The effect of moral intuitions on decisions in video game play: The impact of chronic and temporary intuition accessibility

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Abstract
The model of intuitive morality and exemplars (MIME) highlights the central influence of innate moral instincts (or intuitions) in media use. Recent experimental research on the MIME found that moral intuitions that are chronically accessible in video gamers are likely to influence players to uphold related moral principles in the game. This study replicated and extended this research to examine the influence of both chronic and temporary accessibility of moral intuitions. Discussion focuses on the prospect that while chronic accessibility should be a better predictor of behavior in most cases, there are proximal in-game instances where environmental cues temporarily increase the accessibility of other moral intuitions. This suggests that (a) players do not necessarily disengage their morals during gameplay, and that moral intuitions influence their in-game decisions, and that (b) this influence is not fixed, but can be continuously modulated by game design features.

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Video games provide players with fertile space in which they can behave in any number of ways, stretching from the fantastical to the hyper-realistic. Although certainly not the first to make this claim, Grodal (2000) argued that one of the great pleasures of video games is their ability to allow players exploration of their identity and personality within the (possibly) safe confines of digital space. However, questions about the social implications of the agency to explore different identities arise when players are given the freedom to commit acts that are normatively considered to be immoral (including violent behaviors such as shooting people). For example, historically violent games such as Death Race (released 1976), Mortal Kombat (1992), and the Grand Theft Auto series (2001 to present) have served as flashpoints in the public debate regarding gaming and immoral behavior (Kocurek, 2012).

In response, media scholars have offered accounts that can explain how violent gameplay might not desensitize players to moral concerns after all. These accounts include strategies related to moral disengagement (Hartmann and Vorderer, 2010) or self-reported guilt reactions (Grizzard et al., 2014; Hartmann et al., 2010) as well as the use of strategic rather than moral decision-making heuristics—particularly among inexperienced players (Krcmar and Cingel, 2016). However, one potential explanation that has yet to receive empirical attention is the prospect that some players might not be desensitized to on-screen content because they consistently draw upon preconscious moral values during gameplay. This area of study is relevant not only because of the emergence of video games built specifically around moral decisions, in which decidedly moral decisions are a core component of gameplay (Oliver et al., 2015), but also in exploring the prospect that players’ moral values actively influence gameplay (Boyan et al., 2015; Joeckel et al., 2012; Krcmar and Cingel, 2016). It becomes even more compelling if we include the possibility that accessing moral values during gameplay may actually prevent players from committing moral transgressions. A great deal of research on video games, including the aforementioned studies that argue that video games do not lead to moral degradation, operates under the assumption that gamers committing morally contentious acts is a given. By contrast, our study presumes that decision making in gameplay is a complex process, which may include the influence of moral instincts that can actively inhibit the violation of salient moral principles.

Based on this presumption, our study explores how this process of moral engagement can be influenced by both innate trait-like factors and environmental cues within the game. A recent study exploring the possibility that gamers’ moral instincts guide gameplay has shown that moral intuitions deeply rooted in the player can influence decision making in video games (Joeckel et al., 2012). However, the procedures used in that study measured a relatively deep-seated and stable dimension of moral intuitions. As such, its findings tested whether the pre-existing strength of moral intuitions (prior to gaming
experience) could influence decision making during gameplay. By showing an effect on decision making, this research supported the model of intuitive morality and exemplars’ (MIME; Tamborini, 2013) proposition that moral intuition salience can predict media use. However, a deeper read of MIME also describes a reciprocal association between media content and moral intuitions by which exposure to content can at times make some moral considerations more salient than others—that is, making some moral concerns temporarily accessible. In turn, this temporary change in accessibility could influence a player’s in-game decisions.

Recent research hints of the possibility that moral shifts can occur in players during gameplay. For example, research on guilt reactions during gameplay shows that players who commit immoral acts feel guilt which can make moral concerns salient (Grizzard et al., 2014), and research asking players to articulate their decision making in situ (Krcmar and Cingel, 2016) suggests that they actively reflect on moral concerns during gameplay. However, studies have yet to examine the possibility that a temporary moral shift can influence subsequent gameplay decisions. To address this gap in the literature, this study explores the role of both chronic and temporarily induced moral salience in understanding players’ reactions to video game content. In doing so, we address broader issues related to the influence of gameplay and other media from a dynamic perspective.

**MIME**

The MIME (Tamborini, 2013) explains how media can influence primordial mental systems related to humans’ fundamental sense of right and wrong and how these systems in turn affect media-relevant and real-world choices. Combining logic from exemplification theory and moral foundations theory (MFT; Haidt and Joseph, 2007), the MIME suggests that exposure to media featuring content that exemplifies the upholding or violating of moral principles will increase the accessibility of related moral instincts (termed as moral intuitions) through both short-term and long-term processes.

The MIME proposes a reciprocal influence of media and its audiences. The moral intuitions of audiences guide their reactions to media content, and the media content in turn influences the salience of these intuitions. More specifically, in the short term, these intuitions impact our initial reactions to content—for example, an individual sensitive to concerns over care and harm would initially react very negatively to a violent film or video game (Joeckel et al., 2012; Tamborini et al., 2012). The short-term component of the MIME also suggests that media exposure in turn can temporarily activate related moral intuitions in the minds of audiences. Support for this suggestion can be found in previous research that shows viewing media content containing exemplars of care- and fairness-related principles, for instance, will increase the accessibility of the care and fairness intuitions in audiences (Tamborini et al., 2016; Tamborini et al., in press). The MIME’s long-term component suggests that repeated exposure to media exemplifying specific moral principles can make related moral intuitions chronically accessible in audiences. Support for this part of the model has been shown in research demonstrating that repeated exposure to media content can influence the accessibility of related moral principles and intuitions (Eden et al., 2014; Tamborini et al., 2012).
Moral intuitions described in the MIME

The moral intuitions described in the MIME are the mental systems described in MFT (Haidt and Joseph, 2007). MFT argues that moral judgment is the product of a two-system psychological process that comprised intuitive and deliberative mechanisms. In contrast to many previous understandings of morality that argue moral judgment is an entirely rational process (Kohlberg, 1984), MFT conceptualizes moral decision making as largely the result of intuitive or gut-level responses and only partially the result of rational, deliberative processes. For example, when evaluating notions of harm or cheating, intuitive gut-level responses are triggered, which usually lead individuals to deem these behaviors as immoral. Although MFT argues that both systems play important roles in moral judgment, it suggests that the intuitive system (which relies more on affect) weighs heaviest in decision making; the rational system is used more by individuals as a post hoc justification for their decisions (Haidt, 2001). In this vein, one might expect that when gamers are presented with moral decisions during gameplay, such as whether to shoot another character or player, intuitive gut reflexes related to morality may influence the player to shoot or not. Players may never think about this decision, but if they did, their deliberative system might be used to justify their choice along strategic lines.

The mental systems identified in MFT are evolutionarily developed sensitivities that produce intuitive gut reactions to five distinct domains of social behavior and the upholding/violation of moral principles related to them. These mental systems (identified above as moral intuitions) are as follows: care (pertaining to principles of compassion and concern for others’ welfare), fairness (relating to notions of equity and justice), loyalty (concerned with bias toward ingroup and against outgroup), authority (suggesting an obedience toward legitimate hierarchies), and purity (related to principles dealing with living a noble life and separating oneself from basal tendencies).

MFT describes a moral intuition as a cognitive mechanism that automatically produces affect in response to a specific type of stimuli. The MIME explicates the affective mechanisms of the moral intuitions using logic from Lazarus (1991), which proposes that humans have evolutionarily based instinctive motivations that shape emotional responses to beneficial goals. Positive affect would result from environmental input patterns that are consistent with evolutionarily beneficial moral principles, while negative affect would result from input patterns that are inconsistent with these principles. For instance, the care intuition is associated with the principle of helping others. Positive affect may spontaneously arise when an individual witnesses an act of care and compassion toward somebody in need. By contrast, he or she may experience negative affect in response to observing an act of cruelty. In a video game setting, moral intuition may influence the player to make decisions that are consistent with their moral principles. For example, if a game scenario involves an act of cheating (which violates the moral principles associated with fairness), the fairness intuition in the player may make him reluctant to commit the act, even if it is strategically beneficial to do so. MIME logic would suggest that the likelihood of the player committing this violation will depend on how strong the fairness intuition is in the player.
The chronic and temporary accessibility of moral intuitions

According to MFT, although the five moral intuitions are present in all humans, the strength of each intuition will vary within each person. These may be due to differences in biological makeup or upbringing. For example, in reference to the above example, consider a player in whom the fairness intuition is very strong, and who would never commit an act of cheating in gameplay, in comparison with another player who only sporadically avoids cheating in gameplay. In this case, the first player is able to readily access the fairness intuition in order to process stimuli, while the second player is not able to consistently access the same intuition as easily. Thus, the MIME describes the activation levels of moral intuitions in terms of accessibility.

The MIME further suggests that media use can influence the accessibility of intuitions within each person as well. The model utilizes logic from exemplification theory (Zillmann and Brosius, 2002) to claim that more recently and frequently activated intuitions will be more accessible. In accounting for the influence of recency and frequency of intuition activation on subsequent accessibility, the MIME conceives moral intuitions as a dynamic construct, one which both constantly influences reactions to media and in turn is influenced by content. Thus, this model can shed light on the complex intertwined mechanisms of appraisal and influence that are involved in real-time media experience.

The MIME outlines two dimensions of accessibility: chronic and temporary. The chronic accessibility of intuitions refers to a stable, baseline level of accessibility that may be the result of biological factors as well as long-term cultural and environmental influence. While this dimension of accessibility is likely to remain consistent over long periods of time, the MIME reasons that short-term environmental factors can also temporarily make some intuitions more accessible. Specific to media on a real-time basis, the MIME reasons that even brief exposure to a fleeting exemplar highlighting a moral principle can temporarily increase the accessibility of a related intuition and in turn influence subsequent reactions to other exemplars highlighting the moral principles related to the same intuition. For example, watching a scene in which a mother feeds her hungry child (a subtle exemplar highlighting a care-related principle) could temporarily increase the accessibility of care intuition, which would lead to increased enjoyment of a subsequent scene in which she commits a major sacrifice for the well-being of others. This form of accessibility, temporarily induced by fleeting stimuli, is an important consideration in media experience and video game play alike. The MIME claims that although the pattern of chronic accessibility of moral intuitions is most likely to influence moral decisions, a temporary increase in a specific moral intuition can sometimes override the effect of a chronic pattern. For example, the chronic accessibility of loyalty may be substantially higher than other intuitions in a person, usually leading the individual to uphold loyalty over care. However, if short-term exposure to a care-related stimulus temporarily increases the accessibility of the care intuition, that person might choose to uphold care over loyalty in that particular moment. In terms of media influence, both chronic and temporary accessibility have played a primary role in examinations of the media’s short-term (cf. Nelson and Norton, 2005) and long-term social influence (cf. Mastro et al., 2007), respectively.
Intuition accessibility and video game play

Past studies exploring the influence of chronic intuition accessibility on decisions during gameplay suggest that active decisions made by players are often informed by enduring moral values. Joeckel et al. (2012) found that gamers were significantly less likely to violate a moral principle that was chronically accessible in them—such as a player sensitive to fairness concerns avoiding fairness violations. Conversely, violations of non-salient moral principles were difficult to predict, suggesting a comparatively unbiased decision-making process. Put another way, players were observed making random game decisions when chronic moral concerns were absent, but more intuitive gut decisions when a game attempted to challenge a strongly held moral concern.

In a survey of Mass Effect players, Boyan et al. (2015) found that an increased accessibility of the harm/care intuition was associated with making in-game decisions aligned with the paragon (heroic) style of gameplay rather than the renegade (villainous) one. Similar work by Lange (2014) also found that gamers tend to play heroic roles in their first play-through of a video game, somewhat because they (a) felt guilt when committing immoral acts and (b) felt as if the games were designed to punish immoral behavior. From this research, it is clear that the moral sensitivities players bring to a video game or virtual world have a substantial impact on how they engage the game. However, the above studies and similar others all consider morality at the chronic accessibility level, without examining more phasic or temporarily induced accessibility that might be triggered by the game environment itself. Accordingly, we propose a hypothesis that takes into account the combined effect of chronic and temporary accessibility of moral intuitions on video game play:

$H1$. The accessibility (chronic and temporarily induced) of a moral intuition will influence the player to make in-game decisions that uphold its related moral principles.

Method

Participants

Non-Chinese-speaking students ($N=219$) enrolled in communication courses in a large Midwestern university were recruited for the study. Students who could read and understand Chinese were ineligible for inclusion because Chinese characters were used to create ambiguous stimuli for our temporary moral accessibility measure. The recruited students had already completed the Moral Foundations Questionnaire (MFQ) earlier in the semester. Two factors caused attrition of the 222 original students. First, nine participants did not report demographic data and video game history (which were used as covariates in our analyses). Second, 24 participants failed to meet the attention-check criteria for the MFQ, suggested on the official MFT website (www.moralfoundations.org). This left 186 subjects ($n_{female}=125$, $M_{age}=19.67$ years, $SD_{age}=2.57$ years) who constituted the final sample for analysis.
Procedure

Upon arrival at the laboratory, participants were seated at a computer station with a set of headphones, a map of the game world for the game they would play, and a sheet with basic instructions for gameplay. After signing the consent form, a research assistant instructed the participants to complete the moral foundations–affect misattribution procedure (MF-AMP). Once finished, the assistant introduced the study as a test of a new computer program designed to study interpersonal interactions through a computer simulation and instructed participants to load the game and choose an avatar. The game controls and instructions were read out loud. Using screen-sharing software, participants watched the research assistant’s screen and followed along during a guided tutorial of gameplay and a practice interaction which possessed no moral undertones. Participants were guided until the end of the practice interaction, after which they were told to complete a short survey on the side of their screen. Once this was completed, the research assistant instructed participants to follow the order of interactions outlined on the map they were provided and complete the questionnaire after each interaction. Once all interactions were finished, the participants completed a post-game survey and were dismissed.

Stimulus materials

A customized version of the video game *Neverwinter Nights* was used in this study—the same used by Joeckel et al. (2012). The game requires players to help an aging, beloved professor find six items (journal entries) by interacting with six non-player characters (students). The six interactions coincided with five pretested moral scenarios and one foil scenario in the following order: harm/care (in a bar room altercation), authority/respect (ordered by an authority to clear blight), fairness/reciprocity (reward children who worked on an orchard with equal pay), foil scenario (no moral principles reflected, a woman who has dropped her goods in a puddle of mud), ingroup/loyalty (advising a son whether to stay with the family business), and purity/sanctity (deciding whether to advise someone to jump into foul-smelling mud which was alleged to feel good). Participants’ in-game decisions were unobtrusively stored by the game during gameplay. Past work has validated the interpretation of these scenarios with four distinct populations (US children and elderly gamers, German children, and elderly users), and both the scenarios and validation data are freely available at http://onmediatheory.blogspot.de/2012/09/gut-or-game-experimental-design.html.

Measuring the accessibility of moral intuitions

*Chronic accessibility.* We utilized the MFQ (Haidt et al., 2006) to measure the chronic accessibility of intuitions. The MFQ is a widely used scale (Graham et al., 2009) and purports to measure the chronic accessibility of moral intuitions as manifested in concrete moral beliefs and attitudes. These beliefs and attitudes are assumed to be stable over periods of time and not easily influenced by momentary considerations. The measure is split into “statement” (e.g. “Justice is the most important requirement for a society”) and “relevance” items (e.g. “Whether or not someone conformed to the traditions of society”).
Participants responded on a 6-point Likert scale, with low scores representing lower accessibility.

The internal consistency of the items in the MFQ representing each intuition was considered to be acceptable (Cronbach’s α: care α = .61, fairness α = .64, loyalty α = .56, authority α = .63, and purity α = .60). Although these reliabilities may appear low, they do not necessarily signify the lack of validity of these scales, given that their validity has been widely established both in real-world (Graham et al., 2009, 2011) and mediated contexts (Eden et al., 2014; Joeckel et al., 2012). Given their demonstrated predictive validity, Graham et al. (2011) argued that the lower reliabilities associated with these scales are likely the result of the substantial theoretical breadth of the constructs they measure. In order to accurately represent the various facets of these moral intuitions, the questionnaire uses items that may differ in broad thematic terms (e.g. the authority scale includes items related to the military, traditions, and gender roles), but are nevertheless all rooted in the fundamental psychological construct (the respective moral intuition) that binds them. In order to ensure that the findings related to this scale are comparable between studies, the scale was used with all items intact. Finally, it is important to note that lower reliabilities have been typically shown to attenuate findings. As such, we would expect any findings associated with this measure to be conservative.

**Temporarily induced accessibility.** Given the practical constraints in continuously measuring intuition accessibility during gameplay, we devised an instrument that could estimate fluctuations in intuition accessibility that result from exposure to fleeting stimuli which are not necessarily concrete or substantive in nature. To measure the extent to which accessibility can be temporarily induced by subtle cues (which may not even be consciously acknowledged), we utilized an MF-AMP, an instrument which measures pre-conscious affective responses to highly transient stimuli representing the moral intuitions. We adapted this measure from an AMP (Payne et al., 2005), which has demonstrated predictive validity (Payne et al., 2005), as well as reliable measurement of affect-specific constructs. Given its ability to indicate the sensitivity of the participant’s moral intuition to ephemeral stimuli, we surmised it would provide us with a reasonable estimate of the extent to which the participant’s moral intuition would be activated by subtle environmental cues during media exposure, such as during video game play. As such, the MF-AMP score was used to represent the temporarily induced accessibility of intuitions for each participant.

AMPs instruct participants to decide whether an ambiguous stimulus is pleasant or unpleasant. Before exposure to the ambiguous stimulus, participants briefly view a target stimulus (presented only for 75 ms), which they are told to disregard. Despite the intent to ignore the target, this stimulus is predicted to influence participants’ subsequent judgments of the ambiguous stimulus as pleasant or unpleasant. Thus, a pleasant target stimulus will induce a pleasant response to an ambiguous character, while an unpleasant target will do the opposite.

The MF-AMP used in our procedure is specifically built to measure the consistency and readiness with which a moral intuition responds (by producing affect) to words representing the moral principle relevant to the intuition. The target stimuli consist of words representative of the moral principle associated with a moral intuition, whereas the
ambiguous stimuli consist of Chinese characters. First, an intuition-relevant word appears for 75 ms, followed by a Chinese character that flashes for 100 ms. Finally, a gray square showing video fuzz acts as a visual noise barrier. This square disappears as soon as participants make judgments of the Chinese character as pleasant or unpleasant. The target stimuli included both positively valenced (i.e. upholding a specific intuition’s moral principle) and negatively valenced (i.e. violating a specific intuition’s moral principle) words. For example, the target word compassion upholds the care intuition, while the word disloyal violates the loyalty intuition.

Temporary increases in the accessibility of a moral intuition are strongly dependent on whether that intuition can be temporarily activated by subtle environmental stimuli. This is based on exemplification theory’s contention that recency of activation can influence subsequent accessibility. If the valence of a subtle intuition-related target does not influence the participant’s eventual response to the ambiguous stimulus, pleasantness judgments will follow a random pattern, indicating that the participant’s sensitivity to fleeting stimuli related to that specific intuition is low. Accordingly, the participant is unlikely to experience temporary increases in the accessibility of that intuition. In contrast, judgments of an ambiguous stimulus as pleasant following an intuition-upholding word, or judgments of an ambiguous stimulus as unpleasant following an intuition-violating word, indicate that the participant is sensitive to fleeting stimuli related to the intuition. Hence, the participant’s moral intuition is more likely to be activated by fleeting-relevant stimuli, making it likely that the subtle, ephemeral stimuli in the game will increase its accessibility. Although not an exact measure of intuition accessibility which may be temporarily induced during a game, measuring temporal in-game accessibility changes without disrupting game experiences was unfeasible. We believed that this measure provided the best possible indicator of temporal change in intuition accessibility induced by fleeting cues in the game environment.

Each trial in the MF-AMP consists of a target stimulus (a word representing a moral intuition) randomly paired with a Chinese character. Each moral intuition was represented by four different words, and each word appeared four times for a total of 16 trials per intuition (care: compassion, kindness, cruel, violence; fairness: fairness, honesty, dishonest, unfair; loyalty: betray, disloyal, foreigner, unfaithful; authority: tradition, disobedience, insubordinate, rebellious; purity: god-like, incest, prostitute, repulsive). The words included were selected based on the level of internal consistency and predictive validity they demonstrated in previous research (Prabhu, 2016). For 10 control trials, an asterisk (*) appeared in place of a word. This measure enabled us to establish a baseline reaction time (RT) for each participant.

In order to account for the accessibility of intuitions, the MF-AMP records the consistency and readiness with which positive/negative affect is generated by brief exposure to upholding/violating words. The instrument records (a) the consistency of participants’ pleasant/unpleasant judgments in response to relevant upholding/violating words and (b) weights each response by the RT for that response in order to account for the readiness with which the response was generated. A pleasant judgment of an ambiguous stimulus after an intuition-upholding target and an unpleasant judgment of an ambiguous stimulus after an intuition-violating target are coded as 1. Conversely, an unpleasant judgment of ambiguous stimuli after an intuition-upholding word and a pleasant judgment of an
ambiguous stimulus after an intuition-violating word are coded as 0. An overall measure of accessibility for each trial was created using the following formula, which accounted for both RT and response code (1/0) measures. First, all RTs under 300 ms were capped at 300 ms, and all RTs >3000 ms were capped at 3000 ms (Greenwald et al., 1998). Second, a participant’s baseline RT was created by averaging RTs for all 10 control (asterisk) trials. Third, the participant’s RT for every trial was divided by the baseline RT to provide a standardized time for each trial. Finally, the reciprocal of the standardized RT was multiplied by the response code to obtain the overall measure of accessibility for each trial. In addition to intuition-related words, four control words (happy, sad, exciting, bored) were flashed four times, and the composite of these 16 words was subtracted from the composite for each intuition. This was done to control for artifacts related to alertness. The internal consistency of the items representing each intuition was considered to be acceptable (Cronbach’s α: care α = .90, fairness α = .91, loyalty α = .86, authority α = .90, purity α = .90, and control = .83).

Results

Prior to testing our core hypothesis, we first examined the relative accessibility of the five moral intuitions assessed in this study. For these tests, multivariate repeated-measures analysis of variance (ANOVA) was performed on the mean scores of the intuitions, and separate analyses were conducted for both the MF-AMP and MFQ scores. Both the MFQ and MF-AMP indicated a significant overall difference between the accessibility of the five moral intuitions—MFQ: $F(4, 181) = 6.33$, $p < .001$, $\eta^2_p = .51$; MF-AMP: $F(4, 181) = 37.30$, $p < .001$, $\eta^2_p = .45$. Post hoc Bonferroni pairwise comparisons showed care and fairness to be the most accessible intuitions by far. While significant differences did exist between the other three intuitions in some cases, the descriptive statistics presented in Table 1 indicate that care and fairness means on both measures were several standard errors higher than the means of the other three intuitions.

Following this, a multivariate repeated-measures ANOVA was used to calculate which of the five moral principles was upheld the most. The decision to uphold the moral principle in each intuition’s scenario was coded as 1, versus the decision to violate, which was coded as 0. Results showed a significant overall difference between the extent to

<table>
<thead>
<tr>
<th></th>
<th>Care</th>
<th>Fairness</th>
<th>Loyalty</th>
<th>Authority</th>
<th>Purity</th>
</tr>
</thead>
<tbody>
<tr>
<td>MFQ</td>
<td>4.58 (0.05)</td>
<td>4.50 (0.05)</td>
<td>4.03 (0.05)</td>
<td>4.12 (0.05)</td>
<td>3.73 (0.06)</td>
</tr>
<tr>
<td>MF-AMP</td>
<td>0.29 (0.03)</td>
<td>0.19 (0.02)</td>
<td>−0.01 (0.02)</td>
<td>0.06 (0.02)</td>
<td>0.08 (0.03)</td>
</tr>
<tr>
<td>Uphold decision proportion</td>
<td>0.90 (0.03)</td>
<td>0.93 (0.02)</td>
<td>0.62 (0.04)</td>
<td>0.61 (0.04)</td>
<td>0.44 (0.04)</td>
</tr>
</tbody>
</table>

MFQ: Moral Foundations Questionnaire; MF-AMP: moral foundations–affect misattribution procedure. Estimated marginal means and standard error reported, with larger means within rows in bold. Means with different subscripts within rows differ at the $p < .05$ level or higher.
which each of the five moral principles (each represented in one scenario) was upheld, $F(4, 129) = 35.36, p < .001, \eta^2_p = .52$. Post hoc Bonferroni pairwise comparisons presented in Table 1 show a pattern that is near identical to the pattern of intuition accessibility. The scenarios related to care and fairness had the least violations of their respective moral principles, wherein the upholding means for care and fairness were several standard errors above the means for the other moral intuitions.

Notably, the parallel between intuitions that are most accessible in players and most upheld in gameplay is based on aggregate figures, and it does not take into account individual differences in the accessibility of intuitions and how these might differentially predict the probability of these intuitions being upheld in gameplay. In order to further substantiate the claim that moral intuition accessibility corresponds to the decision to uphold related moral principles, a binary logistic regression was created for each of these five intuition-related scenarios, such that the player’s decision to uphold or violate the moral principle highlighted in that scenario was the dependent variable, and the chronic (MFQ score) and temporary (MF-AMP score) accessibility of the relevant moral intuition (i.e. the moral intuition relevant to the moral principle in the scenario) were the predictors.

H1 predicted that the accessibility of a moral intuition would influence the player to uphold related moral principles during gameplay. Because we believe that both enduring and fleeting forms of intuition accessibility can influence behavior, the combined influence of both chronic and temporary accessibility of each intuition was considered as the relevant predictor of player choice.

The binary logistic regression for each of the five in-game decisions was structured in the following manner. For each in-game decision, the player’s choice to uphold (coded as 1) or violate (coded as 0) the moral principle was entered as the dependent variable. Demographic and background variables were controlled for gender, age, and gaming experience when entered in the first block of predictors. In the second block, the variables representing the temporary (MF-AMP) and chronic (MFQ score) accessibility of the moral intuition relevant to the moral principle in that scenario were entered as predictors. For example, if the scenario required the player to uphold or violate a care-related principle, then the MFQ composite for care and MF-AMP composite for care were entered as predictors in the second block. Thus, the second block represented the combined influence of temporary and chronic accessibility and the overall influence of moral intuition accessibility on player choice.

The results of the five regression analyses showed that the first block, consisting of control variables, was significant for the separate analyses for decisions related to care ($\Delta \chi^2 = 12.49, p < .01$) and fairness ($\Delta \chi^2 = 7.52, p = .06$), with gender being a significant predictor in both analyses (care $B = 1.67, p < .01$, $Exp(B) = 5.32$; fairness $B = 1.22, p = .09$, $Exp(B) = 3.40$). Additionally, gaming experience was a significant predictor of fairness ($B = 0.86, p = .02$, $Exp(B) = 2.35$). More importantly, the second block, which was the block of theoretical interest, added a significant amount of variance for three of the five scenarios: care ($\Delta \chi^2 = 7.34, p = .03$), loyalty ($\Delta \chi^2 = 5.97, p = .05$), and authority ($\Delta \chi^2 = 10.30, p < .01$).

Notably, the significant effect for the second block in analyses on the care decision was driven by the temporary accessibility of the care intuition (care MF-AMP $B = 2.67, p = .02$, $Exp(B) = 14.46$). Similarly, the significant effects for the second block in analyses
on both the loyalty and authority decisions were driven, respectively, by the chronic accessibility of the loyalty intuition (loyalty MFQ $B=0.58$, $p=0.04$, $\text{Exp}(B)=1.79$) and the authority intuition (authority MFQ $B=0.75$, $p<0.01$, $\text{Exp}(B)=2.12$).

**Discussion**

The results indicated a correspondence between intuition accessibility and the player’s choice to uphold related moral principles in two ways. First, the two intuitions that were dominantly accessible in the minds of the participants were also almost universally likely to be upheld in game scenarios. Second, binary logistic regression showed that three of the five decisions were significantly predicted by relevant intuition accessibility, with effect for the care decision being driven by temporary accessibility of care and the effect for loyalty and authority being driven by chronic accessibility of those intuitions. Taken together, we believe that our findings largely support the study’s central hypothesis which predicts that the accessibility of moral intuitions (consisting of chronic and temporary elements) prompts the player to uphold (rather than violate) related moral principles in gameplay.

Past work has found that a player’s sense of morality—be it intuitive or rational—has an impact on that person’s actions when playing video games. In general, such work suggests that when given the opportunity, players tend to make moral decisions in line with their own moral orientations. However, most of this work has only considered an individual’s chronic sense of morality rather than the possibility for temporary fluctuations that might stem from one’s immediate environment. That is, past work has only looked at the intuitive moral foundations that participants chronically access and bring to the video game (the first step in MIME) and have not looked at the reciprocity between game content and the resultant temporary accessibility of foundations not normally so highly available or taken into account by players. This second step is critically important, as it speaks to the potential for ephemeral cues in media content—in this case, video game play—to demonstrably impact subsequent responses to moral stimuli.

However, our observation that temporary and chronic accessibility predicted player choice differently suggests the need for closer inspection. For two scenarios (loyalty and authority), chronic accessibility as measured by MFQ was a better predictor of player behavior than temporary accessibility as measured by MF-AMP. The fact that chronic accessibility was more important in predicting player behavior than temporary accessibility is consistent with the notion that these enduring characteristics would positively predict behavior unless some cue in the environment were to override that response. This might suggest that players are likely to follow enduring instincts to uphold moral intuitions in most instances, unless there is something in the environment that cues them to do otherwise. This would indicate that in our study, response to the care scenario was triggered by something that made the care intuition temporarily accessible. This finding aligns with other work on care and harm decisions and gameplay (Boyan et al., 2015; Lange, 2014). In both of those studies, as well as larger discussions of morals in video games, care and harm considerations tended to be made rather obvious in aspects of gameplay. This might have been the case in our study as well, as the very premise of the game involved helping arrange a retirement gathering for an aging, beloved professor in
need of help—as well as helping others with their various trials and tribulations. Thus, the very purpose of the game (which involved care-related considerations) might have served as a more subtle game environment trigger, temporarily increased the accessibility of the care intuition in participants, which in turn influenced their decision in the care-related scenario.

The fact that MFQ and MF-AMP scores did not predict in-game behavior for fairness and purity led us to consider the influence of factors related to game mechanics such as the choice alternatives in the game. For the fairness scenario, players were asked to pay two brothers for their work in an apple orchard or to steal the money from the children. In this case, it is likely that the alternative choice (stealing from children), which has strong negative semantic connotations, precluded the active influence of the fairness intuition such that all players (whether low or high on fairness) chose to avoid the obviously immoral act of stealing from children. Some evidence for this may be apparent in the observation that 93% of all participants chose to uphold fairness by giving the children their money. This explanation is consistent with Lange’s (2014) finding that players often expect games to punish them for being too obviously immoral. For the purity scenario, players had to decide whether or not to swim in a putrid and rat-infested pond. In this case, swimming in the putrid pond may have been immediately associated with health risks, and the decision to swim or not may have been primarily driven by safety concerns which may have left little room for the influence of purity-related concerns. For these two scenarios, the influence of other overwhelming non-moral factors may have explained a large proportion variance in player behavior and minimized the scope of both temporary and chronic intuition accessibility to influence outcomes. That being said, these explanations are speculative in nature and should accordingly be considered with caution.

**Implications**

The findings suggesting that the chronic and temporary accessibility of moral intuitions influence gameplay have several implications. First, they provide a more nuanced understanding of decisions in video games and suggest that these decisions may not be as detached from moral considerations as suggested by some scholars (Joeckel et al., 2012). Our study indicates that players do not always ignore their moral instincts and that gameplay is not a passive exercise in which players routinely commit moral transgressions. Instead, our findings indicate that moral considerations (stemming from innate moral intuitions) can have a strong influence on gameplay and can inhibit a player from violating moral principles that are salient to them. One could hence infer that decisions in gameplay are likely shaped by several factors, including strategic considerations, which may be modulated by innate moral sensitivities.

Second, the study indicates that these governing moral sensitivities may themselves be influenced by both innate and environmental factors. This understanding of gameplay calls for a more dynamic understanding of in-game decisions, and additional consideration of how situational cues within the game may interact with pre-existing traits to guide gameplay decisions. This real-time perspective of media effects and choice has additional implications for media experiences outside video games. All media experiences influence
audiences on a continuous basis. One response guides the next, creating a chain of reactions in which each is partly dependent on the former. This study supports a deeper, more dynamic model of understanding media experiences. This may also have implications for game developers who may want to consider the influence of game environmental stimuli on game enjoyment and influence.

Third, these findings also support the theoretical framework of the MIME, which proposes both of these first two implications. It identifies moral intuitions in audiences that actively guide their media use. Thus, it implies an audience which is constantly guided by moral instincts, in contrast to a passive audience that disengages from moral decision making while consuming media. The fact that the intuitive constructs in the study predicted a fair number of outcomes supports the conceptual and predictive validity of these intuitions.

The results also support the MIME’s reciprocal conceptualization of media influence that asserts that media content can both simultaneously influence and be influenced by these moral intuitions. The findings of this study extend this notion to suggest that both temporary and chronic differences in accessibility affect these choices. Although both temporary and chronic differences in accessibility may predict behavior, it seems more likely that specific behavior would be predicted by one or the other rather than both. Moreover, logical arguments can be made for which of the two should be more predictive of behavior. Here, it seems likely that differences in chronic accessibility may be better predictors in most instances, but there are exceptions. For example, the short-term components of the MIME suggest that individual differences in temporary accessibility should predict behavior more strongly when environmental cues temporarily increase an intuition’s accessibility. In addition, we might expect temporary accessibility to be a better predictor of behavior when variance in chronic accessibility is low.

**Limitations and future research directions**

In our game, the care scenario (protecting an innkeeper by using violence or not) was the first encounter that players had after completing their training mission. Thus, it is plausible that care considerations were made especially relevant by the larger game narrative and the specific innkeeper scenario. Moreover, it was not possible for us to rigidly control the order in which gamers encountered each scenario. While all players were given a narrative and a map that attempted to guide them through the game in a set manner (which marked the care scenario as the first intended encounter), the game also existed within an open game world. Thus, potential order effects could not be controlled in these analyses. However, both of these points speak to a compelling line of future research: more specific examination of the impact of prior game environments (and decisions made in those environments) on subsequent moral reactions.

As mentioned above, while game scenarios were pretested to ensure their attention to the focal moral principle and perceived moral relevance (Joeckel et al., 2012), other dimensions of gameplay such as the attraction of different gaming decisions were not assessed. Although this past work found the game was moderately enjoyable and players felt moderate levels of presence in the game world, future research should focus specifically on game mechanics and their impact on moral salience. Related to this, the game
largely relied on menu-based gameplay instead of direct player control. Such gameplay is useful for focusing player’s attention on narrative gameplay elements (reducing the cognitive and behavioral load associated with complex control schemes; Bowman, 2016) but might also result in players feeling more distal to on-screen actions. For example, players of a first-person shooter game who suddenly encounter chemical weapons being fired at a set of unsuspecting civilian refugees (e.g. Spec Ops: The Line) might be far more involved in gameplay and, as a result, more open to the temporary moral accessibility. However, some moral dimensions might be easier to program in than others, which explains why game developers tend to rely on more basic harm and care concerns (Birch, 2014).

**Conclusion**

Our study sought to extend research examining the manner in which the accessibility of moral intuitions can influence the experience of video game play. Findings advance our understanding of how the temporary or chronic accessibility of these intuitions can influence behaviors tied to related moral principles. In the main, the study replicates research revealing the role of chronic moral intuition accessibility in predicting gamers’ moral decision making while also demonstrating that, at least for prominent in-game moral dilemmas, contextual factors can increase the temporary accessibility of moral principles to shape these outcomes.

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