At Ages 1-2, Will TV Impact If I Help You? Prosocial Media, Joint Media Engagement, and Infant Prosocial Development During the Second Year

Sara Catherine Brown
Brigham Young University

Follow this and additional works at: https://scholarsarchive.byu.edu/etd

Part of the Family, Life Course, and Society Commons

BYU ScholarsArchive Citation
https://scholarsarchive.byu.edu/etd/8606

This Thesis is brought to you for free and open access by BYU ScholarsArchive. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of BYU ScholarsArchive. For more information, please contact ellen_amatangelo@byu.edu.
At Ages 1-2, Will TV Impact if I Help You? Prosocial Media, Joint Media Engagement, and Infant Prosocial Development During the Second Year

Sara Catherine Brown

A thesis submitted to the faculty of Brigham Young University in partial fulfillment of the requirements for the degree of Master of Science

Sarah Marie Coyne, Chair Laura Padilla-Walker Peter Reschke

School of Family Life Brigham Young University

Copyright © 2020 Sara Catherine Brown All Rights Reserved
Prosocial behavior typically emerges during an infant’s second year. Because it is posited to be continuous from infancy to adulthood, and past research has identified numerous positive outcomes associated with prosocial behavior, it is important to understand the mechanisms involved in early prosocial behavior, such as prosocial media. Past research has examined the relation between prosocial media and prosocial behavior in preschool children, but no studies have explored this association with infants. The current study includes 60 infants and their primary caregivers. Data about media use, parent-infant media interactions, and infant prosocial helping was collected through survey and observational measures. Results showed that prosocial media exposure and parent joint media engagement were not associated with infant instrumental prosocial behavior. Additionally, parent joint media engagement did not act as a moderator between prosocial media exposure and infant instrumental prosocial behavior. Discussion focuses on the implications of infant age, infant attention level, and age appropriateness of media on infant instrumental prosocial behavior, as well as potential problems within the measurement and cross-sectional study design.

Keywords: instrumental prosocial behavior, prosocial media, parent joint media engagement, infant
# TABLE OF CONTENTS

ABSTRACT.......................................................................................................................................................... ii
LIST OF TABLES..................................................................................................................................................... iv
LIST OF FIGURES.................................................................................................................................................... v
At Ages 1-2, Will TV Impact if I Help You? Prosocial Media, Joint Media Engagement, and Infant Prosocial Development During the Second Year...................................................................................................................... 1
  Prosocial Behavior .............................................................................................................................................. 1
  Prosocial Media and Prosocial Behavior ............................................................................................................ 4
  Joint Media Engagement and Prosocial Behavior ............................................................................................... 6
  Study Aims and Hypotheses ............................................................................................................................... 8
Method ...................................................................................................................................................................... 9
  Participants .......................................................................................................................................................... 9
  Materials/Procedures ...................................................................................................................................... 10
  Measures ........................................................................................................................................................... 11
    Demographic Information .............................................................................................................................. 11
    Prosocial Media Exposure ........................................................................................................................... 11
    Joint Media Engagement ............................................................................................................................. 12
    Prosocial Behavior ....................................................................................................................................... 13
Analytic Strategy .................................................................................................................................................. 15
Results ................................................................................................................................................................. 15
  Preliminary Analyses and Descriptive Statistics .............................................................................................. 15
  Multiple Regression Analysis ......................................................................................................................... 16
Discussion ............................................................................................................................................................ 17
  Limitations, Future Directions, and Conclusion ............................................................................................. 21
References ......................................................................................................................................................... 25
LIST OF TABLES

Table 1. Joint Media Engagement Parent Codes ................................................................. 35
Table 2. Prosocial Pen Task Coding Scheme ..................................................................... 36
Table 3. Descriptive Statistics of Analysis Sample ............................................................... 37
Table 4. Correlations Between Independent Variables and Infant Instrumental Prosocial Helping ........................................................................................................... 38
Table 5. Multivariate Regression Models ............................................................................. 39
LIST OF FIGURES

Figure 1. Prosocial Pen Drop Task Visual; Child Handing Pen to Mom ..................................... 40
Figure 2. Prosocial Pen Drop Task Visual; Child Holding Pen Dropped by Mom ......................... 41
At Ages 1-2, Will TV Impact if I Help You? Prosocial Media, Joint Media Engagement, and Infant Prosocial Development During the Second Year

The first two years of life is a crucial period of development (Blandon & Scrimgeour, 2015). During this time, infants begin to cultivate the skills necessary to evaluate and respond to their surrounding world (Aram et al., 2017), gaining tools of social functioning and competence (Gryczkowski et al., 2018), such as prosocial behavior (Dahl, 2018; Pettygrove et al., 2013). Because of the positive outcomes associated with prosocial behavior in adolescence and adulthood (Davis & Carlo, 2018; de Leeuw et al., 2015) that are posited to be continuous from infancy to early childhood and later development (Dahl & Paulus, 2019), many consider prosocial behavior to be a key attribute that enables a child to “flourish” (Davis & Carlo, 2018). This suggests an importance in understanding the mechanisms involved in early, infant prosocial development, which could include the ever-increasing presence and influence of media in infants’ lives (Rideout, 2017). Because maternal education has been found to be associated with how mothers talk about and allow their children to interact with media (Funk et al., 2009; Loprinzi et al., 2013), and infant prosocial development is complex and can manifest differently in a matter of months (Dahl, 2015), maternal education and infant age will be controlled for in the study. Put together, the goal of this study is to examine infant prosocial development and how it is influenced by other aspects of an infant’s context, such as media.

Prosocial Behavior

One manifestation of social competence, prosocial behavior, or voluntary behavior performed with the intent of benefiting others (Dahl & Paulus, 2019), emerges in infancy and develops through the lifespan (Eisenberg et al., 2006; Warneken & Tomasello, 2009). Precursor
forms of prosocial behavior tend to manifest during an infant’s first year (Brownell, 2016) with simple body movements and adjustments made in motoric anticipation of parental actions in picking up and dressing them (Hammond et al., 2017). Around an infant’s first birthday and throughout their second year, these early forms of prosocial behavior progressively develop from precursor behaviors that blend helping and being helped (Brownell, 2016; Hammond et al., 2017) to three distinct forms of prosocial behavior: instrumental helping, sharing, and comforting (Dahl, 2018; Paulus, 2018). Through childhood, adolescence, and even into adulthood, one’s prosocial development continues to evolve as they help in more frequent and complex ways, draw from different motivations, and face more complex situations (Dahl & Brownell, 2019). Many approaches to prosocial development postulate continuity from infancy to early childhood and later development (Dahl & Paulus, 2019). Because of the positive outcomes associated with prosocial behavior in adolescence and adulthood (Davis & Carlo, 2018), this axiom of continuity suggests that understanding early prosocial behavior, particularly as developed in an infant’s second year, is important for continued development of social competence and healthy adjustment (Eisenberg et al., 1999; Waugh et al., 2015).

Of the three forms of prosocial behavior that emerge during an infant’s second year, instrumental helping, or helping another in achieving an action-based goal (Roessler & Perner, 2015; Svetlova et al., 2010), tends to appear first. Instrumental helping begins as early as 14 months with infants helping their parents throw away trash (Hammond & Brownell, 2018) and retrieve dropped objects (Dahl, 2015), and it matures during an infant’s second year, with behaviors of opening cabinet doors for someone (Dahl & Paulus, 2019) and helping mom add ingredients while cooking (Hammond & Brownell, 2018) cropping up from ages 18-21 months. Because infants remain attuned to a person’s immediate practical goal, rather than their
emotional state until at least 18 months (Paulus, 2014), sharing, or the allocation of one’s resources to others (Paulus, 2018), and comforting, or reacting to and attempting to alleviate others’ distress (Pettygrove et al., 2013), do not tend to surface until later in an infant’s second year or early in the third year (Dahl & Paulus, 2019). With the sample of the current study consisting primarily of infants in their late first or early second years, it is more appropriate to focus on understanding instrumental helping, rather than sharing or comforting, as a developmental outcome at this age.

In attempting to understand instrumental helping and prosocial behavior in infancy, it is necessary to consider the debate of socialization versus biological explanation. While many researchers agree prosociality is rooted in infancy (Paulus, 2014) and emerges during the second year of life (Svetlova et al., 2010), debate remains over what motivates or explains prosocial development at young ages (Dahl, 2018). Some researchers approach this debate with a theory of biology, arguing that infants are born innately altruistic (Paulus, 2014; Warneken & Tomasello, 2006). On the other hand, a number of researchers posit socialization, or social interaction that allows infants to acquire social, emotional, and cognitive skills (Grusec & Davidov, 2010), accounts for infant prosocial development (Brownell, 2016). This debate of biology versus socialization is further informed by the multi-dimensionality of prosocial behavior.

Prosocial behavior is complex and multi-faceted with various types and forms, targets, motivations and mechanisms, and responses (Dunfield, 2014; Gross et al., 2017). Although prosocial behavior is thought to be continuous from preschool to adulthood (Paulus, 2018), not all forms of prosocial behavior are related, particularly those developed during an infant’s second year (Dunfield et al., 2011; Paulus, 2014). Because of this, researchers tend to propose that different forms of prosocial behavior emerge from diverse origins (Paulus, 2014), with a number
of researchers postulating that instrumental helping is more clearly influenced by socialization factors, such as maternal scaffolding (Pettygrove et al., 2013) and elicitation of emotion talk (Brownell et al., 2013; Paulus, 2014), than by biology. One theory of socialization, the Social-Normative Model, stresses the role of the social environment in fostering and supporting the emergence of prosocial behavior (Paulus, 2014). The Social-Normative Model, along with the PPCT model (Person-Process-Context-Time model) of Bronfenbrenner’s bioecological theory, which suggests that interactions between an individual and their environment account for the constantly changing proximal processes in a child’s life by identifying subtle coinciding intersections with person characteristics, context, and time (Tudge, 2017; Tudge et al., 2009), could allow for a more comprehensive understanding of infant instrumental helping. The use of these complementary theories will bring about a more holistic understanding of infant prosocial behavior by looking at the interplay of various contextual factors, including sources of socialization in the home environment and parenting influences, rather than relying on one predictor. One of these sources of socialization in the home environment that is becoming increasingly more prevalent is prosocial media.

**Prosocial Media and Prosocial Behavior**

Infants are growing up as “digital natives” with the presence of media permeating almost every home (Rideout, 2017); as such, it is important to consider the role media plays in socialization in the home environment and infant developmental outcomes, such as prosocial behavior. Although the American Academy of Pediatrics recommends that young children not be exposed to media before the age of 18 months (2016), infants aged 0-2 watch a daily average of 1-2 hours of media (Brown, 2011; Rideout, 2017). A type of media often watched by infants and young children is prosocial media, which is a subset of educational media (FCC, 2019). While
educational media programming aims to educate children in school-related skills, such as literacy, numeracy, and social skills (Ostrov et al., 2006), prosocial media content tends to depict helpfulness, kindness, and sharing (Coyne et al., 2018). Specifically designed to help children learn social and emotional skills (Rasmussen et al., 2016), prosocial programs have adapted over the years to meet the current developmental needs of children (Catapano, 2016). Some prosocial programs, such as Daniel Tiger’s Neighborhood, help to produce higher levels of empathy and emotional regulation (Rasmussen et al., 2016), while others, like Sesame Street, promote cultural prosocial behavior and social inclusion (Catapano, 2016). Researchers have observed that children are more prosocial and empathetic after watching prosocial behavior in the media (for meta-analysis reviews, see Coyne et al., 2018; Mares & Woodard, 2007), with one case study even showing more prosocial behavior two years later (Anderson et al., 2000). While much of the prosocial media literature examines children’s learning and behavioral outcomes, it is important to understand how prosocial media can act as a socializing factor in infants’ prosocial development and how that compares to the role prosocial media plays in older children’s development. This study aims to address that hole in the literature.

Intentionally designed to help children learn social and emotional skills (Rasmussen et al., 2016), prosocial media can be considered a socializing agent in infants’ lives that scaffolds infants’ attention to, interest in, and inferences about others’ internal states (Grusec & Davidov, 2010; Svetlova et al., 2010) through its visuals, scripts, and sounds. According to the Social-Interaction Model of socialization theory, prosocial media, as a part of an infant’s social environment (Grusec & Davidov, 2010), acts to foster and support the emergence of prosocial behavior (Paulus, 2014). While prosocial media might influence prosocial behavior through socialization, Bronfenbrenner’s PPCT model would posit that the complex, proximal processes
of infant prosocial development (Dunfield, 2014; Rosa & Tudge, 2013) would be better understood by looking at the interplay of the socialization efforts of prosocial media and a form of parental scaffolding, positive joint media engagement (Tudge, 2017; Tudge et al., 2016).

**Joint Media Engagement and Prosocial Behavior**

To more fully understand the influence of prosocial media on infant prosocial development, it is important to consider another piece of an infant’s social environment – joint media engagement. With the amount of media that saturates infants’ worlds (Bleakley et al., 2014; Levine et al., 2019), parents often feel responsible to monitor the media that is being consumed in the home (Padilla-Walker et al., 2018). Parental media monitoring typically manifests in three different forms: restrictive media monitoring (e.g., placing limits or rules on media time or content), active media monitoring (e.g., media-based, parent-child conversations aimed to promote critical thinking about media), and co-viewing (i.e., a parent is present while the child is exposed to or engaging with media) (Gentile et al., 2012; Padilla-Walker et al., 2018). Joint media engagement, a media-specific form of parent-child discourse, employs both co-viewing and active media monitoring.

Parental behaviors of being present while one’s child is watching television (co-viewing) and asking questions or making observations about the media (active media monitoring) begin to be more developmentally appropriate in the beginning of an infant’s second year. The time around an infant’s first birthday is characterized by increased interest and improvements in joint attention (Dahl, 2015; Dahl & Paulus, 2019), with infants showing higher levels of prosocial behavior in simple instrumental helping activities, especially when these activities are encouraged and sustained by a parent (Dahl et al., 2011). Parents often do this through age-appropriate scaffolding, supporting an infant’s helping situations with praise, thanking, and
emotion talk (Dahl, 2018; Dunfield, 2014) that is typically exaggerated to make the encouraging cues salient and clear (Svetlova et al., 2010). These socializing behaviors of parental scaffolding map well onto the concepts incorporated in joint media engagement; as such, it could be helpful to consider the role of joint media engagement in an infant’s socialization and subsequent behavioral outcomes, such as prosocial behavior.

Elements of co-viewing seem to coordinate with an infant’s increased interest in joint attention activities, and aspects of parental praise and elicitation of emotion talk meant to promote infant instrumental helping could correspond with behaviors and commentary made during active media monitoring. These connections could be especially salient in the context of prosocial media. For example, while watching a prosocial program with their infant, a parent might employ techniques of active media monitoring by making commentary (Padilla-Walker et al., 2018) that praises or encourages the instrumental helping displayed by one of the characters on the screen, or explains a character’s prosocial intentions through emotion labelling (Gentile et al., 2014; Paulus, 2014). Like praise and elicited emotion talk given in response to an infant’s early displays of helping (Dahl, 2018; Dunfield, 2014), these verbal cues about co-viewed media might scaffold infants’ interest in and attention to instrumental helping (Pettygrove et al., 2013). In this sense, joint media engagement, as a media-based form of parental scaffolding and socialization, would act according to the Social-Normative Model of socialization theory and foster and support the emergence of prosocial behavior (Paulus, 2014). More than just exploring joint media engagement as a socializing influence on an infant’s prosocial development, Bronfenbrenner’s PPCT model would argue for the consideration of the interrelated processes of an infant’s social context (Rosa & Tudge, 2013; Tudge, 2009), such as that between joint media engagement and prosocial media.
Prosocial media is a socializing factor in infants’ prosocial development, and studies have shown a link between prosocial media exposure and prosocial behaviors (Coyne et al., 2016; Mares & Woodard, 2007). The joint media engagement literature would suggest that the processes of joint media engagement might change or influence the processes of prosocial media as a socializing factor in infant prosocial development. Joint media engagement not only tends to make infants pay more attention to and spend more time looking at the co-viewed media content (Barr et al., 2008; Demers et al., 2013), but also through parental commentary, it leads to higher levels of learning and comprehension than an infant could achieve on their own (Collins et al., 1981; Linebarger & Vaala, 2010). With joint media engagement producing more time with and responsiveness to media and more positive outcomes, the current study posits that joint media engagement moderates the effect of prosocial media on infant prosocial helping behaviors.

**Study Aims and Hypotheses**

In the current study, I aim to examine the impact of contextual, socializing factors on early prosocial development. Given that previous studies have shown that prosocial behavior emerges in an infant’s second year (Dahl, 2018; Pettygrove et al., 2013), during which time media (Rideout, 2017) and joint media engagement (Collins et al., 1981; Demers et al., 2013) have been seen to play roles in infants’ socialization, I will examine the association between these two contextual factors (prosocial media and joint media engagement) as well as developmental outcomes (infant prosocial behavior).

Rooted in the bioecological theory, as explained through the PPCT Model (Bronfenbrenner, 1986), the Social-Normative model of socialization theory (Paulus, 2014), and previous research, I propose the following hypotheses. First, I hypothesize that exposure to prosocial media will be related to displays of infant prosocial helping behavior. Second, I
hypothesize that parent displays of joint media engagement will be related to displays of infant prosocial helping behavior. Finally, I hypothesize that parent displays of joint media engagement will moderate the relationship between prosocial media and infant prosocial helping behavior. Specifically, the relationship will be stronger for infants with parents who display higher levels of joint media engagement.

Method

Participants

Data were drawn from a larger study: Project M.E.D.I.A. (Media Effects on Development from Infancy to Adulthood), which is an ongoing, longitudinal study currently in its third wave of data collection. The aim of Project M.E.D.I.A. is to examine the development of “digital natives”, or children growing up in a media saturated world.

Participant families were recruited from a large mountain west city in 2017 and have been surveyed each subsequent year. The current study is based on the data collected during May 2018-September 2018. Participants were recruited using multiple methods including flyers in areas frequented by families with young children (e.g., pediatrician offices, free clinics, social services office, child entertainment businesses, public parks) and mailers sent through the Colorado Office of Health and Vital Record. Letters were sent to 1,500 people within the Denver metro area who had a child within the last year. Research assistants visited mailer participants at their homes and invited them to participate; of the people who were visited at their home (and qualified to participate), 66% participated in Wave 1. Looking at the breakdown of how participant recruitment 52% of participants were recruited through a data collection firm, 30% were recruited from flyers, and 18% were recruited from mailers.
For the current study, all data were taken from Wave 2 data collection, specifically only those who participated in the in-home portion of the study, because of the availability of the measures of interest. The overall in-home sample consists of 269 infants (50% female, $M$ age = 17.83 months, $SD = 3.50$ months, $min = 11.34$ months, $max = 26.23$ months) and their primary caregivers (98% mothers, $M$ age = 31.07 years). Of the in-home sample, the analysis sample only included the infants and their parents who were randomly assigned to participate in the instrumental helping prosocial task (instead of the sharing prosocial task, and instead of with a research assistant). The analysis sample consists of 60 infants (48% female, $M$ age = 17.64 months, $SD = 3.12$ months, $min = 11.34$ months, $max = 25.55$ months) and their primary caregivers (97% mothers, $M$ age = 31.28 years). The sample were ethnically and socioeconomically diverse, with approximately 59% Caucasian, 9% Black, 22% Hispanic/Latino, 7% Mixed or Other. Median family annual income was $40,000 to $49,000 with 46% of families making less than $50,000. In terms of maternal education, 50% had a high school education or some college, with only 26% who has a bachelor’s degree. Of the primary caregivers, 67% were married, 16% were single-never married, 12% had an unmarried partner living with them, and 3% were divorced or separated. All families were proficient in English.

**Materials/Procedures**

Parents completed all questionnaires at home, either online or on paper. Parents responded about demographic information, the number of children living at home, and their child’s top three favorite television shows. Parental media monitoring and prosocial behavior were both observational tasks, including video-taping and subsequent coding of parent-child media interactions and child prosocial behavior towards parents (primary caregiver). Children
were tested and observed in their own home, with each task being video recorded for observational coding purposes.

**Measures**

**Demographic Information**

Parents reported on basic demographic information about themselves, including age, gender, ethnicity, marital status, education, and household income. Additionally, parents provided demographic information about their child, including age and gender.

**Prosocial Media Exposure**

Prosocial media exposure was measured using parent reports of their child’s top three favorite and most frequently viewed television shows. Reported shows included “Paw Patrol”, “Daniel Tiger’s Neighborhood”, and “SpongeBob SquarePants”, among various other titles. Ratings were obtained using scoring from the nonprofit media content coding website, Common Sense Media. According to the website, the company is committed to providing parents with reliable information about media in the 21st century, and subjects media sources (television shows, movies, video games, etc.) to a “detailed evaluation process by expert, trained reviewers, who come from every corner of the media, academic, and parenting worlds…[including] teachers, librarians, and experiences academics who’ve studied the impact of media at length….and have been extensively trained in a child development-based rating rubric.” Though the company does not provide formal reliability statistics that are common in this type of research, Coyne (2020) conducted a reliability analysis on the ratings and found the ratings to be valid and reliable ($r = .80; SD = .07$). Though the reliability analysis from Coyne (2020) focused on video game violence, rather than prosocial television content, it provides increased confidence in the Common Sense Media ratings. With this confidence, research assistants searched the three,
parent-reported television shows and recorded the values assigned by Common Sense Media to the show in the categories of “Positive Messages” and “Positive Role Models & Representation”. These assigned scores range from 0 (not present at all in the media) to 5 (very present in the media). These two scores were added together to get a joint prosocial score (out of 10); this was done for all three shows. The prosocial score of the three shows was then averaged to create an overall prosocial media exposure variable.

**Joint Media Engagement**

Joint media engagement was measured by recording children as they watched a short, five-minute video clip with their parent. The clip was from Daniel Tiger’s Neighborhood, a program that encourages social and emotional development, especially when parents discuss media content with children (Rasmussen et al., 2016). Participants watched video clips from the episode “Daniel Gets Mad”, which depicts the characters dealing with strong emotions following a disappointment (Santomero, 2012). Participants were instructed to watch the show as they normally would, including any normal parent-child processes. The research assistant recording the participants was located on the side of the participant rather than directly in front in order to minimize distraction during the task and to ensure mobility if the child left the frame.

Parent-child interactions were subjected to a detailed coding process to examine both parent and child behaviors during this time of joint media engagement (for a validation of the measure, refer to Padilla-Walker et al., 2020). Coders were trained university students who took part in an intensive training program over the course of one semester, learning codes that were loosely based on coding schemes developed by Lauricella et al. (2014) and Fidler et al. (2010). Behaviors were rated in 30-second intervals, with 0 = behavior absent, 1 = behavior present, and
X = non-codeable. The numbers from each of the 30-second intervals were added to get a sum score. These scores were then averaged to get an overall joint media engagement score.

For the purpose of this study, only the parent codes will be included in the joint media engagement variable. These four codes fall under *Maternal Positive Engagement* and consist of repetition of media, talking about media, participation with the program, and the use of emotional language (refer to Table 1 for a list of these four coding behaviors, examples, and reliability for each code). Acceptable reliability was achieved for each of the codes: repetition of media (Krippendorf’s $\alpha = .70$), talking about media (Krippendorf’s $\alpha = .78$), participation with the program (Krippendorf’s $\alpha = .76$), and the use of emotional language (Krippendorf’s $\alpha = .90$).

*Prosocial Behavior*

Procedures took place in the toddler’s home environment and were video recorded on iPads. After a brief warm-up period, children engaged in a helping task that was administered by the child’s parent. For this helping task, the toddler’s parent would “accidently” drop a pen out of her/his reach (refer to Over & Carpenter, 2009 for a similar helping task).

During this task, the parent would sit on the couch or the ground with the child. Recording started once everything was set up. The parent would begin by opening with the line “I have some jobs to do” and would then pretend to write and drop her/his pen (at this point, the research assistant would start the timer). During this timed section, the parent would deliver a standard set of four successive cues which provided increasing information about the nature of her/his need. The first cue (10 seconds of the corners of their mouth turning down, looking at the pen and saying “Ooohh” in a sad tone, and continuing to reach for the out-of-reach pen) conveys the need nonverbally. The second cue (10 seconds of coughing and then looking back and forth from the pen to the toddler while continuing to express mild sadness) continues to convey
nonverbally, but more directly. The third cue, (10 seconds of a second cough followed by “My pen! I can’t finish my jobs.”) describes the nature of the need as well as how to alleviate it. The fourth and final cue (30 seconds of a repeat of all three previous cues) conveys nonverbally and verbally the need and a source of alleviating the need. At the end of this helping task, if the child hands their parent the pen, the adult would say, “Oh, now I can do my jobs!” and would express mild happiness (all through body language, no other words were uttered) and continue to do their jobs for a few seconds. If the child did not hand the parent their pen, the parent would say, “I guess I’ll finish next time.”

Using a coding scheme based on research by Newton et al. (2014) and Vaish et al. (2009), videos were coded to determine whether and when the child helped and what they did when they were not helping (see coding scheme in Table 2). During each of the four cues, the child could help in an instrumental way (give their parent the desired object), help in a nigh/ineffective manner (ineffective helping such as giving their parent a different item or partially helps physically or verbally), be prosocial in a non-instrumental manner (distracts their parent), describe the situation (imitates the parent or describes what is going on without making suggestions), attend to the situation (attend to the parent or watch them for at least 5 seconds), or ignore the situation/parent (refer to figures 1 and 2 for visuals of the measure from Wave 2 of Project M.E.D.I.A.).

One researcher blind to the study’s hypotheses coded child’s instrumental helping behaviors in the pen task using a 5-point scale (for a more thorough description of the five types of behaviors described above and the associated codes, refer to table 2). A second researcher also blind to the study’s hypotheses coded a random 20% selection of children. Interrater reliability was excellent (Cronbach’s $\alpha = .88$).
This code attempts to capture the degree to which the child acts in a way that relieves their parent’s unfortunate predicament. The highest score possible is assigned to the child based on all of their behaviors during the 60-second coding window (e.g., if a child describes the situation [coded as a 2] AND shares with the parent [coded as a 5], the child would receive a 5).

**Analytic Strategy**

In order to determine the association between prosocial media exposure and infant prosocial helping behavior, I will utilize ordinary least squares bivariate and multivariate regression analysis in STATA 16. In answer to the first hypothesis, bivariate regression analyses will be utilized to determine whether prosocial media exposure is associated with infant prosocial helping behavior. Second, multivariate regression analyses will be used to determine whether parent joint media engagement is associated with infant prosocial helping behavior. Finally, interaction analyses in STATA 16 will be conducted to determine whether parent joint media engagement moderates the association between prosocial media exposure and infant prosocial helping behavior. Control variables include maternal education and infant age.

**Results**

**Preliminary Analyses and Descriptive Statistics**

Using STATA 16, initial descriptive statistics were collected for the analysis sample (refer to table 3). Prior to testing the study hypotheses, assumptions for measurement error, multicollinearity and independence, heteroskedasticity, linearity, and non-normally distributed errors were checked.

Linear regression assumptions of measurement error, multicollinearity and independence, heteroskedasticity, linearity, and non-normally distributed errors were tested prior to the study hypotheses to ensure robust and sound statistical models. Variables were recoded to account for
measurement error, and correlations were conducted to test for multicollinearity (refer to table 4). Descriptive statistics were collected for the analysis sample (refer to table 3); the only statistically significant correlations were between infant age and maternal education ($r = 0.136, p = .041$), as well as between infant age and parent joint media engagement ($r = 0.145, p = .030$).

While infant age and maternal education, as well as infant age and parent joint media engagement, were correlated, variance inflation factors lower than 10 indicated no issues with multicollinearity. White’s ($R^2 = 0.624, F(35, 24) = 1.14, and p = .377$) and the Breusch-Pagan ($\chi^2(1) = 6.98, p = .008$) test indicated some heteroskedastic errors, which were corrected using the Huber-White Sandwich Estimator. Scatterplots and histograms, along with a preliminary regression model with the study independent variable (prosocial media exposure) squared, indicated that linear regression, rather than nonlinear, would be the most appropriate approach to assess the relationship between the study variables. Cooks D test, a regression with studentized residuals, and the Dffits test indicated there are no outstanding influential observations. With these assumptions accounted for and corrected, the study hypotheses could be tested.

**Multiple Regression Analysis**

Testing the first study hypothesis, a bivariate ordinary least squares analysis was conducted to determine if prosocial media exposure is associated with infants’ levels of prosocial instrumental helping behavior. In the model, it was found that the overall model fit statistics were such that $R^2 = 0.007, F(1, 66) = 0.47, and p = 0.494$. The results suggest prosocial media exposure is not associated with infant prosocial instrumental helping behavior ($\beta = 0.082, p = .494$).

To test the second study hypothesis, a multivariate ordinary least squares analysis was run to determine if prosocial media exposure and parent joint media engagement are associated
with infants’ levels of prosocial instrumental helping behavior, while including maternal
education and infant age as controls (refer to table 5, Model A). The overall model fit statistics
were such that $R^2 = 0.063$, $F(4, 55) = 0.347$, and $p = 0.494$. The results suggest that prosocial
media exposure ($\beta = 0.090$, $p = .475$), parent joint media engagement ($\beta = -0.022$, $p = 0.860$),
maternal education ($\beta = 0.150$, $p = 0.305$), and infant age ($\beta = -0.206$, $p = 0.157$) are not
associated with infant prosocial instrumental helping behavior.

To test the third study hypothesis, a multivariate ordinary least squares regression
analysis was run to determine if prosocial media exposure is associated with infants’ level of
prosocial instrumental helping behavior, while including maternal education and infant age as
controls. Additionally, parent joint media engagement was incorporated into this model as a
moderator (refer to table 5, Model B). The overall model fit statistics were such that $R^2 = 0.064,$
$F(5, 54) = 0.95$, and $p = 0.459$. The results suggest that prosocial media exposure is not
associated with infant prosocial instrumental helping behavior ($\beta = 0.104$, $p = 0.577$). Maternal
education ($\beta = 0.151$, $p = 0.308$) and infant age ($\beta = -0.205$, $p = 0.164$) also are not associated
with infant prosocial instrumental helping behavior. Lastly, the interaction between prosocial
media exposure and parent joint media engagement was not significant ($\beta = -0.050$, $p = .863$).

Discussion

The purpose of this study was to examine the relationship between prosocial media
exposure and infant prosocial instrumental helping, as moderated by parent joint media
engagement. The results of the current study revealed that prosocial media exposure was not
associated with infant prosocial instrumental helping. Additionally, parent joint media
engagement was not associated with infant prosocial instrumental helping, nor did it moderate
the association between prosocial media exposure and infant prosocial instrumental helping.
Our hypotheses were not supported by the findings in the current study. The first two hypotheses, that exposure to prosocial media and parent joint media engagement would be related to displays of infant prosocial helping behavior, were based upon past research findings, Social-Interaction Model of socialization theory (Paulus, 2014), and Bronfenbrenner’s PPCT Model of the bioecological theory (Rosa & Tudge, 2013; Tudge, 2017). Given this literature, there are a number of reasons why our results do not support previous work. One of the primary reasons draws from the scarcity of research on infancy, media, and prosocial development. While we had past findings of positive associations between prosocial media and prosocial behavior to refer to, none of the studies involved infants. Even in the meta-analysis reviews from Coyne et al. (2018) and Mares and Woodard (2007), with 72 and 34 studies, respectively, the earliest age studied was preschool children. Although the Social-Interaction and PPCT Models might point to prosocial media and parent joint engagement being parts of infants’ social environments that influence their prosocial behavior (Paulus, 2014; Tudge, 2017), and past research would support this with evidence of associations in preschool and later years (Coyne et al., 2018), the 11-26 month old infants in our sample might not be capable of the same functions as preschoolers and older children that are necessary for these associations between prosocial media and prosocial behavior to exist.

Although infants watch an average of 1-2 hours of media a day (Brown, 2011; Rideout, 2017), one distinct difference in their experience and that of a preschooler or older children during media consumption is level of attention. In order to learn from the prosocial content and messages of a television program, and eventually model and demonstrate similar behaviors, one has to first be able to pay attention to the screen, storyline, and messages. While attention patterns of infants ages 6-18 months typically include being able to attend to scenes with salient
aural (music, laughter, applause) or visual (rapid movement, bright color) stimuli (Linebarger & Vaala, 2010), it is not until ages 19-35 months that infants are capable of looking longer at less salient scenes that contain more central content (Valkenburg & Vroone, 2004). These scenes include informative dialogue and attention directing speech (Valkenburg & Vroone, 2004), and require more controlled processing and advanced cognitive capacity to make sense of the storyline and educational lessons presented (Lang, 2000; Linebarger & Vaala, 2010).

While infants tend to pay more attention to the screen and content displayed when their parent’s attention is directed there (Demers et al., 2013), until an infant is at least 18 months old, elaborate gestures and efforts are often required from parents to direct their infant’s gaze to the screen (Deák et al., 2000). Even if a 12-18 month old infant does not get distracted by peripheral objects when being directed to the screen (Butterworth & Jarrett, 1991), interactions of parent-child joint media engagement are not as effective unless the television program is age appropriate and educational (Demers et al., 2013). In our study, of the television shows reported by parents to be their infant’s favorite and most frequently watched, few, if any, were designed for the age range included in our sample (ages 11-26 months). The most commonly reported shows, such as Daniel Tiger’s Neighborhood, Dinosaur Train, and Paw Patrol, are rated by Common Sense Media to be for children ages 3-4. Other frequently reported movies, such as Moana and Frozen, are recommended by Common Sense Media for children 5-6+. Although all of these programs contain high levels of prosocial messages and role models, they may not be age appropriate. The infants of our study (11-26 months) likely are unable to decipher the fairly complex storylines and prosocial messages. Because children do not learn from screen media as well as they do from real-life displays (Anderson & Hanson, 2010), and prosocial behavior is barely beginning to develop in rudimentary forms during the second year (Svetlova et al., 2010),
the infants of our study likely do not have the skills yet to understand and mimic the prosocial messages and behaviors demonstrated in a television program. Thus, in our current study, prosocial media exposure is not associated with prosocial instrumental helping behaviors.

We attempted to explore the association between prosocial media exposure and prosocial behavior cross-sectionally, but it might actually be better understood longitudinally. Consistent exposure to prosocial media messages and role models in television shows, and repeatedly hearing parents discuss or ask questions about prosocial media content might be necessary for the promotion of prosocial development. While infants in their second year might not be able to make the abstract connection between prosocial television characters and themselves and model their prosocial behaviors, these early moments of prosocial media exposure might contribute to later prosocial development. Or, perhaps, these early moments of prosocial media exposure are not going to have long-term benefits and might just be time taken away from more age-appropriate activities or socialization that might better promote prosocial development during this young age. It would be worth exploring these ideas in future research to understand if the relationship between prosocial media exposure and prosocial behavior is longitudinal, and if prosocial media in the first two years of life is helping long-term or is ultimately hurting.

Lastly, the third hypothesis was not confirmed as parent joint media engagement does not significantly moderate the association, or lack of association, between prosocial media exposure and infant prosocial instrumental helping. Because there was no significant association between prosocial media exposure and infant prosocial instrumental helping, even when adding in parent joint media engagement as an interaction term in the model, parent joint media engagement cannot moderate or explain the relation between prosocial media exposure and infant prosocial instrumental helping. While the results of the current study suggest no effect of prosocial media
at this age, the limited amount of research on infancy, media, and prosocial development would likely profit from further consideration of potential limitations of the study and future research directions.

**Limitations, Future Directions, and Conclusion**

The current study was one of the first to explore the nexus of prosocial media, parent joint media engagement, and infant prosocial behavior. Notwithstanding the novelty and strengths exhibited in this study (including relatively large $N$ for observational research and in-home observations), there are limitations to be considered in the development of future studies. The first potential limitation to consider is the prosocial media exposure measure. To our knowledge, there is not a measure or scale that is the norm for the research in this field, and so we used the “Positive Messages” and “Positive Role Models & Representation” values assigned by Common Sense Media, a nonprofit website, to generate an overall prosocial media exposure variable. While Common Sense Media is a good resource for parents to gain a better understanding of what content and messages are being portrayed in children’s media, a more comprehensive measure of prosociality in infant and child media is needed. Because of this, the data in the study might not be an accurate representation of the prosocial messages infants are being exposed to, which could potentially change the results.

Additionally, this study might not have accurately accounted for frequency of prosocial media exposure. Parents were asked to report their infant’s top three favorite and most frequently viewed television shows, but these reports might not have been accurate. Among other issues, these reports could reflect false recall. Being put on the spot with this survey question, parents might not have been able to remember their infants’ top three television shows, and instead opted to list the last three television shows they remember their infant watching. Perhaps the shows
reported are ones that the infant has watched at some point, and are in fact, rated highly prosocial, but are not the television shows the infant is most frequently exposed to and watching, which might be less prosocial, or could even be an adult’s television show that their parent is regularly tuned in to. It could be argued that elements of an infant’s social environment that are more frequent and prevalent have a larger role in fostering and supporting prosocial development. As such, it would be worth considering how to ensure accuracy in reports of frequency and amount of time exposed to media in future studies.

Third, while the current study exclusively considered instrumental helping, future studies about prosocial media and infant prosocial behavior might benefit from a deeper exploration of other types of prosocial behavior, such as sharing, as well as associated motivations and intentions. For example, in terms of the measures and results of the current study, a beneficial question to ask would be what instrumental helping looks like and actually is at this age (11-26 months). Understanding whether instrumental helping at this age is goal completion, social interaction, prosocial behavior, or some type of combination, could necessitate exploring different predictors and factors of an infant’s social environment. Additionally, instrumental helping is typically considered a low-cost prosocial behavior. In the current study, instrumental helping through picking up a pen might not have been very high cost for the infants, and as such, it could be worthwhile in future studies to explore and compare these early manifestations of prosocial behavior to a type associated with a higher cost, such as sharing. Future studies should consider how different types of infant prosocial behavior are impacted by age and target (parent/family member versus experimenter).

Lastly, the current sample included primary caregiver participants who were coded to have low scores of joint media engagement. It is possible that the lack of significant results in the
current study is due to low levels of parent joint media engagement displayed during the study, and not because parent joint media engagement does not matter for infant prosocial instrumental helping. One reason for lower parent joint media engagement scores could be that the participating parents might have felt some discomfort in front of the camera, showing fewer displays of joint media engagement than they might in a non-study circumstance. On the other hand, joint media engagement might just be something that parents wait to participate in until their children are older and more capable of verbalizing and responding to their questions and comments about media program content. It would be interesting to see if levels of parent joint media engagement increase in later waves of data collection. Additionally, future studies might benefit from considering infant media engagement. The relationship between prosocial media exposure and infant prosocial behavior might be better moderated by infant media engagement, as more of a matter of parents attending to and following their infant’s lead. This idea for future direction is supported by a finding in the joint media engagement literature that reports infant fussiness and negative affect during media co-viewing to be associated with parental positive media engagement (Padilla-Walker et al., 2020). Perhaps infant temperament, interest in, and engagement during media co-viewing better informs parent-infant media interactions and potential outcomes. Overall, it might be that joint media engagement is largely unrelated to infant prosocial development during the second year but is a socializing factor worth considering in later infancy and childhood.

To conclude, the results of the current study suggest that prosocial media exposure and parent joint media engagement are not associated with infant prosocial instrumental helping, in this sample of infants and their primary caregivers. The results did not support our theory and research-based hypotheses, but rather suggest that beyond potential study limitations, the
primary reason for a lack of findings was the age of our sample. While prosocial media might not have an effect during an infant’s second year, the increasing prevalence of media in infants’ and children’s social environments, and the current lack of research on infancy, media, and prosocial development strongly suggests a need for future exploration of these associations. An infant’s first two years of life are crucial developmentally (Blandon & Scrimgeour, 2015), and as they grow up in a progressively digital world, it is important to understand the impact of media on infants’ social environments and development.
References


https://doi-org.erl.lib.byu.edu/10.1111/1467-8624.00100

https://www.fcc.gov/consumers/guides/childrens-educational-television

https://doi.org/10.1111/j.1532-7078.2009.00013.x

https://doi-org.erl.lib.byu.edu/10.1542/peds.20081543

https://doi-org.erl.lib.byu.edu/10.1111/j.1741-3729.2012.00709.x


https://doi.org/10.1016/j.chb.2018.12.045


https://doi-org.erl.lib.byu.edu/10.1016/j.dr.2010.03.006


https://doi-org.erl.lib.byu.edu/10.1007/s10995-012-0952-8


https://doi-org.erl.lib.byu.edu/10.1111/j.1467-9280.2009.02419.x


Table 1

*Joint Media Engagement Parent Codes*

<table>
<thead>
<tr>
<th>Parent Codes</th>
<th>Description</th>
<th>Examples</th>
<th>Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repetition of Media</td>
<td>Repeating specific phrases from the program.</td>
<td>Parents starts to sing with the program, “We’re going to the music shop to play some instruments, won’t you ride along with me”</td>
<td>.70</td>
</tr>
<tr>
<td>Talking about Media</td>
<td>Parent ask child about questions about the media or making observations about the media. Parents were also given this code if they praised the child’s engagement with the show or made verbal bids to further the child’s interest in the program</td>
<td>Parent says to the child, “Look! Daniel is going to the beach today!”</td>
<td>.78</td>
</tr>
<tr>
<td>Participation with Program</td>
<td>Parent reacts physically to the program.</td>
<td>Parent starts to clap in time to the song.</td>
<td>.76</td>
</tr>
<tr>
<td>Emotion</td>
<td>Parent mentions specific emotion words, descriptions of emotion manifestation, questions about emotion or repeating specific emotion-based language from the program.</td>
<td>Parent says, “How do you think Daniel is feeling right now? He looks angry!”</td>
<td>.90</td>
</tr>
</tbody>
</table>
### Table 2

**Prosocial Pen Task Coding Scheme**

<table>
<thead>
<tr>
<th>Code</th>
<th>Behaviors</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Instrumental Helping</td>
</tr>
<tr>
<td></td>
<td>• Instrumentally helps (gives parent the pen)</td>
</tr>
<tr>
<td></td>
<td>• Shares without parent responding (Offers by clearly holding out pen to parent for at least 3 seconds but parent does not take it). NOTE: This does not include instances where the infant seems oblivious to parent and tries to draw on parent’s clipboard.</td>
</tr>
<tr>
<td>4</td>
<td>Nigh Helping</td>
</tr>
<tr>
<td></td>
<td>• Ineffective helping (gives parent a different item)</td>
</tr>
<tr>
<td></td>
<td>• Partial help (puts pen near parent, but does not hand it to her; throws pen to parent)</td>
</tr>
<tr>
<td></td>
<td>• Gives verbal suggestions to solve the problem (“It’s there!”)</td>
</tr>
<tr>
<td></td>
<td>• Gestures helpfully AND makes a suggestion (directs parent to pen AND says, “pick it up!”)</td>
</tr>
<tr>
<td></td>
<td>• Distracts parent (tries to redirect parent’s attention to something else)</td>
</tr>
<tr>
<td>3</td>
<td>Describes Situation/Hypothesis Testing</td>
</tr>
<tr>
<td></td>
<td>• Imitates parent</td>
</tr>
<tr>
<td></td>
<td>• Describes or references situation to parent or self without making suggestions (“She wants that.” “Uh-Oh.” “Sorry.”). Must be positive (e.g., not “No!” or “Nuh Uh” as if resisting)</td>
</tr>
<tr>
<td></td>
<td>• Gestures to parent about the situation without making a suggestion (points to the pen, points to parent)</td>
</tr>
<tr>
<td>2</td>
<td>Attends to Situation</td>
</tr>
<tr>
<td></td>
<td>• Watches parent for at least 5 consecutive seconds</td>
</tr>
<tr>
<td>1</td>
<td>Ignores Situation</td>
</tr>
<tr>
<td></td>
<td>• Watches parent but NOT for at least 5 consecutive seconds</td>
</tr>
<tr>
<td></td>
<td>• Ignores/does not attend to parent</td>
</tr>
</tbody>
</table>

*Note.* This coding scheme was based on research by Newton et al. (2014) and Vaish et al. (2009).
Table 3

Descriptive Statistics of Analysis Sample

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant Prosocial</td>
<td>3.843</td>
<td>1.451</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Instrumental Helping</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prosocial Media Exposure</td>
<td>6.630</td>
<td>2.230</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Parent Joint Media</td>
<td>0.912</td>
<td>0.946</td>
<td>0</td>
<td>4.25</td>
</tr>
<tr>
<td>Engagement</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal Education</td>
<td>4.500</td>
<td>1.148</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Infant Age</td>
<td>1.470</td>
<td>0.259</td>
<td>0.95</td>
<td>(11.34 months)</td>
</tr>
</tbody>
</table>
Table 4

*Correlations Between Independent Variables and Infant Prosocial Instrumental Helping*

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant Prosocial Instrumental Helping</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prosocial Media Exposure</td>
<td>0.083</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parent Joint Media Engagement</td>
<td>0.004</td>
<td>0.016</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal Education</td>
<td>0.037</td>
<td>0.108</td>
<td>0.136*</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Infant Age</td>
<td>0.012</td>
<td>0.115</td>
<td>0.001</td>
<td>0.145*</td>
<td>--</td>
</tr>
</tbody>
</table>

*p < .05*
Table 5

*Multivariate Regression Models*

<table>
<thead>
<tr>
<th></th>
<th>Model A</th>
<th></th>
<th>Model B</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\beta$ (se)</td>
<td>$\beta$ (se)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prosocial Media Exposure</td>
<td>0.090 (0.081)</td>
<td>0.104 (0.121)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parent Joint Media Engagement</td>
<td>-0.022 (0.200)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parent Joint Media Engagement*Prosocial</td>
<td>0.021(0.436)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal Education</td>
<td>0.015 (0.175)</td>
<td>0.151 (0.176)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infant Age</td>
<td>-0.206 (0.807)</td>
<td>-0.205(0.814)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>(1.561)*</td>
<td>(1.728)*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Standard errors in parentheses

* $p < 0.05
Figure 1

Prosocial Pen Drop Task Visual; Child Handing Pen to Mom
Figure 2

Prosocial Pen Drop Task Visual; Child Holding Pen Dropped by Mom