




Narrative Media's Emphasis on Distinct Moral Intuitions Alters Early Adolescents' Judgments

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Abstract: Logic from the model of intuitive morality and exemplars (MIME) suggests that narrative media emphasizing moral intuitions can increase the salience of those intuitions in audiences. To date, support for this logic has been limited to adults. Across two studies, the present research tested MIME predictions in early adolescents (ages 10–14). The salience of care, fairness, loyalty, and authority intuitions was manipulated in a pilot study with verbal prompts ($N = 87$) and in the main study with a comic book ($N = 107$). In both studies, intuition salience was measured after induction. The pilot study demonstrated that exposure to verbal prompts emphasizing care, fairness, and loyalty increased the salience of their respective intuitions. The main study showed that exposure to comic books emphasizing all four separate intuitions increased salience of their respective intuitions in early adolescents. Results are discussed in terms of relevance for the MIME and understanding narrative media's influence on children's moral judgments.

Keywords: moral intuitions, moral judgment, children and media, media effects

Media's potential to change the attitudes and behaviors of children has long interested researchers and various publics, with considerable focus on media's sway over pro-social and anti-social outcomes for children. Although existing research has examined various cognitive mechanisms that might explain media's impact on children (e.g., the general learning model, Buckley & Anderson, 2006; and social cognitive theory, Bandura, 1989), recent developments in moral psychology have provided a new lens through which to view this influence.

The model of intuitive morality and exemplars (MIME; Tamborini, 2013) builds on the developments in moral psychology to examine the mechanisms through which media can influence moral judgment. The MIME suggests that narrative media content can influence audiences' moral judgments and behaviors through the activation of biologically rooted moral sensitivities (*moral intuitions*). A growing body of research grounded in the MIME has demonstrated that media content highlighting specific moral intuitions can activate those intuitions' salience and strengthen the role they play in audiences' decision-making (Tamborini, Lewis, et al., 2016; Tamborini et al., 2017).

To date, the MIME's predictions have been tested in adults. However, if the underlying principles of the MIME are correct, they should also be apparent in children (i.e., audiences under 18; Hahn et al., 2017; Tamborini, 2013). To test the short-term predictions of the MIME in children specifically, and in a wider range of audience types broadly, we present two studies examining the effects of exposure to messages that highlight a set of moral intuitions on the momentary salience of those intuitions in early adolescents (ages 10–14).

The Model of Intuitive Morality and Exemplars – MIME

The MIME draws on the social intuitionist perspective (Haidt, 2001) to describe how media content can impact moral judgment and behavior in audiences. Contrary to rationalist perspectives (Kohlberg, 1981), which argue that moral judgment is the product of deliberative evaluation, the social intuitionist perspective holds that moral judgment is determined primarily by automatic, pre-consciously

activated gut reactions generated by these moral intuitions, and that deliberative reactions occur only when complex moral dilemmas arise.

Building on the social intuitionist perspective, the MIME describes how media influence five broad moral intuitions identified by moral foundations theory (MFT; Haidt & Joseph, 2007). The model suggests that each of these five intuitions is activated in response to different environmental and social stimuli, and this in turn influences subsequent assessments and related social behaviors. The moral intuitions include:

- (1) *Care*, which motivates compassion, empathy, and concern for others' welfare;
- (2) *Fairness*, prompted by concerns for truth, justice, and equity in people;
- (3) *Ingroup loyalty*, which leads to preference/bias toward members of one's ingroup and against members of outgroups;
- (4) *Authority*, characterized by deference to social traditions and institutional dominance hierarchies; and
- (5) *Purity*, rooted in disgust-avoidance that motivates a desire to live a clean, wholesome life.

According to MFT, each moral intuition is a primal instinct that exists in all humans from birth (see also Miller, 2008; Turiel, 2008). MFT explains that moral intuitions motivate humans to perform evolutionarily beneficial behavior. Extensive evidence points to their existence even in young children (Hamlin, 2013): For example, an intuitive sensitivity to care is evident in infants who cry in response to other infants' suffering (Sagi & Hoffman, 1976); fairness is apparent in babies who have a tendency to distribute things equally (Geraci & Surian, 2011); loyalty can be seen in infants who prefer others similar to themselves (Hamlin et al., 2013); respect for authority has been demonstrated in children showing deference to social/organizational hierarchies (Laupa, 1991); and purity has been shown in infants who reject food based on taste and avoid contaminants (Cashdan, 1998). Considerable conceptual ambiguity surrounds the purity intuition (e.g., Eden, 2011), raising questions as to whether purity is a sensitivity toward the combination of all other moral intuitions, general moral righteousness, or something else. Given this, and the unclear methodological implications depending on the chosen conceptualization, we did not attempt to manipulate the salience of purity in the present studies.

According to the MIME, media content that portrays an action as upholding or violating an intuition can serve as a moral exemplar. For example, if a child observes Daniel Tiger (a beloved cartoon character) choosing to spend time with his childhood friends instead of the "cool" crowd, this would be an exemplar of ingroup loyalty. According to the MIME, exposure to media featuring a moral exemplar (e.g.,

sticking together with one's friends) will activate its respective intuition in viewers (ingroup loyalty), in turn influencing a variety of loyalty-related judgments, attitudes, and behaviors, from team solidarity to school spirit.

Salience of Moral Intuitions

While the mere existence of each intuition is thought to be innate, environmental factors can shape an intuition's weight in determining moral judgments (Graham et al., 2011). Moral psychologists have claimed that humans have a "preparedness" to acquire certain kinds of moral knowledge and, through socialization, they "can very easily be taught or made to care [more] about harm, fairness, ingroups, [and] authority" (Haidt & Bjorklund, 2008, p. 204). The MIME conceptualizes the weight given to certain intuitions when determining moral judgment in terms of *salience*. As a direct test of the MIME, the present study focuses on the distinct influence of media exemplars on young audiences' temporary intuition salience.

The model adopts logic from exemplification theory (Zillmann, 2002) suggesting that the recency (pertaining to short-term influence) and frequency (pertaining to long-term influence) of exposure to relevant media exemplars increases the salience of moral intuitions in audiences. In the short term, recent exposure to a media exemplar of a specific moral intuition can increase the salience of that intuition in audiences, which subsequently affects related moral outcomes (Haidt & Bjorklund, 2008; Tamborini, 2013). For example, a child in whom authority is made temporarily salient will likely show greater respect to parents, teachers, and other superiors, at least for a short time. This process assumes the moral exemplar is situated within a narrative that young observers can comprehend (e.g., Cingel & Krcmar, 2020; Mares & Acosta, 2008).

Evidence suggests that the temporary salience of moral intuitions in adults can be shaped by exposure to media exemplars (Tamborini, Lewis, et al., 2016), despite the fact that an adult's moral sensitivities are well established from years of media exposure and other forms of socialization. Recent MIME scholars (Hahn et al., 2017; Tamborini, 2013) have suggested that effects observed in adults may be stronger for children given that children's moral sensitivities have experienced fewer years of socialization from media and other environmental sources.

The present study extends previous research examining the MIME's short-term prediction: that exposure to media content featuring specific moral intuitions will increase audiences' intuition salience. We test this prediction in early adolescents, whose narrative comprehension is sufficient to identify a story's main ideas, yet not so advanced that they might get bored with the rudimentary storylines necessary for controlled narrative research stimuli (van

den Broek et al., 2003). Although the MIME's applicability to children has not been tested directly, evidence from previous research supporting the existence of the MIME's short-term mechanisms leads us to expect that MIME predictions will hold in young audiences.

Media's Influence on Children According to the MIME

The MIME provides a unique understanding of the mechanisms that govern narrative media's influence on behavior. Although media's influence has not historically been studied in this manner, the MIME's claims build on more traditional explanations of media effects based on learning (e.g., Bandura, 1989) or priming (Roskos-Ewoldsen et al., 2009). Unlike most children's research that classifies media behavior using normatively determined, context-specific labels such as "prosocial" (e.g., helping, sharing) and "antisocial" (e.g., aggression, violent behavior; Anderson et al., 2003), the MIME offers a comprehensive, context-independent scheme to organize understandings of media's moral content and its effects. This scheme provides generalizable predictions about outcomes from exposure to media content that have greater precision than frameworks that do not account for these intuitive mechanisms. For example, Mares and Braun (2013) found that exposure to TV programs portraying peer conflict increased the likelihood that children discussed group functioning, which subsequently increased their advocacy for excluding outgroup members. They concluded that viewers acquire general negative mental scripts from exposure to the content. However, general negative mental scripts might lead us to expect wide-ranging forms of antisocial outcomes in child viewers, such as fighting with friends, shoplifting, or disobeying parents and teachers. By comparison, the MIME would suggest that a narrative that associated group solidarity with benefit effectively increased the salience of ingroup loyalty, which resulted in advocacy for excluding outgroup members. This same logic could be applied to other studies investigating the short-term effect of exposure to a moral exemplar on children's care-/harm-based attitudes and behaviors (e.g., de Leeuw & van der Laan, 2018).

Additionally, MIME-based logic differs from early learning theories and their social cognitive adaptations (e.g., Bandura, 1989), which have dominated narrative media effects research. These perspectives largely use priming logic to suggest that media exemplars activate a network of related concepts that lead people to *imitate* specific behaviors (Huesmann & Taylor, 2006). However, decades of research provide little evidence that people spontaneously transfer specific behaviors learned from narrative media (e.g., Gentile et al., 2014). As a result, it is difficult

for such cognitive learning models to explain or predict media's influence on outcomes other than those closely related to the specific behaviors observed.

Instead of explaining media's influence as resulting from the learning and transfer of new *behavioral* scripts and schemas, the MIME suggests that exemplars in narrative media trigger (i.e., prime) innate mechanisms that shape judgment and behavior. It explains how observing the *same behavior* motivated by different moral intuitions can produce outcomes that represent completely *different domains* of behavior in viewers. For example, a narrative about a young man sharing cookies with an older man might emphasize different intuitions if the young man shared because he felt (a) compassion for a hungry old man or (b) an allegiance to an old man who was a member of the same fraternity. Observing the single act of the young man sharing his cookies, given different motivations, could lead young audiences to make different judgments (or perform behaviors) related to care or loyalty. By focusing on the underlying intuitive motivations for the observed behavior, the MIME considers the influence of mechanisms previously overlooked in media effects research.

The Current Studies

Evolutionary psychology research has demonstrated evidence of intuitive moral drives in young children, and media content may strengthen their salience (Haidt & Bjorklund, 2008). The MIME describes how media exemplars can increase the salience of moral intuitions to impact ensuing judgments of right and wrong or good and bad. Therefore, we expect that media can increase the salience of these intuitions in early adolescents, akin to findings from adults.

Hypothesis 1 (H1): The salience of (a) care, (b) fairness, (c) loyalty, and (d) authority intuitions will be greater in early adolescents after exposure to narrative content highlighting those intuitions than after exposure to content highlighting other intuitions.

Method

The hypothesis offered in this study tests the MIME's suggestion that exposure to exemplars presented specifically through narrative media can increase the salience of moral intuitions. We conducted two studies to examine the hypothesis. The first study was a pilot test of a new instrument, the moral foundations-measure of intuition salience in children (MF-MISC), designed to measure the salience of care, fairness, loyalty, and authority. We tested this measure in two samples of early adolescents. Given that

this study's main purpose was to pilot test the MF-MISC, we used exposure to brief verbal cues to induce intuition salience instead of narrative media. The second study tested the central hypothesis by examining whether exposure to one of four versions of an engaging media narrative (a comic book) highlighting a given moral intuition could increase the salience of that particular intuition in early-adolescent audiences. Our decision to test the MIME's basic proposition in fifth-, sixth-, and seventh-graders was a pragmatic one, as the stimulus we adapted for use in the main study was crafted for children in Grades 3–7. Additionally, children this age can comprehend the main point of narratives yet would be expected to be engaged by the kind of relatively rudimentary storyline necessary for a controlled stimulus that emphasizes the importance of only one moral intuition (van den Broek et al., 2003). All procedures were approved by the university's Institutional Review Board.

Open Science Statement

Data, analysis syntax, and materials used in both studies, including the stimuli and words used in the MF-MISC, are available at: <https://osf.io/a4wbc/>

Study 1: A Pilot Test of the MF-MISC

The first study acted as a pilot test of the MF-MISC's ability to detect changes in moral intuition salience. The MF-MISC was administered to children who were exposed to verbal cues meant to evoke specific moral intuitions. Our goal was to test whether exposure to a verbal exemplar of an intuition increased the salience of that intuition in relation to intuitions that had not been activated in participants.

Sample

For Study 1, we recruited 87 sixth-graders (49% female; $M_{\text{age}} = 11.69$; age range 11–13) from a Pennsylvania middle school via a parental consent form sent home with the students. Parents were asked to give consent for their child's participation, and if given, their children were selected for participation. Participating children then signed an assent form, and were later compensated with stickers for returning the parental consent form and finishing the survey.

The MF-MISC

The most commonly administered measure of moral intuitions among adults is the moral foundations questionnaire

(MFQ; Graham et al., 2011), which features moral terminology and dilemmas that are likely not comprehensible to children, whose reading ability can vary widely. We thus created a measure for children that contains simple instructions and language that can be easily understood by children of even a young age, and which can detect even temporary changes in the salience of intuitions.

The moral foundations measure of intuition salience in children (MF-MISC) asked participants to choose one of four words (one associated with each of the four moral intuitions) as being either the best or worst of the four words (depending on the question). Six sets of words were included in the procedure that measured care ($\alpha_{\text{ordinal}} = .68$), fairness ($\alpha_{\text{ordinal}} = .72$), loyalty ($\alpha_{\text{ordinal}} = .83$), and authority ($\alpha_{\text{ordinal}} = .72$). Three sets contained positively valenced words representing each of the four intuitions, and three other sets contained negatively valenced words representing each of the four intuitions. In each positively valenced set, respondents were asked to choose words according to "which you think it is better to be" (e.g., response options in one set included: "kind," "honest," "loyal," or "respectful"). In each negatively valenced set, respondents were asked to choose words according to "which you think it is worse to be" (e.g., response options in one set included: "hurtful," "unfair," "disloyal," or "disrespectful"). Aside from being commonly accessible and easily identified by early adolescents (Flesch-Kincaid Reading Ease = 73.4), each of these behaviors was chosen because it appeared valid on its face, and because it was deemed to be closely associated and representative of each moral intuition in a previous meta-analysis related to the moral intuitions (Prabhu, 2018).

The MF-MISC is a suitable measure of intuition salience in children because the abstract nature of the task involved in this measure is likely to make participants use their instincts/intuitions to respond. By asking participants to choose one behavior over many, most people would be guided by the positive/negative affect generated by their moral intuitions. This would especially be the case for children, whose ability to rationally deliberate is limited (e.g., Eisenberg-Berg, 1979). Although formal validation attempts are necessary in future research, efforts to develop the measure here highlight the instrument's face and content validity in line with MFT and MIME research (Haidt & Joseph, 2007; Tamborini, 2013).

MF-MISC Scoring

Scoring for the MF-MISC is consistent with the notion that moral intuitions are affective mechanisms, such that a strongly salient intuition will consistently produce strong positive affect in response to intuition-upholding stimuli (in this case, behaviors upholding the evolutionary goals

of a moral intuition), and strong negative affect in response to intuition-violating stimuli (in this case, behaviors violating the evolutionary goals of a moral intuition). Accordingly, the strongest moral intuition should lead the participant to choose behaviors related to the intuition for both the positively and the negatively valenced items. For instance, if care is most salient among the four intuitions in a participant, we would expect that participant to indicate that it is always better to perform actions that uphold care-related principles and always worse to violate principles related to care. Therefore, for each set of words in the scale, we scored the items so that the word chosen as best/worst in each set was coded as 1, and all the other words in that set were coded as 0.

Finally, we created four intuition salience indices (one for care, fairness, loyalty, and authority) for each participant by summing the number of words participants chose as best/worst for each intuition and dividing this sum by the number of sets the participant responded to. The resulting four intuition salience indices represent the proportion of time an intuition's corresponding words were chosen first. That is, a score of 1 indicated that words associated with an intuition were chosen first in all sets, and a score of 0 indicated that words associated with an intuition were not chosen first in any sets.

Procedure

Children from two classrooms participated in the study. In each classroom, participants were seated at their desks while the researcher delivered a paper survey containing the assent, the MF-MISC, and demographic questions. The researcher then provided Part 1 of the study instructions by describing the study and reminding children that they did not have to participate, but if they wanted to, they should write their name on the assent form. Children who did not want to participate were instructed to sit quietly, read, or work on homework in the back of the classroom or at their desks. The second part of the instructions provided the pilot study induction for all assenting participants. Before students completed the MF-MISC, the researcher provided a verbal prompt designed to prime one of the four moral intuitions. Each prime was disguised as a friendly verbal prompt. When presenting each prompt, the researcher acted as if she was deviating from her procedure in order to speak colloquially to the class. For example, to prompt ingroup loyalty, the verbal prompt was, "We are trying to see whether more people in *this group* will do the study than the *other groups*. Don't you want this *group* to win? It would be great if you all *stuck together* and tried to do better than the other class!" All verbal prompts are available at: <https://osf.io/a4wbc/>

Given that four intuitions were manipulated through verbal prompts in two classrooms, participants could not be randomly assigned to different conditions within rooms. Therefore, participants in each classroom received two different verbal prompts, each at different times. Classroom 1 first heard a fairness prompt and then completed the first half of the MF-MISC, which contained the three sets of positively valenced words. Upon completion, a care prompt was given. Then participants filled out the second half of the MF-MISC, which contained the three sets of negatively valenced words. Classroom 2 followed the same procedure, but this group heard an authority prompt before completing the three sets of positively valenced words, and then heard a loyalty prompt before completing the three sets of negatively valenced words.

This unusual procedure was driven by a need to prompt all four intuitions and measure the intuition importance immediately after each prompt. With only two classrooms available, each classroom had to be prompted twice. Because we could not have them complete the same measures after different prompts, we divided in half the six items measuring intuition salience. Because randomly selecting items for each half would have produced an unequal number of positive/negative words for different intuitions in each half, we included all positive items following the first prompt and all negative items following the second prompt.

Results

Using participants' intuition indices (hereafter referred to as "MF-MISC scores") as dependent variables and condition as an independent variable, we conducted a series of one-way planned-contrast ANOVAs on participants' MF-MISC scores. Given that the MIME makes predictions only about the salience of intuitions that *are* exemplified (and does not make predictions about the relative salience of intuitions not exemplified), planned contrasts were adopted for all ANOVAs such that the MF-MISC score of the relevant intuition in its matched condition (e.g., the *care* MF-MISC score in the care condition) were compared with the relevant intuition scores in all other conditions (e.g., the *care* MF-MISC score in all conditions where care is not exemplified). Moreover, because the hypotheses tested with these ANOVAs represent specific directional predictions based on the MIME's theoretical logic, all planned contrasts reported were assessed using one-tailed tests. This is in line with recommendations by Fields (2000) and Levine and Banas (2002) that one-tailed tests provide the most accurate test of such hypotheses. Specifically, the MIME offers a directional hypothesis predicting that the relevant intuition score (in this case the *care* MF-MISC score) should

be *higher* when it is exemplified (in the *care* condition) than when it is not exemplified (in any other condition).^{1,2}

The results of the planned contrast analyses comparing the care index score when care was exemplified with when it was not exemplified revealed that in the care condition, care MF-MISC scores were higher ($M = 0.44$, $SD = 0.39$) than in any other condition ($M = 0.29$, $SD = 0.33$), $t(170) = 2.34$, $p = .01$ (one-tailed), $\omega^2 = .02$. Matching contrast analyses for fairness indicated that in the fairness condition, fairness MF-MISC scores were higher ($M = 0.31$, $SD = 0.32$) than fairness scores in any other condition ($M = 0.23$, $SD = 0.28$), $t(170) = 1.69$, $p = .047$ (one-tailed), $\omega^2 = .06$. Similarly, contrast analyses for loyalty indicated that in the loyalty condition, loyalty MF-MISC scores were higher ($M = 0.24$, $SD = 0.30$) than loyalty scores in any other condition ($M = 0.13$, $SD = 0.25$), $t(170) = 2.62$, $p = .005$ (one-tailed), $\omega^2 = .03$. Unlike these other probes, however, the contrast analyses comparing the authority MF-MISC score in the authority condition ($M = 0.28$, $SD = 0.29$) with all other conditions ($M = 0.28$, $SD = 0.30$) did not indicate any difference, $t(170) = -.33$, $p = .37$ (one-tailed).

Study 1 Discussion

Results of Study 1 support H1 for the intuitions of care, fairness, and loyalty, but not authority. The brief verbal cue inductions used in Study 1 affected intuition salience in three out of four cases, providing promising support for the MIME's predictions that moral exemplars emphasized in narrative media can shape the salience of moral intuitions in early adolescent audiences.

The failure to find an effect on the authority MF-MISC score could indicate that (a) the MF-MISC does not provide a good measure of the authority intuition's salience, (b) the verbal prompt used to induce authority salience was especially weak, (c) the authority prompt influenced another intuition, or (d) something else in the procedure unintentionally increased the salience of authority across all

conditions, eliminating the MF-MISC's ability to detect differences in its salience due to the authority manipulation. Retrospective consideration of the procedure lends post hoc credence to this last possibility, when considering that in each classroom the teacher (a benevolent authority) gave participants varying instructions related to listening to the researcher, remaining quiet, etc. However, we understood that teachers would not be giving varying instructions in our main study. With this in mind, and given evidence from Study 1 showing measured change in the intuition salience of care, fairness, and loyalty after brief verbal prompts, we proceeded to test our central hypothesis predicting that moral intuition exemplars in narrative media could increase the salience of those intuitions in early adolescents.

Study 2: A Test of the Central Hypothesis

An a priori power analysis was conducted using the pwr package in R (Champely et al., 2020) with power ($1 - \beta$) set at 0.80, $\alpha = .05$, and for five groups (described later). Effect size estimates were obtained based on the results of the pilot study (which used the same measure and sampled from the same population). Analysis revealed the total sample size necessary in Study 2 would be 100.

Sample

In Study 2, 235 participants (54% female) in Grades 5–7 ($M_{\text{age}} = 11.94$, age range 10–14) were recruited from a Pennsylvania middle school. Of these, 116 reported paying a little attention to the stimulus, and 12 reported not paying attention. Only participants who reported that they paid close attention were retained for further analyses, resulting in a total of 107 participants for final analyses (55% female; $M_{\text{age}} = 11.86$, age range = 10–14).³

¹ We acknowledge that one-tailed tests are somewhat uncommon in communication research, despite several researchers pointing out their legitimacy under the specific circumstances in the present studies (e.g., Cho & Abe, 2013; Levine & Banas, 2002). With this in mind, we also use bias-corrected accelerated bootstrapping (10,000 random samples) to estimate the 95% lower-bound of a confidence interval for each mean difference associated with our hypothesis in both studies. These analyses do not change the interpretation of the present studies' results and are reported at: <https://osf.io/a4wbc/>

² At first glance it may seem reasonable to also compare the salience of an intuition when it was activated with the salience of other intuitions that were not activated. However, our investigation was focused on assessing the extent to which our activations could impact their respective intuition's salience alone. Notably, we would expect care and fairness to be more salient in general (e.g., Graham et al., 2011), thus looking at the relative salience as it naturally occurs would be less informative than our analyses, which examine relative salience after an induction. This distinction is important. Although the effect of our stimuli is expected to increase the salience of the activated intuition, this does not suggest that it would totally override the naturally greater salience of a stronger intuition.

³ Although we felt the theoretical and pragmatic value of excluding low-attention participants outweighed the attenuation of effect size by including them in analyses, we replicated these analyses with the inclusion of participants who paid a little attention ($N = 223$). The pattern of results remained the same with the exception that fairness only trended toward significance and loyalty differences were not statistically significant. These analyses, along with the original data, are available at: <https://osf.io/a4wbc/>

Measures

The MF-MISC described in Study 1 was again employed, producing measures of care ($\alpha_{\text{ordinal}} = .70$), fairness ($\alpha_{\text{ordinal}} = .38$), loyalty ($\alpha_{\text{ordinal}} = .74$), and authority ($\alpha_{\text{ordinal}} = .64$). The results of Study 1, although demonstrating a promising pattern, left questions remaining as to why authority salience was not affected. We suspected this might partially be due to a lack of attention to the stimulus. For Study 2, we included an additional item on the last page of the survey asking participants to indicate how much attention they paid to the stimulus. We disguised the attention question by asking them whether they: (1) found the story really interesting and paid close attention, (2) found the story a little interesting and paid a little attention, or (3) did not find the story very interesting and did not pay close attention. Although this created a double-barreled question, the potential for impression management to affect the attention measure, and thus our outcome, was deemed much greater than the potential effect of the confound between liking and attention.

Stimulus

The stimulus in Study 2 consisted of a manipulated 41-page *Cleopatra in Space* comic book. Five different versions of the comic book were created to either highlight the upholding of one of the moral intuitions – care, fairness, loyalty, or authority – or no moral intuition. Consistent with recommendations from Fisch (2005) on creating educationally effective narrative media content, we manipulated a comic geared for a 10- to 14-year-old audience. Fisch recommended (a) using humor that is understandable and interesting to children, (b) reinforcing a small number of ideas, (c) drawing explicit connections among conceptually related segments, (d) including action filled visuals instead of talking heads, and (e) tying the educational content directly to the plotline.

Basic Story

We utilized all of Fisch's (2005) recommendations, and the resulting five comic versions all contained the same plot, differing only in the intuition (or lack thereof) highlighted. Each comic began with a main character, Cleopatra, attending school. During class, Cleopatra is summoned to the "Grand Council" where she receives a mission that she must complete. The Council requests that she go to a nearby planet, retrieve a key that unlocks treasure, and return it to them. During her trip, she is captured by the planet's creatures ("Nebulans"), who want the key for themselves, and she must decide what to do.

Conditions

The plot varies at four specific points, which were chosen because of their centrality to the narrative: when Cleopatra

(1) arrives late to class and is asked a question by her professor, (2) is caught by the Nebulans, who then try to talk her into giving them the key, (3) decides what to do with the key, and (4) returns to her spaceship and tells her friend what decision she made. At each variation point (detailed at: <https://osf.io/a4wbc/>) the text of the narrative was manipulated to highlight its relevant intuition (or no intuition) through bolded key words (e.g., care: "supporting those in need"; fairness: "truth and justice"; loyalty: "sticking together"; authority: "follow the orders of your leader"; and no-moral comparison: "seeking happiness"). None of the words included in the MF-MISC was present in any of the four versions of the comic. The comic's Flesch-Kincaid Reading Ease was 87.8 (easy to read).

Procedure

Following the same assent/consent procedure as Study 1, participants were randomly assigned to read one of five versions of the manipulated comic. Participants were instructed to read their comic silently to themselves. After reading the narrative on their own, participants completed a survey consisting of the MF-MISC, demographics, and the attention check item. The complete procedure lasted approximately 25 min.

Narrative Manipulation Check

Content analysis was used to examine each character's dialogue and actions for exemplars of any of the four intuitions with each page as the unit of analysis. Three coders, blind to the study's hypothesis, were trained for 3 weeks to identify intuition exemplars in media using an established coding manual (e.g., Hahn et al., 2017). After training, two coders examined each page in all five versions of the 41-page comic and recorded present intuition exemplars. All content was assessed for interrater reliability using Krippendorff's α , which was acceptable across intuitions (care $\alpha = .74$; fairness $\alpha = .86$; loyalty $\alpha = .80$; authority $\alpha = 1.00$). The third coder acted as a referee for all disagreements.

Ten pages in each version of the comic were manipulated to emphasize an intuition, with all other pages identical across versions. To ensure that any one version of the comic exemplified its respective intuition and only that intuition, we conducted a 6 (page type: manipulated to feature care, fairness, loyalty, authority, no intuition, or unmanipulated) \times 4 (intuition: care, fairness, loyalty, authority) chi-square test on the coders' ratings. Results showed that each version of the comic exemplified its respective intuition and only that intuition, $\chi^2(12, N = 46) = 106.91, p < .001$, Cramer's $V = .88$. For pages manipulated to feature care (adjusted standardized residual = 6.4) or fairness (adjusted standardized residual = 5.4), no other intuitions

Table 1. Means and standard deviations for intuition salience in Study 2

	Care condition	Fairness condition	Loyalty condition	Authority condition	No-moral comparison condition	Average when not activated
Care MF-MISC score	0.57 (0.28)^A	0.27 (0.22)	0.19 (0.17)	0.33 (0.24)	0.34 (0.30)	0.29 (0.24) ^B
Fairness MF-MISC score	0.15 (0.15)	0.30 (0.21)^A	0.25 (0.25)	0.22 (0.15)	0.26 (0.17)	0.22 (0.17) ^B
Loyalty MF-MISC score	0.13 (0.19)	0.19 (0.21)	0.30 (0.21)^A	0.13 (0.16)	0.16 (0.16)	0.15 (0.18) ^B
Authority MF-MISC score	0.16 (0.17)	0.28 (0.18)	0.25 (0.15)	0.31 (0.23)^A	0.25 (0.22)	0.24 (0.18) ^B

Note. Scores for activated intuitions are in bold. Standard deviations appear in parentheses. Comparisons are horizontal (comparing only the activated condition with the average when not activated). Scores with different superscripts indicate significance at $p < .05$ (one-tailed).

were coded as appearing on those pages. That is, on pages manipulated to feature care ($n = 10$), care appeared alone on all 10 pages. The same was true of fairness ($n = 10$). For pages manipulated to feature loyalty (adjusted standardized residual = 5.5) or authority (adjusted standardized residual = 5.9), nine of the 10 manipulated pages were coded as featuring loyalty and authority, respectively. In both of these cases, one page was coded as featuring fairness, instead of the relevant intuition.

As intended, results revealed that the pages manipulated in the no-moral comparison condition did not feature any moral intuition. The 31 pages left unmanipulated (i.e., pages that appeared in every stimulus version) did not feature any one intuition more than others (although each intuition did appear at least once on these pages, no intuition appeared more than twice). Intuition exemplar frequencies in each comic version are available at: <https://osf.io/a4wbc/>

Results

First, like the pilot test, four MF-MISC index variables were created for each participant (one for each of the intuitions), each representing the percentage of times that intuition was chosen as most important. A preliminary glance at each of the intuition indices revealed that each intuition was selected as the most important intuition more frequently *when it was exemplified* in the comic book than when it was *not exemplified* (see Table 1).

To test H1, four one-way planned-contrast ANOVAs were conducted, each with the relevant MF-MISC score as a dependent variable and planned-contrast coefficients comparing the matching condition of interest with all other conditions. Contrast results were significant for all four intuitions – care, fairness, loyalty, and authority – indicating that when exposed to media content exemplifying a specific intuition, participants were more likely to choose it as the most important intuition than when they were exposed to any other intuition. Specifically, results of the contrast analyses comparing the care score in the care condition with all other conditions revealed that the care MF-MISC score was significantly higher in participants who read a comic about

care ($M = 0.57$, $SD = 0.28$) than those who read about any other intuition ($M = 0.29$, $SD = 0.24$), $t(102) = 4.39$, $p < .001$ (one-tailed), $\omega^2 = .16$. A similar analysis indicated that the fairness scores were higher when participants read a comic featuring fairness ($M = 0.30$, $SD = 0.21$) than when reading about any other intuition ($M = 0.22$, $SD = 0.17$), $t(102) = 2.03$, $p = .02$ (one-tailed), $\omega^2 = .04$, and that loyalty scores were higher in the loyalty condition ($M = 0.30$, $SD = 0.21$) than any other condition ($M = 0.15$, $SD = 0.18$), $t(102) = 3.07$, $p = .002$ (one-tailed), $\omega^2 = .06$. Unlike Study 1, contrast analyses revealed that authority scores were significantly higher for participants in the authority condition ($M = 0.31$, $SD = 0.23$) compared with participants in any other condition ($M = 0.24$, $SD = 0.18$), $t(102) = 1.81$, $p = .04$ (one-tailed), $\omega^2 = .03$. No statistically significant difference was found between MF-MISC scores of those in the no-moral comparison condition compared with any moral conditions: including care, $t(102) = .02$, $p = .49$ (one-tailed), fairness, $t(102) = .50$, $p = .31$ (one-tailed), loyalty, $t(102) = -.60$, $p = .27$ (one-tailed), or authority, $t(102) = -.08$, $p = .47$ (one-tailed). As intended, this suggests that each stimulus increased MF-MISC scores for its targeted intuition. There is no evidence that the stimuli increased MF-MISC scores for intuitions as a whole.

Study 2 Discussion and General Discussion

Overall, the pattern of results in both studies offered support for H1 and the MIME's contention that media content exemplifying an intuition can increase the salience of that intuition in young audiences. This pattern was supported for care, fairness, and loyalty in Study 1, and all four intuitions in Study 2. These results contribute to existing research in three key ways including: (1) adding to research on children and media by explicating intuitions that govern media's influence on children's moral judgments, (2) testing the validity of the MIME's processes by examining them with young audiences, and (3) introducing

a preliminary tool to measure intuition salience in early adolescents.

Explicating Mechanisms of Media's Influence on Children's Moral Judgments

To the extent that the MF-MISC provides a valid and reliable indicator of intuition salience, this measure can be a valuable addition to research on the relationship between media entertainment and children. Using the MIME to examine media's influence on young audiences may help researchers identify the small and often difficult-to-perceive effects that exposure to individual media exemplars can have on the relative salience of intuitions. By examining MIME processes in early adolescents, the present study shows that researchers can observe the impact of care, fairness, loyalty, and authority intuition exemplars in media on their respective intuition salience in a young audience. Although the observed effects in the present studies were small to moderate in size, such effect sizes were observed after only a very brief exposure to a verbal prompt (Study 1) or a comic book (Study 2). In MIME research with adults, effects on intuition salience are usually small and difficult to replicate (e.g., Tamborini, Lewis, et al., 2016; Tamborini, Prabhu, et al., 2016). Our findings also encourage consideration of attention for identifying media's typically weak effects on the transience of intuition salience. The current studies' robust short-term effects in early adolescents increases the plausibility of MIME-based assertions that media's influence on intuition salience at a young age plays a central role in shaping the foundation upon which moral judgments are made.

The MF-MISC: A New Tool to Measure Intuition Salience

Although some established measures of moral intuition salience have proven useful with adults, their inappropriateness for children highlights the need for a new instrument. Previous research has measured intuition salience by using response time measures of the reported affect associated with moral intuitions (i.e., the moral foundation-affect misattribution procedure; Tamborini, Lewis, et al., 2016) and by measuring the extent to which intuitions play a role in audience's judgments of right and wrong (i.e., the MFQ; Graham et al., 2011). However, pragmatic concerns related to reading comprehension have restricted researchers' ability to use either of these existing measures with child audiences.

The MF-MISC addresses these concerns and measures intuition salience in a child-friendly manner. By asking children to choose which moral principle is better or worse

than others, respondents are being asked to make judgments that are not uncommon for children of any age. The value of a valid and reliable scale that measures the salience of moral intuitions in children should not be understated. Pending a formal validation of the instrument, the accessibility of the MF-MISC to children with a wide range of reading abilities positions this instrument as an important new tool for measuring media's impact on mechanisms that can shape children's judgments of right and wrong.

Limitations and Future Directions

Our study's first limitation was that we did not measure *absolute* or trait-related differences in intuition salience, but focused only on *relative* salience and state-based outcomes. As such, we do not know how trait differences in moral intuition salience might moderate the influence of moral exemplars on audience response. Future research should examine how trait-like intuition salience interacts with narrative comprehension to alter media content's impact on state-like intuition salience and related outcomes.

Second, in Study 1, the four moral-intuition inductions had to be delivered through verbal prompts to all students in a classroom, but only two classrooms were sampled. This triggered an unusual procedure where children in each classroom received two different verbal prompts, each followed by the completion of half of the items in the MF-MISC. Although split-half designs are not unheard of, unique risks are associated with this approach. One risk is that the first test will bias responses to the second. The most common effect of this is increased error resulting in a conservative test, which would do little to weaken our claims. However, a systematic bias produced by some unidentified confound of the first test with responses to the second test is also possible. Although it may be difficult for us to imagine how any such confound would produce the patterns observed in Study 1, this possibility remains. The replication of these findings in Study 2 helps address these concerns.

Third, excluding those who did not pay close attention to the stimulus in Study 2 reduced our sample size considerably. The importance of attention is implicit in the MIME, and can be considered a necessity for testing the MIME's claims. Future studies could attempt to replicate this study using highly engaging video stimuli, which might overcome the comparatively low attention levels afforded by text-based media. Our study used a comic book in which text was extensively integrated with visual information. However, previous research (Huff et al., 2020) indicates that the combination of text and pictures in comics requires more effortful processing compared to purely pictorial

comics. This may hold true particularly for the younger audiences in our studies, and may have potentially contributed to the varying attention levels that we observed. Future studies could attempt to replicate this study using purely visual stimuli such as pictures or videos. Relatedly, the wording of our attention check item raises the possibility that by excluding participants who indicated they only paid a little attention, we may have inadvertently excluded participants who did not enjoy the comic. If this is the case, our results may generalize to children who enjoyed, rather than paid attention to, the comic. This possibility should be further considered by future researchers.

Next, the fact that both studies took place in a classroom may have increased the chances for participants to give socially desirable responses. Although social-desirability artifacts are always a concern with research on children who need to be observed as they complete procedures, future researchers should attempt to minimize this issue.

Last, although the MF-MISC procedure in Study 2 indicated acceptable reliability for three intuitions, the alpha value for fairness fell below the accepted .70 threshold. Low reliability might be expected to attenuate the strength of the observed findings in the main study. Nevertheless, future work should attempt to increase the reliability of the fairness measure. Although the measure showed predictive utility in the current study, further validation of the MF-MISC is certainly needed.

Conclusion

Moral education is often at the forefront of parents' concern for their children's well-being. Although there is value in directly teaching children moral principles through instruction about what to do or not do, our results support an indirect approach to socializing children's morality (Haidt & Bjorklund, 2008). This first step at exploring narrative media's ability to activate moral intuitions in young audiences should be accompanied by additional work examining how "direct route" lessons, such as those contained in the Ten Commandments, may complement narrative media's impact on children's morality.

Our studies provide evidence supporting the MIME's predictions about narrative content's influence on moral intuition salience. Future research should build on these findings to examine whether this elevated intuition salience can influence broader values, judgments, and behaviors in children. Such examinations should be especially important for researchers interested in both the mechanism responsible for media's influence and the extent of media's impact on malleable, developing children, who may be socialized by media content.

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