Does Repeated Exposure to Popular Media Strengthen Moral Intuitions?: Exploratory Evidence Regarding Consistent and Conflicted Moral Content

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Does Repeated Exposure to Popular Media Strengthen Moral Intuitions?: Exploratory Evidence Regarding Consistent and Conflicted Moral Content

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Previous studies have indicated that media consumption may influence moral intuition sensitivity. The present exploratory studies sought to expand on these findings by employing a three-phase, longitudinal experiment conducted over nine weeks, where participants were exposed to two genres of films (romance, action) mixed in various ratios (high = 100% romance, medium = 60% romance, low = 20% romance, none = 0% romance). Findings from the initial study indicate that repeated exposure to romantic films led to increases in sensitivity for four of the five moral intuitions (i.e., care, fairness, authority, purity); at the same time, any exposure to action films seemed to erode these changes. A follow-up post-hoc content analysis sought to confirm these findings and test an operationalization of “moral conditioning.” We discuss the results in regards to media entertainment theory and research, and the societal implications of the role of media entertainment to reinforce standards of moral judgment.

Two longitudinal studies have found that repeated exposure to media entertainment content can alter the foundations of moral judgments in viewers (see Address correspondence to Matthew Grizzard, Department of Communication, University at Buffalo, The State University of New York, 356 Baldy Hall, Buffalo, NY 1426, USA. E-mail: mngrizza@buffalo.edu

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Eden et al., 2014; Tamborini, Weber, Eden, Bowman, & Grizzard, 2010). Tamborini et al. (2010) found that repeated exposure to soap opera content led to decreased acceptance of antisocial behaviors, and Eden et al. (2014) found that repeated exposure had a reinforcing effect on audience members’ moral intuitions as compared to a no exposure control. These studies, along with moral foundations theory (MFT; Haidt & Joseph, 2007), provided a framework for the development of the model of intuitive morality and exemplars (MIME; Tamborini, 2011, 2013). Notably, both of the aforementioned studies seem to indicate an effect whereby repeated exposure to the same moral content (moral consistency) led to changes in the severity of moral judgments. This article extends the research paradigm provided by the MIME and these earlier studies to examine the effect of exposure to similar versus dissimilar moral content by varying the amount of exposure to romantic films in a relatively continuous manner. Although our data are not entirely consistent with hypotheses of the study—particularly the intuition-specific nature of the hypotheses—post-hoc analyses indicate that consistency of exposure may be an important determinant for explaining the effects of earlier research (e.g., Eden et al., 2014; Tamborini et al., 2010). In this manner, this article represents an exploratory examination of potential mechanisms (moral consistency and moral conditioning) thought to underlie changes in moral intuition sensitivity and provides directions for further conceptual and operational specification of these processes as they relate to the MIME (Tamborini, 2011, 2013).

In addition, previous studies have implicitly assumed a linear relationship between media exposure and changes in moral intuition sensitivity; however, recent media effects research has suggested that the relationship between media exposure and its effects is likely to vary in a nonlinear fashion (e.g., Arendt, 2013). These nonlinear effects may relate to alternative mechanisms of either exponential accumulation (akin to learning curves) or a threshold effect. Although Arendt’s (2013) research focused on news media, it is possible that similar nonlinear patterns might also occur for moral media content. The design and manipulations of the current study seeks to examine this potential.

MEDIA EXPOSURE AND MORAL INTUITION SENSITIVITY

The last 10 years have seen a flurry of social scientific research examining whether exposure to media entertainment can influence an individual’s moral judgments, with a marked increase in such studies over the last 5 years (see Eden, Oliver, Tamborini, Limperos, & Woolley, 2015; Eden et al., 2014; Grizzard, Tamborini, Lewis, Wang, & Prabhu, 2014; Hartmann, Krakowiak, & Tsay-Vogel, 2014; Hofer & Wirth, 2012; Joeckel, Bowman, & Dogruel, 2012; Klimmt, Schmid, Nosper, Hartmann, & Vorderer, 2006; Krakowiak & Oliver, 2012; Krakowiak & Tsay-Vogel, 2013; Lee & Shapiro, 2014; Lewis & Mitchell, 2014; Lewis, Tamborini, & Weber, 2014; Oliver & Bartsch, 2011; Raney, 2005;
Tamborini, 2011, 2013; Tamborini, Eden, Bowman, Grizzard, & Lachlan, 2012; Tamborini et al., 2012. Many of these studies have adopted moral foundations theory (MFT; Haidt & Joseph, 2007) as their guiding theoretical perspective. MFT proposes that human morality is the byproduct of evolutionary pressures, which resulted in humans possessing intuitive sensitivities to the upholding and violation of five areas of morality: care, fairness, loyalty, authority, and purity, which are referred to as the five moral intuitions (Graham, Nosek, Haidt, Iyer, Koleva, & Ditto, 2011).

Care relates to the natural aversion humans show to the suffering of others and results from our mammalian ancestry, which privileges sensitivity to the pain and discomfort of offspring. Fairness relates to humans’ preference for equitable treatment and their distaste for social cheating. Living in cooperative systems requires that individuals be sensitive to the violation of social contracts. Loyalty relates to the well-known ingroup bias humans exhibit. This intuition is thought to be the result of prehistoric living conditions, where ingroup members were more likely than outgroup members to be genetically related to an individual. Authority relates to dominance-hierarchies and the deference humans and other mammals show to “legitimate” authorities. Again, this moral intuition is thought to be the result of prehistoric living conditions (e.g., alpha males and alpha females). Lastly, purity relates to the need to avoid bodily contamination and disease. Humans show a strong disgust response to contaminated items (e.g., rotten food, feces, and rodents). This disgust response extends to other areas of morality, including promiscuous sexual behaviors or actions deemed “dirty,” and relates to a preference in humans for distinguishing ourselves from our “animalistic” past (Brandt & Reyna, 2011).

MFT argues that the five moral intuitions are evolutionarily derived and, thus, should be present in all individuals (Graham et al., 2011). The relative strength of the moral intuitions for judgments, however, varies within individuals and between groups. For example, conservatives tend to place relatively equal weight on all five moral intuitions and may consider violations of authority to be just as unacceptable as violations of fairness. Liberals, on the other hand, place more weight on violations of care and fairness than the other three moral intuitions. Additionally, liberals are more averse to violations of care and fairness than to violations of loyalty, authority, or purity (see Graham, Haidt, & Nosek, 2009). The variance of moral intuition strength is commonly referred to as sensitivity within media effects literature on morality (see Grizzard et al., 2014).

The model of intuitive morality and exemplars (MIME; Tamborini, 2011, 2013) provides the most complete account of how exposure to media content representing moral intuitions might alter an audience’s moral intuition sensitivity. The MIME adopts the theoretical framework of morality provided by MFT, and incorporates this framework with traditional media effects theories to describe both macro- and micro-level processes related to the intertwining influence of media exposure and audience morality. The micro-level
processes, which are most relevant for the current investigation, relate to how exposure to content depicting the moral intuitions can alter audience members’ patterns of moral intuition salience in the short-term (i.e., through a single exposure) and in the long-term (i.e., through repeated exposure). The MIME proposes that mechanisms for such effects are related to either increasing the accessibility of moral intuitions, consistent with priming and network models of memory (see Roskos-Ewoldsen, 1996; Roskos-Ewoldsen & Roskos-Ewoldsen, 2009, for overviews of the relevance of these models for media research) or increasing the sensitivity of individual intuitions, consistent with social learning theories (see Bandura, 2009). Notably, MIME research has used the term salience to refer to both accessibility and sensitivity (see Eden et al., 2014; Grizzard et al., 2014). The term salience originates from cognitive psychology and is most closely related to concepts of construct accessibility, or how central a concept is to an individual’s decision making (see Shrum, 2009, for a description of accessibility as it relates to media effects). The sensitivity of moral intuitions relates to how strongly one feels about violations or upholdings of the moral intuitions. For example, someone with high sensitivity to purity would likely find prostitution and drug usage highly immoral, whereas someone with low sensitivity to purity likely would not. Increasing the accessibility would be expected to alter the speed with which such categorizations are made (see Tamborini, Lewis, Prabhu, Grizzard, Hahn, & Wang, 2016; Tamborini, Prabhu, Lewis, Grizzard, & Eden, 2016), while increasing the sensitivity would alter the magnitude of such categorizations; prostitution and drug usage would seem more wrong. In this article, we focus on moral intuition sensitivity as examination of moral intuition accessibility necessitates examining response latencies.

The direction and strength of media’s influence on an individual’s moral intuition sensitivity relates to how the intuitions are depicted within content (Tamborini, 2011, 2013). Each intuition can be upheld or violated. For example, showing compassion and obeying a superior are respective examples of the care and authority intuitions being upheld. Conversely, committing an act of violence and disobeying a superior are respective examples of the care and authority intuitions being violated. Although the mere presence of either upholding or violation might increase the accessibility of a specific moral intuition, the context of the portrayals (i.e., whether upholding and violation is reinforced or punished, moral conditioning) should determine changes in moral intuition sensitivity. Our description of moral conditioning processes represents an extension of predictions described in the MIME (cf. Tamborini, 2013). There, Tamborini (2013) suggested that media depictions will often associate positive or negative consequences with the upholding or violation of moral intuitions, but explication of how these two concepts interact (i.e., reinforcement contingencies and moral upholding/violation) is not fully described. Rather, the MIME assumes that “media content will predominantly associate benefit
with affirmation and detriment with transgression” (Tamborini, 2013, p. 53). Although such an assumption may be warranted, explicating expected relationships between these two variables is necessary for advancing the MIME.

Observational learning models incorporated into the MIME would predict that media content depicting positive moral conditioning—that is, associating (a) upholding with reinforcement or (b) violation with punishment—would be expected to increase moral intuition sensitivity. Media content depicting negative moral conditioning—that is, associating (c) upholding with punishment or (d) violation with reinforcement—would be expected to decrease moral intuition sensitivity. Because these processes relate to the coordination of reinforcement and punishment contingencies, one would expect 1) the strongest increase of moral sensitivity to be associated with the combination of (a) and (b), and 2) the strongest decrease of moral sensitivity to be associated with the combination of (c) and (d). These depictions represent moral intuitions in a consistent manner (i.e., moral consistency), and convey a similar moral lesson to the audience (e.g., being caring is good and being cruel is bad, or vice versa). The weakest effects, in absolute terms, should be observed with a mix of reinforcement/punishment with upholding/violating (i.e., moral inconsistency), with these combinations sending mixed signals (e.g., being caring is good but so is being violent). Previous empirical research on media exposure’s effect on moral intuition sensitivity implicitly supports this proposition (e.g., Eden et al., 2014; Tamborini et al., 2010).

**EMPIRICAL RESEARCH ON MORAL INTUITIONS AND MEDIA EXPOSURE**

In a quasi-experimental longitudinal study, Eden et al. (2014) exposed participants to either eight weeks of an online web drama (i.e., the treatment group) or not (i.e., the control group). Results indicated that the control group experienced a reduction in sensitivity for three out of the five moral intuitions (care, fairness, and purity) that was not experienced by the treatment group over the eight weeks of the study. Eden et al. further found that the maintenance observed for the treatment group was predicted by the presence of the respective moral intuitions within the viewed media content and, more specifically, participants’ ratings of the hero and villain’s behaviors with regard to the moral intuitions. Eden et al. suggested that the effects might have been related to moral conditioning—or the association of rewards and punishments with specific moral intuitions (with the hero and villain serving as proxies for reinforcement and punishment contingencies)—and that these effects would be strengthened with repeated exposure to content with similar conditioning contingencies.
There are additional reasons to believe that exposure to consistent moral conditioning over time is an important determinant of effect strength. Prior research by Tamborini et al. (2010) indicated repeated exposure led to polarizing effects on moral judgments. Participants who experienced greater exposure to the same content experienced more change in moral judgments than those who experienced less exposure. Importantly, these changes were predicted by the extent to which the moral characters of the narrative were rewarded and the immoral characters of the narrative were punished. The results of these studies suggest that exposure to morally consistent content should have stronger effects than exposure to morally inconsistent content, but because this research did not expose participants to more than one type of content (i.e., exposure consisted only of positive moral conditioning), this suggestion remains untested.

Based on this previous research and the logic proposed in this article, we should expect the stronger effects to be observed with more morally consistent media exposure. However, this proposition does not assume linearity of effects. The current study attempts to test this logic in a longitudinal experiment whereby participants are exposed to two different genres of media in various ratios. To the extent that one genre presents consistent moral conditioning (e.g., upholding is reinforced and violation is punished; romance in the current study) and the other genre presents inconsistent moral conditioning (e.g., both upholding and violation are reinforced; action), one should expect stronger effects for repeated exposure to the former than either repeated exposure to the latter or a mixture of exposure to both genres.

The Current Study

We utilized a longitudinal experimental design. Participants watched one film per week across five weeks. Consistency of moral conditioning was manipulated by varying exposure to romance versus action films. We utilized a relatively continuous manipulation of exposure by including high, medium, low, and no romance exposure conditions, allowing for a relatively continuous manipulation of exposure to consistent—versus inconsistent—moral conditioning. We selected romantic films and action films as our manipulation of consistency for several reasons, but primarily because we expected differences in the moral conditioning contingencies depicted in some of these films. We note that our selection and discussion of our rationale governing selection is not intended to be a representative description of all romantic films and all action films. There are obviously exceptions to every rule. However, some findings from the literature suggest that selection of specific films within these genres could maximize differences in moral conditioning, to the extent that such maximization is possible using popular films. Moreover, the importance of the selection is not so much that action films feature entirely inconsistent
moral conditioning and romantic films feature entirely consistent moral conditioning; rather the importance is that there are patterns of difference whereby inconsistent moral conditioning is higher in action films as compared to romantic films.

RATIONALE AND HYPOTHESES

There is no research regarding the depiction of the five moral intuitions in films based on film genre. Thus, our rationale is largely exploratory and based on limited previous literature regarding narrative conventions in romantic and action genres, and integration of these genre conventions with MFT’s moral intuitions.

Care. Romantic films prominently feature upholding of care (e.g., love, romance, and emotional support; Johnson & Holmes, 2009), whereas action films prominently feature violation of care (e.g., aggression and violence; Oliver & Kalyanaraman, 2002). At the same time, action films also seem to prominently feature upholding of care (e.g., a hero tends to fight for a just cause, while helping those who are too weak to fight back). Furthermore, violation of care within action films is usually rewarded, with heroes using extreme force to end conflicts; romantic films tend not to associate reward with this type of behavior. Thus, with regard to care, romances tend to depict care in a relatively consistent manner (reinforcing care) and action films tend to depict care in a relatively inconsistent manner (reinforcing both care and cruelty). Based on this logic, we expect increases in the moral sensitivity of care to be associated with exposure to romances.

Fairness. There do not appear to be clear differences between romance and action films with regard to fairness depictions. Romances tend to have a strong focus on reciprocal relationships (i.e., upholding fairness): Romances typically feature a relationship between two equally important characters who negotiate intimacy. Action films also often feature themes of reciprocity, but the focus is on retributive justice doled out by the heroic protagonist upon the villainous antagonist. For both film genres, upholding fairness tends to be reinforced and violating fairness tends to be punished. Therefore, specific directional predictions seem unwarranted.

Loyalty. With regard to loyalty, both film genres seem to include similar positive moral conditioning. For romances, loyalty depictions relate to the loyalty shown between the lead characters who are starting or maintaining a committed relationship. Loyalty depictions are similar in action films where, according to Brown (1993), a main theme is the relationship between the main character and a partner. Action and romances tend to show the relationships between characters increasing in quality throughout a film as each character demonstrates—through various gestures—increasing loyalty to his or her ingroup. Moreover, neither genre tends to reinforce disloyalty or
betrayal or to punish loyalty. Therefore, we do not expect differences for the loyalty intuition.

**Authority.** Similar to loyalty, we also do not expect differences for authority. This lack of difference is primarily due to the fact that both types of films feature violations of authority. In romances, this violation involves a character rebuking traditional social norms to continue a relationship with a partner (e.g., star-crossed lovers, Romeo and Juliet). Likewise, research on heroes and villains indicates that action movie heroes are likely to violate authority (e.g., vigilante crime fighter, Batman; Eden et al., 2015). Again, the resolution of these films tends to reinforce the main characters’ actions.

**Purity.** Finally, with regard to purity, we expect that consistent exposure to romances, as opposed to action, should increase purity sensitivity because of the disgusting content found in action films. As previously stated, action films typically feature scenes of violence. Because violence is a core theme of action movies (e.g., Brown, 1993; Weaver & Wilson, 2009), action films are more likely to include graphic scenes of violence, gore, and disgust-inducing content, which is often coupled with positive narrative resolutions. Thus, the lack of disgusting content in romance films, as compared to action films, may be expected to increase purity sensitivity.

**METHOD**

**Design and Stimuli**

This study consisted of three phases (Phase 1: pretest measures; Phase 2: movie exposure; and Phase 3: posttest measures), which took place over a nine-week period (beginning September 8, 2014). During the two-week long Phase 1, participants (Ps) arrived at a lab to respond to a battery of measures. At this point, Ps were assigned to one of four conditions: high romance, medium romance, low romance, and no romance (i.e., action condition). During the five-week long Phase 2, Ps attended a weekly movie session that was scheduled on Monday and Thursday evenings (see Table 1 for design and movie exposure by condition and week). Phase 3 began the week immediately following completion of Phase 2 and ran for two weeks. In this phase Ps completed the same battery of measures as Phase 1.

After careful discussions among the authors of the study for suitable films, the films included in the study were selected primarily based on several criteria: a) they were released 15 years ago or more to reduce novelty effects, b) the action films did not include romantic subplots and the romantic films did not include extensive action sequences (in order to maximize the difference between the films), and c) the films were of roughly equivalent quality as determined by Metacritic ratings. Metacritic is a website that aggregates a number of professional reviews on media entertainment (from video games to films) and calculates a weighted average score of the reviews—referred to
as a Metascores—to represent the critical opinions on the entertaining materials (Metacritic, n.d.). Results of independent samples t tests suggest that the films’ Metascores did not differ (one-tailed \( p = .26 \)), with the action films (\( M = 59.20, SD = 17.81, \text{min} = 36, \text{max} = 83 \)) scoring similarly to the romantic films (\( M = 67.20, SD = 14.91, \text{min} = 48, \text{max} = 87 \)).

Participants

A total of 188 Ps were recruited, with 173 Ps completing Phase 1 (75 males, 98 females). A total of 87 Ps (34 males, 53 females) completed the movie study in its entirety including all outcome measures (\( M_{\text{Age}} = 20.41, SD = 1.97 \); see Table 2 for complete demographic information). Ps received course credit for their participation in each phase of the study and were awarded additional credit for completion of all phases. All procedures were approved by the human subjects institutional review board of the university at which data were

<table>
<thead>
<tr>
<th>TABLE 1 Movie exposure by condition and week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Film Pairing</td>
</tr>
<tr>
<td>Romance</td>
</tr>
<tr>
<td>Action</td>
</tr>
<tr>
<td>Romantic Exposure Condition</td>
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</tbody>
</table>

*Note. Prior to data collection, order of movies was determined at random.*

<table>
<thead>
<tr>
<th>TABLE 2 Demographics for study participants by phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic</td>
</tr>
<tr>
<td>Sex</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Ethnicity</td>
</tr>
<tr>
<td>White/Caucasian</td>
</tr>
<tr>
<td>Black/African American</td>
</tr>
<tr>
<td>Native American</td>
</tr>
<tr>
<td>East Asian (e.g., Korean)</td>
</tr>
<tr>
<td>West Asian (e.g., Indian)</td>
</tr>
<tr>
<td>Middle Eastern</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>Did not report</td>
</tr>
</tbody>
</table>
collected. Data were collected at a large public university in a northeastern state in the United States.

The current study suffered from P mortality. P mortality, however, is only a concern in experimental research if a) random assignment was not successful and b) mortality significantly interacts with randomly assigned conditions or the variables employed in the study. Results of a 5 (within-subjects factor: five moral intuitions) × 4 (between-subjects factor: condition) mixed analysis of variance (ANOVA) on only those Ps who completed the study indicated that random assignment was successful with regard to the five moral intuitions at Phase 1 with a nonsignificant condition by moral intuition interaction, \( F(12, 246) = 1.39, p = .17 \), and a nonsignificant condition main effect, \( F(3, 83) = 0.62, p = .92 \). We also examined whether genre preference or genre viewing interacted with condition at Phase 1 in two 3 (within-subjects factor: action, romantic comedy, romantic drama) × 4 (between-subjects factor: condition) mixed ANOVAs. Again, at Phase 1 the results suggested that there were no significant interactions between condition and genre liking for those Ps who completed the study, \( F(6, 164) = 0.84, p = .54 \), or general viewing habits, \( F(6, 166) = .12, p = .99 \). Nor were there any effects at Phase 1 of condition on liking, \( F(3, 82) = 1.73, p = .47 \), or viewing, \( F(3, 83) = 2.46, p = .07 \). In addition, a 5 (within-subjects factor: five moral intuitions) × 4 (between-subjects factor: condition) × 2 (between-subjects factor: mortality) mixed ANOVA indicated that mortality did not interact with condition, \( F(3, 165) = 0.35, p = .79 \), with regard to the moral intuition sensitivity for the Ps who completed the study. Finally, results of the three-way multivariate test on the interaction between condition, mortality, and moral intuitions were also nonsignificant and less than 1, \( F(12, 492) = 0.93, p = .52 \). This combined evidence is consistent with successful random assignment and lack of mortality by experimental manipulation interaction.

Measures

All Ps filled out a battery of measures for several simultaneous data collections. However, for the purposes of this study only the measures of interest will be discussed further. At both Phase 1 and Phase 3, Ps responded to the 30-item Moral Foundations Questionnaire (MFQ; Graham et al., 2009), which uses 6-item subscales comprised of the following two sets:

- three relevance items (prompt: “When you decide whether something is right or wrong, to what extent are the following relevant to your thinking? Whether or not…”), with anchors 1 (not at all relevant) and 7 (extremely relevant); examples include: “… someone suffered emotionally” (care), “… someone was denied his or her rights” (fairness), “… someone showed a lack of loyalty” (loyalty), “… someone showed a lack of respect for
Composites were created for each of the five moral intuitions by averaging the items for each subscale (see Table 3 for descriptive statistics).

RESULTS

The current study sought to examine whether long-term exposure to consistent moral conditioning might lead to alteration of moral values. To test this hypothesis, we submitted change scores of moral intuition sensitivity (i.e., Phase 3–Phase 1) to five analyses of covariance (ANCOVAs) with condition as the independent factor and the relevant moral foundation intuition sensitivity score from Phase 1 as the covariate.

**TABLE 3** Descriptive statistics of MFQ M$\bar{s}$ and (SDs) by study condition

<table>
<thead>
<tr>
<th>Moral foundation</th>
<th>Care 1</th>
<th>Care 3</th>
<th>Fairness 1</th>
<th>Fairness 3</th>
<th>Loyalty 1</th>
<th>Loyalty 3</th>
<th>Authority 1</th>
<th>Authority 3</th>
<th>Purity 1</th>
<th>Purity 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>phase</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High romance</td>
<td>5.49</td>
<td>5.61</td>
<td>5.26</td>
<td>5.40</td>
<td>4.70</td>
<td>4.90</td>
<td>4.67</td>
<td>5.13</td>
<td>4.12</td>
<td>4.82</td>
</tr>
<tr>
<td>(n = 27)</td>
<td></td>
<td></td>
<td>(0.69)</td>
<td>(0.75)</td>
<td>(0.63)</td>
<td>(0.66)</td>
<td>(0.72)</td>
<td>(0.66)</td>
<td>(0.58)</td>
<td>(0.84)</td>
</tr>
<tr>
<td>Medium romance</td>
<td>5.34</td>
<td>4.97</td>
<td>5.24</td>
<td>4.88</td>
<td>4.75</td>
<td>4.53</td>
<td>4.99</td>
<td>4.58</td>
<td>4.33</td>
<td>4.32</td>
</tr>
<tr>
<td>(n = 22)</td>
<td></td>
<td></td>
<td>(0.81)</td>
<td>(0.98)</td>
<td>(0.76)</td>
<td>(0.93)</td>
<td>(1.00)</td>
<td>(1.05)</td>
<td>(0.65)</td>
<td>(0.79)</td>
</tr>
<tr>
<td>Low romance</td>
<td>5.64</td>
<td>5.25</td>
<td>5.34</td>
<td>5.10</td>
<td>4.57</td>
<td>4.79</td>
<td>4.50</td>
<td>4.74</td>
<td>3.96</td>
<td>4.28</td>
</tr>
<tr>
<td>(n = 16)</td>
<td></td>
<td></td>
<td>(0.56)</td>
<td>(0.72)</td>
<td>(0.56)</td>
<td>(0.61)</td>
<td>(1.19)</td>
<td>(0.76)</td>
<td>(0.87)</td>
<td>(0.68)</td>
</tr>
<tr>
<td>No romance</td>
<td>5.20</td>
<td>4.96</td>
<td>5.09</td>
<td>4.89</td>
<td>4.76</td>
<td>4.52</td>
<td>4.77</td>
<td>4.69</td>
<td>4.27</td>
<td>4.48</td>
</tr>
<tr>
<td>(n = 22)</td>
<td></td>
<td></td>
<td>(0.81)</td>
<td>(0.97)</td>
<td>(0.92)</td>
<td>(0.95)</td>
<td>(0.71)</td>
<td>(0.83)</td>
<td>(0.67)</td>
<td>(0.89)</td>
</tr>
<tr>
<td>Total</td>
<td>5.41</td>
<td>5.22</td>
<td>5.23</td>
<td>5.08</td>
<td>4.70</td>
<td>4.69</td>
<td>4.74</td>
<td>4.81</td>
<td>4.18</td>
<td>4.50</td>
</tr>
<tr>
<td>(N = 87)</td>
<td>(0.74)</td>
<td>(0.90)</td>
<td>(0.73)</td>
<td>(0.82)</td>
<td>(0.88)</td>
<td>(0.83)</td>
<td>(0.69)</td>
<td>(0.83)</td>
<td>(1.03)</td>
<td>(0.95)</td>
</tr>
</tbody>
</table>

Repeated Exposure to Moral Content in Popular Media
Care

Results of the ANCOVA ($R^2 = .20$) on care sensitivity demonstrated a non-significant effect of condition, $F(3, 82) = 2.71, p = .05, \eta^2_p = .09$, and a significant effect of the covariate, $F(1, 82) = 13.86, p < .001, \eta^2_p = .15$. The pattern of means suggested that the effect may have been nonlinear and observable only for the high romance condition. Because ANOVA is an underpowered test, we conducted the following contrast analysis (high = 3, medium = -1, low = -1, and none = -1). The results of the contrast analysis were significant, $F(1, 82) = 7.73, p = .007, \eta^2_p = .09$. Overall, the results for the care intuition suggest that the high romantic exposure condition experienced a significant increase from Phase 1 to Phase 3, but no other groups experienced this change (see Figure 1).

Fairness

Results of the ANCOVA ($R^2 = .21$) on fairness sensitivity demonstrated a significant effect of condition, $F(3, 82) = 2.85, p = .04, \eta^2_p = .10$, and a significant effect of the covariate, $F(1, 82) = 13.73, p < .001, \eta^2_p = .14$. Results of the previously discussed contrast analysis were significant for fairness, $F(1, 82) = 7.63, p = .007, \eta^2_p = .09$. Overall, the results for the fairness intuition suggest that the high romance exposure condition experienced a significant increase from Phase 1 to Phase 3, with no other groups experiencing this change (see Figure 1).

![FIGURE 1 Depiction of the estimated marginal means of change scores by condition. Error bars represent ±1.96 SEs for the high exposure condition and indicate that the high romantic exposure condition experienced significantly more positive change than the other three conditions ($p < .05$) for the care, fairness, authority, and purity foundations.](image-url)
Loyalty
Results of the ANCOVA ($R^2 = .35$) on loyalty sensitivity did not demonstrate a significant effect of condition, $F(3, 82) = 1.94, p = .13$, $\eta_p^2 = .07$, but they did show a significant effect of the covariate, $F(1, 82) = 36.53, p < .001$, $\eta_p^2 = .31$. Again, because ANOVA is underpowered, we repeated the contrast analysis. Results of the contrast analysis were not significant, $F(1, 82) = 2.77, p = .10$, $\eta_p^2 = .03$. Overall, the results for the loyalty intuition suggest that the high romance condition did not experience the same positive effects (see Figure 1).

Authority
Results of the ANCOVA ($R^2 = .31$) on authority sensitivity demonstrated a significant effect of condition, $F(3, 82) = 3.54, p = .02$, $\eta_p^2 = .12$, and a significant effect of the covariate, $F(1, 82) = 19.81, p < .001$, $\eta_p^2 = .20$. Because of the significant effect of condition, we repeated the previously discussed contrast analysis, which was again significant, $F(1, 82) = 7.85, p = .006$, $\eta_p^2 = .09$. Overall, the results for the authority intuition are consistent with the results for the care and fairness intuitions, suggesting that the high romance exposure condition experienced a significant increase from Phase 1 to Phase 3 (see Figure 1).

Purity
Results of the ANCOVA ($R^2 = .39$) on purity sensitivity indicated a nonsignificant effect of condition, $F(3, 82) = 2.52, p = .06$, $\eta_p^2 = .08$, and a significant effect of the covariate, $F(1, 82) = 41.14, p < .001$, $\eta_p^2 = .33$. We repeated the contrast analysis to examine whether the effect for purity was similar to the effects observed for care, fairness, and authority. Again the results were significant, $F(1, 82) = 6.85, p = .01$, $\eta_p^2 = .08$. Overall, the results for the purity intuition suggest that the high romance exposure condition experienced a significant increase from Phase 1 to Phase 3, with no other groups experiencing this change (see Figure 1).

Results Summary and Post Hoc Content Analysis

Overall, the results suggest that the high romance condition experienced positive change in moral intuition sensitivity not experienced by other groups (see Figure 1). Earlier in this article, we argued that action and romantic films would differ in terms of consistency of moral conditioning, and that potential nonlinear effects may be related to this consistency. To determine whether these expectations were justified, we completed a content analysis. Two expert coders naïve to the hypotheses coded four variables (presence of
moral intuition upholding and violation, as well as respective reinforcement and punishment) for each of the five moral intuitions in the 10 movies.

Sample selection. Because our design and hypotheses pertained to holistic moral messages in the films, our sample consisted of plot summaries of the films rather than the specific content of the films. The specific content of the films would place too great an emphasis on minor plot actions relative to major plot actions, as some character actions may be relatively infrequent yet crucial to the overarching takeaway message of the film (e.g., a climactic scene, which by definition occurs infrequently). The plot summaries were retrieved from Wikipedia, which has been used in prior research for coding holistic moral content of popular films (cf. Grizzard, Lewis, Lee, & Eden, 2011). Wikipedia was determined to be an appropriate source not only for its past usage, but also because a) it is editable by a large and diverse community, which should reduce systematic biases compared to single author sources and b) errors in Wikipedia are comparable to encyclopedias with professional editors (Giles, 2004).

Coding criterion and coding definitions. The two coders have extensive training in coding for the presence and consequences of the five moral intuitions, and have trained other coders to identify moral intuitions in narratives for more than three years. They relied on an extensively used coding manual (Tamborini, Hahn, Prabhu, Kleibig, & Grail, in press; see http://osf.io/cn6s9), which has been used to identify the moral intuitions in a range of narratives including news content, movies, soap operas, primetime television, and children’s media. Because viewers typically focus on the central character in a film, and are most influenced by that character’s actions, only actions and associated conditioning (reinforcements and punishments) pertaining to the primary protagonist of the film were coded.

The coders focused on whether the upholding or violation of a moral intuition was a primary concern of the central character. This resulted in four variables. First, presence of moral intuition upholding was coded when the upholding of the moral intuition was a central concern to the protagonist in the movie. For example, in the movie Ghost, the central character Sam is primarily motivated by his concern to protect Molly. Because the aforementioned coding manual describes acts of concern and protection as representing care upholding, both our coders independently coded care upholding as present (+1). In the same manner, raters coded the positive aspect of the five moral intuitions (e.g., caring, fair, loyal, respectful, or pure behaviors) as present (+1) or absent (0). Behaviors associated with care upholding included “showing a deep awareness of and concern for another’s physical and emotional suffering,” and “offering or providing physical and emotional assistance”; fairness upholding included acting in a manner such that “the benefits people receive is based on equally meeting everybody’s needs” and “the benefits[costs] people receive is proportional to their contribution”; loyalty upholding included “showing solidarity/cohesiveness/harmony toward a
specific group” and “sacrifice of any individual interests for the group”; authority upholding included “acts showing respect for traditional customs and social norms of any group or institution to which the person belongs”; and purity upholding included demonstrating “temperance in the pursuit of hedonistic pleasure.”

Second, presence of moral intuition violation was coded when the violation of the moral intuition was a central concern to the protagonist in the movie. For example, in the movie Predator, the central character Dutch is driven by his desire to kill the Predator and other various secondary characters (e.g., guerrillas). Because the desire to endanger or kill represents a violation of care, the coders independently coded care violation as present (−1). Content typifying the violation of the five moral intuitions (e.g., cruel, unfair, disloyal, disrespectful, or impure behaviors) was coded as present (−1) or absent (0). Behaviors associated with care violation included “causing another’s physical or emotional pain, or planning to put another in jeopardy of physical or emotional pain” and “enjoying the pain or distress of others”; fairness violation included acting in a manner such that “benefits provided meet some individual or group’s needs more than another individual or group’s needs” and “benefits[costs] people receive is not proportional to their contribution”; loyalty violation included “behaviors that sacrifice or have the potential to sacrifice ingroup interests for the self or other groups’ benefits”; authority violation included “acts showing disrespect for the legitimate power of any group or institution to which the person belongs”; and purity violation included demonstrating “the excessive pursuit of hedonistic pleasure.”

Finally, the conditioning of upholding and violating was coded as the overt reinforcement or punishment that befell a character due to involvement with the upholding or violating of the moral intuitions. If the central character achieved the overriding goal associated with a moral intuition (e.g., Sam in Ghost managed to secure Molly’s safety), the raters coded reinforcement (+1). If the central character was punished or restrained in attempts to fulfill the goal associated with the intuition, the coders coded punishment (−1). If no consequences were present or if both reinforcement and punishment were present, the content was coded as absent or neutral (0).

Intercoder reliability. Typical intercoder reliability estimates are subject to imprecise estimates based on limited data points, which is the case here (i.e., 10 movies). However, the expert coders agreed 81% of the time across all of their decisions, and yielded acceptable reliability for their combined decisions (Krippendorff’s $a = .68$; Krippendorff, 2004). Based on these facts, the intercoder reliability present here is acceptable. Moreover, to further strengthen the validity of the coding, all disagreements between coders were resolved among the coders.

Data aggregation. Prior to substantive analyses, we created composite variables designed to represent the extent to which moral upholding of each
moral intuition was reinforced and the moral violation of each intuition was punished. We deemed this the moral conditioning composite, as it reflects moral conditioning as described earlier in the article. The formula for the moral conditioning composite is: (presence of moral content) × (consequence associated with that content), with positive scores indicating upholding being rewarded or violation being punished and negative scores indicating upholding being punished or violation being rewarded.\(^8\) Moral conditioning scores were created for both moral upholding content (i.e., moral upholding conditioning) and moral violation conditioning (i.e., moral violating conditioning). See Table 4 for data from content analysis. Note that purity did not vary based on coding and, therefore, was not included in further analyses.

These composites were then used to create a total moral conditioning composite for each of the five moral foundations. The formula for the total moral conditioning composite is: (moral upholding conditioning) + (moral violation conditioning × \(\pi\)). Note that moral violations were weighted by \(\pi\). Previous research suggests that humans are more sensitive to negative information than positive information (see Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001) and that this preference can be reflected by a weighting factor of \(\pi\) (Larsen, 2009).

Content analysis results. In order to verify our claims regarding systematic differences between the films, we conducted a mixed ANOVA on the total moral conditioning score: Movie genre (−1 = action; +1 = romance) was the between-subjects factor and moral intuition (care, fairness, loyalty, authority, and purity) was the within-subjects factor. The multivariate results indicated a nonsignificant effect of moral intuition, Wilks’ \(\lambda\) = .47, \(F(4, 5) = 1.43, p = .35, \eta^2_p = .53\), but a significant interaction between moral intuition and genre, Wilks’ \(\lambda\) = .12, \(F(4, 5) = 9.49, p = .015, \eta^2_p = .88\). The within-subjects effect of moral intuition was also nonsignificant, \(F(4, 32) = 1.64, p = .19\), although the effect size (\(\eta^2_p = .17\)) was considerable considering the small degrees of freedom. The within-subjects interaction between moral intuition and movie genre was significant, \(F(4, 32) = 3.51, p = .02, \eta^2_p = .31\). Finally, the between-subjects effect of movie genre was nonsignificant, \(F(1, 8) = 3.08, p = .12, \eta^2_p = .28\), but again, the effect size is considerable given the small sample size (\(N = 10\)). The sizable effect of the between-subjects factor and the significant interaction suggests that the films may have differed in their depictions, with the pattern of means suggesting that moral conditioning was more positive in the romance movies.

Integration of content analysis with findings presented in this article. In order to further determine whether the content analysis was consistent with the previous findings, contrast coefficients were created representing the movie exposures experienced by the four experimental conditions. We then replicated our analyses from the ANCOVAs, replacing the contrast coefficients
<table>
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<tr>
<th>Moral foundations</th>
<th>Care</th>
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<th>Loyalty</th>
<th>Authority</th>
<th>Purity</th>
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used in this article with the contrast coefficients derived from the content analysis.

Results largely corroborated the findings in this article. The contrast was:

- marginally significant for care, $F(1, 82) = 3.97, p = .05, \eta^2_p = .05$;
- significant for fairness, $F(1, 82) = 6.38, p = .01, \eta^2_p = .07$;
- nonsignificant for loyalty, $F(1, 82) = 2.00, p = .16, \eta^2_p = .02$; and
- significant for authority, $F(1, 82) = 7.85, p = .006, \eta^2_p = .09$.

As mentioned before, purity was left out of analyses due to the fact that it did not vary in the content analysis.

**DISCUSSION**

Previous studies have suggested that repeated exposure to media entertainment may affect moral intuition sensitivity (e.g., Eden et al., 2014). The present study sought to further examine processes related to this finding by utilizing a fully randomized experimental design and including a more continuous manipulation of exposure to media content. Results replicate previous studies (e.g., Eden et al., 2014) indicating that exposure to media entertainment can alter the sensitivity of moral intuitions. Beyond simple replication, the current findings suggest that these effects may not always be linear and that they are dependent on repeated exposure to media content with consistent moral conditioning. In addition, the current study provided conceptual and operational definitions of moral conditioning consistency.

**Altering Moral Intuition Sensitivity: The Potential for Nonlinear Effects**

Previous research on the ability of media entertainment to alter the foundations of moral judgment processes has relied on binary manipulations of exposure and repeated exposure paradigms (e.g., high exposure versus low exposure or exposure versus control; cf. Eden et al., 2014; Tamborini et al., 2010). This methodology assumes that the effect of media entertainment exposure will be positive and linear, which may not always be warranted (cf. Arendt, 2013, for discussion of nonlinear effects). The current study indicates that exposure effects may not be linear, as demonstrated by the fact that the high exposure condition experienced positive change from Phase 1 to Phase 3, which was not experienced by other conditions. This finding is particularly striking given the fact that random assignment was confirmed for the current study, and the high exposure condition scores on moral intuitions were neither the highest nor lowest condition at Phase 1.
The explanation that alteration of moral intuition sensitivity may require repeated exposure, and that the moral conditioning in such content may counteract or reinforce previous exposures, is implicitly supported by previous studies (Eden et al., 2014). Tamborini et al. (2010) found that alteration of moral judgments was positively related to duration of exposure to the same content in an eight-week study with dispositional outcome as a mediator (defined as the extent to which the program adhered to disposition theory’s tenets; see Zillmann & Cantor, 1976; see also Raney, 2006). The fact that dispositional outcomes predicted change in the Tamborini et al. (2010) study is in line with the interpretation of effects here, and suggests that inconsistent moral conditioning within content might serve to reduce systematic effects. Although these interpretations are somewhat tentative, the current study provides an avenue for future research examining these issues in a more controlled manner and with greater predictability. Our conceptual and operational definitions of moral conditioning may allow future research not only to predict directional effects, but also to quantify the level of effect in cross-sectional designs with various levels of moral conditioning manipulated within an independent variable. For example, stimuli could be created that vary moral conditioning consistency in a within-subjects design, leading to more precise estimates of effects and more powerful experimental designs.

Although explanations regarding mechanisms of effect in the current study are tentative, they are consistent with the predictions of current theory (e.g., MIME; Tamborini, 2011, 2013). For example, the MIME suggests that, in both its short- and long-term components, repeated exposure to moral content will shift viewers’ moral intuition sensitivity in a manner consistent with content depictions. The inclusion of the content analysis provides some evidence that this may indeed be true with effects being subject to moral conditioning. Moreover, observing exposure-dependent effects in moral intuition sensitivity a week after the final exposure to content in the current study substantiates that the effects proffered by the MIME may be somewhat lasting.

Implications for Practitioners

The results of our study suggest that the effect of media exposure on moral intuitions is both tenuous (i.e., any exposure to action films reduced or eliminated the effect) and lasting (i.e., the delay in measure of one week suggests that the results are somewhat long lasting). Taken together these implications are relevant for practitioners, particularly those who are involved with children’s programming or media “edutainment.” Educational programming often targets social change through the use of modeling behaviors (e.g., telenovelas). Moreover, young children’s programming often attempts to increase moral upholding through reinforcement. For example, The Wonder Pets encourage altruistic behaviors (i.e., care) and teamwork (i.e., loyalty)
when they help their animal friends out of trouble, and receive reinforcement for doing so. The current study has implications for the producers of these programs and suggests that moral conditioning consistency is important. This suggestion becomes particularly relevant for programming targeted toward older children when moral violations, mainly performed by villains, become more prevalent in the content. To the extent that educational programmers are attempting to increase moral upholding behaviors, programmers should recognize that consistent moral conditioning may be necessary for exacting the change that they are targeting.

Limitations

One limitation of the current study is that there was low internal consistency in the measurement of moral intuitions—consistent with prior research examining change in moral intuition sensitivity (e.g., Eden et al., 2014)—but this fact should not invalidate the current findings. Low internal consistency attenuates the ability to identify systematic effects between variables. Thus, it is possible that in the present study a Type II error may have been committed, which could explain why the contrast analyses (which are more powerful than omnibus tests) were significant when the omnibus tests were not. In addition, there may have been differences between the other conditions (e.g., medium and low) that were not detected because of the low reliability. However, if the magnitude of the relationship between exposure and moral intuition sensitivity is attenuated due to low internal consistency, then our effects are even more impressive. Still, replications of this study are warranted to determine the validity of our findings and whether the moral conditioning explanation proposed in the current study holds.

A second possible limitation of the present study is the low test-retest reliabilities in the moral intuition measures between Phase 1 and Phase 3 (range $r = .40$ to $.60$). Given that test-retest reliability is negatively influenced by a) actual change in scores, b) time, and c) low internal consistency, the low test-retest reliabilities in the present study are of less concern. The results of the study suggest the experimental manipulation induced systematic change. Moreover, there was a large amount of time between the first and last assessment of moral intuition sensitivity (i.e., between six to eight weeks). Finally, as previously discussed, internal consistency was somewhat low. Based on these facts, we find the levels of test-retest reliability to be acceptable.

A third potential limitation is that a history effect may have occurred related to the experiment altering participants’ viewing habits and media preferences. To test for history effects, we conducted repeated measures multivariate ANOVAs (RM-MANOVAs) on changes in viewing habits and genre preferences (action, romantic comedy, and romantic drama) between Phase 1 and Phase 3 with a 4 (between-subjects: condition) $\times$ 2 (within-
subjects: Phase 1 vs. Phase 3) factorial design. The RM-MANOVA on genre preference indicated a nonsignificant effect of condition, \( F < 1 \), and a nonsignificant condition by phase interaction, \( F < 1 \). In addition, all univariate tests of the interaction were nonsignificant with \( F_s < 1 \). We repeated this RM-MANOVA analysis for genre viewing. The multivariate tests again indicated a nonsignificant effect of condition, \( F(9, 243) = 1.25, p = .27 \), and a nonsignificant interaction, \( F < 1 \), with all univariate tests of interaction being nonsignificant with \( F_s < 1 \). These results suggest that a history effect related to action and romantic viewing did not occur.

A fourth limitation relates to the content analysis conducted in the current study and its relationship to some of the findings. Although the content analysis generally yielded results consistent with findings, there were notable inconsistencies. First is the fact that total moral conditioning exposure to authority for the high condition was negative. This finding was due to the fact that a) *Coming to America*’s plot centers around bucking tradition—a theme also found in *Shakespeare in Love*—and b) exposure to these films only existed in the high condition. All things being equal, this negative moral conditioning exposure should have led to a decrease for the high condition on the authority intuition. Why was this the case? It could be that the holistic content analysis did not accurately reflect the content of the films. This is of course a possibility, but the other content analysis findings seem to suggest that this was not the case as they were in the same direction as the findings from the experiment. It could also be that violations of authority are viewed more positively for our sample than other violations. The films in question (*Shakespeare in Love* and *Coming to America*) both feature young adults fighting authority and being rewarded for it. Yet, the resolution of both films resolves the anti-authority tendencies of the main characters in accordance with a deference and respect for legitimate authority. In *Shakespeare in Love*, Viola comes to the understanding that authority must be respected (as suggested by Queen Elizabeth) and in *Coming to America*, Prince Hakeem and his father resolve their differences. Thus, these films suggest that violations of authority from young adults are a component of “growing up” and, ultimately, mutual respect can come from such rebellious activities. This may be a theme that is particularly appealing to a sample of undergraduate students negotiating their own autonomy from their parents. Still, if the theoretical backing of the hypotheses of the current study were entirely valid, this pattern should not have occurred. Future research should continue to test these processes and determine whether interpretation of violations might differ between audience segments. If this is the case, then our description of moral conditioning would be subject to not only objective definitions of moral violation but also subjective definitions of what is considered a moral violation and moral upholding. Still, this does not invalidate the current approach but rather points to additional nuance not captured in our approach or in earlier work.
A second deviation between the content analysis and the results of the experimental study relates to the purity intuition. Similar effects were found for purity in the experimental study, but these effects were not evident in the content analysis. In fact, purity did not vary in the content analysis. This again may simply indicate a lack of ability of the coding manual or content analysis to capture variance in purity. Another explanation may relate to the possibility that purity is not a unique moral intuition, and instead represents a category of “general morality.” This possibility—which argues that purity represents a composite of other moral intuitions—is currently being contested in the literature (see Cameron, Lindquist, & Gray, 2015; Graham, 2015; Gray & Keeney, 2015a, 2015b). Thus, the variance in purity observed in the experimental study may be a generalization of the effects observed for the other moral intuitions. This possibility warrants further empirical testing in future research.

A final limitation relates to whether the effects observed relate to cumulative growth over time or a minimum dose effect. Notably, the data patterns observed in the current study cannot differentiate between the two, although its nonlinear nature is consistent with both. Although this article must remain agnostic to these two differential mechanisms, the operationalization of moral conditioning presented herein could potentially tease them apart using a different design. Such a design should a) hold moral conditioning constant within content and b) repeatedly expose participants to such content over time, observing moral intuition sensitivity after each exposure. If a growth curve mechanism explains the effect, then an exponential function would best fit the data. If a minimum dose mechanism explains the effect, then a step function would best fit the data.

CONCLUSION

This article presents further evidence that exposure to popular media is capable of influencing the moral sensitivities of audiences. The findings here reinforce the suggestion that popular media exposure can alter the foundations upon which individuals make moral judgments, but indicate that this influence may occur in a nonlinear fashion. In addition, this article provides a template for standardizing procedures across future studies. The features of a) random assignment, b) repeated exposure and measurement, c) continuous manipulation of the independent variable, d) the utilization of standardized measures of moral sensitivity, and e) integration of moral conditioning as an explanatory variable all have the potential of becoming building blocks for a strong research paradigm examining the intertwining influence of media and morality. Although some of the limitations of this study indicate multiple explanations for the observed effects, we believe that the current study generates hypotheses for future studies, describes
processes related to those hypotheses, and suggests improved methods for testing those process-focused hypotheses. Initial tests of MIME’s logic (Tamborini, 2011, 2013) provided basic evidence of the underlying hypotheses. Future research should continue to grapple with mechanistic explanations underlying the MIME’s predictions, but advancement may only be possible through increased precision of operational definitions and hypotheses.

NOTES

1. Both a learning curve and a threshold effect would relate to nonlinear patterns. However, the mechanisms underlying them would differ. The learning curve implies that growth is continuous, but the rate of growth varies over time; the threshold effect implies that change only occurs after a minimum dose is reached.

2. Some researchers criticize MFT for placing too little emphasis on cognitive components of moral decision-making (see, e.g., and Bilandzic 2011, and Gibbs, 2013). Although these criticisms may or may not be valid, the distinction between intuitive versus deliberative processes is inconsequential for this article, because we do not measure response time.

3. Recent studies have indicated a potential sixth moral intuition, liberty/oppression (Iyer, Koleva, Graham, Ditto, & Haidt, 2012). However, this intuition has yet to be formally integrated into MFT and is considered provisional (Haidt, 2012).

4. We ran our results through the p-checker application (Schönbrodt, 2015) in order to examine how they conform to expectations regarding the R-Index and test of insufficient variance (Schimmack, 2014) as well as the p curve. Results are available at http://osf.io/cn6s9.

5. This analysis procedure is often employed when the amount of change experienced from exposure is dependent on an individual’s initial score on a variable (see Fossum, Arborelius, & Bremberg, 2004; McDonell, Short, Berry, & Dyck, 2003; Postmes, Spears, & Lea, 2002).

6. These post hoc analyses were suggested by two anonymous reviewers of an original draft of this manuscript.

7. Upon completion of the coding, these coders were asked to join the project as coauthors. They did not have access to any study data or hypotheses prior to the completion of coding.

8. This composite is similar to the disposition vector developed by Weber, Tamborini, Lee, and Stipp, 2008.

9. An interesting pattern emerged whereby reliability increased from Phase 1 to Phase 3 for all moral intuitions. This pattern may suggest further evidence of the causal claims made in this article, given that systematic changes as described in the article would increase systematic variance in scores and reliability estimates, which are a function of systematic variance.

REFERENCES


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