AMP assumes that the intuitive affect associated with the target words bias the subject's evaluations of the neutral Chinese character stimuli, even though participants are explicitly told to avoid this. Thus, if a person experiences positive affect in response to the target

words (representing one of the moral intuitions), s/he should be more likely to give a positive evaluation of the Chinese character. On the other hand, if a person experiences negative affect in response to the target word, s/he should be more likely to give a negative evaluation of the Chinese character.

The MF-AMP lasts approximately six to eight minutes for each participant. For every trial, the participant's response is recorded. Every pleasant response given to a positive, intuition-upholding word, and unpleasant response given to a negative, intuition-violating word is coded as 1. Every unpleasant responses given to a positive, intuition upholding word and pleasant response given to a negative, intuition-violating word is coded as 0. Because higher accessibility of an intuition produces a greater number of pleasant responses to intuition-upholding words, and unpleasant responses to intuition-violating words, it is reflected through a relatively higher number of 1s and lower number of 0s.

The MF-AMP stimuli consist of two groups: words representing the five moral intuitions and control words. The intuition-related target words consist of positively or negatively valenced words representing the five intuitions (e.g., caring is the positively valenced word representing care, while killing is the negatively valenced word representing the same intuition). Each intuition related word is flashed four times (i.e., used in four trials). In addition, an asterisk symbol (\*) is flashed three times in each cycle of the MF-AMP. Because the asterisk symbol is not expected to generate any affect, the participant is expected to press a random key (the I key on the right, or E key on the left) on the keyboard following the asterisk symbol. However, the participant's response for such trials tends to be biased toward his/her dominant hand. A right handed person is more likely to press the right key in response to the asterisk symbol. This tendency of left- or right-handedness is an artifact that can also influence the responses of trials

which involve intuition-representing words. Therefore to control for this artifact, all the asterisk responses were averaged to give a composite for *handedness*, which was controlled for in the analyses validating the MF-AMP.

The control stimuli consist of eight control words (Overjoyed, Magnificent, Delighted, Ecstatic, Unhappy, Miserable, Horrendous, Terrible). Half of the words have a positive semantic valence whereas the other half have a negative semantic valence. Accordingly, they are expected to generate positive/negative affect respectively. Moreover, the words are unrelated to any of the five moral intuitions. Each of these eight control words are also used in four trials, giving a total of 32 trials containing the control words. The pleasant responses given to positive words, and unpleasant responses given to negative words in the MF-AMP are used to represent the participant's baseline sensitivity to positive/negative stimuli. For example, a person who is naturally inclined to be highly sensitive to negative stimuli is likely to consistently give unpleasant responses to most negative words. If this person rated most care-violating words as unpleasant, this might not mean that the care intuition is highly accessible in her/him, because s/he would have likely rated those words as unpleasant even if care were not accessible in her/him. The control words thus establish a baseline against which the consistency of positive/negative responses to words representing the moral intuitions are compared. If an individual has given positive responses to all positive words representing moral intuitions and negative words to all intuition-violating words, but has also given similar positive/negative responses to all control words, then the latter has to be controlled for because his/her responses to the words representing intuitions are similar to that of the baseline. The control word composite was also used as a control variable in analyses testing the validity of the MF-AMP.

**Liking of social groups.** When considering the real-world implications of the intuitions, the MIME suggests that the accessibility of intuitions determines the way people react to various

ideologies, as well as to related groups and organizations. Accordingly, we should expect an intuition to produce a positive reaction to a social group that functions to facilitate the adaptive goals of the intuition (for example, nurses are expected to look after a patients' needs, which are consistent with the goals of the care intuition) and a negative reactions to social groups that represent the violation of the adaptive goal of a moral intuition (for example, people who take drugs violate the adaptive goals of the purity intuition). Accordingly, MF-AMP scores for an intuition should be a positive predictor of gut preferences for social groups that violate a moral intuition.

The procedure for participants to indicate their gut preference of the social groups upholding/violating a moral intuition was as follows. To ensure that participants only gave their immediate, gut reactions to the social groups, the name of each social group was shown only for three seconds. Participants then had to make a like/dislike judgment of that group by hitting the I button (like) or E button (dislike) button in those three seconds itself. Failure to respond in three seconds led to their non-response being coded as a missing, and was not included in the composite for that moral domain. A like response given to a social group upholding an intuition and a dislike response given to social group violating an intuition was coded as 1, whereas a dislike response given to an intuition-upholding social group or like response given to an intuition-violating social group was coded as -1. This number (1/-1) was labelled as the *response code* of that trial. Because a slower response indicates a greater degree of deliberation (Greenwald, McGhee & Schwartz, 1998), and this study attempted to measure both like/dislike responses towards social groups as well as how intuitive those responses were, the time taken for each response was also recorded. The like/dislike response was combined with a reaction times to give a combined measure of whether the participant liked or disliked the social group, and how intuitive/deliberative the like/dislike was.

The reaction times were processed in the following manner. According to Luce (1986), responses with reaction times under a 100 ms are considered to be too fast for proper stimulus perception and resulting motor response. Accordingly, responses with RTs under 100ms were considered as invalid responses and were accordingly deleted. All responses with an RT under 100 ms were coded as missing responses. Ratcliff (1993) suggests using cutoffs to eliminate longer outlier reaction times. He suggests that a cutoff should be chosen such that no more than 10% of the responses are eliminated by the cutoff. Accordingly, the upper limit cutoff for the RTs was set at 2000 ms. In responses which took longer than 2000 ms were coded as missing responses. In all, about 9% of all responses were eliminated by the cutoffs. In addition to indicating their like/dislike for social groups associated with the moral intuitions, participants also indicated their like/dislike for 8 control positive and negative social groups (e.g., good people, sad people). The groups were chosen because they had no association with any of the moral intuitions, and because they were expected to produce quick intuitive like/dislike judgments. The average of all of the capped reaction times (RTs) for the control social groups constituted the baseline RT for social groups for that participant. The capped RT for each trial for a social group representing a moral intuition was divided by the baseline RT for social groups for that participant to give the standardized RT for that trial. After this, the response code (1/-1) was multiplied by the reciprocal of the standardized reaction time for that trial to give the combined response-RT score for that trial. For example, consider a participant whose baseline RT for social groups is 1000 ms. Let us consider that the participant gave a like response for Habitat for Humanity (a social group upholding care) in 500 ms. Because a positive response was given to a social group upholding the intuition, the response code for the trial would be 1.

Since this participant gave a response that was twice as fast as the baseline RT, this means it was more intuitive (and less deliberative) than the baseline responses. Therefore the combined RT-response score for that trial would be 1 \* 1/(500/1000) = 2.

Participants responded to a total of 35 social groups (seven for each intuition) four times, but an attempt was made to retain only those social groups that were clearly associated with each intuition. Therefore, a CFA model similar to one made for the MF-AMP words was created, and an attempt was made to retain four social groups for each intuition that only correlated with groups related to their intuitions, and did not correlate to groups related to other intuitions. This attempt was not entirely successful as it proved difficult to find a combination of social groups that were clean enough to exclusively represent one intuition and produce an excellent fit. Hu and Bentler (1999) state two criteria that can be used to accept a model fit, and claim that either of the two criteria can be used as evidence for a model fit. The CFA for the measurement model for social groups met the second criteria. The RMSEA for the model was 0.06 and SRMR was 0.08. The CFI of 0.91 was not ideal, but the model was nevertheless accepted because these were the fit measures for one of the MF-AMP's correlates (liking of social groups) and not fit measures for the MF-AMP itself (which, as we will see in the results section, were much better), and hence, the adherence to Hu and Benteler's (1999) criteria for accepting model fit was considered sufficient. The list of all social groups included in the final measurement model can be found in Appendix A.

**Liking of Characters.** The intuitions examined in this study are thought to play a key role in shaping narrative enjoyment. The manner in which audiences perceive and react to narrative characters and their actions plays a critical role in popular areas of narrative research such as disposition theory (Zillmann, 2000) and social cognitive theory (Bandura, 2001). According to disposition theory, media audiences act as constant moral monitors, and form positive or

negative dispositions towards characters depending on whether the characters are upholding or violating moral norms (akin to facilitating or thwarting the adaptive goals of moral intuitions).

Until recently, research in this area has been critiqued for its failure to explicate the mechanisms that govern moral content's influence on character perception (Ames, Fiske, & Todorov, 2011). Research on the MIME has addressed this concern by suggesting that the affective mechanisms underlying moral intuitions may explain how dispositions are formed towards the outcome of events in narrative media (Eden & Tamborini, in press) and towards the characters that perform them (Eden, Tamborini, Wang, & Sarinopoulos, 2012). This program of research has examined on the manner in which of moral intuitions can shape audience response to narrative. The findings from this research generally support claims that moral intuitions shape these reactions to characters and narrative plots (cf. Eden et al., 2012). The logic underlying the MIME would suggest that the positive or negative affect produced by the intuition influences the affective reactions towards a character, such that characters upholding moral intuitions have positive affect associated with them, and are hence liked, whereas characters violating the moral intuitions have negative affect associated with them, and are hence disliked. Based on this logic, the accessibility of moral intuitions should influence the strength of the like/dislike experienced towards characters, such that intuitions that are more accessible in an individual should produce stronger liking towards characters that uphold, and stronger dislike towards those that violate an intuition.

After the respondents indicated their liking for social groups, they were asked to rate their like/dislike of characters based on brief descriptions of characters either upholding or violating a moral intuition. Participants were told that they would see a series of brief descriptions of a hypothetical person, and that they had to indicate their like or dislike of that hypothetical person based on each description. Each description was a few words long (e.g., "Shows unquestioned

obedience to authority") and was displayed on screen for three seconds. If participants did not make a like/dislike judgment (by hitting the I/E button) within three seconds, the response for that trial was not recorded and the next description appeared. Similar to the procedure for liking of social groups, both responses and RTs were recorded. Each character description was flashed four times. Eight control characters, whose descriptions (listed in Appendix B) were unassociated with any of the moral intuitions, were also flashed four times each in order to calculate the participant's baseline RT for character descriptions. Combined response-RT scores were calculated and averaged in a manner similar to that of the procedure for social groups. A measurement model with four character descriptions representing each intuition was built in a manner similar to that of the measurement model for social groups. The CFA produced fit statistics which met the criterion laid down by Hu and Bentler (1999) as it obtained an RMSEA of 0.05 and SRMR of 0.06. The CFI for the model was .93.

Self-report scales. In order to test for convergent validity, the scale of each moral intuition of the MF-AMP was correlated to a self-report scale associated with the intuition. Schwartz's human values (Schwartz, 1994) outlines ten distinct drives that motivate human behavior. Some of these drives are equivalent to the moral intuitions outlined in MFQ. These include *benevolence*, which is akin to the care intuition, *universalism*, which is equivalent to the fairness intuition, and *conformity*, which is a drive that is consistent with the adaptive goals of MFQ's authority intuition. Accordingly, the benevolence, universalism and conformity dimensions in Schwartz's Portrait Values Questionnaire (PVQ, Schwartz et al., 2001) were correlated to the care, fairness, and authority intuition scores in the MF-AMP respectively. Beer and Watson's (2009) Group Loyalty scale was correlated to the MF-AMP loyalty scale. The disgust sensitivity scale (Rozin, Haidt, McCauley, Dunlop, & Ashmore, 1999) was correlated to the purity MF-AMP scale. Because the disgust scale had too many items (32 items) that could be feasibly

incorporated into the study, a shortened version of the scale consisting of 13 items (found in Appendix C) was used.

#### Study 2: Test-retest reliability

Test-retest reliability indicates whether a scale measures the same construct consistently across time. When a scale is administered to the same set of participants on two different occasions (sufficiently removed from each other), a strong positive correlation between the scores at the two time points would indicate consistency across time. In this context, test-retest reliability examines the validity of the MF-AMP as a trait measure of moral intuitions.

**Participants and procedure.** 89 undergraduate students ( $n_{\text{females}} = 52$ ,  $M_{\text{age}} = 21.78$ ,  $SD_{\text{age}} = 1.45$ ) enrolled in Communication classes were recruited from a Midwestern university in the USA. They completed MF-AMP on one day, and then returned the following week to once again complete the MF-AMP. On both occasions they first completed a consent form, after which they created and entered an anonymous research code. Then they completed the MF-AMP. Their MF-AMP responses from each occasion were matched with the help of their anonymous research code. All participants were treated according to guidelines laid down by the university's Institutional Review Board (IRB).

#### Study 3: Validating the MF-AMP as a state measure of moral intuitions

A unique property of the MF-AMP is that it can be used to non-invasively detect the accessibility of moral intuitions resulting from the recent activation of intuitions in individuals. Unlike other measures of moral intuitions, such as the MFQ, the MF-AMP assesses the accessibility of moral intuitions while in use, and is thus well-suited to be a state measure of moral intuitions, detecting temporary fluctuations in their accessibility. Study 2 was designed to test whether the MF-AMP could accurately measure the increased accessibility of each moral intuition in participants after exposure to media highlighting those intuitions.
**Participants and procedure.** 321 students ( $n_{females} = 193$ ,  $M_{age} = 20.39$ ,  $SD_{age} = 1.88$ ) enrolled in communication classes in a Midwestern university in USA were recruited for the study. Of these, data from 17 participants was not included in subsequent analyses because the participants indicated that they could read and understand the Chinese script. Participating students received course credit for their participation in the study. All participants were treated in accordance with the guidelines established by the university's Institutional Review Board (IRB).

Participants first signed a consent form. After this, they created and entered an anonymous research code that was used to label their data. They then watched one of six videos, each focusing either on one moral intuition or a control. After viewing they completed the MF-AMP. All the videos were about 7 to 8 minutes long. The contents of each of the six videos are listed in Appendix D.

#### RESULTS

Analyses were conducted to examine the MF-AMP's internal consistency, as well as its properties as a state and trait measure of moral intuitions. MF-AMP data collected in Study 1 was used to validate the internal validity (confirmatory factor analysis and Cronbach's Alpha) of the MF-AMP. Study 1 data was also used to validate the MF-AMP as a trait measure by correlating it to extrinsic measures. Study 2 data was used to calculate test-retest reliability, and Study 3 data was used to validate the MF-AMP as a state measure of moral intuitions.

The MF-AMP operates on the principle that the accessibility of an intuition is discernible to the extent that responses veer away from randomness. A pleasant response given to a intuition upholding word, and unpleasant response is given to an intuition violating word is coded as 1 (a success trial), while an unpleasant response given to an intuition upholding word, and or a pleasant response given to an intuition violating word is coded as 0 (a failure trials). According to the logic of the MF-AMP, if an intuition is not accessible in a participant, it will result in a more or less equal number of success trials (1s) and failure trials (0s). However, if an intuition is accessible in participant, it will result in a greater proportion of success trials (1s) and fewer failure trials (0s). Therefore, to examine if the proportion of success trials (1s) and five intuitions was significantly different from chance, the composites of five intuitions (which represent the ratio of 1s and 0s) were tested against 0.5 on a binomial distribuition. The binomimial distribuition probabilities were also calculated for the control word score and asterisk composite (handedness score). The results are presented in Tables 7 and 8.

	Total	Success	
Intuition	Trials	Trials	р
Care	29456	17231	< 0.000001
Fairness	25248	14218	< 0.000001
Loyalty	29456	17272	< 0.000001
Authority	23144	13450	< 0.000001
Purity	25248	14118	< 0.000001
Control words	16832	9743	< 0.000001
Asterisk (Handedness)	6312	3650	< 0.000001

Table 7. Binomial distribution probability for data in MTurk Study.

Table 8. Binomial distribution probability for data in Priming Study.

	Total	Success	
Intuition	Trials	Trials	р
Care	17024	10345	< 0.000001
Fairness	14592	8597	< 0.000001
Loyalty	17024	10262	< 0.000001
Authority	13376	7643	< 0.000001
Purity	14592	8493	< 0.000001
Control words	9728	5760	< 0.000001
Asterisk (Handedness)	3852	2165	< 0.000001

### **Internal validity**

**Confirmatory Factor Analysis.** A confirmatory factor analysis (CFA) procedure was conducted to check the five factor structure of words included in the MF-AMP. The measurement model included a control for a measurement artifact known to bias AMP responses. Scores of observed variables are influenced not only by latent constructs but also by measurement methods (Podsakoff, MacKenzie, Lee & Podsakoff, 2003). This variance attributed to measurement methods is known as common method variance and is represented in a CFA through a method factor (Richardson, Simmering & Sturman, 2009). In the MF-AMP, a word that produces no positive or negative affect in a participant produces a random response, in which the participant arbitrarily presses the I key (pleasant) on the right side of the keyboard or E key (unpleasant) the left side on the keyboard. However, in such cases, the responses are not quite random and are usually biased towards their dominant hand. Thus, when a word produces no affect, a right handed participant is more likely to use his right hand, thereby unnaturally inflating the proportion of pleasant/like responses for positively-valenced words, and unnaturally inflating the proportion unpleasant/dislike responses for negatively-valenced words. A lefthanded participant would have a bias that works in the opposite direction, where in the proportion of unpleasant/dislike responses for positively-valenced words is inflated, as is the proportion of pleasant/like responses for negatively-valenced words. In the case of both lefthanded and right-handed participants, this artifact causes the relationship between positively- and negatively-valenced words to become more negative and less positive. Thus, a method factor was introduced to control for this artifact in the measurement model. As per recommendations in the aforementioned research on method factors, every word in the measurement model loaded on two factors: a) a latent factor representing the moral intuition that the word belongs to, and b) a single method factor common to all words (positive and negative), but on which the positive and negative words loaded in opposite directions. Because this dominant-hand artifact influences the scores of all words equally (except that it affects the scores of positive and negative words in opposite directions), factor loadings on the method factor were constrained to be equal in magnitude, but opposite in direction for positive and negative words. Factor loadings for factors representing the moral intuitions were not constrained.

Participant fatigue issues can be a concern for AMPs designed to measure several different variables. Given this concern, a decision was made to narrow the word pool to around 8 words per intuition, based on the factor loadings and modification indices of the CFA. Words which had a factor loading (on their respective intuitions) below .30 were not considered to adequately represent their intuition, and were thus excluded from further consideration. In order to account for discriminant validity, any word which had a modification index of value greater than 4,

indicating that a regression path should be drawn from a non-relevant intuition to it, was also excluded from further consideration. This left 8 words representing care (Caring, Kindness, Helping others, Charity, Helpful, Vicious, Killing, Heartless), 6 words representing fairness (Equality, Justice, Honesty, Falsehood, Deceitful, Racism), 7 words representing ingroup loyalty (Together, Loyalist, Treason, Enemy, Betray, Disloyal, Outsider), 5 words representing authority (Commander, Supervisor, Government, Reverence, Follow the leader) and 6 words representing Purity (God-like, Beastly, Prostitute, Filth, Devil, Unnatural). A measurement model including these words showed a good fit with the data,  $\chi^2$  (453, N = 526) = 487.27, p = .13,  $\chi^2/df = 1.07$ , CFI = .99, TLI = .99, IFI = .99, RMSEA = .01, SRMR = .04.

**Croncbach's Alpha.** A Cronbach's alpha procedure was conducted for each intuition for all four exposures for all words representing the intuition. This produced an alpha of .73 for care, .70 for fairness, .75 for ingroup loyalty, .68 for authority and .76 for purity. Some of these alphas may seem low, especially the alpha for authority, which is below a conventional threshold of 0.7. However it must be noted that factors aside from internal consistency also impacted alpha scores. The reversed responses are binary in nature (1/0) and cause problems related to a restriction in range which limits inter-item correlations. More importantly, the dominant-hand bias artifact (described earlier) suppresses positive correlations between positively- valenced and negatively-valenced words, and there is no way to control for this artifact in a Cronbach's Alpha procedure. The fact that the Cronbach's Alpha met the conventional threshold for four of five moral intuitions, coupled with the excellent fit obtained in the CFA, was used to accept this set of words and perform further analyses.

**Test-retest reliability.** MF-AMP scores of the five intuitions collected on both occasions in Study 2 were correlated. The test-retest correlations were .42 for care, .31 for fairness, .43 for loyalty, .56 for authority and .53 for purity (all p<0.01). While these test-retest correlations might

seem modest, it must be noted that a test-retest reliability assumes that the construct being measured is stable over time. If we were to assume that a person who is relatively higher on the care intuition will remain relatively higher on the care intuition over a period of time, the test-retest reliability is an appropriate test of a measure's validity. However, moral intuitions are frequently activated in response to everyday events and are rarely stable. It is possible that a person in whom care was activated prior to the first session (and in whose MF-AMP scores are accordingly lower than the mean) will score lower on the care MF-AMP in the second session because care was not again activated right before the procedure. The constructs measured by the MF-AMP display a mixture of trait- and state-like properties. The intermittent nature of a constructs state accessibility of should be noted while considering its moderate test-retest reliabilities measured by the MF-AMP.

### **Predictive validity**

Liking of Social Groups. In order to examine if MF-AMP scores predicted liking of social groups, the MF-AMP scores in Study 1 were correlated to liking of social group scores from the same study. Partial correlations between MF-AMP scores and liking of social groups were carried out controlling for the control word composite and handedness (asterisk composite). The partial correlations between the MF-AMP scores for the intuitions and five social groups are listed below in Table 9. Significant correlations are marked with an asterisk and the highest correlation in each row is bolded. As can be seen, the MF-AMP scores significantly and positively predicted liking for social groups for their respective intuitions in four out of five cases (all except fairness), with the significant correlations also being strongest in each row. Notably, in each case a positive correlation was predicted for MF-AMP scores and their respective social groups. As such, directional, one-tailed p-values are reported. Similarly, as all

subsequent tests of liking predict positive parameters, one-tailed p-values are also presented for them.

				υ	0 1	
		Care ME-AMP	Fairness ME-AMP	Loyalty ME-AMP	Authority ME-AMP	Purity ME-AMP
	r	0.100*	0.034	-0.009	0.013	0.012
Care Social		(0.015,	(-0.052,	(-0.094,	(-0.073,	(-0.074,
Groups	<i>C.I.</i>	0.184)	0.119)	0.077)	0.098)	0.097)
_	р	0.014	0.226	0.58	0.386	0.399
	r	0.057	0.05	0.031	-0.053	0.022
Fairness Social		(-0.029,	(-0.036,	(-0.055,	(-0.138,	(-0.064,
Groups	<i>C.I</i> .	0.142)	0.135)	0.116)	0.033)	0.107)
-	р	0.103	0.134	0.244	0.878	0.311
	r	0.017	0.039	0.092*	-0.085	0.042
Loyalty Social		(-0.069,	(-0.047,	(0.007,	(-0.169, 0)	(-0.044,
Groups	<i>C.I.</i>	0.102)	0.124)	0.176)		0.127)
_	р	0.356	0.193	0.021	0.97	0.18
	r	0.006	-0.029	-0.041	0.170*	0.01
Authority Social		(-0.08,	(-0.114,	(-0.126,	(0.086,	(-0.076,
Groups	<i>C.I.</i>	0.091)	0.057)	0.045)	0.252)	0.095)
_	р	0.449	0.737	0.814	<0.001	0.415
	r	0.022	0.002	0.035	0.014	0.095*
Purity Social		(-0.064,	(-0.084,	(-0.051,	(-0.072,	(0.01,
Groups	<i>C.I</i> .	0.107)	0.087)	0.12)	0.099)	0.179)
	р	0.317	0.484	0.218	0.375	0.018

Table 9. Partial correlations between MF-AMP scores and liking of social groups.

Note. \* = p < .05. The highest correlation in each row is bolded. Partial correlations control for control words and handedness

In order to see whether the relationship between MF-AMP scores and liking of social groups was unique and would persist even after controlling for MFQ scores, a regression procedure was conducted, in which the MFQ and MF-AMP for an intuition (along with the control word and handedness composites) acted as predictors, and liking for that intuition's respective social group was the dependent variable. The results are displayed in Table 10. As can be seen, the stable/chronic intuition accessibility gauged by the MFQ is the stronger predictor in all five cases. However, the MF-AMP predicts a significant amount of unique variance in four out of five cases.

		MFQ	MF-AMP
Care Social Crowns	β	0.226*	0.113*
Care Social Groups	p	0.000	0.029
	$\Delta R^2$	0.051	0.007
	β	0.262*	0.04
Fairness Social Groups	p	0.000	0.261
	$\Delta R^2$	0.068	0.001
	β	-0.028	0.138*
Loyalty Social Groups	p	0.732	0.019
	$\Delta R^2$	0.001	0.009
	β	0.382*	0.157*
Authority Social Groups	p	0.000	0.001
	$\Delta R^2$	0.146	0.018
	β	0.287*	0.109*
Furity Social Groups	p	0.000	0.032
	$\Delta R^2$	0.082	0.006

Table 10. Regressions for liking of social groups with MFQ/MF-AMP.

Note. \* = p < .05.

**Liking of characters.** Partial correlations between MF-AMP scores and liking of characters were carried out controlling for the control word composite and handedness (asterisk composite). The correlations presented in Table 11 show that the relevant the care and authority MF-AMP scores significantly and positively predicted liking for characters upholding the intuition. While the relevant correlations for fairness, loyalty and authority were not significant, they were all positive, and higher than the correlations between each MF-AMP score and non-relevant outcomes representing other intuitions.

		Care MF-AMP	Fairness MF-AMP	Loyalty MF-AMP	Authority MF-AMP	Purity MF-AMP
	r	0.084*	0.028	-0.044	-0.062	-0.015
Care		(-0.002,	(-0.058,	(-0.129,	(-0.147,	(-0.1,
Characters	<i>C.I.</i>	0.168)	0.113)	0.042)	0.024)	0.071)
	р	0.033	0.266	0.837	0.915	0.631
	r	0.039	0.039	0.029	-0.046	-0.038
Fairness		(-0.047,	(-0.047,	(-0.057,	(-0.131,	(-0.123,
Characters	<i>C.I.</i>	0.124)	0.124)	0.114)	0.04)	0.048)
	р	0.193	0.194	0.264	0.843	0.797
	r	0.059	0.044	0.066	-0.109	0.002
Loyalty		(-0.027,	(-0.042,	(-0.02,	(-0.193, -	(-0.084,
Characters	<i>C.I</i> .	0.144)	0.129)	0.151)	0.024)	0.087)
	р	0.097	0.166	0.074	0.992	0.482
	r	-0.01	-0.037	-0.025	0.142*	0
Authority		(-0.095,	(-0.122,	(-0.11,	(0.057,	(-0.085,
Characters	<i>C.I.</i>	0.076)	0.049)	0.061)	0.225)	0.085)
	р	0.587	0.795	0.707	0.001	0.497
	r	-0.022	-0.016	0.02	-0.033	0.055
Purity		(-0.107,	(-0.101,	(-0.066,	(-0.118,	(-0.031,
Characters	<i>C.I.</i>	0.064)	0.07)	0.105)	0.053)	0.14)
	р	0.69	0.637	0.327	0.764	0.113

Table 11. Partial correlations between MF-AMP scores and liking of characters.

Note. \* = p < .05. The highest correlation in each row is bolded. Partial correlations control for control words and handedness.

The MF- AMP did not predict unique variance (after controlling for MFQ, control words and handedness) in liking for characters. A regression procedure was conducted with character liking for each intuition as the dependent variable and the respective MFQ and MF-AMP scores for that intuition (along with the control word and handedness composites) as predictors. The results are presented in Table 12.

		MFQ	MF-AMP
Cone Chanastan Lilving	β	0.275*	0.089
Care Character Liking	p	0.000	0.070
	$\Delta R^2$	0.066	0.004
	β	0.179*	0.034
Fairness Character Liking	p.	0.000	0.295
	$\Delta R^2$	0.032	0.001
	β	0.015	0.095
Loyalty Character Liking	p.	0.372	0.077
	$\Delta R^2$	0.000	0.004
	β	0.496*	0.114
Authority Character Liking	p	0.000	0.051
	$\Delta R^2$	0.246	0.010
	β	0.269*	0.055
Purity Character Liking	p	0.000	0.174
	$\Delta R^2$	0.072	0.002

Table 12. Regressions for liking of characters with MFQ/MF-AMP.

Note. \* = p < .05.

Self-report scales. Partial correlations between MF-AMP scores and liking of self-report scales administered in Study 1 were carried out controlling for the control word composite and handedness (asterisk composite).. The benevolence, universalism and conformity dimensions in Schwartz's Portrait Values Questionnaire (PVQ) were correlated to the care, fairness, and authority intuition scores in the MF-AMP and the widely used Group Loyalty and Disgust scales were correlated to loyalty and purity MF-AMP scores. Table 13 shows the correlations between the five MF-AMP variables and five self-report scales. As can be seen in the table, the fairness, authority and purity MF-AMP scores correlated with their respective self-report scales and also predicted unique variance in them, but care and loyalty did not.

		Care MF-AMP	Fairness MF-AMP	Loyalty MF-AMP	Authority MF-AMP	Purity MF-AMP
	R	0.015	0.080*	-0.027	-0.043	-0.055
PVQ -		(-0.071,	(-0.006,	(-0.112,	(-0.128,	(-0.14,
(Coro)	<i>C.I.</i>	0.1)	0.164)	0.059)	0.043)	0.031)
(Cale)	Р	0.367	0.039	0.726	0.826	0.888
DVO	R	0.053	0.126*	-0.034	-0.117	-0.03
PVQ -		(-0.033,	(0.041,	(-0.119,	(-0.2, -	(-0.115,
(Epirness)	<i>C.I</i> .	0.138)	0.209)	0.052)	0.032)	0.056)
(Panness)	р	0.122	0.003	0.771	0.995	0.749
Crease	r	0.04	0.007	0.06	0.137*	0.084*
Group		(-0.046,	(-0.079,	(-0.026,	(0.052,	(-0.002,
(Loyalty)	<i>C.I</i> .	0.125)	0.092)	0.145)	0.22)	0.168)
(Loyalty)	р	0.187	0.443	0.092	0.001	0.032
DVO	r	-0.078	-0.056	-0.038	0.097*	0.007
PVQ -		(-0.162,	(-0.141,	(-0.123,	(0.012,	(-0.079,
(Authority)	<i>C.I</i> .	0.008)	0.03)	0.048)	0.181)	0.092)
(Authority)	р	0.959	0.89	0.799	0.017	0.441
	r	0.048	-0.036	-0.003	0.011	0.088*
Disgust		(-0.038,	(-0.121,	(-0.088,	(-0.075,	(0.003,
(Purity)	<i>C.I</i> .	0.133)	0.05)	0.083)	0.096)	0.172)
	р	0.143	0.785	0.523	0.408	0.026

Table 13. Partial correlations between MF-AMP scores and self-report scales.

Note. \* = p < .05. The highest correlation in each row is bolded. Partial correlations control for control words and handedness

The MF- AMP also predicted unique variance (after controlling for MFQ, control words and handedness) in the self-report scale for fairness. Like in the previous two cases, a regression was conducted with the self-report scale for each intuition as the dependent variable, and the respective MFQ and MF-AMP scores for that intuition (along with the control words and handedness) as predictors. The results are presented in Table 14.<sup>1</sup>

		MFQ	MF-AMP
DVO Benevielance (Core)	β	0.528*	-0.032
PVQ - Benevolence (Care)	p	0.000	0.729
	$\Delta R^2$	0.278	0.001
DVO Universalian (Fairmana)	β	0.511*	0.120*
PVQ - Universalism (Fairness)	p	0.000	0.016
	$\Delta R^2$	0.261	0.007
	β	0.722*	0.012
Group Loyalty (Loyalty)	p	0.000	0.401
	$\Delta R^2$	0.521	0.000
	β	0.755*	0.035
PvQ - Conformity (Authority)	р	0.000	0.158
	$\Delta R^2$	0.570	0.001
Discourt (Duritar)	β	0.393*	0.093
Disgust (Purity)	p	0.000	0.051
	$\Delta R^2$	0.154	0.005

Table 14. Regressions for self-report scales with MFQ/MF-AMP.

Note. \* = p < .05.

**Examining MF-AMP as a state measure of moral intuitions.** In order to examine if the MF-AMP could measure a temporary increase in accessibility of moral intuitions following media exposure, each participant in Study 3 was randomly assigned to watch one of six videos (each featuring clips that focused on one specific intuition, or a control video) and then completed the MF-AMP. From a theoretical perspective, the post-test MF-AMP scores for each intuition should be highest in participants who watched the video focusing on *that* specific intuition. For example, the MF-AMP score for care should be highest in participants who watched the video focusing on an intuition other than care. Therefore, in order to test if the MF-AMP score for each intuition was highest for participants who watched the video focusing on that intuition was the dependent variable, participants who watched the video focusing on that specific intuition was the dependent variable, participants who watched the video focusing on that specific intuition was the dependent variable, participants who watched the video focusing on that specific intuition was the dependent variable, participants who watched the video focusing on that specific intuition was the dependent variable, participants who watched the video focusing on that specific intuition was the dependent variable.

remaining five conditions (including the control condition) were coded as -1. So for example, for the care condition contrast, which had the MF-AMP care score as the dependent variable, the care videos group was coded as 5 and the remaining groups (including the control group) were coded as -1. Each of the five contrasts was also tried with the four non-relevant MF-AMP scores as dependent variables. For example, consider the care condition contrast in which the care video condition was coded as 5, and the remaining conditions were coded as -1. After this contrast was applied to the care MF-AMP score as the dependent variable, it was also applied to the other four MF-AMP scores as a dependent variables for comparison purposes. In all, this led to a total of 25 analyses. Of these, only five analyses (the contrasts in which the video condition corresponding to the intuition used as the dependent variable was coded as 5) were expected to produce a significant result with a positive contrast coefficient. The remaining 20 analyses, were not expected to produce significant results. The results of these analyses are presented in Table 15.<sup>2</sup>

		Care	Fairness	Loyalty	Authority	Purity
		MF-	MF-	MF-	MF-	MF-
		AMP	AMP	AMP	AMP	AMP
Care Condition	t	3.055*	1.759*	1.350	0.793	0.724
Contrast	р	0.001	0.040	0.089	0.214	0.235
Fairness Condition	t	-0.715	-0.539	-0.351	-0.543	-0.151
Contrast	р	0.763	0.705	0.637	0.706	0.560
Loyalty Condition	t	0.112	-0.188	-0.444	0.281	-1.069
Contrast	р	0.456	0.575	0.671	0.390	0.857
Authority Condition	t	0.649	-0.027	-1.097	1.648*	-0.528
Contrast	р	0.259	0.511	0.863	0.050	0.701
Purity Condition	t	-0.289	0.499	0.386	-0.720	1.760*
Contrast	р	0.614	0.309	0.350	0.764	0.040

Table 15. Contrast ANOVAs with MF-AMP scores as the dependent variables.

Note. \* = p < .05.

As we can see in the above table, the contrasts for care, authority and purity showed significant results for their respective MF-AMP scores, while fairness and loyalty did not.

Notably, these were the only three significant results of all the contrasts performed. When the similar analysis was done with MFQ scores, none of the relevant contrasts were significant.

Table 10. Colluast ANOVAS w		z scores as	the depend		105	
		Care MFQ	Fairness MFQ	Loyalty MFQ	Authority MFQ	Purity MFQ
	t	1.593	1.259	1.680*	0.120	0.577
Care Condition Contrast	р	0.056	0.105	0.047	0.453	0.282
Fairness Condition	t	1.300	1.601	-1.003	0.604	2.047*
Contrast	р	0.098	0.055	0.659	0.273	0.021
	t	1.448	-0.370	0.363	-0.326	0.355
Loyalty Condition Contrast	р	0.075	0.856	0.359	0.872	0.362
Authority Condition	t	-1.996	-1.202	0.081	0.152	-2.320
Contrast	р	0.524	0.615	0.468	0.440	0.511
	t	-0.959	-2.418	-0.622	-0.977	0.505
Purity Condition Contrast	р	0.669	0.508	0.768	0.665	0.307

Table 16. Contrast ANOVAs with MFQ scores as the dependent variables

Note. \* = p < .05.

### DISCUSSION

# **Overview of Results**

The findings broadly establish the validity of the MF-AMP as both a trait and state measure of moral intuition accessibility.

**MF-AMP as a trait measure of moral intuitions.** The validity of the MF-AMP as a trait measure of moral intuitions was established by the fact that the baseline MF-AMP scores for four of five moral intuitions significantly predicted like/dislike of social groups upholding/violating its relevant moral domain. This lends credence to the MF-AMP's ability to predict outcomes relevant to the moral intuitions. While only attitudes towards social groups were measured in this research, other outcomes related to moral intuitions such as moral judgments, attitudes towards social/political issues, and even behavior could be predicted in the future.

It is noteworthy that MF-AMP scores significantly predicted like/dislike of relevant social groups even after controlling for the effect of the MFQ trait measure. This shows that the MF-AMP has utility as a trait measure, in that it can explain unique variance in outcomes beyond the variance explained by the MFQ.

In contrast to the correlations for social groups, the correlations between the MF-AMP scores and relevant character descriptions and self-report measures produced significant results in only two out of five, and three of five cases respectively. For liking of characters, the MF-AMP scores were correlated to the relevant outcomes only for care and authority. The MF-AMP scores for fairness, authority and purity were significantly correlated to their respective self-report scales, while also being stronger than any applicable cross-correlations, thus strengthening evidence for the validity of these scales. The MF-AMP scores for care and loyalty were not significantly correlated to their PVQ Benevolence and Group Loyalty scales respectively. These

could be because of limitations in these MF-AMP scales suggesting the need for improvement in them. Alternatively, other factors could also explain these results. First, participants completed the character liking and self-report scales after they finished the MF-AMP and the social groups procedure. Thus they may have been fatigued after about 15-20 minutes into the procedure. Second, the social groups procedure might have influenced the accessibility of moral intuitions for participants coming into the character liking and self-report scales. Hence the initial MF-AMP scores may no longer have been relevant predictors of the participants' character liking and self-report scales. These procedural issues are discussed in more detail in the limitations section.

In addition, although the PVQ Benevolence and Group Loyalty scales were thematically related to the care and loyalty domains respectively, some items in the scales might have been associated with other moral domains. For example, the PVQ Benevolence scale contained items pertaining to loyalty towards friends and to forgiving people. These items might seem related to loyalty and fairness respectively. Similarly, though the group loyalty scale contained items that nominally pertained to the ingroup, such as loyalty towards country, these items could also seem to gauge levels of conformity related to the authority domain, and nobleness relevant to the purity intuition. On the whole, while the relatively weaker correlations of the MF-AMP with self-report scales might be cause for concern for the instrument's validity, it must be noted that these weaker correlations could result from other factors that added additional error variance in self-report measures.

**MF-AMP as a state measure of moral intuitions.** The validity of the MF-AMP as a state measure of moral intuitions was tested in Study 2, in which the instrument was administered to participants who were assigned to watch one of six videos: each focusing on a specific moral domain or a control video. For three moral intuitions (care, authority and purity) the post-test score of the relevant MF-AMP intuition was significantly highest in participants

who watched the video focusing on that specific moral intuition. This supports the utility of the MF-AMP as a tool which can be used to measure short term increases in intuition strength following domain-relevant experiences.

For two of the five moral domains (fairness and loyalty) the post-test MF-AMP score of the relevant intuition was not highest in participants who watched the video focusing on that specific domain. Although these results could have arisen because of limitations in MF-AMP as a state measure of moral intuitions, they could also have arisen because the videos chosen to represent the domain were inadequate or inaccurate. The fairness video featured two scenes from films dealing with racial equality, and this could have spurred concerns related to both care and ingroup loyalty in participants. The videos representing ingroup loyalty featured clips in which individuals pledge loyalty to superior figures, such as a coach in one case and king in another. In addition to loyalty, these clips could have also increased the accessibility of the authority intuition in participants. Future efforts along these lines could choose audio-visual stimuli that are more purely representative of individual moral domains. On the whole, however, the MF-AMP does show promise in its ability to measure short-term increases in intuition accessibility. This effect is particularly notable in contrast to the MFQ's effect, because all five videos failed to influence respective intuition scores on the MFQ.

# Applications of the MF-AMP

The MF-AMP could be used both as a trait measure (useful for measuring the more stable/chronic aspect of moral intuition accessibility), and a state measure (useful for measuring more fleeting changes in intuition accessibility over time). Given that there exists another instrument (MFQ) to measure the more stable/trait aspect of intuition accessibility, the MF-AMP might be more useful as a state measure of moral intuition accessibility, but both dimensions should nevertheless be considered and discussed separately.

The MF-AMP as trait measure of moral intuition accessibility. The MF-AMP can be used to measure the more stable/chronic aspect of intuition strength in individuals which accounts for their basic sensitivities to moral issues aligned along the various moral domains. When individuals are not prompted by external influences, their moral behavior and judgment likely varies as a function of their chronic intuition accessibility.

While the MF-AMP can detect individual differences in chronic intuition accessibility, this is not the only measure that purports the same. The MFQ is a self-report measure which has also been created to gauge the strength of moral intuitions, primarily, the chronic accessibility of moral intuitions. The results of this study show that the MF-AMP measures a unique aspect of chronic intuition accessibility which persists even after controlling for variance predicted by the MFQ. Though the predictive power of the MF-AMP is lesser than that of the MFQ, the effect accounted for by the MF-AMP is unique and stable, indicating that it could be a useful accompaniment to MFQ in measuring the chronic accessibility of moral intuitions.

While measuring the chronic accessibility of moral intuitions, the use of MF-AMP could provide new insights into the strengths of moral intuitions in individuals as well as in groups. For example, research using the MFQ has shown that conservatives have higher levels of loyalty, authority and purity than liberals. The use of the MF-AMP in such a study might provide additional insights, such as a slightly different pattern of intuition accessibility or finer gradations in the strength of moral intuitions in different groups.

The MF-AMP as state measure of moral intuition accessibility. The MF-AMP is useful tool for theoretical frameworks in which the accessibility of moral intuitions varies with time. MFT (Graham, Haidt & Nosek, 2009) states that the basic strength of moral intuitions varies across people, such that various intuitions are more easily activated in some individuals than others. However, this perspective ignores the fact that the activity of some intuitions varies

in the same individual over different periods of time. Theoretical frameworks such as the MIME describe how external influences (such as media) can change the accessibility of an intuition over time. The MF-AMP is a useful tool for studies based in such frameworks which describe relatively finer changes in intuition accessibility over short periods of time.

*Detecting media's influence on intuition accessibility.* The MF-AMP is well-suited to detect subtle changes in intuition accessibility over time, including changes that might be caused by media exposure. To date, media effects research has focused largely on how exposure can influence outcomes such as the importance given to socio-political issues (Graham, Haidt & Nosek, 2009) or pro-social or anti-social behavior. Media's ability to activate innate instincts in users is a largely unexplored area of research, partly hindered by the lack of cheap, reliable and non-intrusive tools that can detect the activation of these instincts. The MF-AMP can help address this impediment by detecting the ability of various types of media to activate moral intuitions.

*Detecting the influence of news media.* Of all media, news may have the most sustained and powerful impact on moral instincts. News from newspapers, television or internet, frequently touch upon moral concerns. Based on MIME logic, these morally charged stories should activate moral intuitions in audiences in a manner similar to face-to-face interactions. With the recent onset of round-the-clock news availability, the impact of news media on moral intuitions could be considered to be consistent and strong. The MF-AMP could measure the impact of news stories on the accessibility of moral intuitions through experimental set-ups which involve administering the instrument immediately after participants read or watch a news story. Because most responses given in the MF-AMP are automatic in nature, participants can do the MF-AMP while still reflecting on the news story that they just read or watched, thereby ensuring that the impact of the news story will be seen in their responses.

Detecting the influence of entertainment media. In addition to news media,

entertainment media including films, TV shows and videos on the internet can also activate moral intuitions in audiences. Unlike in news media, the moral themes in entertainment content are often subtle, and may not strongly influence an audience member's moral structure at the conscious level. But they can still reinforce some moral values or make them more salient by causing audiences to focus on specific moral values over others. While the MFQ might only be able to detect profound, foundational changes in an individual's moral structure, the MF-AMP may be better suited to detect increased short-term focus on specific moral intuitions. For example, if a movie features an act of patriotism, it may cause an audience member to reflect on the importance of loyalty, without permanently making him a more loyal person. The MF-AMP is well-suited to detect this temporary increase in salience of the loyalty intuition in this individual. When the instrument is administered immediately after media exposure, its passive procedure may not interfere in the participant's reflections, thereby allowing her/his responses to be influenced by the ongoing reflections.

*Detecting the influence of socio-political events.* While the MF-AMP is a useful tool to measure the immediate impact of media on the accessibility of moral intuitions, it could also gauge the short-to-medium term impact of powerful socio-political events on the moral intuitions of individuals. Various events such as natural disasters, terrorist attacks, political scandals, etc. have the ability to provoke strong moral reactions and reflection in people. While many of these events may or may not necessarily lead to a permanent change in moral structure, they can lead to a sustained emphasis on specific moral intuitions for longer periods of time.

Given that the MF-AMP is well-suited to detect the temporal activation of moral intuitions, it could identify which moral intuitions are activated in the days following a major sociopolitical event. The MF-AMP was able to detect an increase in the care intuition following

the Paris terrorist attacks of 2015 (Hofer, 2015) and increase in care and authority following the Boston Marathon attacks (Prabhu, 2013) in 2013. Thus, the MF-AMP is not only useful to identify the immediate effect of media stimuli on moral intuitions, but can also identify a stimulus' effect if it sustains for a longer period of time, such as for a few days or weeks.

### Limitations of the MF-AMP

Because the MF-AMP is an implicit instrument in which participants remain unaware of what the procedure's intent, their responses can vary as a function of intuition accessibility and various other factors. These could include the participant's attention level, their left/right handedness, and other situational factors that can influence which button was pressed over the other. As a result, the responses in MF-AMP (like responses collected through most implicit measures) have a greater degree of error variance as compared to responses collected through self-report measures. This error attenuates the reliabilities associated with the instrument, causing statistics such as Cronbach's Alpha to be low (albeit not necessarily unacceptably low). However, errors such as those caused by the dominant-hand bias are controlled by the fact that scores (including their error components) are reversed for negatively-valenced items (thereby the error is cancelled when positive and negative items are combined in the composites) and also by dividing the composites by the control word composite. Therefore, despite a greater proportion of error in the raw responses of the MF-AMP, adopted data processing techniques minimize the error in the final composite, thereby ensuring the validity of MF-AMP's results.

The MF-AMP is also limited by its technique, which involves gauging the accessibility of affect produced by words associated with each intuition. Although this indirect technique for detecting recent activation of intuitions has its advantages, it is limited by the fact that it does not involve direct activation of the intuition. This hinders its utility as a trait measure of moral intuitions, in which directly measuring the extent to which an intuition can be activated is ideal.

In addition, because only a limited number of words can be included in the MF-AMP and the responses are binary (positive/negative) in nature, the finer precision with which moral intuitions can be measured is limited. However, despite these limitations, the MF-AMP could still be considered a useful trait and state measure of moral intuitions, given its varied utility and unique advantages.

### Limitations of the study

A limitation of both Studies 1 and 2 concerns the sample's representativeness. Study 1 recruited participants from Mechanical Turk. Participants recruited on Mechanical Turk were almost exclusively American, and as such may not be representative of the varied global population to which the MF-AMP may apply. In addition, questions could also be raised on as to whether an MTurk subject pool adequately represents the U.S. populace. This latter concern is at least partly addresses by the fact that the obtained sample in Study 1 had substantial demographic variance. Participants recruited through Mechanical Turk varied greatly in terms of gender, age, ethnicity, household income and education. Study 2 recruited students enrolled in communication courses in a Midwestern university. As such, representativeness concerns can be raised about this sample. However, while this sample might be relatively restricted in terms of demographics (especially in terms of age), the processes examined in this study are thought to be universal, and thus unaffected by demographic factors. Study 2 attempted to understand if the MF-AMP could detect narrative media's influence on the short-term accessibility of the moral intuitions. This process is expected to apply similarly to people of all cultures, genders, ages and backgrounds. Hence providing evidence for this process, even in a subset of the general population, can lend support to the MF-AMP's ability to detect short-term increases in intuition accessibility.

A limitation of Study 1 in particular stems from the lengthy and exhausting procedure for participants. The subjects first completed the MF-AMP, then indicated their like/dislike for social groups and character descriptions, and finally completed a range of self-report measures. The entire battery of measures lasted for around 35 minutes, and this might have compromised latter responses, particularly those of the self-report scales. All scales and measures in Study 1 had to be administered at once, because the Mechanical Turk interface does not allow the researcher to contact multiple workers batch-wise. In addition, the very act of indicating like/dislike for morally-relevant social groups might have activated moral intuitions, thus decreasing the accuracy of the correspondence between the initial MF-AMP scores and the final character liking and self-report scores. Because of this, the final self-report scores were more closely a function of moral intuition accessibility after the social groups and character descriptions procedures. Future attempts to validate the MF-AMP should ideally keep the procedures short and avoid multiple testing procedures after the initial MF-AMP measurement.

The procedure of Study 1 was limited by the fact that the social groups and character descriptions chosen may have represented additional intuitions beyond their respective moral domains. Although every effort was made to ensure that the social groups and character descriptions used in Study 1 represented only their respective moral domains, some social groups and character descriptions might have also been associated with other moral domains. This not only led to less-than-ideal measurement model fits for the social groups and character descriptions, but also may have caused some MF-AMP scores to correlate to social groups and character descriptions of unrelated moral domains. Future attempts to test the validity of MF-AMP should ensure that the correlates chosen for testing are pure representations of their respective moral domains.

Notably, the MF-AMP was not used to predict behavioral measures in this dissertation. While study 3 did prime moral intuitions, it did not examine the influence of these primed intuitions on subsequent behavioral outcomes. Future attempts to test the validity of the MF-AMP should first prime moral intuitions and then measure the increased accessibility of the intuitions with the MF-AMP. After this, the influence of the primed intuitions on behavioral outcomes (such as donations, outgroup prejudice, etc.) should be examined.

### **Future Directions**

Future attempts to test the validity of the MF-AMP as a trait measure should improve upon correlates used in this research and also test the validity of the MF-AMP with new correlates. As just stated, the social groups and character descriptions should be purely representative of their respective moral domains. Future efforts meant to test the validity of the MF-AMP as a trait measure could use a two-step process in which correlates like social groups and character descriptions are first pilot tested to ensure they are sufficiently representative of their intended moral domains without meaningful overlap between moral domains.

Future efforts to test the MF-AMP could also examine whether the MF-AMP can predict additional outcomes. These could include the importance given to different moral values (such as helping, patriotism, obedience, etc.), social codes and, more specifically, the liking and appreciation of maxims and quotes that focus on distinct moral domains. Given that moral intuitions also influence an individual's lifestyle and broad moral outlook, MF-AMP scores also could be used to predict things such as religious adherence, and other personal moral practices such as charity, vegetarianism, etc. In order to examine if the MF-AMP can predict political beliefs and preferences, MF-AMP scores could be correlated with the extent to which people a) adhere to different political ideologies (such as conservatism/liberalism) and approve of related political parties and political outfits, b) approve of political hot-button issues related to distinct

moral domains (such as abortion, capital punishment, euthanasia etc.), and c) approve of political/legal interventions related to the upholding or violation of distinct domains of morality (such as affirmative action, immigration laws, etc.).

An individual's moral outlook and moral intuitions also influence her/his preference for other morally charged objects, such as media artifacts. MF-AMP scores could be used to predict preference for specific types/genres of songs, movies, and television shows. Given that the MF-AMP is well suited to measure the temporary accessibility of moral intuitions over short time periods, it could be used to predict real-time media choices, preferences such the decision to watch one TV show/channel over another, or decisions in gaming environments. Recent research has already begun to investigate the efficacy of the MF-AMP along these lines (Prabhu et al., 2014, Tamborini et al., 2016).

In order to gauge the validity of the MF-AMP as a state measure of moral intuitions, the MF-AMP could be administered to participants immediately after exposure to various mediated as well as non-mediated events. In a mediated context, the validity of the MF-AMP could be ascertained by administering it after both interactive and non-interactive media experiences. The MF-AMP could be administered after participants are exposed to non-interactive media such as clips from film, TV shows, internet videos, etc. These clips need not solely be related to entertainment media (as was the case in this research) but can also be news and infotainment related clips which touch upon concerns related to specific moral domains. The validity of the MF-AMP can also be tested by examining if it can detect changes in intuition accessibility after interactive media experiences, touching upon moral concerns such as video games involving moral dilemmas or focused discussions in internet chat rooms. The MF-AMP is well suited to measure the subtle shifts in moral structures caused by such experiences.

Various non-mediated events also influence temporary intuition accessibility, and these could be studied with the help of the MF-AMP. Numerous face-to-face interactions in everyday life are capable of eliciting moral intuitions. For example, instances of empathy could elicit care, cheating could elicit fairness, and so on. Future research could simulate such domain-upholding or domain-violating moral behavior (with the help of confederates) and examine if it can influence relevant scores on the MF-AMP. The influence of major socio-political events which grip public consciousness and continually influence moral intuitions could also be studied with the help of MF-AMP. Future research could administer the MF-AMP to participants shortly after they have been made aware of an event such as a terrorist attack or a major natural disaster to see if the MF-AMP can detect any changes in the accessibility of intuitions.

Future research should examine the impact of primed moral intuitions on subsequent behavioral outcomes. Procedures involving an interaction with a confederate (such as an act of generosity, cheating or loyalty) can be used to prime the moral intuitions, following which the MF-AMP can be administered to gauge if the moral intuitions have been primed in in the participants. After this, the impact of the primed intuitions on certain behavioral outcomes (such as donation behavior, respect for authority, acts of loyalty, etc.) can be observed. The MF-AMP could also be administered after the behavioral outcomes to examine if the behavioral outcomes further primed the moral intuitions.

# Conclusion

This research tried to establish the validity of the MF-AMP, both as a trait and state measure of moral intuitions. The results provide broad support for the MF-AMP in both capacities, thus establishing its usefulness in measuring the strength of moral intuitions. In some cases, the MF-AMP scale for a specific intuition also predicted correlates of other non-relevant moral domains. These could be because the correlates chosen to represent each moral domain

may, in some cases, have minor associations with other non-relevant moral domains. Future efforts along these lines could pre-test correlates to ensure that they are cleaner representations of their moral domains, and also further test the MF-AMP by examining its association with other types of correlates.

The MF-AMP has varied utility as a measure of moral intuitions. It can be used to predict various outcomes, as well as detect subtle changes in the accessibility of moral intuitions. As a trait measure it can be used independently or in combination with the MFQ (Moral Foundations Questionnaire) to predict outcomes such as moral judgment, moral behavior, and media liking/choice. As a state measure, it can be used to detect short-term increases in moral intuition accessibility following various mediated and non-mediated experiences. On the whole, the instrument has vast utility and applications, and is worthy of further inquiry.

### ENDNOTES

<sup>1</sup>Although another test of the MF-AMP, pertaining to cross-cultural differences in intuition accessibility between U.S., Indian and Mexican people, was proposed, it could not be carried out. This was because Mechanical Turk (the platform on which MF-AMP data from these countries was to be collected) had temporarily banned non-U.S. workers in the period following the proposal.

<sup>2</sup> Previous variants of the MF-AMP have combined responses with reaction times. For comparison purposes, the analyses reported in main text were carried out with combined response-reaction times, and are reported in Appendices E, F, G and H. In a procedure similar to the ones used for the RTs in social groups, cutoffs times were adopted (100 ms and 1500 ms) which eliminated slightly less than 10% of the data. Baseline reaction times were calculated from the average RTs of the asterisk (\*) trials, and the RTs and responses were combined in a manner similar to social groups and character descriptions.

APPENDICES

Appendix A: Social groups representing the five moral intuitions.

Moral				
Intuition		Soc	ial groups	
	Habitat for			
Care	Humanity	Peace Corps	Care givers	Charitable people
	Human Rights	Civil Rights		
Fairness	advocates	Associations	Social Activists	Fair Trade Federation
Loyalty	Relatives	Turncoats	Team mates	Fraternities/Sororities
		Military		
Authority	Soldiers	Officers	Bosses	Sheriffs
-		People who		
Purity	Angels	take drugs	Whores	Missionaries
		Good		
	Nice people	people	Pleasant people	Happy people
Control		Unpleasant		
201100	Sad people	people	Bad people	Not-so-nice people

Table 17. Social groups representing the five moral intuitions.

Appendix B: Character descriptions relevant to the five moral intuitions.

Moral								
Intuition		Character Descriptions						
Care	Understands the pain of others	Is kind and charitable	Is large- hearted and generous	Donates time to good causes				
Fairness	Treats everyone as equals	Is dishonest	Is fraudulent Breaks the	Is unfair and unjust				
Loyalty	Is always loyal to his group	Is a proud to be a member of his group Shows	trust of his group members	Is ashamed of his group				
Authority	Strongly disciplines his children	unquestioned obedience to authority	Follows the order of leaders	Supports traditional values				
Purity	Is spiritual	Is pure of body and mind	Is lewd and lustful	Indulges in carnal behavior				
Control	Is a nice person	Is a good person	Is pleasant	Is a happy person				
	Is not-so-nice	Is a bad person	Is unpleasant	Is a sad person				

Table 18. Character descriptions relevant to the five moral intuitions.

Appendix	C:	Adapte	d Disgus	t scale	used	in	Study	1.
							~ ~ ~ ~ ~	

Table 19. Adapted Disgust scale used in Study 1.

I might be willing to try eating monkey meat, under some circumstances.

It would bother me to see a rat run across my path in a park.

Seeing a cockroach in someone else's house doesn't bother me.

It bothers me to hear someone clear a throat full of mucus.

If I see someone vomit, it makes me sick to my stomach.

It would bother me to be in a science class, and see a human hand preserved in a jar.

It would not upset me at all to watch a person with a glass eye take the eye out of the socket.

It would bother me tremendously to touch a dead body.

I would go out of my way to avoid walking through a graveyard.

I never let any part of my body touch the toilet seat in a public washroom.

I probably would not go to my favorite restaurant if I found out that the cook had a cold.

Even if I was hungry, I would not drink a bowl of my favorite soup it if had been stirred with a used but thoroughly washed flyswatter.

It would bother me to sleep in a nice hotel room if I knew that a man had died of a heart attack in that room the night before.

Appendix D: The contents of the videos used in the six conditions.

# Table 20. The contents of the videos used in the six conditions.

# Care

A public service announcement featuring various caring images

A clip from *The Blind Side* in which a homeless person is offered shelter

A clip from *Charlotte's Web* in which the protagonist rescues a runt pig

A clip from *Cinderella Man* in which people lend the protagonist money for his family

A public service announcement in which a girl cuts her hair to support her cancerstricken brother

# Fairness

A scene from *Les Miserables* in which the protagonist admits his wrongdoing A scene from *Harrys Law* in which a lawyer talks about the importance of justice A scene from *Glory* in which black soldiers protest against inequitable pay A scene from *Law and Order* in which a lawyer implores the jury to justly punish an offender

# Loyalty

A scene from *Spartacus* in which his fellow slaves stand up for Spartacus A scene from *Coach Carter* in which players do push ups for their teammate A clip from *Suits* in which the protagonist demands loyalty from his friend A scene from *Hoosiers* in which a player steps down to support his coach A scene from *Rudy* in which team players step down to support a fellow team member

# Authority

A clip on the American military focusing on obedience A clip from *Merlin* where people proclaim "Long live the King" A clip in which Napolean's soldiers honor and celebrate him A speech from *MacArthur* focusing on duty, country and honor An interrogation from *A Few Good Men* focusing on the importance of orders A clip from *Battleship* in which the protagonist takes charge and gives orders

# Purity

A clip from *The Miracle of our Lady Fatima* which focuses on purity and divinity A clip from *The Lord of the Rings: The Two Towers* which focuses on holiness and divinity

A clip from Noah which features the Bible's account of how man was created

# Control

A documentary on the creation of the universe

Table 21. Partial correlations between MF-AMP (with RT) and social groups.								
						Purity		
		Care	Fairness	Loyalty	Authority	MF-		
		MF-AMP	MF-AMP	MF-AMP	MF-AMP	AMP		
Corro	r	0.059	0.04	0.025	0.044	-0.098		
Care		(-0.027,	(-0.046,	(-0.061,	(-0.042,	(-0.182,		
Groups	<i>C.I.</i>	0.144)	0.125)	0.11)	0.129)	-0.013)		
Oroups	р	0.097	0.187	0.292	0.167	0.985		
Foirmoss	r	-0.005	0.027	-0.049	-0.078	-0.09		
Fairness		(-0.09,	(-0.059,	(-0.134,	(-0.162,	(-0.174,		
Groups	<i>C.I.</i>	0.081)	0.112)	0.037)	0.008)	-0.005)		
Groups	р	0.543	0.277	0.862	0.958	0.976		
Lovalty	r	-0.012	0.041	0.04	-0.075	-0.079		
Loyalty		(-0.097,	(-0.045,	(-0.046,	(-0.159,	(-0.163,		
Groups	<i>C.I</i> .	0.074)	0.126)	0.125)	0.011)	0.007)		
	р	0.605	0.182	0.186	0.951	0.96		
Authority	r	0.018	-0.001	0.006	0.150*	-0.007		
Social		(-0.068,	(-0.086,	(-0.08,	(0.065,	(-0.092,		
Groups	<i>C.I</i> .	0.103)	0.085)	0.091)	0.233)	0.079)		
Groups	р	0.345	0.511	0.448	0.001	0.563		
Descitor	r	-0.049	-0.059	-0.034	-0.046	-0.058		
Fully		(-0.134,	(-0.144,	(-0.119,	(-0.131,	(-0.143,		
Groups	<i>C.I</i> .	0.037)	0.027)	0.052)	0.04)	0.028)		
Oroups	р	0.859	0.905	0.777	0.847	0.899		

Appendix E: Partial correlations between MF-AMP (with RT) and social groups.

Note. $* = p < .05$ .	The highest corr	relation in eac	th row are l	bolded. Partia	l correlations	control for
control words and	handedness					

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						Purity
		Care	Fairness	Loyalty	Authority	MF-
		MF-AMP	MF-AMP	MF-AMP	MF-AMP	AMP
	r	-0.018	0.001	-0.081	-0.082	-0.163
Care		(-0.103,	(-0.085,	(-0.165,	(-0.166,	(-0.245,
Characters	<i>C.I</i> .	0.068)	0.086)	0.005)	0.004)	-0.079)
	р	0.654	0.49	0.964	0.966	>0.999
	r	-0.041	-0.026	-0.027	-0.055	-0.191
Fairness		(-0.126,	(-0.111,	(-0.112,	(-0.14,	(-0.272,
Characters	<i>C.I</i> .	0.045)	0.06)	0.059)	0.031)	-0.107)
	р	0.816	0.715	0.723	0.889	>0.999
	r	-0.015	0.019	-0.01	-0.127	-0.089
Loyalty		(-0.1,	(-0.067,	(-0.095,	(-0.21, -	(-0.173,
Characters	<i>C.I</i> .	0.071)	0.104)	0.076)	0.042)	-0.004)
	р	0.631	0.339	0.591	0.998	0.975
	r	0.04	-0.002	0.013	0.142*	-0.022
Authority		(-0.046,	(-0.087,	(-0.073,	(0.057,	(-0.107,
Characters	<i>C.I</i> .	0.125)	0.084)	0.098)	0.225)	0.064)
	р	0.191	0.517	0.39	0.001	0.685
	r	-0.075	-0.051	-0.05	-0.063	-0.077
Purity		(-0.159,	(-0.136,	(-0.135,	(-0.148,	(-0.161,
Characters	<i>C.I</i> .	0.011)	0.035)	0.036)	0.023)	0.009)
	р	0.951	0.869	0.865	0.918	0.956

Appendix F: Partial correlations between MF-AMP (with RT) and character liking.

Table 22. Partial correlations between MF-AMP (	(with RT) a	nd character liking.
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Note. \* = p < .05. The highest correlation in each row is bolded. Partial correlations control for control words and handedness

						Purity
		Care	Fairness	Loyalty	Authority	MF-
		MF-AMP	MF-AMP	MF-AMP	MF-AMP	AMP
DVO	r	0.012	0.067	-0.048	-0.089	-0.046
PVQ -		(-0.074,	(-0.019,	(-0.133,	(-0.173, -	(-0.131,
(Care)	<i>C.I</i> .	0.097)	0.152)	0.038)	0.004)	0.04)
(Calc)	р	0.396	0.071	0.857	0.976	0.844
DVO	r	0.021	0.105*	-0.06	-0.132	-0.042
PVQ -		(-0.065,	(0.02,	(-0.145,	(-0.215, -	(-0.127,
(Fairness)	С.І.	0.106)	<b>0.189</b> )	0.026)	0.047)	0.044)
(1 anness)	р	0.323	0.01	0.909	0.999	0.826
	r	0.079*	0.005	0.072	0.098*	0.081*
Group Loyalty		(-0.007,	(-0.081,	(-0.014,	(0.013,	(-0.005,
(Loyalty)	<i>C.I</i> .	0.163)	0.09)	0.157)	0.182)	0.165)
	р	0.041	0.46	0.057	0.015	0.038
PVQ - Conformity (Authority)	r	-0.01	-0.028	0.014	0.067	0.052
		(-0.095,	(-0.113,	(-0.072,	(-0.019,	(-0.034,
	<i>C.I</i> .	0.076)	0.058)	0.099)	0.152)	0.137)
	р	0.589	0.728	0.378	0.07	0.125
Disgust (Purity)	r	0.039	-0.035	0.013	-0.001	0.080*
		(-0.047,	(-0.12,	(-0.073,	(-0.086,	(-0.006,
	С.І.	0.124)	0.051)	0.098)	0.085)	0.164)
	р	0.193	0.778	0.387	0.507	0.038

Appendix G: Partial correlations between MF-AMP (with RT) and self-report scales.

Table 23. Partial correlations between MF-AMP (with RT) and self-report scales.

Note. \* = p < .05. The highest correlation in each row is bolded. Partial correlations control for control words and handedness
Table 24. Contrast ANOVAs with MF-AMP scores (with RT).						
		Care	Fairness	Loyalty	Authority	Purity
		MF-	MF-	MF-	MF-	MF-
		AMP	AMP	AMP	AMP	AMP
Care Condition	t	2.560*	1.388	1.150	-0.154	0.896
Contrast	р	0.006	0.083	0.126	0.561	0.186
Fairness Condition	t	-0.827	-0.230	-0.272	0.120	-0.108
Contrast	р	0.796	0.591	0.607	0.453	0.543
Loyalty Condition	t	0.415	0.030	-0.079	-0.118	-0.990
Contrast	р	0.339	0.488	0.532	0.547	0.839
Authority Condition	t	1.783*	0.992	0.229	2.264*	0.798
Contrast	р	0.038	0.161	0.410	0.012	0.213
Purity Condition	t	-0.707	-0.074	0.073	-0.678	0.758
Contrast	p	0.760	0.530	0.471	0.751	0.225
Note $* \sim 05$						

Appendix H: Contrast ANOVAs with MF-AMP scores (with RT).

Note. \* = p < .05.

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