A TEST AMONG PRE-TEEN CHILDREN EXAMINING THE MEDIATION PROCESSES OUTLINED IN THE MODEL OF INTUITIVE MORALITY AND EXEMPLARS

By

Lindsay Hahn

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ABSTRACT

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The present study tested the mediation processes outlined in the short-term component of the model of intuitive morality and exemplars (MIME). The MIME holds that narrative media emphasizing certain moral intuitions can increase the accessibility of those intuitions in audiences, which subsequently affects related behaviors among audience members. The present study tested this mediation process in a pre-teen audience. Previous support for this mediation model was limited to adults. Participants (N = 210; 48.8% female; M_{age} = 11.74; age range 10-13) were exposed to one of five versions of a comic book. Each version was manipulated to emphasize one of four moral intuitions identified in the MIME, or no moral intuition. After exposure, participants completed a measure of intuition accessibility (M-MIA), followed by a moral measure of intuitively motivated behavior (M-MIMB). The M-MIMB was designed to give participants the opportunity to share tokens with intuition-relevant others. Three major outcomes were observed: For participants in all four moral conditions, exposure to a comic book emphasizing an intuition (1) directly increased both the accessibility of that intuition and (2) directly increased their sharing with intuition-relevant others. Moreover, (3) media exposure's effect on participants' behavior was mediated by intuition accessibility in models for care and (in one analysis) fairness, but no other intuition. The findings are discussed in terms of their value for children's media research and the MIME.

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INTRODUCTION

Previous research has shown that the accessibility of *moral intuitions* can mediate the influence of media exposure on behavioral intention (Tamborini Hofer et al., 2017). Recent experimental work has begun to examine these processes in children, but to date has only examined media's impact on intuition accessibility. Guided by the model of intuitive morality and exemplars (MIME; Tamborini, 2013), the present study attempts to replicate existing work examining the influence of media content on pre-teen children's intuition accessibility, and extend this work by investigating the ability of intuition accessibility to mediate the influence of media exposure on their actual behavior. This investigation goes beyond previous work on children's media effects which has traditionally examined media's effects on simple measures of judgment, but not resulting behavior (e.g., Cingel & Krcmar, 2017; Cingel, Sumter, & van de Leur, 2017; Krcmar & Cooke, 2001; Krcmar & Curtis, 2003; Martins & Wilson, 2012; Mares & Acosta, 2008; Mares & Braun, 2013). This paper begins with an overview of the MIME and its associated mechanisms, and follows with a discussion of research that sheds light on the ability of intuitions to mediate the impact of narrative media content on audience behavior. It then goes on to describe previous research supporting this mediation and the present study.

THE MODEL OF INTUITIVE MORALITY AND EXEMPLARS

The model of intuitive morality and exemplars (MIME; Tamborini, 2013) draws on exemplification theory (Zillmann, 2002) and the social intuitionist perspective (Haidt, 2001) to explain narrative media content's impact on audiences' moral judgments and behaviors that result from these judgments. The MIME outlines a reciprocal relationship between media and audiences wherein, in the short-term, media content's exemplification of specific moral *intuitive motivations* (or intuitions) is thought to shape the importance that audiences place on those specific intuitions. In the long term, the importance that audiences place on these intuitions subsequently drives the popularity of and desire for media content featuring them. As a result, writers and producers feature these popular intuitions in their content more often, which in turn increases the availability of these intuitions in media environments and the likelihood that they will reactivate the short-term processes outlined in the MIME. Although several models feature the reciprocal relationship between media exposure and audience response, the MIME offers a unique perspective on the relationship between narrative media content, moral judgement, and behavior.

The MIME distinguishes itself from most previous research on media influence by (a) its examination of media's influence on intuitions instead of on attitudes and beliefs, and (b) its application of broadly applicable theory from moral psychology outlining mechanisms that shape moral judgment and resulting behaviors. First, and perhaps most importantly, the MIME describes the mechanisms that govern the media's relationship to its audience in terms of intuitions. Whereas most models of media influence explain media's effect on behavior as resulting from changes in attitudes or beliefs, the MIME focuses on the mediating role of more

basal instincts that function intuitively as motivators. These instincts, termed *intuitions*, are conceptualized as more primitive concepts than attitudes and are argued to be the foundation upon which attitudes and beliefs are constructed (e.g., Haidt & Joseph, 2007; Tamborini, 2013). In doing this, the model builds on moral foundations theory's (MFT; Haidt & Joseph, 2007) discussion of a unique set of moral intuitions and the mechanisms that govern their influence.

Second, the MIME makes detailed predictions about the manner in which media content that highlights moral intuitions should influence specific classes of moral judgement and resulting behavior in audiences. Notably, the class of judgments and behaviors resulting from any one intuition is, by nature, broad. For instance, observing an episode of *Law and Order* in which detectives rightfully convict and imprison a murderer should increase the accessibility of justice in audiences, strengthening the influence of justice considerations in subsequent judgments where *fairness* concerns are relevant. Yet the result of favoring fairness over other values can manifest itself in a broad range of judgments related to justice, honesty, or equity, and in the subsequent elicitation of behaviors shaped by these judgments, such as decisions to punish, tell the truth, or share. MIME predictions therefore go beyond previous accounts of media influence, which advocate a pure rationalist approach to abstract modeling as a mechanism through which an observer learns moral principles or standards (i.e., scripts) in one context and then applies them to other cases that rely on the same rules (e.g., Bandura, 2001; Bandura, Ross, & Ross, 1963). By contrast, the MIME maintains that media exposure can regulate audiences' intuition accessibility, and through this, afford some intuitions greater influence on subsequent moral judgments spanning a wide range of intuitively motivated behaviors and contexts.

The MIME draws its notion of *intuitions* from the social intuitionist perspective (Haidt, 2001) and MFT (Haidt & Joseph, 2007). Unlike rationalist perspectives offered by Kant (1964/1785) and Kohlberg (1964, 1981) which argue that moral judgment is the result of calculated, deliberate evaluation, the social intuitionist perspective suggests that *intuitive gut-responses* (intuitions) are the primary determinant of moral judgment, and that deliberative, rational responses occur when different intuitive preferences are in conflict within the mind of an audience member (Lewis, Tamborini, & Weber, 2014; Tamborini, 2011). Building on this perspective, MFT reasons that moral judgments are the result of a distinct set of moral intuitions (or instincts) that are innate. The current research operates under theoretical assumptions consistent with this belief. Haidt (2001) defines these intuitions as evolutionarily-developed, biologically-rooted sensitivities that produce positive or negative affect in response to actions that are inherently beneficial or detrimental to society (Haidt & Bjorklund, 2008; Haidt & Joseph, 2007; Tamborini, 2013). These affective responses form the foundations upon which evaluations of right and wrong are made, and are thought to shape attitudes and behaviors. MFT (Haidt & Joseph, 2007) identifies five domains within which these foundations (i.e., moral intuitions) operate, and maintains that they exist and operate across all ages (Hamlin, 2013; Turiel, 2008) and cultures (Miller, 2008).

Intuitions

The MIME adopts MFT's five intuitions, which serve as the key mechanism through which it describes media's influence on audiences. The five intuitions include: care, fairness, ingroup loyalty, respect for authority, and purity. The first intuition, care, is a sensitivity associated with compassion, empathy, and concern for others' welfare. Care might be

exemplified by positive affect in response to observing acts of kindness and providing support to those in need, or negative affect in response to observing acts of harm and indifference to those in need. Evidence of a care instinct is apparent even in young children who demonstrate a sensitivity to distressed others (e.g., Martin & Clark, 1982; Sagi & Hoffman, 1976) and empathy (e.g., Dunfield, Kuhlmeier, O'Connell, & Kelley, 2011; Zahn-Waxler, Radke-Yarrow, Wagner, & Chapman, 1992; see also Hamlin, 2013; Turiel, 2008; and Warneken & Tomasello, 2009 for reviews).

The fairness intuition is rooted in concerns for truth, justice, and equity. This might be exemplified by positive affect in response to observing acts representing the equitable distribution of resources and the upholding of justice, or negative affect from observing acts of cheating and lying. Like care, considerable evidence supports the existence of this intuition in infants who value equal and/or equitable distribution (see Swanson, 2016 and Turiel, 2008 for reviews; see also Geraci & Surian, 2011; and Sloane, Baillargeon, & Premack, 2012).

Ingroup loyalty is associated with a bias in favor of one's ingroup and against members of outgroups. Ingroup loyalty might be exemplified by positive affect in response to observing acts of solidarity with one's ingroup, or negative affect from observing acts of betrayal or treason. Evidence for this intuition can be seen in research on young children demonstrating that infants like puppets who help similar others or hinder dissimilar others (e.g., Hamlin, Mahajan, Liberman, & Wynn, 2013).

Respect for authority represents a sensitivity favoring legitimate authority that is rooted in reverence for institutional dominance hierarchies and social traditions. This might be exemplified by positive affect in response to observed acts that show respectful obedience to

benevolent leaders, or negative affect in response to defiance and rebellion. Several studies have suggested that children as young as six years old in both Western and Eastern cultures (Kim & Turiel, 1996) understand social and organizational authority hierarchies (Laupa, 1991; Laupa & Turiel, 1986; Tisak, 1986).

Finally, the purity intuition pertains to sacredness and social decontamination. Purity might be exemplified by positive affect in response to observing acts of nobility or the temperance of hedonistic desires, and negative affect from observing socially degenerative excesses. Although purity is included in investigations examining adult moral sensitivities (e.g., Graham et al., 2011; Koleva, Graham, Iyer, Ditto, & Haidt, 2012), no known research illustrates the existence of this intuition in children. Moreover, there is considerable conceptual ambiguity surrounding the purity intuition, as it is presently unclear whether purity may simply represent a sensitivity toward the combination of all other moral intuitions, a sensitivity toward some broader, more general moral righteousness, or something else altogether. As such, this domain will not be included for inspection in the present study.

Intuition Accessibility

Although each of these intuitions are thought to exist in all humans, the role they play in decision making is expected to vary across individuals and groups. Some intuitions can become more accessible, and through this attain greater influence than other intuitions on subsequent moral judgments and resulting behavior. One way that intuitions can become enduringly more accessible is through socialization, a process through which the values of one's social group are passed on to subsequent generations. Haidt and Bjorklund (2008) argued that humans have a unique "preparedness" to acquire specific domains of moral knowledge and, as

a result of socialization, they "can very easily be taught or made to care [more] about harm, fairness, ingroups, [or] authority," (p. 204). In other words, socialization can afford greater influence to different moral intuitions.

According to the social intuitionist perspective, socialization can be thought of as a process that increases the accessibility of particular moral intuitions. This strengthens the ability of those intuitions to guide children's and adults' moral judgments and behaviors at the expense of other, less salient intuitions. For children in particular, Haidt and Bjorklund (2008) noted that "learning, practice, and the assistance of adults, peers, and the media" create a "tuning up" of intuition accessibility (p. 210). The extent to which any one or any one set of intuitions might guide an individual's moral judgment (and subsequent behavior) is driven by this socialization process. Socialization can occur as the outcome of direct moral education, peers, and various other influences; however, mass media have been explicitly noted in MFT research as an agent of long-term socialization (e.g., Haidt & Bjorklund, 2008). The MIME adds to this perspective to also consider the potential of media exposure to impact the short-term accessibility of these intuitions.

Intuition Accessibility as a Mechanism of Media Influence

Building on exemplification theory (Zillmann, 2002) and social intuitionist logic, the MIME (Tamborini, 2013) suggests that media exemplars featuring specific intuitions can increase both the short-term and long-term accessibility of those intuitions in audiences, which can subsequently influence a person's judgments or behaviors. In this manner, the model posits that the influence of media exposure on judgement and behavior is mediated by intuition accessibility. Accordingly, specific intuitions are made more accessible in a receiver's mind

through recent or frequent exposure to exemplars that highlight the intuition. Recent exposure increases the intuition's short-term accessibility, whereas frequent exposure increases its long-term accessibility (for reviews see Riddle, Potter, Metzgar, Nabi, & Linz, 2011; Roskos-Ewoldsen et al., 2002).That is, both recent and frequent exposure to media content exemplifying certain intuitions can influence both the short-term and long-term hierarchies of intuitions in audiences.

If an intuition's accessibility is increased to the point where it has become more salient than another intuition or set of intuitions, the MIME holds that this more salient intuition will play a larger role in determining subsequent moral judgments or related behavior. For example, viewing a courtroom drama in which an attorney successfully brings a criminal to justice should temporarily increase the accessibility of *fairness* in audiences. If those viewers then found themselves in a situation where they had to make a choice influenced by conflicting moral considerations, fairness concerns should outweigh other equally relevant concerns. As such, if a viewer had to choose whether to let a friend cut in line (thereby violating fairness to uphold loyalty) or not cut in line (thereby upholding fairness and violating loyalty), the MIME would predict that the viewer would be less likely to let the friend cut (thus upholding fairness at the cost of loyalty; Tamborini, 2013).

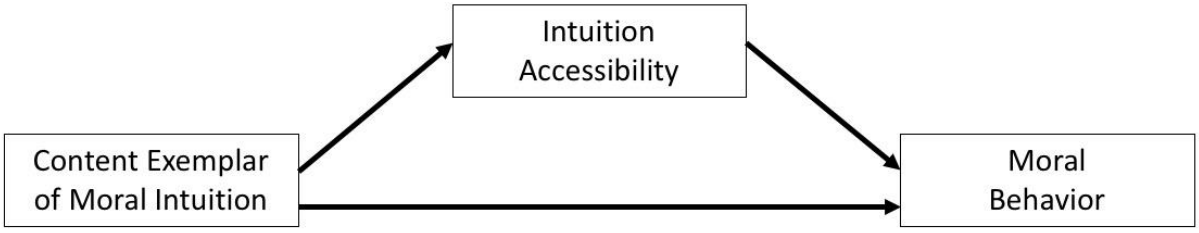
The MIME claims that the activation of one intuition could drive an entire class of judgments and behaviors resulting from that intuition. In the above case, an increase in the salience of the fairness intuition led to an equitable behavior, but it could have just as well led to behaviors of sharing, equal distribution, or honesty. Hence, the MIME considers intuition

accessibility as a mechanism of influence that shapes media's impact on a broad range of audience's judgments and behaviors.

Mediation Indicated in the Short-Term Component of the MIME

The mechanism of influence outlined by the MIME's short-term processes suggest a simple mediation model in which exposure to media exemplifying an intuition influences the intuition's accessibility (path A), the intuition's accessibility influences related judgment and/or behavior (path B), and the influence of exposure to the media exemplar on related judgment/behavior (path C) is accounted for by the intuition's accessibility (see Figure 1).

Figure 1. The MIME's predicted mediation.



Similar models have been put forward in other areas of research examining the manner in which environmental factors influence human behavior. These inquiries describe and test models that propose prime-to-behavior mechanisms (Wheeler & DeMarree, 2009; Wheeler DeMarree, & Petty, 2014). Like logic offered by the MIME, research on prime-to-behavior mechanisms explicates how the activation of different cognitive mechanisms can subsequently influence behavior. More precisely, this line of work suggests a mediation process where events in the environment serve as primes, which activate cognitive mechanisms that facilitate behavioral outcomes.

Research on prime-to-behavior mechanisms suggests support for dual-process theories which outline both automatic (i.e., intuitive) and controlled (i.e., deliberate) processes as

mechanisms of behavioral effects (see Gawronski & Payne, 2011; Sherman et al., 2014; Payne, Brown-Iannuzzi, & Loersch, 2016). This predicted mediation aligns closely with the short-term predictions of the MIME, which also draws from dual-process notions of influence. In the MIME, media exemplars highlighting specific intuitions (i.e., environmental primes) increase the salience of those intuitions in audiences (i.e., activate cognitive mechanisms), which can influence subsequent behavior.

Evidence of the mediation processes indicated in the MIME. Research in different areas shows support for the mediation processes suggested by the MIME. This includes evidence showing that media exemplars influence intuition accessibility (path A), that intuition accessibility influences judgment/behavior (path B), and that intuition accessibility also accounts for an exemplar's influence on judgment/behavior (path C).

Several studies offer evidence that media exemplars can influence intuition's accessibility. Some of this evidence can be seen in recent experiments on college-aged adults. For instance, in two experimental studies, exposure to a courtroom drama containing exemplars highlighting both care and fairness temporarily increased the accessibility of both intuitions (Tamborini Lewis et al., 2016; Tamborini, Prabhu, Lewis, Grizzard, & Eden, 2016). In a third experiment, exposure to separate news stories containing exemplars highlighting either the plight of tornado victims or an Iran nuclear crisis temporarily increased the accessibility of the care and authority intuitions respectively (Tamborini, Prabhu, Hahn, Idzik, & Wang, 2014).

Of particular interest to the present investigation, evidence for media's effect on intuition accessibility has also been found in research on pre-teen children. In two experiments, children aged 10-13 were exposed to content highlighting either care, fairness, loyalty, or

authority. Exposure was varied by having children listen to different verbal prompts in the first study and reading different comic books in the second (Hahn, Tamborini, Prabhu, Grall et al., 2017). Results of both studies suggested that priming care, fairness, and loyalty increased the salience of those intuitions. In the second study, the priming effect for authority accessibility was found as well. Taken together, these findings offer strong support for the MIME's contention that media content highlighting specific intuitions can increase those intuitions' accessibility, particularly when those audiences are children (see Hahn, Tamborini, Prabhu, Klebig et al., 2017; Tamborini, Hahn, Prabhu, Klebig, & Grall, 2017).

Evidence supporting the second path in the model, that intuition accessibility can impact behavior, can be found in several other areas of research. For example, in research showing the relationship between intuition accessibility and video game players' in-game choices, Joeckel, Bowman, and Dogruel (2012) demonstrated that moral accessibility decreased the probability of players committing moral violations in the game. When moral accessibility was low, players' in-game moral violation decisions followed no discernable pattern. Similar studies by Tamborini, Bowman et al. (2016) and Weaver and Lewis (2012) found evidence that players' in-game decisions were predicted by moral accessibility.

Although little effort has been made to examine the entire mediation model, one investigation provides evidence that intuition accessibility can mediate the impact of media exposure on judgments and behavior. In an experimental study manipulating exposure to news of the 2015 Paris terrorist attack, Tamborini, Hofer et al. (2017) found that exposure to news of a terrorist attack increased the salience of the authority intuition, which mediated the negative effect of the news story on donation intentions toward outsiders. This finding comes close to

providing support for the prime-to-behavior mechanism suggested in the short-term component of the MIME, as it shows mediation of behavioral intent. As such, mediation of actual behavior is still unobserved. Notably, this study looked only at an adult sample and the ability of one intuition (authority) to act as a mechanism of media's influence. The present study attempts to examine the mediating ability of four of the five intuitions in pre-teen children.

Applying the MIME to children. If the temporary accessibility of moral intuitions and related behavior in adult populations can be shaped by exposure to media exemplars, this effect occurs despite the fact that the moral sensitivities in this population have been solidified by years of media exposure and other forms of socialization. Under these conditions, we might expect the likelihood of seeing any change in these sensitivities due to a single, brief media exposure would be limited. MIME logic suggests that media's effects on both intuition accessibility and resulting behavior should be stronger for children than adults, given that children's moral sensitivities have experienced fewer years of socialization (e.g., Hahn, Tamborini, Prabhu, Klebig et al., 2017; Tamborini, Hahn et al., 2017).

It should be easier for media to influence the intuition accessibility and resulting behavior of children because the chronic structure of their intuitions has not yet become set as would be expected in adults. Preliminary evidence of this has been found in at least one study that examined media exposure's influence on the intuition accessibility of attentive pre-teen children (Hahn, Tamborini, Prabhu, Grall et al., 2017). Although no direct comparison exists, the magnitude of media's effect on intuition accessibility for pre-teens appeared larger than this effect in comparable studies on adults (e.g., Tamborini, Lewis et al., 2016; Tamborini, Prabhu et

al., 2016). Consistent with the MIME's contention of stronger effects, prime-to-behavior researchers have suggested that "children may be the most consistently affected," by behavioral primes (Harris, Bargh, Brownell, 2009, p. 11). The present study seeks to replicate and extend previous MIME research on pre-teen children by examining the extent to which intuition accessibility acts as a mediator of media's influence on their behavior (see Figure 1).

Media's Influence on Children through a MIME Perspective

Most previous research investigating the effect of moral content in media on pre-teens has examined this influence without consideration of moral intuitions or their accessibility. For example, previous studies have investigated media's influence on moral behaviors such as sharing and helping (see Fisch, 2005), and immoral behaviors such as aggression and violence (see American Academy of Pediatrics, 2001; Anderson et al., 2003; Mares & Braun, 2013; Paik & Comstock, 1994). Although these studies do not look at intuition accessibility, they may have examined processes governed by intuition accessibility, without including this as a mediator in their research. Had they done so, intuition accessibility may have accounted for their findings.

While this might seem inconsequential given that the models used could account for their findings, the inclusion of intuition accessibility would provide greater benefit because it would allow those concerned about media's effects broadly, and effects on pre-teen children specifically, to understand how specific features in media content, related to the motivations that intuitively drive character behavior, may influence receivers' value systems, judgments, and behaviors. For example, a recent study showed that exposure to a television show featuring intergroup conflict increased the likelihood that adolescents advocated for the social exclusion of outgroup members (Mares & Braun, 2013). Although this study did not take

intuition accessibility into account in its model, in line with MIME logic, we would argue that media's effect on social exclusion judgments was likely mediated by an increase in the accessibility of the ingroup loyalty intuition.

Both high-conflict stimuli conditions in Mares and Braun's (2013) study included exemplars highlighting outgroup bias. The first, an episode of *That's So Raven*, featured conflict between a protagonist and a rival group, both of whom are in pursuit of a boy. The second, an episode of *Unfabulous*, featured a protagonist who contemplated the idea of abandoning her friends to join a new social group, realized her new social group was mean, and eventually rejoined her original social group. In both of these episodes, ingroup loyalty was both exemplified by the protagonist and then associated with positive affect. Additionally, both episodes portrayed ingroup loyalty as (1) accompanied by humor, (2) tied directly to the storyline, and (3) highlighted with exciting, action-oriented visuals. All three of these narrative devices have been noted for their ability to strengthen television narratives' influence on children's socialization (Fisch, 2005).

Mares and Braun (2013) explain their findings on children's judgments in accordance with viewers' acquisition of negative mental scripts from socially negative content. However, the MIME would explain these findings differently: Viewing narratives that associate reward with the upholding of ingroup loyalty (in this case, by showing bias toward ingroup and against outgroups) increased the accessibility of ingroup loyalty in audiences, which led viewers to support the exclusion of outgroup members.

By drawing on a comprehensive theory of moral judgement, the MIME's mediation logic attempts to increase understanding of media content's influence on decision making.

Moreover, it does this in a manner that does not pre-define specific behaviors (e.g., social exclusion) as good or bad, without attention to the motivation for that behavior. Although some research in this area has considered motivations (e.g., Wilson et al., 2000), the various motivations included seem limited, and the features that distinguish them as moral (or altruistic) seem unclear. Building on social intuitionist logic, the MIME provides a wide-ranging scheme that details unique dimensions of moral intuitive motivations and the features that make them moral. For example, it would suggest that content featuring exemplars of ingroup loyalty would increase the accessibility of ingroup loyalty among audience members, and through this impact a whole host of judgments and behavioral outcomes involving ingroup loyalty. These outcomes could range from those typically deemed beneficial to society, such as acts of team solidarity or patriotism, to those typically deemed detrimental to society, such as acts of social exclusion or bigotry.

Without a coherent scheme for identifying the dimensions of moral motivation and the mechanisms that shape their influence on moral judgements, it is difficult to determine their impact on behavior. When using an equivocal definition of right and wrong, content selected to represent "bad" behavior might easily exemplify another positive dimension of morality that has been overlooked. If so, it should elicit positive audience outcomes along a dimension of morality unconsidered during the act's selection as an exemplar of bad/negative behavior. By focusing on motivations, the MIME forces us to consider all aspects of an act's moral implications. The present study attempts to advance work in this area by incorporating this focus in research examining the effect of moral intuitions in pre-teen children's media.

Overview of the Current Study

The MIME describes a mediation process in which media exemplars influence intuition accessibility (path A), intuition accessibility influences judgment/behavior (path B), and intuition accessibility accounts for an exemplar's influence on judgment/behavior (path C). Support for path A has been shown in adults (Tamborini, Lewis et al., 2016; Tamborini, Prabhu et al., 2016) and pre-teen children (Hahn, Tamborini, Prabhu, Grall et al., 2017). Qualified support for path B and the full mediation (path C) has been shown in one study with adults (Tamborini, Hofer et al., 2017).

Although this mediation has not been tested with children, intuition accessibility has likely shaped the findings of previous research on pre-teen children. However, intuition accessibility's mediating effect has gone undiscovered because of its omission from this research. If the MIME's assumptions are accurate, we should see evidence of media's ability to increase the accessibility of intuitions in adolescents, which should subsequently influence their behavior in these domains. To examine these claims, the present study tests the following hypothesis:

H1: The accessibility of the (a) care, (b) fairness, (c) loyalty, or (d) authority intuitions will mediate the influence of exposure to narrative content that highlights that intuition on pre-teens' behavior related to that intuition.

METHOD

The study's hypothesis was tested on a sample of pre-teen children in a school environment. To manipulate intuition accessibility with media, pre-teens were presented one of five different stimuli in the form of comic books manipulated to highlight either one of the four moral intuitions, or no moral intuition (as a comparison condition). Participants then completed the moral measure of intuition accessibility (M-MIA; Hahn, Tamborini, Prabhu, Grall et al., 2017). Finally, participants played an economic game which we termed the moral measure of intuitively motivated behavior (M-MIMB). In this game, participants were given tokens and the opportunity to keep the tokens for themselves, or share those tokens with three other people (targets) in a manner that would exemplify an act of care, fairness, ingroup loyalty, or respect for authority.

Sample

To estimate the sample size necessary for sufficient statistical power, an a priori Monte Carlo power analysis for indirect effects using correlations was conducted using an R application built by Schoemann, Boulton, and Short (2017). Target power ($1 - \beta$) was set at 0.80, sample size was estimated in steps of five, 1000 replications were conducted, and 20000 Monte Carlo draws were taken for each replication. The random seed was set at 1234 and the confidence level was set to 95%. Average correlation estimates were obtained from previous research for the a path (r = .33 based on Hahn, Tamborini, Prabhu, Grall et al., [2017] corrected for attenuation), b path (r = .22 based on Tamborini, Hofer et al., [2017] corrected for attenuation), and c path (r = .09 based on Tamborini, Hofer et al., 2017). Analysis revealed a sample size of N = 205 attentive participants was necessary in the present study.

Based on the expectation that slightly more than 60% of the child participants would pay close attention, a total of 310 participants (50% female) in grades 5-7 (M_{age} = 11.77) were recruited from two rural Pennsylvania middle schools. Participants were recruited via a parental consent form that was sent home to all students in grades 5-7. Parents were asked to consent to their child's participation in the study, and, if they consented, their child was selected for participation. Before partaking, participants were asked to sign a child assent form. Participants were compensated for finishing the study with small gifts such as pencil toppers, stickers, and toys.

Eighty-eight participants reported paying only a little attention to the stimulus, and two reported not paying attention at all. Only data from participants who reported that they paid close attention to the stimulus were retained for further analyses. This resulted in a total of N = 210 participants who were included in the final analyses (48.8% female; M_{age} = 11.74).

Procedure

Students who obtained parental consent to participate were seated together in their classroom while the researcher passed out 20 tokens and a paper survey (containing the assent, the M-MIA, instructions on how to complete the M-MIMB, and demographic questions) to each participant. The researcher read the assent instructions aloud, and willing participants were then instructed to write their name on the assent form. Those willing to participate after the assent procedure were randomly assigned to one of the five conditions by being handed one of five versions of a comic book that had been manipulated to highlight one of the four moral intuitions or no moral intuition. After this, the researcher instructed participants on how to complete all survey items and the M-MIMB. Participants were instructed to (1) read their comic

book silently to themselves, (2) fill out a survey, and (3) make some decisions about who would get tokens they can exchange for prizes. The survey contained the M-MIA (which was completed before the M-MIMB) and additional demographic measures (completed after the M-MIMB). The entire duration of their participation lasted around 30 minutes.

Measures

M-MIA. In order to assess the extent to which each intuition was accessible in audiences after exposure to the comic, the moral measure of intuition accessibility (M-MIA) was employed. The M-MIA is a scale developed specifically for use with pre-teen children and tested in research on adolescents between the ages of 10 and 13 years (Hahn, Tamborini, Prabhu, Grall et al., 2017). The M-MIA provides participants with a list of four words (each associated with one of the four moral intuitions) and asks them to choose which they think it is better or worse to be.

Six sets of words are included in the measure. Three sets contain positively valenced words representing each of the four intuitions, and three other sets contain negatively valenced words representing each of the four intuitions. Respondents are asked to choose the positively valenced words according to "which you think it is BETTER to be" and the negatively valenced words according to "which you think it is WORSE to be." Although this scale was initially developed by Hahn, Tamborini, Prabhu, Grall et al. (2017), several alterations were made to the scale in the present study in order to improve its reliability. All words used in the present study's scale, and which of these differ from Hahn, Tamborini, Prabhu, Grall et al.'s (2017) version, can be viewed in Appendix A.

The words participants chose were expected to correspond to the intuitions most accessible in their minds. For instance, if fairness is made accessible in participants, it is expected that for the positively valenced items, they would choose words associated with upholding fairness (e.g., *fair* or *tell the truth*) as best. For the negatively valenced items, it is expected that they would choose words related to violating fairness (e.g., *unfair* or *lie*) as worst. To score responses on this measure, words associated with the intuition chosen (i.e., best or worst) were coded as 1. Words associated with intuitions not chosen were coded as 0. Then, the number of times each word was chosen was summed for each of the four intuitions, resulting in 4 variables (a sum for care, fairness, loyalty, and authority). After this, the summed scores were divided by 6 to give the average score across all six items. Thus, four indices were created for each participant representing the percentage of times each intuition was chosen throughout the measure: one for care ($\alpha_{ordinal}$ = .52), fairness ($\alpha_{ordinal}$ = .53), loyalty ($\alpha_{ordinal}$ = .64), and authority ($\alpha_{ordinal}$ = .57). In this index, a score of 1 indicated that the intuition was chosen in all six items, and a score of 0 indicated that the intuition was not chosen in any of the items.

M-MIMB. After finishing the M-MIA, participants completed the moral measure of intuitively motivated behavior (M-MIMB). The M-MIMB is a new procedure developed to assess intuitively motivated moral behavior. It uses a protocol adapted from the dictator game (e.g., Benenson, Pascoe, & Radmore, 2007; Gummerum, Keller, Takezawa, & Mata, 2008; Kahneman, Knetsch, & Thaler, 1986). In this protocol, participants are given 20 tokens at the beginning of the game, followed by the opportunity to share those tokens with others (targets) or keep the tokens for themselves. Participants were told that they would be able to exchange the tokens

they kept for small prizes when the study was complete. In actuality, all participants received the same number (three) of prizes for their remaining tokens (even if the number was zero) when the study was completed.

Participants were shown pictures of three children (targets) who were of a similar age to them. The first target represented an exemplar of care. The text under her photograph read: "She is a new student in the grade below you. She is feeling *pretty sad* because her family has to move to a new town and she will have to make new friends. She has been *crying a lot* in school. The *poor girl* really *needs help*." The second target represented an exemplar of authority. The text under her photograph read: "She is a student in the *grade above* you. She is going to be the next president of her class and will be *in charge* of making new school policies. She is the most *respected leader* the school has ever had, and *students always listen to her advice*!" The third target represented an exemplar of loyalty. The text under her photograph read: "She lives in the *same neighborhood* as you. Last year, she was a student in the *same class* as you are in now, and she even has the *same birthday* as you. So you have a *lot more in common* with her than the other two people." The target pictures and their accompanying text were presented to participants in a randomized order.

Once participants decided with which target (if any) to share their tokens, they placed the tokens in an envelope corresponding to each target. Any tokens they chose to not share were placed in an envelope they kept for themselves. In order to familiarize participants with the M-MIMB procedure, participants completed a practice round of the M-MIMB during the researcher's instructions (see Appendix B, page 74).

In line with previous research (e.g., Engel, 2011), it was expected that participants would donate more tokens to the targets who they deemed more deserving. The extent to which participants shared more of their tokens with the targets exemplifying care, authority, or loyalty was interpreted as indicating behavior driven by the accessibility of that intuition. The extent to which participants distributed their tokens equally among the three targets and the self was interpreted as indicative of the participants' sensitivity to the fairness intuition.

In accordance with this logic, five token sharing scores were computed for each participant. The first three were for care, loyalty, and authority. These three scores represent the number of tokens the participant shared with the target representing that intuition. The fairness token sharing score was computed by calculating the sum of the absolute value of 5 minus the number of tokens shared with each girl and subtracting it from 20. Then, adding 10 and multiplying it by 2/3 to create a range from 0-20 ($[20 - \mathbf{\Sigma}|5 - i \mid +10] \times 2/3$ where i indicates the number of tokens given to each target). Higher scores here indicated a greater tendency to equally distribute tokens, and thus this was interpreted in line with a greater sensitivity toward fairness. The fifth score calculated was the number of tokens participants kept for themselves.

Two pilot tests of this measure were conducted with separate samples of students. The first was conducted on a small convenience sample of pre-teen children (N = 4; age range 8-12) to determine whether they judged (a) the picture selected to represent care as sadder than the other targets, (b) the picture selected to represent loyalty as more loyal than the other targets, and (c) the picture selected to represented authority as more of a leader than the other targets. These pictures were presented to the children without the background descriptions used for the main study (i.e., those written to associate the person depicted with characteristics that

exemplify the intuition represented in each picture). The goal of this pilot test was simply to provide an initial determination of whether the pictures generally fit the categories for which they were selected to represent. Participants in this pilot test were asked to rate the extent to which each target looked (a) sad, (b) loyal, and (c) like a leader. Responses were obtained on a scale from 1 (*not at all*) to 10 (*very much so*). The results of this pilot test suggested the tendency for the pictures to fit the intended categories; with the picture of the care target rated as most sad, the loyalty target being as most loyal, and the picture of the authority target being rated high on leadership. Notably, though, the loyalty target was rated as slightly higher on leadership compared to the authority target. Because the M-MIMB does not use a picture of a target representing the fairness intuition, no pretest of fairness was obtained in the first pilot test.

The second pilot test was conducted on a separate sample of participants (N = 20, age range 10-13) in a classroom setting similar to the one used in the main study. Participants complete the M-MIMB after reading one of the five comics. This was done simply to ensure that participants understood the procedure and could complete it without problems. Simple means were examined to determine whether participants in different comic conditions showed a tendency to share with targets in the expected manner. Because of the small sample size, no statistical tests were conducted. However, visual inspection of the means suggested not only that participants understood the procedure, but also a tendency by them to share in a manner consistent with expectations. Based on these initial pilot tests, the decision was made to employ the M-MIMB in the main study in its original form.

Additional measures. Several demographic variables, including age, sex, and grade level, were also measured and, based on the procedure by Hahn, Tamborini, Prabhu, Grall et al. (2017), participants were asked to indicate the extent to which they paid attention to the comic book while they were reading. To limit the effect of impression management biasing responses to this item, participants were asked to indicate if they: (1) *found the story really interesting and paid close attention,* (2) *found the story a little interesting and paid a little attentio*n, or (3) *didn't find the story very interesting and did not pay close attention.* Although this created a double-barreled item, the possibility of impression management was seen as more likely to bias responses to this question than the possibility of a confound between attention to and liking for the comic. The entire survey instrument can be viewed in Appendix B.

Stimulus

The stimulus consisted of five versions of a Cleopatra in Space comic book manipulated to highlight the upholding of either care, fairness, loyalty, authority, or no moral intuition. The different versions have been used in previous research and shown to increase the accessibility of their respective manipulated intuition (Hahn, Tamborini, Prabhu, Grall et al., 2017).

Basic story. In accordance with Fisch (2005), the five comic versions all featured the same general plot, differing only in specific areas tied to the relevant intuition. The general plot is as follows: Cleopatra, the main character, attends school with her friend, Akila. Cleopatra is then summoned to go on a mission wherein she must go to a nearby planet, retrieve a key that unlocks treasure, and return it to her commander. Cleopatra agrees, travels to retrieve the key, retrieves it, and attempts to go back to her spaceship. While she is on her way back to the ship, she is caught by the planet's creatures ("Nebulans"), who want the key for themselves, and she

must decide what to do with it. She makes a decision; heads back her ship and explains her decision to Akila. The story ends with Cleopatra flying into space to carry out her decision.

Conditions. The plot varies at four specific points that are central to the story. It varies (1) when Cleopatra and Akila arrive late to class and are asked a question by their professor, (2) when the Nebulans try to talk Cleopatra into giving them the key, (3) when Cleopatra decides what to do with the key, and (4) when Cleopatra makes it back to her spaceship and discusses her decision. At each of these four points, exemplars are given to highlight the upholding of the relevant intuition in that condition. Variations in each condition can be viewed in Appendix C.

RESULTS

Manipulation Check

Prior to testing the study's central hypothesis, analyses were conducted to verify that the stimuli highlighted intuitions as expected. Although previous research has already verified the ability of the stimuli used in the present study to increase the accessibility of their respective intuitions (Hahn, Tamborini, Prabhu, Grall et al., 2017), prior research did not verify the greater presence of content highlighting pertinent intuitions in respective comic conditions. Content analysis was conducted to confirm that the comic stimuli contained clear exemplars of the intuitions they were manipulated to highlight. This content analysis used a coding manual that has been implemented in the past to identify MFT's moral intuitions in media content (e.g., Hahn, Tamborini, Prabhu, Klebig, 2017; Tamborini, Hahn, Prabhu, Klebig, & Grall, 2017). Two coders who were unaware of the study's hypothesis underwent three weeks of coder training where they learned how to code the presence/absence of moral intuitions in narrative media. [i]

In this content analysis, the comic book pages served as the units of analysis. In all, 10 pages in each comic stimulus were manipulated to feature one or none of the four intuitions, and the remaining 31 pages appeared in every version of the comic stimuli. Intercoder agreement was assessed using Krippendorff's alpha on all coded material, and was deemed acceptable for all four intuitions including care ($\alpha = .74$), fairness ($\alpha = .86$), loyalty ($\alpha = .80$), and authority ($\alpha = 1.00$). A third expert coder, who was also unaware of the study's hypothesis, served as a referee to address coder disagreements.

Next, in order to assess the extent to which any one comic stimulus highlighted exemplars of the four intuitions, a 6 (page type: manipulated to feature care, fairness, loyalty,

authority, no intuition, or unmanipulated) x 4 (intuition: care, fairness, loyalty, authority) chi-square was conducted, $\chi^2(12, N = 46) = 106.91$, $p < .001$, *Cramer's V* = .88. Results revealed that, for pages manipulated to feature a moral intuition, each condition featured exemplars of its respective intuition substantially more than any other intuition. For pages manipulated to feature care (adjusted standardized residual = 6.4) or fairness (adjusted standardized residual = 5.4), no other intuitions were coded as appearing on those pages. Put another way, 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.

Additionally, results revealed that the pages manipulated in the comparison condition (i.e., those manipulated to contain no morally laden content) indeed did not feature any moral intuition. Those pages not manipulated (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). Frequency counts of the number of intuition representations in each comic version can be seen in Table 1.

Table 1. Frequency of intuition representations in each comic condition.

	Care Condition	Fairness Condition	Loyalty Condition	Authority Condition	No Moral Comparison Condition	Pages Common to all Conditions
Intuition Representation	$N_{pages} = 10$	$N_{pages} = 10$	$N_{pages} = 10$	$N_{pages} = 10$	$N_{pages} = 10$	$N_{pages} = 31$
Care Representations	10	0	0	0	0	1
Fairness Representations	0	10	1	1	0	2
Loyalty Representations	0	0	9	0	0	1
Authority Representations	0	0	0	9	0	2

Testing the MIME's Mediation Process in Pre-teen Children

A first look at each of the intuition indices from the M-MIA showed that participants selected each intuition as most important more often *when it was primed* in the comic book than when it was *not* primed. In the M-MIMB, participants gave more of their tokens to targets that exemplified care, authority, or loyalty when they were in that intuition's respective comic condition than when they were in any other condition. This pattern also held true for the fairness intuition, as participants in the fairness condition had higher fairness token scores on average than participants in any other condition. Means and standard deviations for intuition indices and token sharing scores from the M-MIMB in all conditions are shown in Table 2.

Table 2. Means and standard deviations for accessibility indices and tokens shared.

	Care condition	Fairness condition	Loyalty condition	Authority condition	No-moral Comparison condition	Overall
Intuition indices	*n* = 45	*n* = 41	*n* = 49	*n* = 33	*n* = 42	*N* = 210
Care	**.48 (.28)**	.27 (.18)	.26 (.24)	.26 (.24)	.33 (.24)	.33 (.25)
Fairness	.12 (.16)	**.36 (.25)**	.13 (.16)	.11 (.14)	.12 (.11)	.15 (.18)
Loyalty	.13 (.18)	.14 (.15)	**.36 (.20)**	.21 (.19)	.21 (.21)	.22 (.21)
Authority	.26 (.21)	.34 (.23)	.25 (.19)	**.45 (.21)**	.33 (.21)	.32 (.22)
Token scores						
Care	**6.29 (3.34)**	4.44 (2.18)	4.20 (2.69)	4.20 (2.82)	4.88 (3.14)	4.82 (2.94)
Fairness	15.69 (3.25)	**17.43 (2.96)**	16.34 (2.95)	16.19 (3.23)	15.75 (3.13)	16.28 (3.13)
Loyalty	3.67 (2.13)	4.16 (1.75)	**4.65 (2.04)**	3.46 (1.82)	3.41 (1.98)	3.91 (2.00)
Authority	3.33 (2.67)	4.02 (1.68)	3.22 (2.09)	**5.34 (3.07)**	2.91 (2.03)	3.69 (2.36)
Kept for self	6.71 (5.53)	7.37 (4.94)	7.92 (4.65)	7.00 (4.55)	**8.81 (6.28)**	7.58 (5.24)

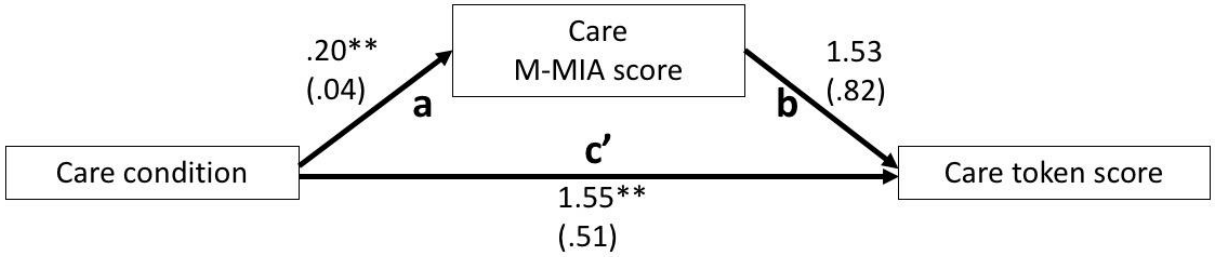
Note. Scores for primed intuitions are in bold. Standard deviations appear in parentheses.

The present study proposed a mediation model wherein reading a comic book that highlights a particular moral intuition exemplar was predicted to influence moral behavior via the salience of that particular highlighted intuition. To test the study's main hypothesis, four simple mediation models were created for each intuition condition: one for the conditions of care, fairness, loyalty, and authority. In each model, condition was entered as the exogenous

variable with the relevant condition dummy coded as 1 and all other conditions coded as 0. The M-MIA index score of the relevant intuition was entered as the mediator variable, and the token score for the relevant intuition was entered as the outcome variable. Analyses were carried out using model 4 in the SPSS macro Process (Hayes, 2017). [ii]

In the first model, for care, participants in the care condition showed an increased likelihood of choosing the care intuition as most important in the M-MIA (*a* = .20, *SE = .04*, *p* < .01, 95% CI [.12, .28]). Furthermore, participants who chose care as more important *tended* to share more tokens with the care target, although the confidence interval associated with this path was not fully above zero (*b* = 1.53, *SE* = .82, *p* = .06, 95% CI [-.09, 3.15]). A bootstrap confidence interval for the indirect effect (*ab* = .31, *SE* = .20,) based on 5,000 bootstrap samples was just above zero (bias-corrected 95% CI [.01, .81]). Beyond this evidence of mediation, there was evidence that exposure to the care comic directly influenced the number of tokens donated to the care exemplar independent of care intuition salience (*c'* = 1.55, *SE* = .51, *p* < .01, 95% CI [.55, 2.54]). As such, results for the care model revealed that exposure to the care comic book increased token donations to the care target and this relationship was mediated by care intuition salience. Results of the path model for care can be seen in Figure 2.

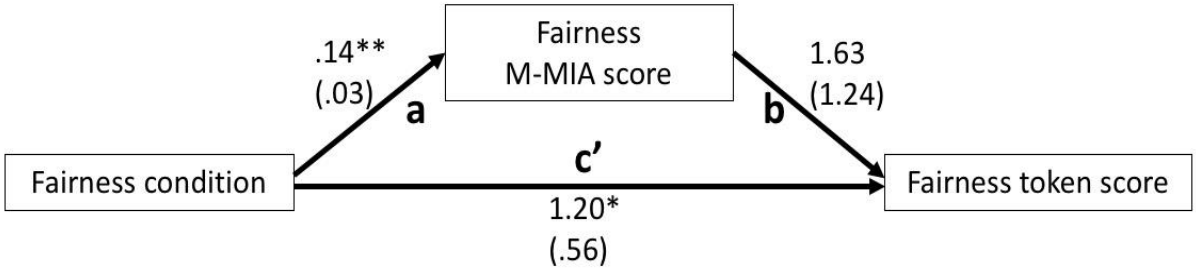
Figure 2. Results of care mediation analysis in Process.



*Note. Indirect effect: ab = .31 (SE = .20), bias-corrected 95% CI [.01, .81]. All coefficients are unstandardized. * indicates statistical significance at p < .05 level and ** indicates statistical significance at p < .01 level. Standard errors are in parentheses.*

In the second model, this time for fairness, participants exposed to the fairness comic showed an increased likelihood of choosing the fairness intuition as most important in the M-MIA (*a* = .14, *SE* = .03, *p* < .01, 95% CI [.08, .20]), but this, in turn, did not influence fairness token scores (*b* = 1.63, *SE* = .1.24, *p* = .19, 95% CI [-.80, 4.06]). Examination of the indirect effect (*ab* = .22, *SE* = .20) failed to convincingly demonstrate mediation, as a bootstrap confidence interval based on 5,000 bootstrap samples crossed just below zero (bias-corrected 95% CI [-.03, .23]). Once again, however, independent of fairness intuition's salience, there was evidence that exposure to the fairness comic directly influenced participants' tendency to distribute their tokens equally, however (*c'* = 1.20, *SE* = .56, *p* < .05, 95% CI [.10, 2.30]; see Figure 3).

Figure 3. Results of fairness mediation analysis in Process.

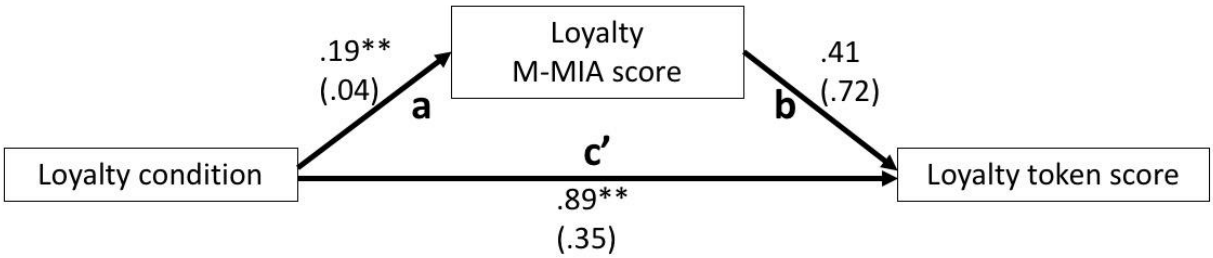


*Note. Indirect effect: ab = .22 (SE = .20), bias-corrected 95% CI [-.03, .23]. All coefficients are unstandardized. * indicates statistical significance at p < .05 level and ** indicates statistical significance at p < .01 level. Standard errors are in parentheses.*

The model for loyalty showed no indication for mediation at all. Participants in the loyalty condition were more likely to choose the loyalty intuition as most important in the M-MIA (*a* = .19, *SE* = .04 *p* <.01, 95% CI [.13, .25]), but this did not go on to influence token donations to the loyalty target (*b* = .41, *SE* = .72, *p* = .57, 95% CI [-1.00, 1.81]). The indirect effect (*ab* = .08, *SE* = .15,) failed to support mediation as the bootstrap confidence interval of 5,000 bootstrap samples clearly included zero (bias-corrected 95% CI [-.23, .36]).Once more,

however, results in this condition revealed that exposure to the loyalty comic had a direct effect on participants' tendency to donate their tokens to the loyalty target, independent of loyalty intuition's salience (*c'* = .89, *SE* = .35, *p* = .01, 95% CI [.21, 1.56]; see Figure 4).

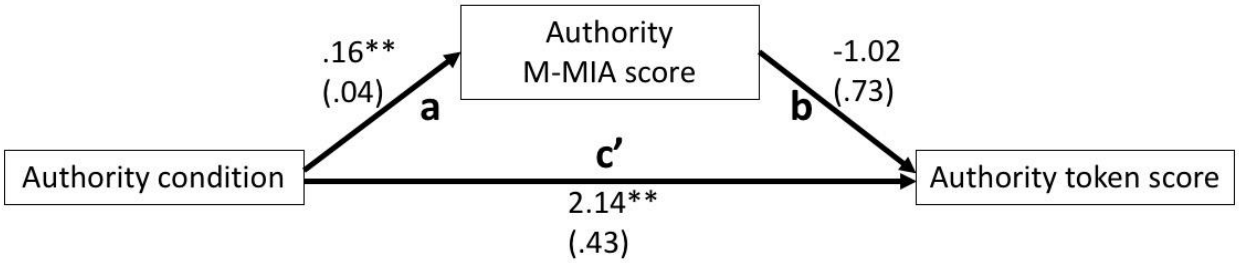
Figure 4. Results of loyalty mediation analysis in Process.



*Note. Indirect effect: ab = .08 (SE = .15), bias-corrected 95% CI [-.23, .36]. All coefficients are unstandardized. * indicates statistical significance at p < .05 level and ** indicates statistical significance at p < .01 level. Standard errors are in parentheses.*

Finally, in the model for authority, participants exposed to the authority comic showed an increased likelihood of choosing the authority intuition as most important in the M-MIA (*a* = .16, *SE* = .04, *p* < .01, 95% CI [.08, .23]), but participants who chose the authority intuition as most important were no more likely to show increased donations to the authority target (*b* = -1.02, *SE* = .73, *p* = .16, 95% CI [-2.46, .41]). A bootstrap confidence interval for the indirect effect (*ab* = -.16 *SE* = .13,) based on 5,000 bootstrap samples clearly crossed below zero, (bias-corrected 95% CI [-.19, .02]). Like the first three models, however, results from the authority model revealed that exposure to the authority comic did directly increase participants' donations to the authority target, independent of authority intuition's salience (*c'* = 2.14, *SE* = .43, *p* < .01, 95% CI [1.29, 2.99]; see Figure 5).

Figure 5. Results of authority mediation analysis in Process.



*Note. Indirect effect: ab = -.16 (SE = .13), bias-corrected 95% CI [-.19, .02]. All coefficients are unstandardized. * indicates statistical significance at p < .05 level and ** indicates statistical significance at p < .01 level. Standard errors are in parentheses.*

Overall, each model revealed that exposure to a comic book featuring a moral intuition directly influenced (a) that intuition's salience and (b) the extent to which participants donated tokens to a target who exemplified that intuition. [iii] Because there was no equivalent measure of "no-moral" salience in the M-MIA, there are no equivalent tests for the impact of exposure to the "no-moral" comic on "non-moral" intuition salience or the ability of "non-moral" salience to mediate sharing behavior. However, the MIME would predict that participants in the no-moral comparison condition should keep more tokens for themselves. This prediction comes from MIME logic suggesting that exposure to any moral condition should result in participants sharing more tokens to a relevant intuition target, and as such, participants in any moral condition should share more tokens overall than participants in the no-moral comparison condition. This directional hypothesis was tested in a separate Mann-Whitney test was conducted to examine the impact of exposure on tokens kept for self. Results revealed that participants kept more tokens for themselves when they were in the no-moral comparison condition (M = 8.81, SD = 6.28, Mdn = 7.00) than when they were in a condition highlighting a moral intuition (M = 7.30, SD = 4.97, Mdn = 6.00), U = 3980, z = 1.29, p = .05 (one-tailed), r = .09.

Additional analyses testing for mediation were less uniform. The model for care was consistent with mediation, however, no other models showed support for this effect. Results of all path analyses are presented in Table 3. [iv]

Table 3. Path coefficients and indirect effects for four mediation models in Process.

	Path coefficients		Indirect effects		
Model 1 - Care	To M-MIA (M)	To Token-Score (TS)	Estimate	Bootstrap 95 % CI with percentile method	Bootstrap 95% CI with bias correction
from condition (CO)	.20 (.04)**	1.55 (.51)			
from M-MIA (M)		1.53 (.82)**			
CO → M → TS			.31 (.20)	[-.03, .74]	[.01, .81]
Total effect (c)		1.85 (.48)**			
Model 2 - Fairness					
from condition (CO)	.14 (.03)**	1.20 (.56)*			
from M-MIA (M)		1.63 (1.24)			
CO → M → TS			.22 (.20)	[-.11, .66]	[-.03, .23]
Total effect (c)		1.42 (.53)**			
Model 3 - Loyalty					
from condition (CO)	.19 (.04)**	.89 (.35)**			
from M-MIA (M)		.41 (.72)			
CO → M → TS			.08 (.15)	[-.24, .35]	[-.23, .36]
Total effect (c)		.97 (.32)**			
Model 4 - Authority					
from condition (CO)	.16 (.04)**	2.14 (.43)**			
from M-MIA (M)		-1.02 (.73)			
CO → M → TS			-.16 (.13)	[-.44, .05]	[-.19, .02]
Total effect (c)		1.98 (.42)**			

Note. * indicates significance at $p < .05$ level and ** indicates significance at the $p < .01$ level. Standard errors are in parentheses.

Post Hoc Analyses

Additional analyses beyond those outlined in the proposal for this dissertation were conducted in an attempt to correct for measurement error in each of the four models. [v] After correcting for measurement error, a path analysis procedure that relies on a product rule was performed (Hunter & Gerbing, 1982; Hunter, Gerbing, & Boster, 1982). This post hoc procedure involved multiplying (a) the correlation of condition with intuition salience by (b) the correlation of intuition salience with token scores to obtain a predicted correlation between exposure

condition and token scores. For example, if $r_{\text{condition, salience}}$ = .30 and $r_{\text{salience, token score}}$ = .20 then the causal model predicts $r_{\text{condition, token score}}$ = (.30)(.20) = .06.

Correction for attenuation due to measurement error for use with these additional path analyses was achieved using Spearman's (1904) formula. Spearman (1904) maintained that a true correlation can be calculated by dividing an observed correlation by the square root of the product of the reliabilities for each variable in the correlation $\left(r'_{xy} = \frac{r_{xy}}{\sqrt{xx}\sqrt{yy}}\right)$. In the present study, both the condition variable and the token score variables were assumed to have reliabilities of 1. As such, measurement error in the mediator could be corrected for each model in two steps. Step one, divide the observed correlation between condition (x) and the relevant M-MIA score (y) by the square root of the relevant M-MIA score's reliability $\left(r'_{xy} = \frac{r_{xy}}{\sqrt{xx}\sqrt{yy}}\right)$. Step 2, apply the same correction to the observed correlation between the relevant M-MIA score (y) and the relevant token score (z) $\left(r'_{yz} = \frac{r_{yz}}{\sqrt{yy}\sqrt{zz}}\right)$. Following this, a predicted correlation between condition and the relevant token score can be calculated using the product rule (Hunter & Gerbing, 1982; Hunter et al., 1982), and model fit can be assessed using a chi-square goodness of fit test and a constructed 95% confidence interval. Hunter and Gerbing's (1982) method, including the Spearman (1904) correction, is implemented below for each of the four models. The observed and corrected correlations for all paths in all models, as well as all fit statistics, are shown in Table 4.

Table 4. Observed and corrected correlations for all model paths and model fit statistics.

	Observed		Corrected				
	To M-MIA (M)	To Token-Score (TS)	To M-MIA (M)	To Token-Score (TS)	z	χ^2	95% CI
Model 1 - Care					1.86	3.45	[-.01, .27]
from condition (CO)	.33**	.26**	.47	.13 (.07)#			
from M-MIA (M)		.20**		.28			
Model 2 - Fairness					1.43	2.04	[-.06, .22]
from condition (CO)	.30**	.18**	.41	.08 (.07)#			
from M-MIA (M)		.14*		.19			
Model 3 - Loyalty					2.00*	4.00*	[-.07, .27]
from condition (CO)	.39**	.21**	.49	.07 (.07)#			
from M-MIA (M)		.12		.15			
Model 4 - Authority					4.43**	19.61**	[-.14, .14]
from condition (CO)	.27**	.31**	.34	-.0001 (.07)#			
from M-MIA (M)		-.001		-.01			

Note. * indicates significance at $p < .05$ level. ** indicates significance at the $p < .01$ level. # indicates the predicted correlation (using the product rule) after correcting for measurement error. Standard errors of the correlations between condition and the relevant token scores are in parentheses.

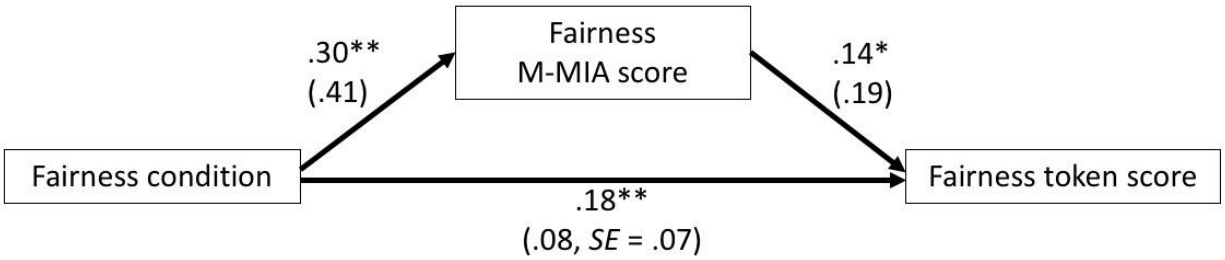
For care, after correcting for measurement error using Spearman's (1904) formula, the predicted correlation (using Hunter and Gerbing's [1982] product rule) between the care condition and the care token score was .13 (*SE* = .07). The difference between the predicted correlation and the obtained correlation was .13. With a sample size of *N* = 210, this difference is interpreted as moderate and, thus, the model is said to fit. This can be further shown when considering that the z-score associated with this difference is not statistically significant, $z = 1.86$, $p > .05$, and $\chi^2 = 3.45$, $p > .05$. Even further, the obtained correlation between the care condition and the care token score ($r = .26$) fits within the corrected 95% CI of [-.01, .27], again suggesting model fit. Despite all other indicators suggesting that the care model fits, it is worth noting that the constructed 95% CI crosses just below zero. Although a widened confidence interval is a consequence of correcting for measurement error (see Spearman, 1904), the model's fit must be interpreted with caution. Results of the path model for care can be seen in Figure 6.

Figure 6. Results of care mediation analysis using product rule method.

*Note. Observed correlations are shown and correlations corrected for attenuation due to measurement error are show in parentheses, z = 1.86, p > .05, and χ^2 = 3.45, p > .05, corrected 95% CI [-.01, .27]. * indicates statistical significance at p < .05 level and ** indicates statistical significance at p < .01 level. Standard errors are in parentheses.*

For fairness, based on the corrected correlations in the path model, the predicted correlation between the fairness condition and the fairness token score was *r* = .08 (*SE* = .07). The difference between the obtained and predicted correlation was .10, which is a relatively small difference within a sample size of *N* = 210. Thus, again, the model is said to fit. This is complemented by the fact that the z-score associated with this difference is not statistically significant, *z* = 1.43, *p* > .05, and χ^2 = 2.04, *p* > .05. Moreover, the obtained correlation between the fairness condition and the fairness token score (*r* = .18) fits well within the corrected 95% CI [-.06, .22]. Once again, despite all other indicators suggesting that the fairness model fits, it is worth noting that the constructed 95% CI crosses zero, this time at a magnitude almost as big as the standard error. Again, this type of widened confidence interval results from Spearman's (1904) correction for measurement error, however the model's fit must be interpreted with caution (see Figure 7).

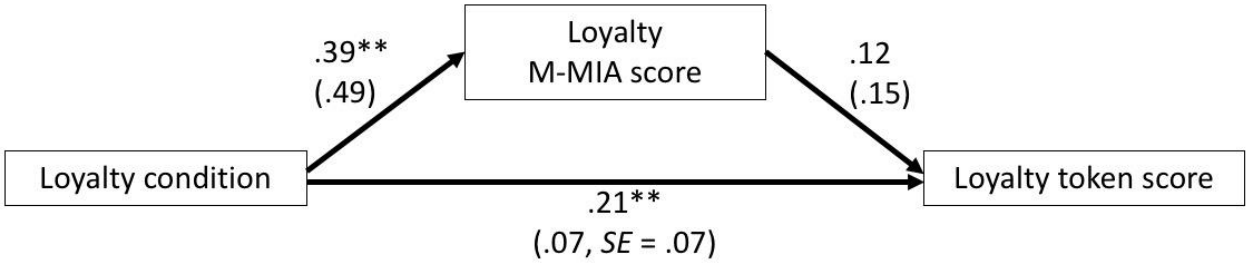
Figure 7. Results of fairness mediation analysis using product rule method.



*Note. Observed correlations are shown and correlations corrected for attenuation due to measurement error are show in parentheses, z = 1.43, p > .05, and χ^2 = 2.04, p > .05, corrected 95% CI [-.06, .22]. * indicates statistical significance at p < .05 level and ** indicates statistical significance at p < .01 level. Standard errors are in parentheses.*

Third, for loyalty, after correcting the correlations in the path model for measurement error, the predicted correlation between the loyalty condition and the loyalty token score was *r* = .07 (*SE* = .07). The difference between the obtained and predicted correlation is .14, which considering the size of the standard error, suggests the model does not fit. Goodness of fit tests further confirm that the model does not fit, *z* = 2.00, *p* < .05, χ^2 = 4.00, *p* < .05. Finally, although the obtained correlation between the loyalty condition and the loyalty token score (*r* = .18) does fit within the corrected 95% CI [-.07, .21], this corrected interval crosses zero. Thus, almost uniformly, the indicators suggest that this model does not fit the data (see Figure 8).

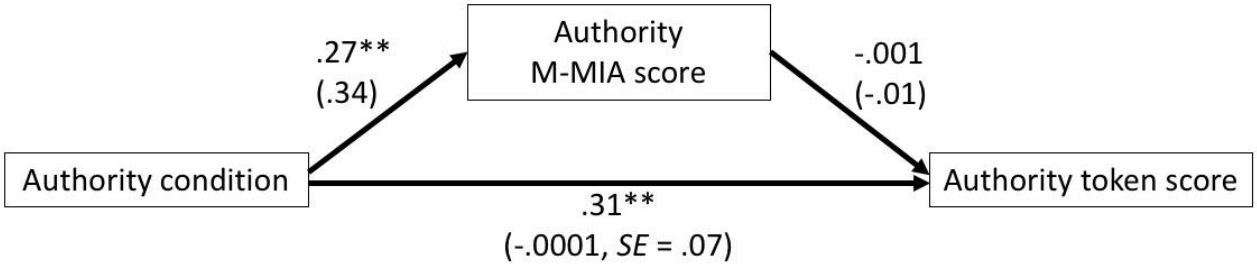
Figure 8. Results of loyalty mediation analysis using product rule method.



*Note. Observed correlations are shown and correlations corrected for attenuation due to measurement error are show in parentheses, z = 2.00, p < .05, and χ^2 = 4.00, p < .05, corrected 95% CI [-.07, .21]. * indicates statistical significance at p < .05 level and ** indicates statistical significance at p < .01 level. Standard errors are in parentheses.*

Finally, for authority, based on the corrected correlations in the path model, the predicted correlation between the authority condition and the authority token score was r = -.0001 (*SE* = .07), which differs substantially from the obtained correlation (r = .31), resulting in failure on all model fit indicators, z = 4.43, p < .01; χ^2 = 19.61, p < .01; corrected 95% CI [-.14, .14]; see Figure 9.

Figure 9. Results of authority mediation analysis using product rule method.



*Note. Observed correlations are shown and correlations corrected for attenuation due to measurement error are show in parentheses, z = 4.43, p < .05, and χ^2 = 19.61, p < .05, corrected 95% CI [-.14, .14]. * indicates statistical significance at p < .05 level and ** indicates statistical significance at p < .01 level. Standard errors are in parentheses.*

DISCUSSION

The primary goal of this investigation was to replicate recent research examining mechanisms explicated in the MIME and to extend this research to pre-teen children. More specifically, it attempted to demonstrate that media content emphasizing specific moral intuitions could influence the accessibility of those intuitions among pre-teen audience members and, through this, affect their subsequent behavior. This section begins with an overview of the study's major findings. It goes on to review the contributions of the present study to research on children's media. Following this, it examines several study limitations and concludes with a discussion of how a MIME-based approach to understanding the prosocial and antisocial influence of media exposure might benefit future research examining media's influence on children.

Overview of Findings

The results of this study showed that exposure to media content emphasizing unique domains of moral intuitions directly influenced both the salience of emphasized intuitions in audiences, and the number of tokens audiences shared with a target person that exemplified sensitivity to that intuition. By showing this, the data suggest that media content emphasizing different moral intuitions may not only affect the likelihood that young audiences will act more altruistically overall but may also determine the specific domains within which the affected behavior will manifest. Expressed in terms of the present study, exposure to media content can not only lead pre-teens to share, but to share in ways that represent predictably and meaningfully different behaviors. Beyond support for these direct effects, this study produced limited evidence for the predicted mediation model. For care and (according only to the results

of the product rule method) fairness, exposure's influence on intuition-relevant sharing behavior was mediated by intuition salience. There was no evidence of mediation for the models based on the loyalty or authority intuitions.

Contributions to Children's Media Research

Taken together, the present study adds to research on children's media effects in several ways. First, this research re-conceptualizes children's prosocial and antisocial media based on the MIME's application of recent advances in psychology. These advances define moral judgment in terms of upholding and violating a set of specific moral intuitions instead of using a simple distinction of good and bad. Second, it demonstrates that narratives in children's media that exemplify sensitivity to these specific moral intuitions strongly affect behaviors uniquely related to those intuitions. Third, it shows partial support for the MIME's suggestion that moral intuitions mediate media's influence on the altruistic behavior of pre-teens. Fourth, it introduces a new procedure to assess media's behavioral effect on children, called the moral measure of intuitively motivated behavior (M-MIMB), which simultaneously measures behavior related to the specific moral intuitions thought to motivate that behavior. This section begins with a discussion of the moral intuition approach to examining media's influence on children's behavior and goes on to discuss implications for the MIME, as well as the implications for using the economic game in media effects research. It ends with a discussion of factors that may have contributed to the lack of mediation, the implications of each, and suggestions for future research in this area.

Reconceptualizing prosocial and antisocial media. Analyses suggesting that exposure to media content featuring any of the four moral intuitions can directly increase not only the

extent to which young readers deem those intuitions important, but their performance of intuition relevant sharing behaviors have important implications for children's media research. In particular, they (1) provide support for an approach that may add conceptual clarity to so-called *prosocial* and *antisocial* media effects. A great deal of mass communication research focuses on the study of *prosocial* and *antisocial* media content, as well as the effects resulting from exposure to this content (e.g., Bushman & Huesmann, 2006; Coyne et al., 2018; Hogan & Strasburger, 2008; Mares, 1996; Mares & Woodard, 2005). Yet, scholars concerned with these classifications of media content or behavioral outcomes do not seem to agree on one definition for these terms.

Some have defined prosocial content simply in terms of behavior that helps others (e.g., Anderson et al., 2010; Gentile et al., 2009; Coyne et al., 2018), while others define prosocial by offering lists of specific behaviors, such as helping, comforting, sharing, and cooperating (Batson and Powell, 2003), or altruism, counter-stereotyping, positive interaction, and self-control (Mares, 1996). Antisocial has been defined in a similar manner, with some scholars characterizing antisocial content and behavior simply in terms of physical aggression (Anderson et al., 2010; Paik & Comstock, 1994), while others offer lists of behaviors normatively considered to be antisocial, such as hostility, manipulativeness, and a lack of empathy (American Psychiatric Association, 2013). One could easily imagine contexts within which the labelling of such behaviors may deviate from these norms (e.g., a surgeon detached from feelings of empathy during a high-risk operation), and also imagine other behaviors normatively identified as good or bad that are absent from these lists.

The broad and imprecise manner in which these terms have been conceptualized in past research suggests that the terms may describe a range of media content, or outcomes resulting from exposure to this content. This may be beneficial in efforts to investigate media's effects on pre-defined behaviors identified as normatively prosocial or antisocial (such as "helping" or "aggression"). However, current conceptualizations surrounding prosocial and antisocial media content, along with outcomes resulting from exposure to such content, are less useful for attempts to advance broader understandings of media's holistic influence. With its focus on moral intuitions, the present study begins to offer conceptual clarity to research in this area.

Instead of describing media content or its influence on audience judgments and behaviors based on normative determinations of good or bad, a MIME-based approach to examining media content and its influence would construe prosocial and antisocial behavior respectively in terms of the upholding and violation of moral intuitions. The present study's ability to show that media can affect these intuitive moral *motivations* for behavior offers a broader understanding of media's influence than previous accounts. We believe this has great value.

Instead of assigning prescriptive normative labels of "good" or "bad" to the media influence observed in the present study, the MIME-based approach to examining media exposure's effects on the accessibility of moral intuitions and related behavioral outcomes provides insight to media's influence that not only offers greater precision but also does not change based on the context in which it was observed. For example, media's influence on audiences' judgments of social exclusion (e.g., Mares & Braun, 2013) may be considered normatively bad or good depending on the context in which such influence is considered. This

could be problematic when attempting to apply research findings from one culture (in which bias against outgroups is considered offensive) to another (in which suspicion of outsiders may be necessary for survival). Reconsidering social exclusion as a behavior motivated by the *upholding of ingroup loyalty* removes the prescriptive labels of "good" or "bad," and allows research findings regarding media's impact on ingroup loyalty to be applied regardless of social context. The value of the ability to present research findings that are not bound by the subjective labeling of individual researchers should not be understated. The ability of science to remain as objective as possible when presenting research findings is especially important in the context of children's media research, as it is an area often fraught with trepidation from concerned publics (e.g., Heid, 2017; Rideout, 2017). A MIME-based approach to this area of research potentially offers a less subjective examination of specific content features that may influence young audiences' judgments and behaviors.

The effect of children's media content exemplifying moral intuitions. The present study's finding that content emphasizing specific moral intuitions directly affects both the salience of the intuition emphasized and behaviors exemplifying sensitivity to that intuition points to the value of applying the MIME to the study of children's media. The MIME's comprehensive scheme not only outlines a set of unique moral intuitions that can help distinguish and identify the representation of moral intuitions in media content, but also offers nuanced predictions regarding media's broadly generalizable yet specific effects on the accessibility of these intuitions among audiences members as well as related judgments and behaviors. This approach should have considerable value for scholars attempting to study children's media effects, as it allows researchers greater precision in attempts to identify both

(a) the specific features of narrative content that may produce socially beneficial or detrimental outcomes in audiences, and (b) the specific areas of behavior affected by these features.

First, a MIME-based approach would benefit researchers attempting to identify specific features in media content that can influence pre-teen children's judgments and behaviors and examine how they are represented in children's media. Previous content analytic work has suggested that media narratives popular among very young children tend to highlight the importance of the moral intuitions, whereas narratives that are popular among older children do so to a lesser degree (e.g., Hahn, Tamborini, Prabhu, Klebig et al, 2017; Hahn et al., 2018; Tamborini, Hahn et al., 2017). This same research shows that content creators build in positive and negative reinforcement cues that may shape the extent to which these intuitions are portrayed as desirable or undesirable. Although only descriptive in nature, these content analytic findings suggest a possible range of narrative content cues that exist in popular media; the likes of which could be investigated for their potential to facilitate both intuition accessibility and related behavioral outcomes.

Integrating findings from educational media research (e.g., Fisch, 2005) with MIME logic would suggest that scholars and parents looking to encourage specific behaviors in children could craft a media diet for children that highlights the importance of intuitions that motivate those behaviors. That is, parents hoping to facilitate compassion or attention to another's needs might present children with narratives that show reward for care motivated behaviors as part of the main storyline. The same could be done for other moral intuitions. Other insights derived by combining logic from educational media and MIME research could similarly help those seeking to identify additional features of narrative content that might promote desirable

outcomes in young audiences. The present study's coding scheme might provide a useful starting point with scholars crafting narratives for such purposes. Using a MIME-based approach to examine both media content and its effect on moral behavior, it may also be interesting to replicate existing studies that did not initially consider the potential influence of intuition accessibility (e.g., Cingel & Krcmar, 2017; Cingel et al., 2017; Krcmar & Cooke, 2001; Krcmar & Curtis, 2003; Martins & Wilson, 2012; Mares & Braun, 2013). This approach may not only provide insight regarding of the specific content features that accounted for their effects, but it would also allow these studies to be understood within a more comprehensive framework.

Second, a MIME-based approach could provide researchers with greater precision in attempts to predict distinct behavioral domains that may be affected by media narratives. MIME logic describes how exposure to specific media content can regulate intuition accessibility and shape intuitively motivated judgments and behaviors within discernible domains that are broadly generalizable. Research into children's media effects could greatly benefit by understanding how moral intuitions may be manifest in their outcome measures, as it could increase understanding of a narrative's moral implications. For instance, the effect of exposure to a narrative highlighting the importance of upholding the ingroup loyalty intuition might manifest itself in a broad array of related behaviors, including some normatively considered prosocial (e.g., supporting local charitable foundations) and others considered antisocial (e.g., ostracizing outgroup members). If only one or the other outcome is measured, different conclusions would be reached. Consideration of the ingroup loyalty intuition's role in

both outcomes might alter our understanding of the processes governing this phenomenon, and potentially change our assessment of exposure's effect.

An example of this can be seen in research suggesting that children are more likely to advocate for social exclusion after observing social exclusion on television (e.g., Cingel et al., 2017; Mares & Braun, 2013). These studies explain their findings with logic proposing that children acquire negative mental scripts from media exposure, which lead to behaviors that closely mirror those scripts. Although this script logic may indeed be accurate, it is possible that such outcomes are better explained by other mechanisms. A MIME-based approach might reveal that the children's judgments were simply one example of behavior driven by the accessibility of the ingroup loyalty intuition, which was made accessible by content cues in the narrative highlighting the value of this intuition. Had other behaviors exemplifying sensitivity to ingroup loyalty been measured, we might have seen that exposure not only increased social exclusion, but also increased school spirit, or acts related to self-sacrifice for the benefit of ingroup members. Future researchers interested in this proposition could induce the accessibility of ingroup loyalty (or any other intuition) in children, and then present them with a battery of behavioral options that exemplify sensitivity to the emphasized intuition. Those interested in this line of inquiry might use the stimuli developed for the present study. Content analysis on these stimuli already show the extent to which the frequency with which exemplars of different moral intuitions are represented in each version of the narrative.

Support for the MIME's mediation in pre-teen audiences. The results of the present study also have implications for the mediation processes outlined by the MIME. Logic from the MIME suggests that media content highlighting specific moral intuitions can increase the

accessibility of those intuitions in audiences (path A), that intuition accessibility influences audiences' behaviors (path B), and that intuition accessibility accounts for media content's influence on behaviors (path C). Results of the present study replicated findings from Hahn, Tamborini, Prabhu, Grall et al. (2017) demonstrating the ability of media exposure to influence intuition accessibility in pre-teen children (path A), and also extended the findings of previous investigations by illustrating the direct influence of exposure to media content highlighting these moral intuitions on pre-teen children's moral behavior. However, only partial support was found for both path B (found in the care intuition model, and in the fairness model when using Gini coefficients[vi]) and the full mediation (path C; with the care and fairness intuition models).

The fact that the present findings revealed partial support for the MIME's mediation processes makes an important contribution to existing research on the MIME's short-term and long-term processes. This contribution comes both from the present study's ability to replicate previous evidence showing that even very brief media exposure can activate the short-term mediation process identified in the MIME, and from its ability to show this influence for the first time in a pre-teen audience. At the same time, this partial support must be considered with great caution, as models for only one of four moral intuitions showed strong support for mediation, the model for a second intuition showed support for mediation using some analytical procedures but not others, and models for the final two moral intuitions failed to provide any support for mediation.

To the extent that this research can offer initial support for the MIME's claim that moral intuition accessibility mediates the effect of media content emphasizing moral intuitions on morally relevant behaviors, the present study adds to understandings of how media's influence

shape and be shaped by an audience's moral hierarchy. Specifically, explicating morality's role in the relationship between media and audiences helps us understand the manner in which media can shape what audiences consider to be right or wrong. The findings here strongly suggest that media content can directly influence the real world decisions that children make about another person's deservingness, and the behaviors that come from those decisions. In addition, though limited, there is some evidence that this influence may be guided by intuition accessibility.

Particularly with children, the present study lays the groundwork for future investigations of both the short-term and long-term processes governing media's influence. In the short-term, future research could work to examine the effects of exposure to stimuli in other narrative forms, such as television, movies, or books. The present study's use of a very brief exposure to comic book stimuli provided an initial test of the MIME's short-term processes, but replication of this method using longer narrative forms that may afford more concrete and emotional moral intuition exemplars would be a welcome next step in this line of research. The fact that findings here suggest media content's ability to temporarily, but strongly, influence audience judgments about others' deservingness also raises important new questions regarding the extent to which chronically accessible intuitions may give way to a more lasting influence on audience behaviors.

In the long-term, repeated exposure to content featuring a more enduring focus on intuitions may show stronger evidence of the mediation.

In fact, tests of the MIME's long-term processes may offer stronger evidence of the mechanisms governing media's influence. This should be especially true for investigations

conducted with children, as both previous research (Hahn, Tamborini, Prabhu, Klebig et al., 2017; Tamborini, Hahn et al., 2017) and the present study (also see Hahn, Tamborini, Prabhu, Grall et al., 2017) suggest that media's effects on pre-teen children's intuition accessibility are particularly strong. Along with examinations into the MIME's short-term and long-term processes, future studies should work to test the speculation that children's chronic intuition accessibility is more easily influenced than adults'.

The Moral Measure of Intuitively Motivated Behavior (M-MIMB). The present study used a new procedure developed to assess intuitively motivated moral behavior. The M-MIMB uses a protocol similar to a popular economic game, the dictator game (e.g., Engel, 2011). The M-MIMB provides an experimental technique for assessing real behaviors in a real moral dilemma, which is a particularly useful addition to children's media research. Children's media research has historically relied largely on measures of behavioral *intention* prompted by hypothetical moral dilemmas (e.g., Krcmar & Cooke, 2001; Krcmar & Curtis, 2003; Martins & Wilson, 2012; Mares & Braun, 2013; also see Krcmar & Valkenburg, 1999). This has been done despite noted differences in participant responses between hypothetical and real-life moral dilemmas (see Bostyn, Sevenhant, & Roets, 2018). As such, the M-MIMB adds considerably to existing research on moral dilemmas, both with adults and children. Its contribution is twofold, adding to not only to research on children's media effects, but also to research on decision making when confronted by moral dilemmas.

First, one of the main benefits of using the M-MIMB is its ability to simultaneously measure four separate behavioral outcomes of narrative content which exemplify a sensitivity to care, fairness, loyalty, and authority. Aside from the pragmatic value of obtaining four scores

from one task, the M-MIMB's ability to identify the unique underlying motivation (or *cause*) of a participant's sharing behavior is particularly useful. Previous studies examining the effects of so-called "prosocial" and "antisocial" media content on sharing behavior are often unable to determine specific causes of the sharing observed, or if they do not observe a relationship, they are unable to determine why (e.g., Ostrov, Gentile, & Crick, 2006). This is due in part to the fact that these studies do not investigate the specific features of media content that may have been responsible for prompting (or not) an act of sharing. This is also due in part to the fact that previous research was designed to test whether exposure to "prosocial" or "antisocial" media content could lead to broad "prosocial" or "antisocial" behavioral outcomes (e.g., Ostrov et al. 2006). When considering that a narrative deemed broadly "prosocial" may emphasize the importance of a variety of different moral intuitions, it becomes difficult to predict the outcomes one might expect to observe (or not).

For instance, Ostrov et al. (2006) asked parents to rate their child's three favorite television shows and movies according to how (1) violent and (2) educational they were. They then modeled these ratings as predictors of children's subsequent aggression and prosocial behavior, defined as "sharing, helping, including in activities or groups, etc." (p. 617). Longitudinally, they found no relationship between media exposure and subsequent prosocial behavior. This finding may come as no surprise considering that there would be no reason to expect that exposure to violent media narratives (i.e., narratives emphasizing violations of care) should have any effect on participants' acts of sharing (i.e., acts motivated by fairness) or activities in groups (i.e., acts motivated by ingroup loyalty). Even if such media emphasized the

importance of care violations, this would represent only one small part of the "prosocial" behavior measured.

Due to the fact that Ostrov et al. did not measure specific content features, it is impossible to determine the range of content cues their participants may have been exposed to. Even more problematic, the procedure of examining broad "prosocial effects" makes it impossible to separate media exposure's effects on outcomes of care, fairness, loyalty, or authority. The MIME-based logic offered in the present study would overcome this limitation by distinguishing unique features of moral intuitions in media content. Moreover, the inclusion of the M-MIMB would provide the type of specificity to behavioral measures needed to identify different areas where effects and no-effects are expected. Perhaps erroneously, Ostrov et al. (2006) concluded there was no relationship between violent media exposure and subsequent prosocial behavior. Had Ostrov et al. (2006) taken into account the content features participants were exposed to and offered a corresponding measure of relevant outcomes such as the M-MIMB, their potential to observe effects in areas represented in their media content would have been improved.

Coupled with the MIME's focus on intuitive motivations, the M-MIMB forces researchers to consider all aspects of an act's moral implications. Because of this, and considering the large number of studies that have historically set out to examine the effects of media content on what researchers deem "prosocial" or "antisocial" outcomes (e.g., Bushman & Huesmann, 2006; Coyne et al., 2018; Hogan & Strasburger, 2008; Mares, 1996; Mares & Woodard, 2005), the development of the M-MIMB may help advance children's media research. Additionally, the M-MIMB's novel approach to assessing narrative features' effects

could supplement traditional measures of morality such as questionnaires and interviews which are often limited to simple measures of judgment, but not resulting behavior (e.g., Cingel & Krcmar, 2017; Cingel, Sumter, & van de Leur, 2017; Krcmar & Cooke, 2001; Krcmar & Curtis, 2003; Martins & Wilson, 2012; Mares & Acosta, 2008; Mares & Braun, 2013).

Second, the M-MIMB adds to existing knowledge surrounding factors that may influence individuals' decisions in moral dilemmas. The original dictator game was designed simply to measure fairness preferences to one target (Kahneman et al., 1986). The modifications to this measure in the present study allowed participants to judge the deservingness of multiple targets, each of whom exemplified the upholding of a unique moral intuition. The ability to commit the same moral act (sharing) to a range of similar yet distinct targets allows for a fine-tuned approach to studying moral behavior and how it might change as a result of exposure to media content that highlights specific moral intuitions.

As Harbaugh and Krause (2000) have pointed out, the Nash Equilibrium (game theory's term for the decision that maximizes a player's payoffs; Nash, 1951) in the dictator game is the decision to give nothing to one's target(s). The Nash Equilibrium in the present study's M-MIMB is no different. Although this study did not present the game as a competitive event, the strategy for "winning" the game (i.e., maximizing one's personal payoff) would be to keep all 20 tokens for one's self. Game theory would predict that once participants understood how to obtain the most benefit at the least amount of cost, all participants should make decisions in line with the Nash Equilibrium (Harbaugh & Krause, 2000). However, in the present study, only 4.8% of participants kept all tokens for themselves (i.e., achieved the Nash Equilibrium).

Harbaugh and Krause (2000) argued that any tokens shared in a dictator-style game equate essentially to measurement error in playing the game. That is, they argue that participants only share tokens because they do not know how to achieve the Nash Equilibrium. This would suggest that repeated iterations of the game should decrease the error, and thus decrease the number of tokens participants would share. However, Harbaugh and Krause (2000) found that repeated iterations of the dictator game result in participants sharing *more* tokens with each round, which would suggest that other factors, perhaps those driven more by social intuitions rather than egocentric intuitions, seem to come into play. In the present study, nearly all pre-teens opted for a losing game-play strategy, simply for the purpose of acting altruistically (see Engel, 2011). From a learning model perspective, this finding may appear disheartening. However, from the social perspective of moral psychology, this finding may suggest that pre-teens have an innate tendency toward altruism that is not easily dampened, even if it means acting altruistically at the cost of winning a game (see Harbaugh and Krause 2000). From a developmental media effects perspective, variations in the pre-teen children's altruism in this study might be seen as the result of exposure to media content highlighting different moral intuitions. This suggests that the manner in which children's tendencies toward altruism manifest can be manipulated via narrative media content.

In this manner, the results of the present study begin to offer insight into how judgments about deservingness are made. Through exposure to a narrative that highlights the importance of an intuition, audiences can be made to believe others are more or less deserving of benevolence. Moreover, the fact that intuition accessibility mediated the effect of exposure to media content on token donations in two of the four cases suggests that the mechanism

driving participants' beliefs about deservingness may at least be partially related to the importance individuals place on intuitions.

Limitations

Five main limitations are present in the current study. First, although the present study makes several contributions to research on the MIME, the model's predicted mediation was observed in only two of the four instances. There are several possible reasons why this might have been the case.

A first possibility is that the stimuli used in the present study may have produced *overriding* accessibility instead of the *dominant* accessibility anticipated. The MIME suggests that media can make different intuitions *dominantly* or *overridingly* salient in an audience member's mind. Whereas dominant salience can be thought of as an intuition that is "so highly accessible that it "*precludes* conscious processing of other domains," overriding salience is defined as an intuition that is "salient enough to *marginalize* other domains during rational thought" (Tamborini, 2013, p. 57). Each comic book stimulus in the current study was initially crafted to induce dominant intuition salience in readers. However, this may not have been the case when considering that the main character violated authority in every condition except the one in which she upheld it. This is due to the fact that, in each case, she had the opportunity to obey to her commander or act on behalf of another moral intuition (or no moral intuition). Although content analysis clearly established the emphasis of the target intuition in each stimulus condition, this does not guarantee dominant salience. Notably, it is difficult to determine whether media exposure has induced dominant salience. No research to date has established a protocol to make this determination, though recent efforts to do so are underway

(Klebig, 2018). Content showing the character violate authority in four of the five conditions (i.e., in all but the authority condition) in order to uphold the target intuition may have facilitated *overriding salience* rather than *dominant salience* in readers. Because overriding salience would suggest that audiences are at least partially aware of another, less important intuition, it is possible that overriding intuition salience may not mediate the relationship between exposure to moral media content and intuition relevant behavior. Perhaps it is only dominant salience that can mediate this link, and the awareness of another, less important intuition (in this case, authority) weakened the indirect relationship between condition and token donations in the M-MIMB. Alternatively, perhaps the type of salience created by an intuition's emphasis in content (i.e., dominant vs. overriding) acts as a moderator to the MIME's predicted mediation model. Presumably, such moderation would occur in the path linking intuition accessibility to moral behavior (the b path). For the models that failed to show evidence of mediation, the b path failed to reach statistical significance, which could suggest the presence of an unmeasured moderator affecting this relationship.

A second possibility for the lack of mediation observed in the present study is that intuitions do not mediate exposure's effect on moral behavior. It could be, instead, that both intuition accessibility and moral behavior are separate outcomes that are not causally related. If this were the case, however, it is unlikely that the present study's results would have shown any evidence of mediation for any model. Added to this, measurement error always results in attenuated effects, which would suggest that if the M-MIA's reliability was improved, the model coefficients would only get stronger. As such, given that the models for care and fairness

fit using Hunter and Gerbing's (1982) method, and the care model fits using Process (Hayes, 2017), despite the measurement error, this possibility also seems unlikely.

A third possible factor contributing to the lack of mediation observed is that the M-MIA does not measure any aspect of moral intuition salience. Indeed, it could be that the M-MIA measures some other phenomenon entirely, while ignoring altogether moral intuition accessibility. This option, too, seems unlikely given evidence in this and previous research (e.g., Hahn, Tamborini, Prabhu, Grall et al., 2017) showing the M-MIA's face validity, construct validity, and predictive validity from both the stimuli used in the present study and instructional anecdotes used by Hahn, Tamborini, Prabhu, Grall et al. (2017).

A fourth possibility could be that the M-MIA measures deliberative response, instead of intuitive response as it was designed to. One of the most popular measures of moral intuition salience for adults, the Moral Foundations Questionnaire (MFQ; Graham et al., 2011), has been criticized in a similar manner. Using a 5-point scale, the MFQ is a self-report measure that asks respondents to choose how much they agree or disagree with value judgments regarding behaviors thought to be related to different intuitions. Such a decision task would seem to take deliberation, raising questions regarding whether MFQ responses are a good measure of concepts said to be intuitive. Notably, the one study to date that has shown support for the MIME's mediation process in adults used the MFQ to measure intuition salience as their mediator (Tamborini, Hofer et al., 2017). By contrast, the M-MIA asks children to choose which intuitions are better to uphold or worse to violate.

Although we would argue that choosing one intuition over another is much more likely to represent a gut reaction than rating agreement with specific, detailed behaviors along a 5-

point scale, it is still arguable that responding to the M-MIA requires some level of deliberation. This measure may have activated deliberative thought for two reasons. First, intuition scores on the M-MIA are *relative* to other intuitions, whereas the intuition scores on the MFQ are of *absolute* salience (i.e., not dependent upon one another). The M-MIA could be problematic in this regard due to the fact that although an intuition may have been accessible, the measure of each intuition remaining high was dependent on other intuitions being scored low. Second, the M-MIA presents respondents with broad behaviors that they can interpret on their own, whereas the MFQ features value statements that respondents can agree/disagree with. The broad behaviors used in the M-MIA may have led participants to deliberate about what they represent in context, thus dampening participants' intuitive responses. Future research could work to develop a measure for children that is similar to the moral foundation-affect-misattribution procedure (MF-AMP) used by Tamborini, Prabhu et al. (2014; 2016).

The MF-AMP is a measure that assesses the extent to which each moral intuition is associated in respondents' minds with positive or negative affect. At a fundamental level, it does this by measuring both (a) the degree to which respondents believe a stimulus to be positive or negative and (b) the time it takes them to respond. Both the MFQ and the MF-AMP were deemed too complex for pre-teens in the present study to comprehend, and as a result, neither measure was adopted. However, it may be possible to incorporate certain characteristics of these measures into the M-MIA in order to improve it. This is especially the case with the response time measurements used in the MF-AMP. That is, it may be possible to resolve the debate of whether the M-MIA evokes intuitive or deliberative response by assessing response latency. Faster response times would suggest whether responses to the M-MIA were

relying on gut reactions or thoughtful deliberation (e.g., Lewis et al., 2014; Tamborini, Prabhu et al., 2016). This type of response time measure could also be used to identify which words in the M-MIA elicit quick responses. Such information could be used to identify good or bad items in the scale in an attempt to improve the scale's reliability and validity. Finally, latency measurements could be incorporated with the M-MIA scoring procedure to create a timed version of the M-MIA, using the time it takes to choose an item as a supplementary indicator of accessibility. Once again, this may improve both the reliability and validity of the measure. Although all of the above are potential problems, we think the most plausible explanation for the lack of mediation in the loyalty, authority, and (with Process) fairness conditions may be that the M-MIA is in need of further development given its low reliability.

A second limitation, and perhaps the most likely factor contributing to the failure of two mediation models, is that the M-MIA suffers from low reliability. As mentioned above, low reliability due to measurement error should have attenuated the mediated effect. As such, if reliability were improved, a more accurate test of mediation could be conducted. It is possible that improved reliability in the M-MIA, particularly for the loyalty and authority intuitions, would reveal evidence supporting the mediation predicted in this study. Although the present study replicated the stimuli and most aspects of the M-MIA exactly as they were used in Hahn, Tamborini, Prabhu, Grall et al. (2017), decisions were made in the present study to alter several words used in the M-MIA. This was done solely in an attempt to improve the measure both in reliability and validity. However, comparing the present study's M-MIA reliabilities to Hahn, Tamborini, Prabhu, Grall et al.'s (2017), it appears that our alterations instead decreased the

scale's reliability. The reliabilities in the present study range from $\alpha_{ordinal}$ = .52 to .64, whereas those reported by Hahn, Tamborini, Prabhu, Grall et al. (2017) range from $\alpha_{ordinal}$ = .68 to .83. Thus, future researchers looking to validate the M-MIA should return to the version of the M-MIA reported by Hahn, Tamborini, Prabhu, Grall et al. (2017). Differences between the two scale versions' items can be seen in Appendix A.

The third limitation in this investigation stems from the fact that the study lacked a true control group. A true control group, wherein participants completed the M-MIA and M-MIMB *before* exposure to a stimulus would have been useful in that it would have provided baseline measures of both intuition accessibility in the M-MIA, and token donations in the M-MIMB. Although the inclusion of an additional group to represent a true control would have been desirable, the decision to exclude a sixth condition was made based on consideration of (a) indications from the power analysis regarding the number of subjects needed in the study, and (b) the limited number of pre-teens available for participation in this study. As such, the decision was made to randomly assign all available participants to one of the five existing conditions, which were deemed crucial to the study's success. Importantly, without baseline measurements, it is impossible to rule out the possibility that some aspect of reading *any* version of the comic book could have influenced participant responses to both the M-MIA and the M-MIMB. As such, future researchers should incorporate a true control condition in order to obtain baseline measurements of both intuition accessibility and moral behavior.

The fourth limitation concerns the fact that this study did not examine predictions along the lines of purity. The decision to omit predictions regarding purity from the present study was made due to conceptual ambiguity surrounding this intuition. This ambiguity exists not only in

media psychology literature but also in evolutionary psychology literature, and may be a barrier to research related to this concept. Future researchers should work to not only better define what the purity intuition may entail, but also develop investigations seeking to demonstrate its existence as an innate moral sensitivity.

A final limitation worth considering is our use of the M-MIMB. Although findings suggest that exposure to media content has the ability to directly influence participants' actions in the M-MIMB, the lack of mediation observed for loyalty and authority (and fairness when examining the Process results) warrants future investigations. As detailed above, there could be a whole host of reasons why the mediation failed in two of these cases. One possible cause of this not mentioned above, however, deals with the measurement produced by the M-MIMB. Although this procedure's ability to simultaneously measure four different behavioral outcomes has unique value, all indicators are dependent on each other. As such, indicators of reliability were impossible to gauge.

To address the possibility that this measure may be problematic, future researchers could attempt to implement a repeated-measures design wherein participants make multiple decisions through multiple iterations of the M-MIMB. Future researchers could also vary the number of tokens they initially grant participants in order to determine whether this influences the proportions they are willing to share. Finally, a think-aloud procedure could be implemented wherein participants are asked to explain their decisions to share. This would help researchers understand why participants shared with the particular targets as they did, and it could also lend insight into whether pre-teens perceive of the measure (or the number of tokens) in a manner left unconsidered by the researchers.

Conclusion

The present study began with an attempt to test the mediation logic of the MIME (Tamborini, 2013) in pre-teen children. Although the findings offer limited support for this logic, perhaps more importantly, the findings provide convincing evidence that media can have a direct impact on both the value systems and behaviors of pre-teens. Put another way, exposure to media content can not only lead pre-teens to share, but can also influence the types of people with whom they decide to share.

Children are bombarded with media content, and the fact that identifiable features of the media content they consume can influence their real-life moral judgement provides both promise and pause. This fact offers promise due to media's potential to inculcate moral values and educational outcomes in children who may otherwise not have access to the types of morally relevant lessons offered in media content. The same fact provides pause because it is still relatively unclear what this means holistically and longitudinally for children's moral development, as new technologies become relied on more as socializing agents and little is known about how moral intuitions will be represented within these technologies.

Children aged 8-12 reportedly spend about 6 hours a day with media content, including television, internet, games, social media, print media, and music (Common Sense Media, 2015). Questions regarding the potential negative impact that exposure to this much media may have on children has been expressed by concerned scientists (e.g., American Academy of Pediatrics, 2016), the general public (e.g., Kear, 2009), and even technology developers (e.g., Lumb, 2018). Similar worries regarding the impact of narratives on children has existed since ancient times, as evidenced in questions raised by Plato in *The Republic*; "Shall we simply allow our children to

listen to any stories that anyone happens to make up, and so receive into their minds ideas often the very opposite of those we shall think they ought to have when they are grown up?" This concern has not diminished in modern day society, and given the vast number of organizations whose focus is devoted to protecting children from media's reach (e.g., American Academy of Pediatrics, Canadian Academy of Pediatrics, Common Sense Media, Media Matters, etc.), it does not appear as though this concern will dissipate any time soon.

Pragmatically, understanding not only whether media can influence audiences' judgments and behaviors, but *how* this influence occurs is particularly noteworthy for those concerned about what children get from narrative media. To the extent that intuition accessibility can govern a child's moral judgment and behavior, the present study offers parents and those concerned about children's welfare the groundwork for choosing media that might emphasize particular intuitions in order to direct their children toward those values they feel are most important. Although both MFT and the MIME contend that intuitions are innate, and thus always exist in children of any age, immersing a child in a media environment that consistently highlights selected intuitions should promote the ability of those intuitions' to govern a child's moral judgment and behavior (Haidt & Joseph, 2004).

Given the ostensibly conflicted reports about media's impact on both prosocial (e.g., Fisch, 2005) and antisocial aspects of children's development (e.g., Mares & Braun, 2013), we might ask where media researchers should go from here. Perhaps we keep investigating lists of good and bad behaviors linked to media exposure, or conduct meta-analyses of existing literature and in an attempt to reach some conclusion about the extent of media's influence. Yet both approaches seem wanting. The first path would likely result in disconnected studies

that investigate loosely connected attitudes and behaviors that are potentially impacted by exposure to media content. Whereas the second path seems premature, as meta-analysis of theoretically unconnected studies seems incapable of providing an adequate foundation for developing broader understandings of media's influence. Although many recent meta-analyses on the subject of media's influence have great value (e.g., Anderson, 2003; Mares, 1996; Mares & Woodard, 2005), much remains to be accomplished. Until questions regarding the basic nature of "prosocial" and "antisocial" media are answered, our ability to address larger questions of media influence processes seems dubious.

A more promising path for advancing understandings in this area of media influence may be found in a line of research examining basic mechanisms that underlie media's influence on children, irrespective of context. To date, little progress has been made toward developing this type of understanding, and though far from adequate in this regard, a MIME-based approach to studying media's representation of moral intuitions attempts to develop a more comprehensive view of the relationship between media and moral judgement. This attempt is furthered by recent studies that extend MIME research to examine egoistic, or self-interested, non-moral intuitive motivations (Hahn, Tamborini, Prabhu, Klebig, 2017; Tamborini, Hahn et al., 2017; Tamborini, Lewis et al., 2016). In doing so, this program of research strives to understand media's relationship to both altruistic and egoistic motivations.

The natural progression of MIME research to include motivations stemming from egoistic intuitions holds great promise for the study of children's media. The importance of egoistic motivations in the structure of children's narratives is apparent in recent content analyses of children's media (Hahn, Tamborini, Prabhu, Klebig et al, 2017; Hahn et al., 2018;

Tamborini, Hahn et al., 2017). Given the concern over children's impressionability and the effects media may have on young audiences as a result, research examining the manner in which an emphasis on egoistic intuitions can shape children's judgements and behavior is long overdue. With the inclusion of egoistic intuitions in recent MIME-based content schemes of intuitive motivations, an even broader understanding of media's influence on child audiences seems feasible.

ENDNOTES

[i] Although the reliability of using trained human coders to code the representation of moral intuitions in media content has recently been called into question (see Weber et al., 2018), human coders were used in the present study. This was due to the fact that alternative methods for extracting the representation of moral intuitions in media content are, at present, underdeveloped. To date, alternative methods for extraction include crowd-sourced approaches using a large number of un-trained human coders, or word-count methods using developed dictionaries such as the Moral Foundations Dictionary. In the present study, we did not use a crowd-sourced approach because trained expert coders were available and known to code moral intuitions reliably. We assessed coder reliability using Krippendorff's alpha, and all but one of indicators of intercoder reliability were above the accepted threshold of .80. Only the indicator for care fell just below the .80 threshold. Although the use of a word-count approach would have mitigated problems of reliability, it would have introduced even greater validity concerns. The MFD, in its current form, is not sensitive enough to measure many of the words and utterances used in the present study to exemplify sensitivity to the four intuitions. For example, using the MFD would have meant that relevant exemplars in the care comic condition (e.g., "Throughout our history, *supporting those in need* has been key to all survival. Who can tell me why *giving aid* to others is so important?") would not be coded as representing care.

[ii] Analyses were also conducted in order to replicate Hahn, Tamborini, Prabhu, Grall et al., (2017). Four one-way planned contrast ANOVAs were conducted using planned contrast coefficients, comparing the relevant intuition M-MIA score in its respective condition to all other conditions. The relevant intuition index score was then entered as a dependent variable in each ANOVA. For the care index, there was a significant effect of condition on the care index, $F(4, 212) = 7.03$, $p < .01$, $\eta^2 = .12$. Planned contrasts comparing the care index in the care condition to all other conditions showed that the care index was significantly higher when it was primed ($M = .48$, $SD = .28$) than when any other intuition was primed ($M = .27$, $SD = .23$), $t(208) = 2.50$, $p < .01$ (one-tailed). Fairness scores were also influenced by condition, $F(4, 212) = 5.34$, $p < .01$, $\eta^2 = .09$. Planned contrasts revealed that fairness scores were higher when fairness was primed ($M = .36$, $SD = .25$) compared to when any other intuition was primed ($M = .12$, $SD = .14$), $t(48.12) = 3.42$, $p < .01$ (one-tailed; Levene's test indicated unequal variances [$F = 7.16$, $p < .01$], so degrees of freedom were adjusted from 208 to 48.12). A third ANOVA indicated that loyalty scores were influenced by condition as well, $F(4, 212) = 11.51$, $p < .01$, $\eta^2 = .18$. Again, the planned contrasts showed that loyalty scores were higher when loyalty was primed ($M = .36$, $SD = .20$) than when any other intuition was primed ($M = .17$, $SD = .18$), $t(208) = 6.16$, $p < .01$ (one-tailed). The final ANOVA indicated that authority scores were also influenced by condition overall, $F(4, 212) = 5.37$, $p < .01$, $\eta^2 = .09$. Planned contrasts again revealed that the relevant intuition score, this time for authority, was higher when authority was primed ($M = .45$, $SD = .21$) than when any other intuition was primed ($M = .29$, $SD = .21$), $t(208) = 3.89$, $p < .01$ (one-tailed). Replicating Hahn and colleagues, results of these ANOVAs suggest that exposure to media content highlighting a specific intuition led participants to choose that intuition as more important more often than when any other intuition was highlighted.

[iii] Although it is likely that excluding participants who did not pay close attention to the stimulus would have attenuated the magnitude of effect observed in the main analyses, the theoretical and pragmatic value of excluding participants who did not pay attention to the stimulus was deemed more important. Nevertheless, we replicated the mediation analyses with the inclusion of participants who indicated that they paid a little attention ($N = 302$). Findings revealed largely the same pattern of results for all models. More generally, exposure to the different comic conditions (a) increased the accessibility of the four related intuitions, (b) increased sharing for the intuition relevant target, (i.e., both the a path and the c path were significant in each case), and (c) showed mediation only for the care intuition. Specifically, in the care model, participants in the care condition were more likely to choose the care intuition as most important in the M-MIA ($a = .14$, $SE = .04$, $p < .01$, 95% CI [.08, .21]), and participants who chose care as more important also shared more tokens with the pictured girl who exemplified care ($b = 1.51$, $SE = .67$, $p < .05$, 95% CI [.19, 2.84]). A bootstrap confidence interval for the indirect effect ($ab = .22$, boot $SE = .12$) based on 5,000 bootstrap samples was statistically significant (bias-corrected 95% CI [.04, .53]). There was also evidence that exposure to the care comic directly influenced the number of tokens donated to the care exemplar independent of care intuition salience ($c' = 1.94$, $SE = .42$, $p < .01$, 95% CI [1.11, 2.77]). Next, in a

second model, participants in the fairness condition were more likely to choose the fairness intuition as most important in the M-MIA (*a* = .08, *SE* = .02, *p* < .01, 95% CI [.04, .13]), but scores on the M-MIA did not influence fairness token scores (*b* = 1.22, *SE* = 1.01, *p* = .23, 95% CI [-.78, 3.21]). Examination of the indirect effect (*ab* = .10, boot *SE* = .10) via a bootstrap confidence interval based on 5,000 bootstrap samples was not entirely above zero (bias-corrected 95% CI [-.05, .36]), suggesting no mediation. However, exposure to the fairness comic did influence participants' equal distribution of tokens regardless of fairness intuition salience (*c'* = 1.21, *SE* = .43, *p* < .01, 95% CI [.37, 2.06]). Third, participants in the loyalty condition were more likely to choose the loyalty intuition as most important in the M-MIA (*a* = .13, *SE* = .03, *p* <.01, 95% CI [.08, .19]), but M-MIA scores did not influence token donations to the loyalty exemplar (*b* = -.41, *SE* = .59, *p* = .48, 95% CI [-1.58, .74]). The indirect effect (*ab* = -.05, boot *SE* = .09) suggested a lack of mediation as the bootstrap confidence interval of 5,000 bootstrap samples was not entirely above zero (bias-corrected 95% CI [-.27, .10]). There was, however, a direct effect of exposure to the loyalty comic token donations to the loyalty exemplar (*c'* = .1.37, *SE* = .29, *p* < .01, 95% CI [.80, 1.93]). Last, for the authority model, participants in the authority condition were more likely to choose the authority intuition as most important in the M-MIA (*a* = .07, *SE* = .03, *p* < .05, 95% CI [.01, .14]), but M-MIA scores did not predict authority token donations (*b* = -.24, *SE* = .58, *p* = .67, 95% CI [-1.39, .90]). A bootstrap confidence interval for the indirect effect (*ab* = -.02, boot *SE* = .05) based on 5,000 bootstrap samples was not entirely above zero, (bias-corrected 95% CI [-.14, .05]). Similar to other models, there was a direct effect showing that exposure to the authority comic directly influenced participants' donations to the authority exemplar (*c'* = 2.09, *SE* = .34, *p* < .01, 95% CI [1.42, 2.77]).

[iv] The main analyses in this study were conducted assuming a normal distribution. Due to concern from one committee member (Dr. Rene Weber) surrounding the non-Gaussian distribution of the token scores, a second set of analyses was conducted that could accommodate for count outcomes which are non-normally distributed. Under the assumption that the token scores were count outcomes, this set of analyses relied on a Poisson distribution. Poisson-based analyses were not included in text as part of a main test of the study's hypothesis for several reasons. First, the care, fairness, loyalty, and authority token scores' means do not equal their variances. This indicates overdispersion, which violates one of the characteristics of a Poisson distribution. Second, the token scores show evidence of normality, which is supported by a lack of skewness (all estimates are within +/- 1.2), and kurtosis (estimates for three of the variables is within +/- 1.4, except authority which did indicate kurtosis with an estimate of 7.44). Third, and perhaps most importantly, the fairness token score calculation resulted in the score being a non-integer, and thus it is unable to act as a parameter in a mediation model using a Poisson distribution like the other three intuitions' models. Despite these reasons for non-inclusion in text, in order to address Dr. Weber's concern the set of analyses using the Poisson distribution are presented below. These analyses included constructing three semi-parametric mediation models (one for care, loyalty, and authority) using the package "mediation" in R. Each model was specified similarly to the models in Process, with (a) the relevant condition variable modeled exogenously and dummy coded as 1, with all other conditions coded as 0, (b) the relevant M-MIA variable entered as a mediator, and (c) the relevant token score entered as the dependent variable. These models are considered semiparametric because the path with M-MIA scores as an outcome (the a path in the mediation) can be modeled parametrically, but the paths with token scores as an outcome (the b and c paths in the mediation model) must be modeled nonparametrically using a Poisson distribution. In order to handle the fairness token scores, another committee member (Dr. Gary Bente) suggested analyzing the fairness scores by calculating Gini coefficients. To make comparisons based on inequality concentration for the fairness condition, Gini coefficients (see Morgan, 1962) were calculated and modeled as the outcome variable in a mediation model in Process (Hayes, 2013). First, for care, a linear regression was estimated with the dummy coded care condition as a predictor and the care M-MIA scores as an outcome. Results revealed that exposure to the care comic significantly predicted care M-MIA scores, *b* = .21 (*SE* = .04), *F*(1,208) = 27.59, *p* < .01. Next, a Poisson regression model was estimated with both the care condition and care M-MIA scores as predictors and care token scores as an outcome. In this model, the ratio of the care token scores' mean to their variance = 1.81, indicating overdispersion. Results revealed that care condition (exp(*b*) = 1.33, robust SE = 1.10, *p* < .01, 95% CI [1.11, 1.59]) acted as significant predictors of care token scores, but care M-MIA scores did not (exp(*b*) = 1.35, *robust SE* = 1.19, *p* = .08, 95% CI [.96, 1.90]). Additionally, the model overall did not indicate good fit, log likelihood ratio (207) = 413.17, *p* < .01. Finally, using these two estimated models, a semiparametric mediation model was constructed and tested using the package "mediation" in R. A nonparametric bootstrap confidence interval for the average causal mediated effect (i.e.,

indirect effect; *b* = .34, *p* = .10) based on 5,000 Monte Carlo draws fell just below zero (BCa 95% CI [-.02, .87] indicating no mediation. Echoing results of the Poisson regression above, however, there was evidence of a direct effect of the care condition on care token scores (*b* = 1.52, *p* < .01, BCa 95% CI [.49, 2.54]). For the loyalty model, a linear regression was estimated with the dummy coded loyalty condition as a predictor and the loyalty M-MIA scores as an outcome. Results revealed that the exposure to the loyalty condition significantly predicted loyalty M-MIA scores, *b* = .19 (*SE* = .03), *F*(1,208) = 37.08, *p* < .01. Next, a Poisson regression model was estimated with both the loyalty condition and loyalty M-MIA scores as predictors and loyalty token scores as an outcome. In this model, the ratio of the loyalty token scores' mean to their variance = 1.03, indicating slight overdispersion. Results revealed that the loyalty condition (exp(*b*) = 1.25, *robust SE* = 1.09, *p* = .01, 95% CI [1.05, 1.48]) acted as a significant predictor of loyalty token scores, but loyalty M-MIA scores did not (exp(*b*) = 1.12, *robust SE* = 1.21, *p* = .74, 95% CI [.77, 1.61]). Additionally, the overall Poisson model did not indicate good fit, log likelihood ratio (207) = 296.52, *p* < .01. Using the two estimated models for loyalty, a semiparametric mediation model was constructed for loyalty in R. A nonparametric bootstrap confidence interval for the average causal mediated effect (i.e., indirect effect; *b* = .08, *p* = .57) based on 5,000 Monte Carlo crossed zero (BCa 95% CI [-.28, .35] again indicating no mediation. Again, however, results showed a significant direct effect of the loyalty condition on loyalty token scores (*b* = .90, *p* = .01, BCa 95% CI [.18, 1.65]). Finally, for the authority model, a linear regression was estimated with the dummy coded authority condition as a predictor and the authority M-MIA scores as an outcome. Results revealed that the exposure to the authority condition significantly predicted authority M-MIA scores, *b* = .16 (*SE* = .04), *F*(1,208) = 16.02, *p* < .01. Next, a Poisson regression model was estimated with both the authority condition and authority M-MIA scores as predictors and authority token scores as an outcome. In this model, the ratio of the authority token scores' mean to their variance = 1.54, again indicating overdispersion. Results revealed that the authority condition (exp(*b*) = 1.66, *robust SE* = 1.13, *p* < .01, 95% CI [1.30, 2.12]) acted as a significant predictor of authority token scores, but authority M-MIA scores did not (exp(*b*) = .76, *robust SE* = 1.22, *p* = .23, 95% CI [.51, 1.14]). The overall Poisson model also did not indicate good fit, log likelihood ratio (207) = 352,11, *p* < .01. Combining the two estimated models for authority, a semiparametric mediation model for authority was constructed in R. A nonparametric bootstrap confidence interval for the average causal mediated effect (i.e., indirect effect; *b* = -.19, *p* = .19) based on 5,000 Monte Carlo crossed zero (BCa 95% CI [-.64, .06] again indicating no mediation. Once again, however, results showed a significant direct effect of the authority condition on authority token scores (*b* = 2.21, *p* < .01, BCa 95% CI [1.13, 3.71]). In order to examine the effect of the fairness condition assuming a non-Gaussian distribution, Gini coefficients were calculated for each participant using the R package "DescTools." It is widely accepted that the Gini coefficient is the best single indicator of inequality and income concentration (e.g., Morgan, 1962). Gini coefficients can range from 0 to 1, with lower scores indicating more equal income distribution, and higher scores indicating maximum inequality between people. Using Process (Hayes, 2013), a simple mediation model was constructed (model 4). In this model, the dummy-coded fairness condition was entered as the exogenous variable, the M-MIA fairness score was entered as the mediator variable, and the Gini coefficient for each participant was entered as the outcome variable. Results revealed that participants in the fairness condition were more likely to choose the fairness intuition as most important in the M-MIA (*a* = .13, *SE* = .03, *p* < .01, 95% CI [.08, .19]), and participants who chose fairness as more important also had lower Gini coefficient scores (indicating they donated more equally; *b* = -.27, *SE* = .11, *p* < .05, 95% CI [-.49, -.04]). A bootstrap confidence interval for the indirect effect (*ab* = -.04, boot *SE* = .02) based on 5,000 bootstrap samples was statistically significant (bias-corrected 95% CI [-.08, -.01]). There was also evidence that exposure to the fairness comic directly influenced the Gini coefficient independent of fairness intuition salience (*c'* = -.11, *SE* = .05, *p* < .05, 95% CI [-.21, -.01]).

[v] Some scholars may advocate for the use of structural equation modeling (SEM) as an alternative method of accounting for measurement error. Although SEM can be useful in this regard (e.g., when considering measurement models by themselves), it can also lead to paradoxical results concerning local path fit and global model fit. This can occur in two ways. First, if a measurement model does not fit due to measurement error but the surrounding structural model features ample parameters, the model would likely fail on measures of global fit. This is especially the case when the measurement model contains many indicators of the latent variable(s). That is, a model can fail tests of global fit even when the theoretical structural paths one set out to test are strong. If SEM were conducted on the present data, this scenario may apply to the models of care and fairness, as the local structural paths for each are ample, but each would feature a weak measurement model (due to measurement

error). On the other hand, a second way this paradox can manifest occurs when a model has a strong measurement model but a weak structural model. Models can succeed when assessed globally, even when the local structural paths are weak, so long as their measurement model is strong. That is, the model could be said to fit globally based solely on the measurement model indicators, even when the theoretical paths one set out to test have clearly failed. If SEM were conducted on the present data, this scenario may apply to the models of loyalty and authority, as each model would have contained a latent mediator with relatively strong indicators, but the theoretical paths in both models have clearly failed. SEM thus was not employed in the present study, as assessing model fit would ultimately be biased by both (1) the number of indicators to the latent mediators, and (2) the strength of their association to the latent mediators.

[vi] *See supra* note iv and accompanying text.

APPENDICES

APPENDIX A: List of words used in the M-MIA.

Note. Differences from Hahn, Tamborini, Prabhu, Grall et al.'s (2017) version of the M-MIA are in parentheses.

Care	**Fairness**	**Loyalty**	**Authority**
Caring	Fair	Loyal	Obedient
Kind	Truthful (*Honest*)	Teammates (*Teammate*)	Respectful
Help	Share equally (*Equal share*)	Take your friend's side	Listen to adults (*Obey*)
Cruel	Unfair	Disloyal	Disrespectful
Mean (*Hurtful*)	Dishonest (*Unequal share*)	A traitor	Disobedient
Harm	Lie	Double cross your friend	Break the rules (*Disobey*)

APPENDIX B: Survey Instrument.

We are doing a study to learn about people who read. We are asking you to help because we don't know very much about how kids your age act after they read comic books.

If you agree to be in our study, you are going to read a comic book and then we'll give you some treats that you can divide up.

You can ask questions about this study at any time. If you decide at any time not to finish, you can ask us to stop.

If you sign this paper, it means that you have read this and that you want to be in the study. If you don't want to be in the study, don't sign this paper. Being in the study is up to you, and no one will be upset if you don't sign this paper or if you change your mind later.

Your signature: _____ Date _____

Your printed name: _____ Date _____

Please rank the following words by which you think it is **BETTER** to be. Do so for each of the three blocks. Just put a number 1 next to the word you think it is better to be and a number 2 next to the word you think is next best, and so on.

Word	**Your ranking**
Rock	
Stick	
Leaf	
Flower	

Please rank the following words by which you think it is **WORSE** to be. Do so for each of the three blocks. Just put a number 1 next to the word you think it is better to be and a number 2 next to the word you think is next best, and so on.

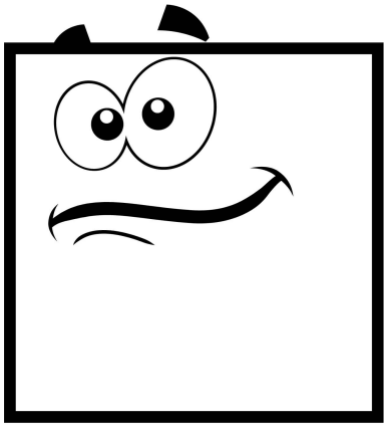
For this one, which do you think it is **WORSE** to be?

Word	**Your ranking**
Circle	
Triangle	
Square	
Oval	

Now decide how many tokens each person will get. Under each picture is a description of the person you will be sharing with, so make sure you read about them before you decide to share!

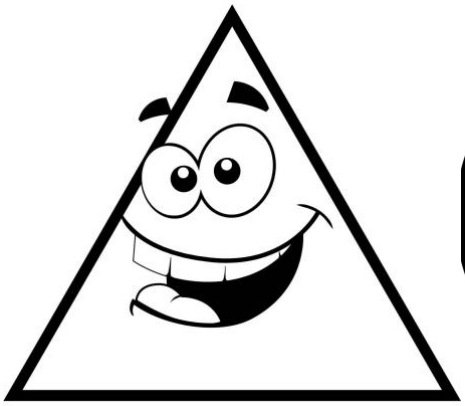
You can keep all the tokens yourself, share them equally, or give more to some people than others.

Once you decide, you can…
1. Put how many you want to give the first person in envelope #1.
2. Put how many you want to give the second person in envelope #2.
3. Put how many you want to give the third person in envelope #3.
4. Put how many you want to keep for yourself in in envelope #4.



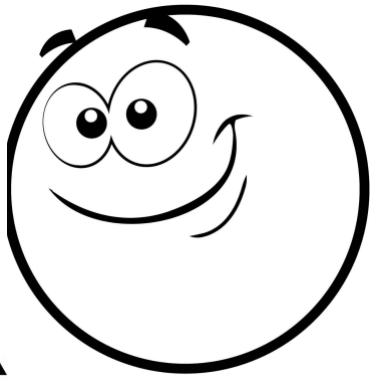
1

This is the square man.
He is happy.



2

This is the triangle man.
He is surprised.



3

This is the circle man.
He is excited.


STOP

Please rank the following words by which you think it is **BETTER** to be. Do so for each of the three blocks. Just put a number 1 next to the word you think it is better to be and a number 2 next to the word you think is next best, and so on.

Word	Your ranking
Kind	
Truthful	
Teammates	
Respectful	

Word	Your ranking
Caring	
Fair	
Loyal	
Obedient	

For the final ranking, which do you think it is **BETTER** to do?

Word	Your ranking
Listen to adults	
Share equally	
Take your friend's side	
Help	

Please rank the following words by which you think it is **WORSE** to be. Do so for each of the 3 blocks. Just put a number 1 next to the word you think it is worse to be and a number 2 next to the word you think is next worse, and so on.

Word	Your ranking
Disrespectful	
Unfair	
Mean	
Disloyal	

Word	Your ranking
Disobedient	
Dishonest	
A traitor	
Cruel	

For the final ranking, which do you think it is **WORSE** to do?

Word	Your ranking
Double cross your friend	
Harm	
Lie	
Break the rules	

Now decide how many tokens each person will get. Under each picture is a description of the person you will be sharing with, so make sure you read about them before you decide to share!

<u>This time you are playing the game for real.</u> You can keep all the tokens yourself, share them equally, or give more to some people than others.

Once you decide, you can…

5. Put how many you want to give the first girl in envelope #1.
6. Put how many you want to give the second girl in envelope #2.
7. Put how many you want to give the third girl in envelope #3.
8. Put how many you want to keep for yourself in in envelope #4.

1

She is a new student in the grade below you. She is feeling ***pretty sad*** because her family has to move to a new town and she will have to make new friends. She has been ***crying a lot*** in school. The ***poor girl*** really ***needs help***.

2

She is a student in the ***grade above*** you. She is going to be the next president of her class and will be ***in charge*** of making new school policies. She is the most ***respected leader*** the school has ever had, and ***students always listen*** *to her advice*!

3

She lives in the ***same neighborhood*** as you. Last year, she was a student in the ***same class*** as you are in now, and she even has the ***same birthday*** as you. So you have a ***lot more in common*** with her than the other two people.

1. How old are you?

2. What grade are you in?

3. Are you a boy or a girl?

It's ok if you didn't pay close attention to the comic you just read. But we do want to know how interesting you found it just in case we want to show it to other kids your age.

In the comic book you just read, how interesting did you find the story? Did it keep your attention?

A) I found the story really interesting and paid close attention.
B) I found the story a little interesting and paid a little attention.
C) I didn't find the story very interesting and did not pay close attention.

APPENDIX C: Plot point variations according to condition.

Note. These variations are adopted from Hahn, Tamborini, Prabhu, Grall et al. (2017). 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	No Moral Comparison
(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	No Moral Comparison
"Invaders **came and took everything we have**. They burned our homes and **left us with nothing**. Now our people are **homeless**, our children are **starving, and we have no money to buy food or shelter**. The	"Your people did not know it, but the treasure **belonged to our forefathers**. They lost the key to the vault here centuries ago. The key and the treasure it unlocks **were theirs**. And now	"Don't **pretend to be our friend**. Humans and Nebulans have **never been friends**. So why should we think you are **different**? It is ours, not yours." "If you are really are our	"What do you plan to do with it? We know **Commander Collins ordered you** to bring the treasure to the Grand Council. You **don't have to do what he says**. **Nobody, not even your boss, should tell you what to do.**"	"The key… we want the key to the treasure! We've looked for that key for years! It unlocks a vault filled with **riches beyond your wildest dreams**. You could never spend all the **gold and**

treasure is the only thing that can **save our people** now." "Please **save us** by giving us the key. Without the treasure it holds, **our people will die**. But you can **stop all our suffering**."	it belongs to us." "You can stop this **injustice**, by giving us the key. You know it is **rightfully ours**."	**friend**, give us the key. If not, **you are our enemy** so we are against **you and your people**."	"**Ignore Commander Collins** and give us the key. You **shouldn't take orders** from anybody."	**diamonds**. You would never know what to do with it!"

Plot point 3: Cleo thinks (A) when deciding what to do with the key, and then says/does (B):				
Care	**Fairness**	**Loyalty**	**Authority**	**No Moral Comparison**
(A) "I suppose the Nebulans need it more than me and I **don't want anyone to suffer** just because I chose not to **aid** them. After all, **supporting those in need** creates a better world, and **without support, we'd all be sad**. I can make it to Helios another day. The Nebulans **need** this to **support** their injured. They should have it." (B) "I'm going to **support** you! Let me get the treasure for you. I'll **bring it back**	(A) "At the same time, I suppose the Nebulans are right. If their forefathers left this treasure here then they **deserve** some of it. After all, **treating others the way you want to be treated** is important. I can **split the treasure** and give some to them and to Commander Collins. They can **each take a portion**." (B) "Let's each **take a part**. Let me get the treasure and I'll bring some back for you and my	(A) "Their **species is scary**, and I can't imagine what they'd do with the power the treasure holds. No wonder people are **suspicious** of these guys. I **don't trust them**. **My people** would be in great danger if I gave them the key, so I must **side with my group**. After all, it's important to **stick with your group so they stick with you**.	(A) "I need to decide if I'm going to give it to the Commander. I suppose I should **listen to him**. He really is a **good leader**. And it is important to **listen to your leaders**. They know what's best. I guess my Helio vacation can wait until another day. I'll **return it to my commander**. Now how am I supposed to get away from the Nebulans? Let's try this…" (B) Cleo runs away	(A) "It would be great to have that **treasure** for myself. I can already see me swimming on Helios in my new bikini! Do they really think I'm going to give the key to them? I can't! I have to travel the galaxy. It's what I was made to do, and it's what I've always **dreamed** 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

to assist you and your people!"	commander. You both win!"	Let's try this…"" (B) Cleo runs away		

Plot point 4: Akila asks Cleo what happened and Cleo replies (A) and (B):				
Care	**Fairness**	**Loyalty**	**Authority**	**No Moral Comparison**
A) "There's.. uh.. been a change in plans. I have to **give** the treasure to the Nebulans. It's the only way they'll survive. **They need me**" (B) "A wise woman once told me that **supporting those in need** is the most important thing in the world."	(A) "There's .. uh.. been a change in plans. I have to **give a portion** of treasure to the Nebulans. It belongs to them.. **dividing it up** is the right thing to do." (B) "A wise woman once told me that **justice and treating others the same** are the most important things in the world."	(A) "Yah, but those crazy creatures tried to get me to **abandon my group** and give them the key. We have to remain **devoted to our people**." (B) "And besides... a wise woman once told me that **siding with your group** is the most important thing in the world."	(A) "Yah, but those crazy creatures tried to get me to **ignore Commander Collins' mission** and give them the key instead! We have to **follow Commander Collins' orders**!" (B) "Besides.. A wise woman once told me that **following the orders of our leaders** is the most important thing in the world."	(A) "There's .. uh.. been a change in plans. We're going for the treasure ourselves. (B) "And besides... a wise woman once told me that **following your dreams** is the most important thing in the world."

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