

EXTENDING RESEARCH TESTING THE MODEL OF INTUITIVE MORALITY AND EXEMPLARS IN
CHILDREN

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ABSTRACT

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The MIME suggests that narrative media content which highlights a specific altruistic or egoistic intuition can increase the accessibility of that intuition in audiences. The present study attempted to replicate research which measured the accessibility of altruistic intuitions in children and extend this to measure the accessibility of egoistic intuitions in children as well. Participants (Mage = 12.12 range = 9-13) read one of five comic books designed to highlight an altruistic intuition (care, fairness, loyalty, authority) or an egoistic intuition (hedonism/power). After exposure, participants completed measures of intuition accessibility, one developed previously to measure the accessibility of altruistic intuitions, and two new measures designed to gauge the accessibility of egoistic intuitions. Findings partially replicated previous research showing that exposure to comic books emphasizing care, loyalty, and authority intuitions increased the accessibility of those intuitions in audiences. However, no differences in the accessibility of fairness or hedonism/power were observed.

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INTRODUCTION

Parents and researchers alike have paid a great deal of attention to the effect of narrative media on the altruistic and egoistic attitudes and behaviors of children. Previous children's media research has examined narrative media's effects on outcomes ranging from attitudes about social exclusion (Mares & Braun, 2013) to behaviors such as helping others (Gentile et al., 2009).

Although considerable research has examined issues related to media effects on the altruistic and egoistic behaviors of children using traditional learning perspectives, more recent research has taken a different approach. Building on recent developments in moral psychology, research of Hahn, Tamborini, Prabhu, Grall, Novotny, and Klebig (2017) has found evidence that media can influence children's moral intuitions. The current study attempts to replicate Hahn et al.'s (2017) demonstration that media primes can influence the temporary accessibility of altruistic intuitions in children and extend this work to examine the potential of media to influence the accessibility of egoistic intuitions as well.

Hahn et al. (2017) based their research on the model of intuitive morality and exemplars (MIME; Tamborini, 2013). The MIME (Tamborini, 2013) explicates the mechanisms through which media can influence moral judgements and posits that the effect is especially strong in children. Hahn et al. (2017) demonstrated that exposure to cartoon narratives highlighting specific altruistic intuitions increased accessibility of those intuitions, which were thought capable of subsequently influencing related moral judgements. Potentially, one of the most valuable contributions of the work by Hahn et al. was the development of an instrument to measure the accessibility of altruistic intuitions. This instrument is called the altruistic measure

of intuition accessibility (A-MIA). The first goal of the present study is to test the reliability of the A-MIA by attempting to replicate the findings of Hahn et al.

Although replication of previous results using the A-MIA is valuable in and of itself, the present study attempts to advance work in this area by developing measures designed to assess the accessibility of egoistic intuitions in children. Whereas the A-MIA measures the accessibility of only altruistic intuitions, recent MIME literature has noted the need to examine media's influence on egoistic intuitions. Building on MIME-based logic explicating the manner in which media exposure can influence the accessibility of egoistic intuitions, and the belief that this influence will be apparent in children, the current extends the approach used by Hahn et al. (2017) to test two measures designed to assess the accessibility of egoistic intuitions in children.

The paper begins with an overview of the MIME. It continues on to discuss previous literature that examines media's influence on children, while also discussing how the MIME can provide clarity to this research. Finally, an approach (based on the MIME) to replicate and extend recent MIME-based research examining media's temporary influence on children is offered, along with a study designed to test these claims.

CHAPTER 1: THE MODEL OF INTUITIVE MORALITY AND EXEMPLARS

The model of intuitive morality and exemplars (MIME; Tamborini, 2011, 2013) describes the reciprocal influence between media exposure and the accessibility of intuitive motivations. The MIME examines the relationship between an audience's moral sensitivities, the psychological processes in their choice of media, and the consumed content (Tamborini, 2011). The model proposes that an audience's evolutionary-developed, biologically rooted morality can be influenced by media.

Two components of the MIME explicate the short-term and long-term processes that govern its reciprocal influence processes. The short-term component of the MIME suggests that salience of a moral exemplar will increase with exposure to the relevant moral cues in an individual's environment. In turn, the reinforcement of the moral exemplar in media content will increase the salience of the moral cue found in the audience's environment. Audiences will then select media content featuring the moral domains that are most salient to them. Finally, the MIME suggests that audience patterns of media selection leads to production of media content that features the moral domains. Thus, the MIME is capable of making longitudinal predictions on the two-way relationship between the influence of the media and perceptions of moral domains held in a society's values and norms.

The long-term component of the MIME suggests that media content created for specific audiences is more likely to feature moral domains salient for that culture. This is based on the assumption that viewers who share similar patterns of moral domain salience will choose media content that aligns with their shared salient domain. Finally, media content is produced to display the shared moral values to be reintroduced to the audience. The content provides

additional moral cues that compliments cues found in the person's cultural environment. The present study replicates and extends the work of Hahn et al. (2017) by experimentally testing the short-term component of the MIME in a sample of children.

The framework underlying the short-term component of the MIME builds on moral foundations theory (MFT) and exemplification theory. The MIME is based on the conception of moral intuitions described in moral foundations theory (MFT; Haidt & Joseph, 2007). A moral intuition is defined as: "the sudden appearance in consciousness, or at the fringe of consciousness, of an evaluative feeling (like-dislike, good-bad) about the character or actions of a person, without any conscious awareness of having gone through steps of search, weighing evidence, or inferring a conclusion" (Haidt, 2001, p. 818).

MFT identifies five mental systems, or moral intuitions, that are triggered in response to different social or environmental stimuli. This triggering influences ensuing assessment and social behavior. The MIME adopts the five moral intuitions of MFT. Care is rooted in empathy, compassion, and concern for the well-being of others. Fairness pertains to concerns for truth, equality, and justice. Ingroup loyalty is a bias/preference towards one's ingroups and against members of one's outgroup. Respect for authority is respect towards institutional dominance hierarchies and social traditions. Purity is the motivation to live a wholesome, or clean, life. Purity is not included in the present study due to past research finding conceptual ambiguity surrounding the purity intuition when using a child sample (Hahn et al., 2017).

The MIME's account of media influence

The MIME embraces logic from Zillmann's (2002) exemplification theory to explain how media exposure increases the accessibility of moral intuitions. It then goes onto describe the

manner in which moral intuitions made accessible by media exposure may subsequently influence the evaluative reactions of audience members and behaviors based on those evaluative reactions.

Accessibility of moral intuitions. The MIME adopts MFT's dual-process model to explicate the processes through which media exposure can increase the short-term accessibility of intuitive motivations. The dual-process of MFT suggests that judgments are generated by two systems working together (Bargh & Chartrand, 1999). The intuitive system is the unconscious process that creates immediate judgements based on the individual's emotional sensitivity towards well-established examples of social behaviors. The rational system of the model is the conscious process that results in a slower response.

MFT states that all humans possess moral intuitions, yet there is variance in the strength of any particular intuition in individuals at any given time. Due to the strength of an intuition being manifested in the readiness or consistency with which it is accessed, the MIME analyzes the strength of the moral intuition in terms of accessibility. Accessibility can be influenced by the recency (pertaining to short-term) or frequency (pertaining to long-term) of media exposure. The MIME's short-term component argues that recent exposure to media exemplifying a particular moral intuition increases the accessibility of that intuition in audiences, which could affect related moral outcomes. In the long term, frequent exposure to a media exemplar of a specific moral intuition can increase chronic accessibility of the particular intuition, bringing about persistent effects.

Previous research has found support for the claim that the temporary accessibility of moral intuitions in adults can be shaped by the exposure to media exemplars (Tamborini et al.,

2014, Tamborini, Lewis et al., 2016; Tamborini, Prabhu et al. 2016). Notably, these outcomes have been observed despite the fact that adults have years of media exposure, along with other forms of socialization, contributing to well established moral sensitivities. The present study extends previous MIME research by examining the short-term prediction that exposure to media content that features a specific altruistic or egoistic intuition will lead to an increase in the accessibility of those intuitions in a child audience.

Moral exemplars. Building on Zillmann's exemplification theory, the MIME reasons that iconic and emotionally impactful exemplars have a particularly strong influence on accessibility. Audio-visual media are inherently iconic and emotionally impactful, affording this media particularly strong accessibility enhancing potential. Moral exemplars are key in describing how media and environment combine as influencers of moral judgements. According to the MIME, media content that depicts an action as upholding or violating an intuition is considered to be a moral exemplar. For example, if a child saw Thomas the Tank Engine (a beloved character) choose to obey the request of Sir Topham Hatt to deliver expensive cargo instead of keeping it for himself, this would be an exemplar of respect for authority. The MIME claims that exposure to media that features a moral exemplar (e.g., obeying a teacher), will trigger its respective intuition in the audience (respect for authority), which can then influence a variety of authority-related attitudes, beliefs, and behaviors.

MIME's account of media's influence on children's altruistic and egoistic intuitions

As children are a special media audience, with their lack of maturity and real-world experience, studying media's influence and children's moral judgements is imperative (Potter, 2014). The MIME suggests that media's effect on both the temporary and chronic accessibility

of moral (aka *altruistic*) intuitions will be stronger on children (Hahn et al., 2017). Although previous frameworks for studying media's influence on children unanimously identify children as more susceptible to media's influence, the MIME differs from most early learning frameworks as it does not base its explanation of media's influence as a result of learning and transfer of behaviors. Instead, the model suggests that the increase in accessibility of the moral intuitions shapes moral judgment of events.

Differing from previous perspectives, the MIME supplies an understanding of outcomes produced by the activation of moral intuitions. Narrative media effects research has been previously dominated by early learning theories (e.g., Bandura, 1965) and their social cognitive adaptations (e.g., Bandura, 1989) which use priming logic to explain how media exemplars activate a network of semantically related concepts that lead people to imitate behaviors in similar settings (Huesmann & Taylor, 2006). A good example of this is the general learning model (GLM; Buckley & Anderson, 2006; Maier & Gentile, 2012). The cognitive framework of GLM predicts that behaviors are the result of the activation and application of schemas that are stored in memory (Bushman & Anderson, 2002). The predilection to imitate specific behaviors is presumed to generalize and transfer to settings where such learned behavior would be appropriate. However, research on narrative media has found little evidence that behaviors viewed in media are spontaneously reproduced in different settings (Gentile, Groves, & Gentile, 2014). The lack of evidence makes it difficult for such cognitive learning models to predict or explain the influence of media on outcomes unless the physical behavior is closely related to the one observed.

The MIME does not contain the same limitations. In contrast to models that explain media's influence as a result of learning a behavior and reproducing it in new settings, the MIME examines how media exemplars trigger the intuitive motivations that can produce various behaviors in line with the underlying drive. The model describes how media can activate specific motivations, which in turn affect behavior. It explains also how narrative content highlighting *different* intuitive motivations for the same action should result in an audience responding differently to the *same* observed behavior. As such, exposure to the same behavior, when instigated by different motivations, may activate different moral intuitions and produce different behavioral outcomes.

For example, consider a narrative about a young girl who shares a box of animal crackers with her elderly female neighbor. Learning models might predict that a child viewing the narrative will imitate the behavior and share their crackers with elderly women, with little consideration of the child's underlying motivations. However, the MIME focuses specifically on the underlying motivation, making different predictions based on the intuitive drives made salient in the narrative (Tamborini, 2013). For example, the influence of exposure on an observer's behavior would differ if the underlying motivation for the character's sharing was a feeling of obligation because the elderly woman had previously baked her a cake, or a feeling of compassion because the woman was starving, or feeling of respect because the woman was her teacher, or a feeling of alliance because the woman was related. This single act of sharing crackers, when given different motivations, could then lead young audience members to behave equitably, compassionately, respectfully, or loyally. The focus on the intuitive

motivations for an observed behavior allows the MIME to consider the underlying mechanism's influence, which is often overlooked in previous media effects research.

Recent advances to the MIME (Tamborini, Lewis et al., 2016) extend research showing media's influence on altruistic intuitions to consider media's influence on egoistic intuitions as well. Adding the study of egoistic intuitions to existing literature on altruistic intuitions is of particular importance as they often serve as important intuitions in narrative media. Recent MIME research has begun to include egoistic intuitions in efforts to examine the role of intuitions in shaping reactions to narrative media. This work is based on the belief that exposure to media exemplars that highlight egoistic intuitions can influence their accessibility and impact on subsequent audience response in a manner similar to that found with exposure to exemplars of altruistic intuitions.

Two bodies of literature have been used to identify six egoistic intuitions in recent research by MIME scholars (Tamborini, Grizzard, et al., 2011). The first three egoistic intuitions come from self-determination theory (SDT), which identifies three intuitive drives said to that exist in all humans (Deci & Ryan, 1985). They include competence (the desire to master a skill and have one's work be recognized), autonomy (the need to feel that one is in control of their own life), and relatedness (the need for one to feel connected with others).

The remaining egoistic intuitions come from Schwartz's (1994) universal human values. Although Schwartz describes ten values, four of them correspond to three of the altruistic intuitions from MFT and represented in the MIME. These include Schwartz's altruistic values of universalism (equivalent to care), benevolence (consistent with ingroup loyalty), and both conformity and tradition (associated with authority). Three additional values match the egoistic

intuitions included in SDT, including autonomy (needing to feel in charge of one's life), relatedness (needing to feel a connection with others), and competence (needed to be recognized for one's work and obtaining a mastery of skills). The remaining three values from Schwartz's list include power (the desire to have control over other individuals or resources), hedonism (the desire to satisfy physical urges and pleasure), and security (the desire to feel safe).

In an effort to extend the work of Hahn et al. (2017) to include egoistic intuitions, the present study examines hedonism and power in addition to the four moral intuitions included by Hahn and colleagues. To accomplish this goal, the study will use the same materials from Hahn et al.'s original study while adding items measuring the salience of egoistic intuitions. In the present study, what Hahn et al. referred to as moral intuitions is relabeled and referred to as altruistic intuitions. This is done to emphasize the distinction being made in this study between the four moral intuitions (i.e., altruistic intuitions) examined in the study by Hahn et al. and the egoistic intuitions added in the present study.

The Hahn et al. study developed the altruistic measure of intuition accessibility (A-MIA) scale to measure altruistic intuition salience in children. Although the central goal of the present study is to replicate Hahn et al. and increase confidence in the A-MIA's reliability, this study also extends the A-MIA to include measures of egoistic intuition salience. The extended scale attempts to measure the accessibility of the six egoistic intuitions examined in recent MIME research to the A-MIA. However, this initial effort will only test media exposure's ability to increase the accessibility of two intuitions, hedonism and power. The extended scale includes two new measures – the egoistic measure of intuition accessibility (E-MIA) and the

altruistic and egoistic measure of intuition accessibility (AE-MIA). The E-MIA attempts to measure the accessibility of the six egoistic intuitions mentioned above (competence, autonomy, relatedness, hedonism, power, and security). The AE-MIA attempts to measure the accessibility the two egoistic intuitions of focus in this study (hedonism and power) in concert with the four altruistic intuitions measured in the A-MIA.

The decision to focus only on hedonism and power is pragmatic. The Hahn et al. study created five different versions of a comic book highlighting four altruistic intuitions (care, fairness, loyalty, and authority), along with a fifth version that highlighted hedonism and power. Hahn et al. included a fifth comic book highlighting hedonism and power for use as a comparison condition, without the intention or ability to measure its influence on egoistic intuitions. Although Hahn et al. manipulated exposure to media content highlighting hedonism and power, they did not assess exposure's influence on the accessibility of these intuitions, as the A-MIA does not include hedonism and power. The current study exposes children to Hahn et al.'s stimuli and asks them to complete the A-MIA along with the E-MIA and the AE-MIA to determine whether exposure to these comic books increase the salience of both altruistic and egoistic intuitions in children.

Although the decision to focus only on two of the six egoistic intuitions (hedonism and power) was driven by pragmatic concerns, this decision is buttressed by evidence suggesting the importance of these intuitions in children's value systems. For example, in a longitudinal study examining the extent to which people valued reward from hedonistic behavior versus that from hard work, children, age 9-18, consistently valued hedonism, while their parents were found to value hard work (Roest, Dubas, & Gerris, 2010). The importance of power can similarly

be seen in research on children, age 8-11, showing that both boys and girls tended to overestimate their status as dominant leaders in the class hierarchy (Boulton & Smith, 1990).

Focusing on only two of egoistic intuitions will limit the researcher from generalizing the results to all six egoistic intuitions. However, using the same materials to replicate Hahn et al. will both provide additional support to their study's evidence of a media exemplar's influence on children's altruistic intuitions, while still extending this research to examine the influence of media on egoistic intuitions.

Previous MIME research examining media's influence on children

Separate lines of early MIME-based research focused on the representation of intuitive motivations in adult media content and how exposure to these representations can influence adult audiences. For example, research on English and Spanish language soap operas found that care and loyalty were overrepresented in English language soap operas, while fairness, authority, and purity were overrepresented in Spanish language soap operas (Tamborini, Enriquez, Lewis, Grizzard, & Mastro, 2011). Research using a similar MIME-based coding scheme examined newspaper headlines the day following the death of Osama bin Laden (Bowman, Lewis, & Tamborini, 2014). In addition to finding that care was overwhelmingly present, this study also noted that headlines in strong conservative regions emphasized authority and loyalty, while headlines in strong liberal regions emphasized fairness and reciprocity.

Related research on adults has provided evidence consistent with the MIME's causal mechanisms. For example, in a study examining exposure to television, Tamborini, Prabhu, Lewis, Grizzard, and Eden (2016) provided evidence of media content featuring behaviors of

specific altruistic intuitions can increase, even if only temporarily, accessibility to those specific altruistic intuitions in the audience. Similar research by Tamborini, Hofer et al. (2017) observed that exposure to news articles about terrorist attacks not only increased the accessibility of respect for authority, but that the accessibility of this intuition mediated exposure's influence on reduced charitableness toward outgroup members (Eden, et al., 2014).

More recently, researchers have begun to apply the MIME to examine both the content and influence of children's media (Hahn, Tamborini, Prabhu, Klebig et al., 2017; Hahn, Tamborini, Prabhu, Grall, et al., 2017; Lewis & Mitchell, 2014). With regard to media content, several analyses have been conducted using a MIME-based coding scheme to examine scenes of popular children's television programs for altruistic and egoistic intuitions. For example, a content analysis on children's television found egoistic intuitions to be more frequently represented; however, altruistic intuitions were portrayed as more desirable (Tamborini, Hahn, et al., 2016).

Lewis and Mitchell (2014) specifically examined scenes in children's television containing representations of altruistic intuitions in conflict, demonstrating that most instances of conflict pitted an egoistic intuition (serving the needs of oneself) against altruistic intuitions (serving the needs of the group). However, they did not examine which motivation was reinforced by the narrative. Hahn et al. (2017) replicated and extended this research by coding narrative reinforcement in the same scenes, finding a tendency to reward egoism more than altruism.

In research using a similar MIME-based coding scheme to examine song verses, Tamborini et al. (2016) found that egoistic intuitions were overrepresented in music produced

for adults, whereas altruistic intuitions were overrepresented in children's music. Finally, content analysis of scenes in popular children's books and movies (Tamborini, Hahn, Klebig et al., 2017) found that the egoistic intuitions of relatedness was represented most often in books, whereas the altruistic intuitions of care was represented most often in popular movies.

In comparison to research on media content, little research has tested the MIME's causal mechanisms on children. Although not adopting a MIME-based perspective, Cingel (2016) observed that children were more accepting of violent retribution after viewing television programming that advocated for equal treatment. Although related to the MIME, this research did not examine the extent to which increased intuition salience might account for this effect on children's attitudes. Applying MIME logic might provide enhanced understanding of the media exposure's effect on children.

Only one known study has tested the MIME's causal mechanisms on children. In a direct test of the MIME, Hahn et al. (2017) examined influence of exposure to media content highlighting altruistic intuitions on the accessibility of altruistic intuitions. No known research has examined these processes with egoistic intuitions. The present study directly builds on the study by Hahn et al.

Replicating and Extending Hahn et al. (2017)

Hahn et al. attempted to test the MIME's claim that highlighting altruistic intuitions in media content will influence the accessibility of the intuition. Though support for the MIME has been found with adult populations, Hahn et al. extended this research to show that support for the model's claims can be observed in a child audience. Their findings revealed that exposure to comic books highlighting care, fairness, loyalty, and authority increased the accessibility of all

four intuitions in children between the ages of 10 and 13. In demonstrating this, their research attempted to advance a new model of media's influence on children by explicating intuitions that control media's influence on the moral judgements of children.

Hahn et al. (2017) also tested a new measure of intuition salience, the altruistic measure of intuition accessibility (A-MIA). The A-MIA measures the accessibility of four altruistic intuitions: care, loyalty, fairness, and authority.

Previous measures, the MFQ and the MF-AMP, have been used to assess the accessibility of altruistic intuitions. Unfortunately, both the comprehension level of the language in the MFQ (e.g. "Justice, fairness, and equality are the most important requirements for a society" or "Chastity is an important and valuable virtue") and the sophistication needed to perform the response-time task required to complete the MF-AMP make them seem unsuitable for use with children (see, Hahn et al., 2017). The A-MIA overcomes these obstacles by using simple instruction and language. In doing this, the scale provides the ability to detect temporary changes in intuition accessibility.

Extrapolating from research on adults showing that media can increase the accessibility of both altruistic and egoistic intuitions (Tamborini et al., 2016; Tamborini et al., 2017), we might reason that content exemplifying egoistic intuitions will increase the salience of those intuitions in a child audience. Whereas Hahn et al. demonstrated media's ability to influence altruistic intuitions, no research to date has attempted to examine media's influence on egoistic intuitions. The present study will attempt to replicate Hahn et al.'s demonstration of media's influence on the accessibility of four altruistic intuitions. In addition, it will attempt to extend this research to demonstrate media's ability to similarly influence the accessibility of egoistic

intuitions. This extension will provide evidence of the media's short-term influence on accessibility of egoistic intuitions.

Hypotheses

H1: The accessibility of the (a) care, (b) fairness, (c) loyalty, and (d) authority intuitions will be greater after exposure to narrative content that highlights those intuitions than after exposure to content highlighting other intuitions.

H2: The accessibility of the (a) hedonism and (b) power intuitions will be greater after exposure to narrative content that highlights those intuitions than after exposure to content highlighting other intuitions.

CHAPTER 2: METHOD

Sample

To estimate the sample size necessary for sufficient statistical power, an a priori power analysis was conducted using G*Power (Faul & Erdfelder, 1992) with power ($1 - \beta$) set at 0.80 and $\alpha = .05$, two-tailed. Effect size estimates were obtained based on Hahn et al.'s (2017) results (care $\eta^2 = .24$, fairness $\eta^2 = .08$, loyalty $\eta^2 = .11$, and authority $\eta^2 = .07$) using the same measure as the present study on a similar population. Analysis showed the total sample size necessary for differences (among 5 groups) to reach statistical significance at the .05 level would be $N = 170$. A total of 224 participants (52.2% female) in grades 5-7 ($M_{age} = 12.67$) from Michigan and Pennsylvania took part in the study. Only participants who reported that they paid close attention were used in the full analysis, which resulted in a total of $N = 174$ participants for the final analyses (51.2% female; $M_{age} = 12.12$).

Participants in Michigan were recruited from an urban middle school (99), two urban elementary schools (56), and a rural middle school (15). Participants in Pennsylvania were drawn from a rural middle school (29) and two homeschool groups (25). Teachers sent home parental consent forms prior to the study's start date. Only children who had parental consent were allowed to participate.

Measures

In order to assess the accessibility of altruistic and egoist intuitions in subjects after exposure to the comic, this study employed the altruistic measure of intuition accessibility (A-MIA) created by (Hahn, Tamborini, Prabhu, Grall et al., 2017). A-MIA scale designed by Hahn et al. (2017) was slightly altered for this study in an attempt to improve its reliability (i.e., *tell the*

truth was changed to *be truthful* and *equal share* was changed to *share equally*). The A-MIA is specifically designed to measure the accessibility of altruistic intuitions in children. It does this using language that is recognizable to children between the ages 10 and 13, whose reading comprehension can vary dramatically. Analyses of the language contained in the A-MIA using Microsoft Word's readability assessment showed the Flesch-Kincaid Grade Level of the survey was 3.9, while the Flesch's Reading Ease was 93.1.

The A-MIA has also been found capable of detecting changes in the accessibility of intuitions (Hahn, et al.). It presents six sets of four words. Each set contains words representing each of the four altruistic intuitions previously identified. Three sets offer positively valenced words, and three sets offer negatively valenced words. For positively valenced words, children are asked "which you think is better" to be or do. For negatively valenced words, children are asked "which do you think is worse" to be or do. The reliabilities observed in this study were as follows: care ($\alpha = .68$), fairness ($\alpha = .26$), in-group loyalty ($\alpha = .56$), and authority ($\alpha = .62$).

In addition to an attempt to replicate previous research on the A-MIA, the current study will test two new scales: egoistic measure of intuition accessibility (E-MIA) and the altruistic and egoistic measure of intuition accessibility (AE-MIA). These two measures, along with the A-MIA, serve as subscales of what is referred to here as the intuitive motivation measure of intuition accessibility (IM-MIA). The E-MIA contains six sets of six words associated with the six egoistic intuitions identified earlier. Similar to the altruistic word sets, after being presented with three sets each of positively valenced and negatively valenced words, children were asked respectively "which you think is better" or "which do you think is worse" to be or do. The reliability of these word sets were as follows: hedonism ($\alpha = -.02$), power ($\alpha = .22$), security (α

= .39), autonomy ($\alpha = .48$), competence ($\alpha = -.06$), and relatedness ($\alpha = .40$). The AE-MIA was included to measure the comparative accessibility of altruistic and egoistic terms presented conjointly. This scale included the four moral items found in the A-MIA along with the items from the E-MIA used to measure hedonism and power. The reliabilities were as follows: (care, ($\alpha = .65$), fairness ($\alpha = .48$), loyalty ($\alpha = .52$), and authority ($\alpha = .51$), hedonism ($\alpha = .33$), and power ($\alpha = .13$). Participants were also asked to report on demographic variables, including sex, age, and grade level. All words used in the A-MIA, E-MIA, and AE-MIA can be found in Appendix A.

Replicating the procedure used by Hahn et al., an item was included on the final page of the survey which will ask participants how well the stimulus held their attention. To avoid pressuring children to answer the way they believe the researcher expects them to (i.e., claiming that they paid very close attention to the comic) the attention question gives the following options: (1) *found the story really interesting and paid close attention*, (2) *found the story a little interesting and paid a little attention*, or (3) *didn't find the story very interesting and did not pay close attention* (Hahn et al., 2017). All items are included in appendix A.

IM-MIA scoring. The scoring of the A-MIA for altruistic intuitions is based on expectation that altruistic intuitions contain affective components which become increasing accessible when activated. Specifically, the intuition will produce positive affect in response to activation by intuition-upholding stimuli (behaviors that uphold the altruistic intuition) and negative affect in response to activation by intuition-violating stimuli (behaviors that violate the altruistic intuition). As such, the most salient intuition should result in the child choosing the word (from the four or six-word set) that is most closely related to that intuition (e.g., “it is

better to be...", or "it is worse to be..."). For example, if authority has been made salient by media content, the participant should say behaviors that uphold authority are always better and behaviors that violate authority are always worse.

Based on this logic, the intuition corresponding to the behavior selected as "better to be" (or "worse to be") was coded as 1, and all other intuitions will be coded as 0. This was done for all six-word sets. Next, the number of times a word representing an intuition was summed separately for each intuition, and the summed scores were divided by 6. This provided four indexes (one for care, fairness, loyalty, and authority) for each participant. In the index, a score of 1 indicated that the intuition was chosen all six times from the six four-word sets, and a 0 score indicated that the intuition was not chosen in any word set.

The scoring of the E-MIA is based on the same expectations as the scoring for the altruistic intuitions contain the original A-MIA scale, suggesting that egoistic intuitions have an affective component which becomes increasingly accessible when the intuition is activated. Specifically, the six egoistic word sets each included six words representing competence, autonomy, relatedness, hedonism, power, and security. Similar to the altruistic word sets, the number of times a word representing an egoistic intuition is selected it was summed separately for each intuition, and the summed scores were divided by 6. This provided six indexes (one for competence, autonomy, relatedness, hedonism, power, and security) for each participant. In the index, a score of 1 indicated that the intuition was chosen all six times from the six, six-word sets, and a 0 score indicated that the intuition was not chosen in any word set.

Finally, the scoring of the AE-MIA is similarly based on the expectation that an intuition, whether altruistic or egoistic, will have increased accessibility when it is activated by narrative.

The six altruistic word sets from the A-MIA, each containing four words representing each altruistic intuition (care, fairness, loyalty, authority) and six-word sets adapted from the E-MIA, are combined in the AE-MIA. The six adapted word sets contained the two words representing hedonism and power (the egoistic intuitions focused on in this study) from each of the six original E-MIA word sets. The combination of the six sets of four words representing each altruistic intuition and the six sets of two words representing each targeted egoistic intuition resulted in the six word sets (each set containing six words) used in the AE-MIA. As with the previous scales, the number of times a word representing an intuition is selected first is summed separately for each intuition. The summed score for each intuition is then divided by six. This creates four altruistic indexes (one for care, fairness, loyalty, and authority) and two egoistic indexes (one for hedonism and power). For each intuition index, a score of 1 indicates that the intuition was chosen six times from the six, six-word sets, while a score of 0 indicates that the intuition was not chosen in any of the word sets.

Stimulus

The stimulus consisted of the 5 different versions of a *Cleopatra in Space* comic book developed by Hahn et al. (2017). Hahn created versions to separately highlight the upholding of the altruistic intuitions of care, fairness, loyalty, and authority along with one highlighting the egoistic intuitions of both hedonism and power. Hahn's goal in this final version was to create a comparison group stimulus void of protagonist motivations based on altruistic intuitions. Since some driving force was needed for the protagonist, Hahn created a stimulus that offered egoistic intuitions as the protagonist's motivation. We now know from content analysis (Hahn, 2018) that Hahn's comparison-group stimulus highlighted hedonism and power. Given this

information, a measure was developed to examine the influence of exposure to the comparison stimulus on the accessibility of the egoistic intuitions of hedonism and power.

Basic story. All five comic book versions have the same overall plot, with the only difference being the highlighting of the intuition. Cleopatra is the main character of the comic, which begins with her attending school with her close friend, Akila. While at school, Cleopatra receives a mission from the “Grand Counsel” to travel to a nearby planet, find the key that unlocks treasure, and bring it back to them. During the mission, Cleopatra is caught by the planet’s inhabitants (“Nebulans”), who desire their key for themselves. The comic concludes with Cleopatra deciding what to do with the key.

Conditions. The plot of the comics varies at five specific points, chosen due to their importance to the narrative. At these points, the wording of the narrative is manipulated to increase the salience of the altruistic or egoistic intuition for that condition. For example, in the care condition the narrative reads “*Throughout our history, supporting those in need has been key to all survival. Who can tell me why giving aid is so important?*” while the authority condition reads “*Throughout our history, following the orders of our leaders has been key to all survival. Who can tell me why doing what your superiors tell you to do is so important?*” To avoid biasing participant responses to the survey, no words from the A-MIA are used in the five manipulated versions of the comic. The text for all versions of the comic can be found in Appendix B.

Procedure

The study was conducted in groups varying in size from 2 to 33. For some groups, the study was conducted in classrooms. For other groups students were taken to a conference

room or cafeteria. Regardless of group, each child was randomly assigned to one of the five comic book conditions. The induction was accomplished by including different versions of the comic in packages provided to participants.

The researcher provided instructions to all participants simultaneously, and passed out a paper instrument which contained the child assent, the IM-MIA, and demographic questions, along with the appropriate version of the comic book. The researcher asked each child if he or she is willing to participate in the study, and instructed them to write their name on the assent form if willing. The researcher then provide directions for the study, including how to fill out the IM-MIA. Finally, participants were instructed to silently read their comic. After reading their version of the comic, participants completed the survey containing the IM-MIA, basic demographics, and attention item. The entire procedure lasted approximately 30 minutes.

CHAPTER 3: RESULTS

Manipulation Check

The stimulus used in this study was shown in prior research to increase the accessibility of the corresponding intuitions (Hahn, Tamborini, Prabhu, Grall et al., 2017). However, this research did not verify that the comic books contained a stronger presence of the intuitions highlighted in the five study conditions. To address this concern, a content analysis was conducted on the five comic conditions to examine the presence of exemplars emphasizing care, fairness, loyalty, authority, and hedonism/power. The content analysis employed a coding manual used in previous research to identify MFT's altruistic intuitions in various types of media (e.g., Hahn, Tamborini, Prabhu, Klebig, 2017; Tamborini, Hahn, Prabhu, Klebig, & Grall, 2017). Drawing its operational definitions from MFT (Haidt & Joseph, 2007), SDT (Deci & Ryan, 1985), and research on universal human values (Schwartz, 1994), the coding scheme was designed to classify 11 motivations for character behaviors (not the behaviors themselves). These included the altruistic motivations of care, fairness, loyalty, authority, and purity, and the egoistic motivations of competence, autonomy, relatedness, hedonism, power, and security. The coding manual included detailed descriptions of all 11 motivations.

Two coders, who were unaware of the study's hypotheses, attended three weeks of coder training to learn how to code narrative media for the presence/absence of content highlighting these intuitions. The coders were told to consider the motivations of the protagonist, Cleopatra. Coders identified whether one of the 11 motivations drove Cleopatra's behavior. Coders examined the central character's action to determine whether it upheld or violated the identified motivation. For example, if a scene involved a Cleopatra helping Akila

who had fallen off her bicycle, coders referred to their coding manual and identified a target in need (Akila) and the central character (Cleopatra) having the ability to fulfill the target's need (Akila). Because Cleopatra helped Akila, the behavior would be coded for upholding care. It must be noted that the target of the behavior was not always a person and, among other things, could be a goal (e.g., when applying to competence) or money (e.g., when applying to power).

Each version of the comic contained 31 identical pages and 10 additional pages containing text-based manipulations intended to highlight either one of the four altruistic intuitions or the egoistic intuitions of hedonism and power. Individual pages of the comic book served as the unit of analysis. Krippendorff's alpha was used to determine intercoder agreement on all coded material, with acceptable agreement for all five intuitions including care ($\alpha = .74$), fairness ($\alpha = .86$), loyalty ($\alpha = .80$), authority ($\alpha = 1.00$), and hedonism/power ($\alpha = .74$). To address any coder disagreement, a third expert coder, who also did not know the study's hypothesis, was employed as referee. The referee decided all cases where the two coders disagreed. The content was categorized in accordance with the referee's decision.

To assess the degree to which any one stimulus highlighted exemplars of the four altruistic intuitions, a 6 (page type: manipulated to feature care, fairness, loyalty, authority, egoism, no intuition) x 6 (intuition: care, fairness, loyalty, authority, hedonism, power) chi-square was conducted, $\chi^2(25, N = 70) = 170.76, p < .000$, Cramer's $V = .71$. Results revealed that in each altruistic condition the manipulated pages overrepresented its respective intuition compared to other non-featured intuitions. Pages designed to feature care (adjusted standardized residual = 7.1) or fairness (adjusted standardized residual = 6.0) each contained 10

exemplars of upholding that intuition, while no other intuitions were coded as appearing on the manipulated pages. For the pages designed to contain loyalty (adjusted standardized residual = 7.0) or authority (adjusted standardized residual = 6.2), nine of the 10 manipulated pages were coded as featuring loyalty and authority, respectively. In both the loyalty and authority comic stimuli, one page was coded as containing fairness, instead of the relevant intuition of loyalty or authority.

Results also showed that the pages manipulated in the egoistic condition (i.e., those manipulated to contain no morally laden content) indeed did not feature any altruistic intuition. On the pages manipulated to feature egoistic intuitions, both hedonism (adjusted standardized residual = 3.3, $n = 5$) and power (adjusted standardized residual = 3.3, $n = 5$) were overrepresented.

Replicating Hahn et al.'s (2017) Tests on the Altruistic-MIA

Planned contrast ANOVAs were conducted to compare the importance rating-scores of the primed intuition (e.g., the ratings of power in the power condition) to the ratings of that intuition in all other conditions (e.g., the ratings of power in conditions where it is not exemplified). H1 was tested with four one-way ANOVAs, one for each altruistic intuition's accessibility. To create the contrast ANOVAs, a contrast score of +4 was given to the cell that corresponded to the altruistic intuition being examined, and contrast score of -1 was given to the remaining cells. To examine the influence of the comic conditions on the accessibility of the altruistic intuitions, contrast analyses were conducted on the accessibility index scores for each intuition (i.e., care, fairness, in-group loyalty, respect for authority, and hedonism/power).

The accessibility scores show that each altruistic intuition was selected as “better/worse” more frequently by participants who were primed for the intuition than participants who were not primed (See Table 1).

Table 1. Means and standard deviations for altruistic intuition accessibility.

	Care condition	Fairness condition	Loyalty condition	Authority condition	Hedonism/ Power Condition	Avg. when not primed
Care index	.48 (.33)^A	.29 (.29)	.31 (.26)	.21 (.28)	.27 (.24)	.27 (.04) ^B
Fairness index	.11 (.13)	.21 (.20)	.17 (.13)	.21 (.17)	.24 (.23)	.18 (.06)
Loyalty index	.14 (.19)	.23 (.25)	.30 (.24)^A	.15 (.17)	.08 (.11)	.15 (.06) ^B
Authority index	.29 (.29)	.28 (.26)	.23 (.24)	.45 (.25)^A	.41 (.25)	.22 (.08) ^B

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

Each contrast ANOVA used one of the relevant intuition index scores as the dependent variable. The planned contrast coefficients compared all other conditions to the relevant condition of interest. This allowed us to compare each intuition score index when it was primed against when it was not primed. The contrast results were significant for the intuitions of care, loyalty, and authority. This suggests that when participants were exposed to the comic book highlighting the specific intuition, they were more likely to choose that intuition as better/worse than when the other intuitions were primed.

Specifically, results of the contrast analyses comparing the care score in the care condition to the other conditions showed that the care score was significantly higher when care was primed ($M = .48$, $SD = .33$) than when any other intuition was primed ($M = .27$, $SD = .04$), $t(170) = 3.87$, $p < .01$ (one-tailed), $\eta^2 = .08$. Loyalty scores were significantly higher when loyalty was primed ($M = .30$, $SD = .24$) than when all other intuitions were primed ($M = .15$, $SD = .06$),

$t(170) = 4.14, p < .01$ (one-tailed), $\eta^2 = .18$. Significant differences were also found for authority when it was primed ($M = .45, SD = .25$) compared to when any other intuition was primed ($M = .22, SD = .08$), $t(170) = 3.01, p = .03$ (one-tailed), $\eta^2 = .09$. The contrast result for fairness was not significant, indicating that scores for fairness were not significantly higher when fairness was primed ($M = .21, SD = .20$) compared to when any other intuition was primed ($M = .18, SD = .06$), $t(170) = 0.9, p = .18$ (one-tailed), $\eta^2 = .05$.

Testing the E-MIA and the AE-MIA

H2 was tested in two ways. Once using E-MIA scores, and again using AE-MIA scores. In both instances, the procedure described above to examine the influence of the comic conditions on the accessibility of the altruistic intuitions was replicated to examine the comic conditions' influence on the accessibility of the egoistic intuitions.

Table 2. Means and standard deviations for egoistic intuition accessibility.

	Care condition	Fairness condition	Loyalty condition	Authority condition	Hedonism/ Power Condition	Avg. when not primed
Hedonism index	.10 (.12)	.11 (.11)	.06 (.13)	.10 (.12)	.13 (.12)	.10 (.02)
Power index	.08 (.12)	.08 (.13)	.06 (.10)	.11 (.17)	.09 (.11)	.08 (.03)

Note. Scores for primed intuitions are in bold. Standard deviations appear in parentheses.

Next, two one-way planned contrast ANOVAs were conducted on the intuition score index for each egoistic intuition represented in the AE-MIA. Following the analysis plan adopted for H1; a contrast score of +4 was given to the cell that corresponded to the hedonistic intuition being examined, and contrast score of -1 was given to the remaining cells. The contrast results were insignificant for both hedonism intuitions.

Scores for hedonism were not significantly higher when hedonism was primed ($M = .13$, $SD = .12$) than when any other intuition was primed ($M = .09$, $SD = .02$), $t(170) = 1.36$, $p = .15$ (one-tailed), $\eta^2 = .14$. Similarly, scores for power were not significantly higher when power was primed ($M = .09$, $SD = .11$) than when any other intuition was primed ($M = .08$, $SD = .02$), $t(170) = 0.25$, $p = 0.8$ (one-tailed), $\eta^2 = .06$. As neither of the egoistic intuition primes were found to be significant, H2 is not supported.

Two one-way planned contrast ANOVAs were also conducted on the accessibility score indexes for each egoistic intuition represented in the AE-MIA (See Table 3).

Table 3. Means and standard deviations for combined altruistic/egoistic intuition accessibility.

	Care condition	Fairness condition	Loyalty condition	Authority condition	Hedonism/ Power Condition	Avg. when not primed
Hedonism index	.04 (.09)	.12 (.14)	.10 (.17)	.07 (.12)	.13 (.14)^A	.08 (.04) ^B
Power index	.06 (.09)	.11 (.12)	.07 (.10)	.07 (.13)	.09 (.12)	.08 (.02)

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

For the egoistic intuitions, the accessibility of hedonism was found to be significant higher when hedonism was primed ($M = .13$, $SD = .14$) compared to when any other intuition was primed ($M = .09$, $SD = .04$), $t(170) = 1.71$, $p = .04$ (one-tailed), $\eta^2 = .05$. However, the contrast result for power was not significantly higher when power was primed ($M = .09$, $SD = .12$) compared to when any other intuition was primed ($M = .08$, $SD = .02$), $t(170) = 0.63$, $p = .02$ (one-tailed), $\eta^2 = .01$.

CHAPTER 4: DISCUSSION

This study began with several goals. First, it attempted to replicate the findings of Hahn et al. (2017) in order to assess the reliability of the A-MIA. Second, it tried to develop and test two measures designed to assess the accessibility of egoistic intuitions in children, the E-MIA and the AE-MIA. Finally, although secondary in this endeavor, it looked to provide additional support to the MIME's prediction that exposure to media content that exemplifies the upholding or violation of specific egoistic intuitions can increase the temporary accessibility of the related intuitions.

The results of this study provide some support (though incomplete) for the reliability of the A-MIA. In doing so, they also support the MIME's prediction that media messages that exemplifying the upholding of altruistic intuitions can increase the accessibility of those intuitions. However, no evidence was found to support the reliability of the E-MIA or the AE-MIA.

The A-MIA's Capacity to Measure Altruistic Intuition Accessibility in Children

The current study replicated the findings of Hahn et al.'s (2017) A-MIA in three of four cases, reproducing outcomes which show that primes exemplifying the upholding of the care, loyalty, or authority intuitions can increase the accessibility of those specific intuitions in audiences. Although the results did not duplicate Hahn et al.'s findings for fairness, these findings have two important implications. First, even partial replication of the results of Hahn et al. (2017) supports the MIME's claim that media exemplars have the potential to increase the accessibility to altruistic intuitions. This finding simply adds to the growing body of recent research demonstrating this potential (Tamborini, Prabhu, Hahn, Idzik, & Wang, 2014;

Tamborini, Prabhu, Lewis, Grizzard, & Eden, 2018; Tamborini, Prabhu, Wang, & Grizzard, 2013). Second, and more directly related to the primary purpose of this study, the partial replication of the results of Hahn et al. (2017) increases confidence in the capacity for the A-MIA to measure the accessibility of distinct altruistic intuitions in children.

Hahn et al. (2017) twice tested the A-MIA scale with children. In a study using an interpersonal prime, the first test showed significant effects on items representing 3 of 4 intuitions (not including authority). In a study using the same media primes employed in the current study, the second test showed effects on all four intuitions. Though not fully replicating Hahn et al.'s second test, the present study duplicated their significant findings on 3 of 4 intuitions, but this time without fairness. Combined with Hahn et al.'s findings using media primes, the present study shows the promise of the A-MIA's potential use. At the same time, the failure to show an effect for the fairness intuition raises questions.

The failure to find an effect for fairness might indicate several things. First, the original A-MIA scale used by Hahn et al. (2017) was slightly altered in an attempt to improve its reliability (i.e., *tell the truth* was changed to *be truthful* and *equal share* was changed to *share equally*). Even these small changes may have changed the meaning of fairness in the minds of the participants. For example, to have an *equal share* means the participant is receiving the fairness, while *share equally* refers to the participant giving fairness, perhaps even being caring. Given the acceptable reliabilities for fairness in both of the studies by Hahn et al., one could argue that these items should be changed back to their original A-MIA form. Second, the accessibility of the fairness intuition may have been unintentionally activated across all conditions, which eliminated the A-MIA's ability to find differences in the accessibility of the

fairness condition. In all classrooms, at least five or more students forgot their consent forms and were thus excluded from participation in the study. All participating students saw that their classmates were excluded from participation. As such, the fairness intuition may have been unintentionally activated.

Although the failure to find an effect for fairness is reason for concern, evidence showing A-MIA was completely predictive in one test (the first study by Hahn et al., 2017), and largely predictive in two other tests (the present study and Hahn et al.'s first study), shows promise for future use. Notably in this regard, the availability of a scale to measure altruistic intuition accessibility in children has great value. Previous research has focused on measuring intuition salience on adults by (1) using response time measures that record the affect associated with intuitions (i.e., the moral foundation-affect misattribution procedure, or MF-AMP; Tamborini, Lewis et al., 2016) and (2) self-report items measuring audience judgments of right and wrong (i.e., the moral foundations questionnaire, or MFQ; Graham et al., 2011).

However, researchers have been unable to use these measures on a child audience, as the language and reading level used in these measures seems beyond the ability of a child population. Hahn et al. (2017) developed the A-MIA to address these concerns and create a measure that would be more suitable for children between the ages of 10 and 13. The A-MIA measures intuition accessibility in a child-friendly way, by using a second grade reading level and asking children to make decisions about what is "better" or "worse." As stated earlier, examination of all words used in the IM-MIA using Microsoft Word's readability assessment showed the language in the survey had a Flesch-Kincaid Grade Level of 3.9 and a Flesch's Reading Ease level of 93.1.

The primary purpose of the present study was to replicate the findings of Hahn et al., and demonstrate the A-MIA's suitability as a measure of intuition accessibility in children. The IM-MIA's attempt to measure intuition accessibility in children may have advantages over other measures of moral decision making. Research using measures that ask children to judge the behaviors of narrative characters as good or bad, and to then tell the researcher why it was good or bad (e.g., Mares, Bonus & Peebles, 2018; Martins, Mares, Malacane, & Peebles, 2016), may be limited by the child's ability to know and/or explain the reasons why something is right or wrong. The approach used in the IM-MIA does not require the child to know or to be able to express the reason why something is right or wrong. If the assumption upon which this measure is based (i.e., that innate and intuitive processes beneath conscious awareness drive these judgements) attempts to measure these processes by asking children to self-report on them may be futile. The approach used in the IM-MIA does not suffer from these same limitations.

Media's Influence on the Accessibility of Egoistic Intuitions on Children

Tests on the E-MIA did not demonstrate the scale's ability to measure the effect of media content designed to prime egoistic intuitions on the accessibility of the egoistic intuitions. However, the AE-MIA found evidence in line with the scale's ability to do this. This is supported by the AE-MIA's use in demonstrating that hedonism scores were higher among participants that were exposed to content that highlighted hedonism. It is possible that the items used to represent the egoistic intuitions may appear similar to children, making it harder to distinguish one egoistic intuition from other. As only the hedonism and power egoistic intuitions were included in the combined scale, the items representing these intuitions may

have been more distinguishable from the four altruistic intuitions included in the scale. It is also possible that participant accessibility was not strongly primed by the stimulus materials used in this study. As the study was replicating Hahn et al. (2017), the same stimulus materials were used, including the comic for the egoistic condition which acted as a comparison. The four moral comic books were designed to highlight one of the altruistic intuitions, while the egoistic comic book was originally meant to be used as a comparison condition that highlights two egoistic intuitions.

Regardless to the reason, egoistic intuition accessibility was not shown in this study. Still, given the importance of egoistic intuition representations in children's media (Hahn, Tamborini, Prabhu et al., 2017; Lewis & Mitchell, 2014) additional efforts are needed to develop and validate a scale measuring the accessibility of egoistic intuitions, and the ability of media exemplars highlighting those intuitions to increase this accessibility in audiences.

Limitations and Future Directions

Three main limitations to the study are worth considering. The first concern is related to the fact that reliabilities of the A-MIA, IM-MIA, and AE-MIA all fell below the accepted .70 threshold. Low reliability is a concern as it may be weakening the expected strength of the findings. Several words were changed from the A-MIA used in Hahn et al. (2017) for use in this study. Unfortunately, although the accessibility effects were similar to Hahn et al. (2017), the changes resulted in a decrease of scale reliability for the A-MIA. The IM-MIA and Altruistic/Egoistic Combined scale should be reexamined to determine which words or phrases may be more closely associated with the egoistic intuitions. To increase reliability, the

substituted words should be changed back to the words found in the original A-MIA and future work should attempt to increase the reliability of all intuition measures.

The second concern relates to the number of participants who self-reported that they did not pay close attention to the comic book. It is not surprising that several participants reported not paying close attention given that the stimuli used in this study was a comic book, and not the type of dynamic media known to increase attention through stimulation of the orienting reflex (e.g., TV or film) or user demand (e.g., video games). Nevertheless, the exclusion of these participants created the need to gather additional respondents in order to reach the sample of closely attending participants called for in power analysis. Though the MIME itself does not make claims regarding the moderating effect of attention, logic suggests that minimal level of attention is necessary for a media prime to influence accessibility. Attention was found to moderate the effect of the media prime on altruistic intuition accessibility observed in Hahn et al. (2017). Future studies should attempt to create more engaging media, especially for a young audience. Highly engaging stimuli may stimulate participant attention levels and allow use to see the impact of media primes on intuition salience.

The final concern is related to survey length. Recruiting children for a study can be challenging and researchers tend to test as much as possible with the participants they receive. The current study is no different, as it contained three measures of intuition accessibility, each of which contained six sets of words. Participant fatigue was an issue at times, as many participants needed extra encouragement to complete the survey packet. Of note, several participants did not complete the entire survey packet in the time allotted; however,

participants who reported high attention completed all survey questions. In part, this may have been responsible for the poor finding associated with measures of egoistic intuitions. The accessibility of egoistic intuitions was always measured last. This was done intentionally, and with an awareness that this placement could introduce bias into the measure. The measure the altruistic intuition accessibility was placed first in order to follow the protocol followed by Hahn et al. (2017). Replicating Hahn et al. was the central goal of the present study. Future research designed to develop an instrument that measures both altruistic and egoistic intuition accessibility in children might benefit from shortening the survey or providing variety in question types to limit participant fatigue. Additional efforts are needed to develop an instrument that measures only egoistic intuition accessibility.

Conclusion

Given the ubiquitous nature of media in modern society, scholars have paid close attention to popular media as an agent of children's socialization, with increasing attention paid to the mechanisms driving this socialization (Bond & Calvert, 2014; Guthrie, 1983; Stroman, 1990). Previous understandings of media's influence have suggested that children learn specific behaviors they observe in media content, which influences their moral development for better or for worse. The MIME goes beyond these understandings to not only provide an account of media's influence, but also to provide an understanding of how *different* outcomes can arise when specific altruistic or egoistic intuitions are activated in audiences.

Without challenging contentions that children can learn from media, the MIME reasons that media exemplars which highlight the importance of altruistic and egoistic intuitions can increase the accessibility of these intuitions and the role they may play in decision making.

Media's influence on an intuition's accessibility can be short-term, as might be expected from a single exposure to an intuition exemplar, or long-term, as might result from continuous exposure to exemplars highlighting the same intuition. Beyond models that explain how children might learn behaviors from media exposure or learn to expect that certain behaviors will be rewarded or punished, the MIME attempts to explicate preconscious processes that explain how media's ability to increase intuition accessibility can shape audiences' moral judgments toward observed behavior.

The current study provides additional support for the MIME's predictions that media content can influence the short-term accessibility of altruistic intuitions in young audiences. Although the influence of exposure to media exemplars on egoistic intuition accessibility was not shown in the present study; the importance of this potential effect dictates the need for future research to explore this possibility. Additional research should examine media's long-term influence on the accessibility of these intuitions themselves as well as on related values, judgments, and behaviors in audience members. Such research can provide further evidence regarding media's reach, as well as the mechanisms responsible for media's more enduring influence on young audiences.

APPENDICES

APPENDIX A: List of words used in the IM-MIA

List of words used in the A-MIA

Care	Fairness	Loyalty	Authority
Caring	Fair	Loyal	Law abiding
Kind	Truthful	Teammates	Respectful
Help	Share equally	Take your friend's side	Listen to adults
Cruel	Dishonest	Disloyal	Disrespectful
Mean	Unfair	A traitor	Defy the law
Hurt	Lie	Double cross your friend	A rule breaker

List of words used in the E-MIA

Competence	Autonomy	Relatedness	Hedonism	Power	Security
A champion	Free to decide	Close to other people	Having a good time	Wealthy	Safe and sound
Good at everything	Given options	Together with buddies	Treated like royalty	Powerful	Secure
Come in first	Make my own choices	Spend time with pals	Get everything you want	Tell other people what to do	Protect yourself
A failure	Restricted	An outcast	Unhappy	Broke	Unprotected
Worthless	Given no choice	Lonely	Uncomfortable	Powerless	Insecure
Always lose	Be told what to do	Feel left out	Something boring	Lose everything	Something unsafe

List of words used in the AE-MIA

Care	Fairness	Loyalty	Authority	Hedonism	Power
Caring	Fair	Loyal	Law abiding	Having a good time	Wealthy
Kind	Truthful	Teammates	Respectful	Treated like royalty	Powerful
Help	Share equally	Take your friend's side	Listen to adults	Get everything you want	Tell other people what to do
Cruel	Dishonest	Disloyal	Disrespectful	Unhappy	Broke
Mean	Unfair	A traitor	Defy the law	Uncomfortable	Powerless
Hurt	Lie	Double cross your friend	A rule breaker	Something boring	Lose everything

APPENDIX B: Plot point variations

Plot point variations according to condition (reproduced from Hahn et al., 2017)

Note. For plot points 1, 3, and 4, condition differences exist only in keywords, while the bulk of the text remains the same for all conditions. The main text for these scenes is presented under the plot point descriptions, and the location key word differences are denoted by (A), (B), and (C) in the plot point description. The keywords that vary for these locations in each condition are in each of the corresponding intuition columns.

Plot point 1: Professor: "Throughout our history (A) has been key to all survival. Who can tell me why (B) is so important?" Akila: "That's easy! (C) makes a stronger and happier society!"				
Care	Fairness	Loyalty	Authority	Hedonism and Power
(A) Supporting those in need (B) Giving aid (C) Supporting those in need	(A) Truth and justice (B) Treating everyone the same (C) Treating others the same	(A) Sticking together (B) Siding with your group (C) Siding with your group	(A) Following the orders of our leaders (B) Doing what your superiors tell you to (C) Our leaders know how to [make]	(A) Seeking happiness (B) Following your dreams (C) Following your dreams

Plot Point 2: Nebulans try to talk Cleo into giving them the key by saying:				
Care	Fairness	Loyalty	Authority	Hedonism and Power
"Invaders <u>came and took everything we have.</u> They burned our homes and <u>left us with nothing.</u> Now our people are <u>homeless,</u> our children are <u>starving, and we have no money to buy food or shelter.</u> The treasure is the	"Your people did not know it, but the treasure <u>belonged to our forefathers.</u> They lost the key to the vault here centuries ago. The key and the treasure it unlocks <u>were theirs.</u> And now it belongs to us." "You can stop this <u>injustice,</u> by	"Don't <u>pretend to be our friend.</u> Humans and Nebulans have <u>never been friends.</u> So why should we think you are <u>different?</u> It is ours, not yours." "If you are really are our	"What do you plan to do with it? We know <u>Commander Collins ordered you</u> to bring the treasure to the Grand Council. You <u>don't have to obey him. Nobody, not even your boss, should tell you what to do"</u> <u>"Ignore Commander Collins,</u> and give us	"We've looked for that key for years. It unlocks a vault filled with <u>riches</u> beyond your wildest dreams. You could never spend all the <u>gold and diamonds.</u> You would

only thing that can <u>save our people</u> now.” “Please <u>save us</u> by giving us the key. Without the treasure it holds, <u>our people will die</u> . But you can <u>stop all our suffering</u> .”	giving us the key. You know it is <u>rightfully ours</u> .”	<u>friend</u> , give us the key. If not, <u>you are our enemy</u> so we are against <u>you and your people</u> .”	the key. You <u>shouldn't take orders</u> from anybody.”	never know what to do with it. “ “But we know what to do with it.”
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Plot point 3:

Cleo thinks (A) when deciding what to do with the key, and then does (B):

Care	Fairness	Loyalty	Authority	Hedonism and Power
(A) “I suppose the Nebulans need it more than me and I <u>don't want anyone to suffer</u> just because I chose not to <u>aid</u> them. After all, <u>supporting those in need</u> creates a better world, and <u>without support, we'd all be sad</u> . I can make it to Helios another day. The Nebulans <u>need</u> this to <u>support</u> their injured. They should have it.” (B) “I'm going to <u>support</u> you! Let me get the treasure for you. I'll <u>bring it back to assist you</u> and your people!”	(A) “At the same time, I suppose the Nebulans are right. If their forefathers left this treasure here then they <u>deserve</u> some of it. After all, <u>treating others the way you want to be treated</u> is important. I can <u>split the treasure</u> and give some to them and to Commander Collins. They can <u>each take a portion</u> .” (B) “Let's each <u>take a part</u> . Let me get the treasure and I'll bring some back for you and my	(A) “Their <u>species is scary</u> , and I can't imagine what they'd do with the power the treasure holds. No wonder people are <u>suspicious</u> of these guys. I <u>don't trust them</u> . My <u>people</u> would be in great danger if I gave them the key, so I must <u>side with my group</u> . After all, it's important to <u>stick with your group so</u>	(A) “I need to decide if I'm going to give it to the Commander. I suppose I should <u>listen to him</u> . He really is a <u>good leader</u> . And it is important to <u>listen to your leaders</u> . They know what's best. I guess my Helio vacation can wait until another day. I'll <u>return it to my commander</u> . Now how am I supposed to get away from the Nebulans? Let's try this...” (B) Cleo runs away.	(A) “I can't. I have to travel the galaxy. It's what I was made to do, and it's what I've always <u>dreamed</u> of doing. I can't just give that up. Now how can I get away from the Nebulans? Let's try this ...” (B) Cleo runs away.

	commander. You both win!"	<u>they stick with you.</u> Let's try this..." (B) Cleo runs away		
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<u>Plot point 4:</u> Akila asks Cleo what happened and Cleo replies (A) and (B):				
Care	Fairness	Loyalty	Authority	Hedonism and Power
<p>A) "There's.. uh.. been a change in plans. I have to <u>give</u> the treasure to the Nebulans. It's the only way they'll survive. <u>They need me</u>"</p> <p>(B) "A wise woman once told me that <u>supporting those in need</u> is the most important thing in the world."</p>	<p>(A) "There's .. uh.. been a change in plans. I have to <u>give a portion</u> of treasure to the Nebulans. It belongs to them.. <u>dividing it up</u> is the right thing to do."</p> <p>(B) "A wise woman once told me that <u>justice and treating others the same</u> are the most important things in the world."</p>	<p>(A) "Yah, but those crazy creatures tried to get me to <u>abandon my group</u> and give them the key. We have to remain <u>devoted to our people.</u>"</p> <p>(B) "And besides... a wise woman once told me that <u>siding with your group</u> is the most important thing in the world."</p>	<p>(A) "Yah, but those crazy creatures tried to get me to <u>ignore Commander Collins' mission</u> and give them the key instead! We have to <u>follow Commander Collins' orders!</u>"</p> <p>(B) "Besides.. A wise woman once told me that <u>following the orders of our leaders</u> is the most important thing in the world."</p>	<p>(A) "There's .. uh.. been a change in plans. We're going for the treasure ourselves."</p> <p>(B) A wise woman once told me that <u>following your dreams</u> is the most important thing in the word."</p>

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