# ANXIETY REGULATION IN PRETEND PLAY: EXAMINING THE RELATIONS AMONG PLAY, WORRY, AND CREATIVITY IN YOUNG CHILDREN

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Abstract

Pretend play has been shown to support the development of emotion regulation skills, coping abilities, and creative thinking. Psychotherapy research has demonstrated that pretend play can be used to help young children cope with anxiety and overcome trauma. However, little research has studied how pretend play can help a normative sample deal with a more temporary experience of worry and uncertainty. In the current study, I investigated the relations among pretend play, creative thinking, and anxiety regulation, predicting that pretend play would increase creativity and decrease worried feelings. Thirteen children between ages 4 and 7 years watched a mildly stressful, unresolved movie scene and were randomly assigned to participate subsequently in either a pretend play or no-play session. Afterwards, children were asked to tell a creative story about how the movie might end. Children self-reported how worried they felt after watching the movie and after play. A heart rate index was also used to compare physiological anxiety at baseline, after the movie, and after play. Results indicated that participants did not differ by condition on their physiological anxiety. However, children who pretend played were more creative than those who did not, and the average degree of worry reported by pretend players trended lower than that of the control. Future research is needed to confirm an association between pretend play and anxiety regulation, and to better understand for whom and in what form pretend play is most beneficial to children learning to manage temporary feelings of distress and worry.

# Anxiety Regulation in Pretend Play:
# Examining the Relations Among Play, Worry, and Creativity in Young Children

Naïve and curious, children experience each day as a new and fascinating journey. They embrace the wonders and novelties of the world, knowing little about the complex and difficult realities. Children are excited by simple pleasures, like playing games, running in the park, and climbing trees. Even in these basic playful activities children's grand and exploratory imaginations are active. Indeed, children value and enjoy their playtime, as it provides special space to wander, adventure, dream, and create without adult obstruction. Naturally existing and inviting, pretend play is a convenient realm in which we can learn more about a child's social, emotional, and cognitive development. The emotional component warrants more study to understand how play relates to emotional understanding, expression, and regulation skills.

Pretend play has been theorized to be a natural space for the expression and exploration of both positive and negative emotions (Russ, 2004). While playing, children can safely act out emotional experiences, becoming more aware and understanding of their feelings. Pretend play has also been theorized as a deeply controlled space, as children are careful to act and speak in ways that align with the character they are pretending to be or the place they are pretending to be in (Bodrova, Germeroth, & Leong, 2013). Thus, pretend play offers a natural and enjoyable world in which children can practice monitoring and regulating their experience of emotion. Previous research has investigated how children regulate and overcome negative emotions through pretend play, focusing mainly on special populations (Goldstein & Lerner, 2016; Milos & Reiss, 1982) and clinical interventions (Gaensbauer & Seigel, 1995; Patterson, Dorsey, & Stutey, 2018). Few studies have explored how pretend play can be used to help typically-developing children cope with or overcome more common, and short-term negative emotions,

such as those they may expect to encounter on an average day (Barnett & Storm, 1981). It is critical that play researchers examine emotion regulation processes further, given the importance of these skills to the preschool years. Indeed, preschool children need mature emotion regulation skills in order to handle the unfamiliar environments and challenging social situations they are beginning to experience.

The goal of the current study was to expand our knowledge about the relations between play and emotion regulation. I examined whether pretend play is more effective than structured, non-pretend play at helping preschool children regulate and cope with their experience of anxiety. I also explored creative thinking as a potential mediator driving the relation between pretend play and anxiety regulation. By understanding the emotional processes of pretend play, we may use pretend play as both an intervention and prevention tool, helping children prepare for future emotional experiences or cope with those they have just faced.

**Pretend Play**

Play is largely defined by any spontaneous and enjoyable behaviors that are engaged in freely and voluntarily by the child. Children naturally engage in play, with the main motive being self-satisfaction and personal enjoyment. Pretend play, or play that involves the use of symbolism, fantasy, and make-believe within an "as if" context, may be a particularly important component of the preschool years (Fein, 1987; Russ, 2004). During pretend play, children enter an imaginary world where they can enjoy expressing themselves without concern for real-life consequences. Pretend players may choose to use ordinary objects in different and unique ways, create fantastical and make-believe storylines, and assume the roles of fictional characters (Russ, 2014). For example, a child in pretend play may act as if he is on a pirate ship, becoming Captain Hook and using a stick as both his sword and his oar.

Offering more than just pleasure and enjoyment, pretend play is a space for the development of critical cognitive, social, and emotional skills (for a review, see White, 2012). More specifically, research supports that pretend play is associated with self-regulation, coping ability, creativity, and problem-solving (Russ, 2004). Self-regulation is a critical component of the cognitive piece, and has received perhaps the greatest attention among play research.

**Pretend Play and Self-Regulation**

Lev Vygotsky famously theorized that children's participation within the imaginary play space exercises and develops their self-regulatory abilities. Important cognitive self-regulation processes include functions like inhibitory control (the ability to withhold non-relevant thoughts and actions), attentional shift (the ability to direct focus to a relevant item and to ignore the non-relevant), and goal-directed planning (the ability to set a longer-term goal), among others (Carlson & White, 2013). Vygotsky highlighted three key features of pretend play that involve self-regulation processes such as these. He noted that pretend players create their own world in which to play (e.g., Neverland), take-on new roles or transform themselves into fictional characters (e.g., become Captain Hook), and name a strict set of rules for the game (e.g., you always have to carry your pirate sword; Bodrova, Germeroth, & Leong, 2013). Importantly, these elements align with the above-named self-regulatory processes. For example, participants exercise goal-directed planning by creating a storyline and following it closely. They also show inhibitory control by inhibiting reality and requiring themselves to act only in ways that fit with their characters or the rules of the game. And finally, children exhibit attentional shift by including only props that are relevant to the scene. Russ (2014) further investigated the relation between pretend play and self-regulation by focusing more closely on a few shared cognitive processes, namely, the organization of sequential storylines, symbolism, and divergent thinking.

In play, children create detailed plotlines with comprehensive cause and effect relations. They also use objects symbolically by imagining that an object can function in a different way, and exercise divergent thinking skills by assigning numerous different and unique functions to a single object.

Researchers have observed the involvement of various cognitive self-regulation processes within pretend play. Thibodeau, Gilpin, Brown, and Meyer (2016), for example, investigated the process of attentional shift, examining children's abilities to switch from the rules of one card-sorting game to those of another. The study compared children's performances on the card sorting task before and after a five-week play intervention, where children either engaged in fantastical play (i.e., pretending to meet creatures on the moon) or non-imaginary play (i.e., coloring and ball games). The study found that after the five-week play intervention, the children who engaged in fantastical pretend play correctly sorted more cards after the rules spontaneously switched, compared to children who had participated in non-imaginary play, thus supporting a link between pretend play and attentional shift (Thibodeau et al., 2016). Another self-regulatory process that has been measured in play is waiting behavior. For example, Karniol et al. (2011) found that children who role-played as Superman could wait longer for a desired object than children who did not play within an imaginary role. The impersonation of other exemplary and make-believe characters (i.e., Batman) in play has also been linked to increased perseverance on tedious tasks (White et. al., 2017).

**Child Emotion Regulation**

Compared to the cognitive processes of pretend play, the affective processes have received much less attention by play researchers. The involvement of affect in play is worth greater study, considering the importance of emotion regulation for healthy child development.

The preschool age is perhaps, the most critical period for children to learn how to regulate their emotional expressions. Indeed, preschool children are beginning to enter an array of unfamiliar and challenging spaces, where they are expected to socialize and make friends, sit still and listen to instructions, and obey specific classroom rules (Russ & Fehr, 2016). Preschool is also one of the first experiences of parent-child separation, meaning children must learn to cope with the anxiety of being away from a parent and to trust the care of a new adult. Importantly, these situations require mature emotion regulation skills, challenging children to control and inhibit the display of emotions that may be considered inappropriate.

Emotion regulation pertains to the shaping of one's emotions, when one has them, and how one experiences them (Gross, 2014). People regulate their emotions for different reasons, and through the use of different strategies. A leader in emotion regulation research, Gross (1998) proposed a process model to deconstruct the processes of emotion regulation. This model outlines two types of regulation strategies, including antecedent-focused—which intervene before the emotional expression is displayed—and response-focused—which intervene after the emotional expression is displayed. During stressful situations, people use antecedent-focused emotion regulation to reevaluate a negative stimulus and to decrease its significance (Gross, 1998). An important antecedent-focused strategy is cognitive reappraisal, which involves changing the way one thinks about an emotional situation or stimulus, so as to alter its emotional impact (Gross, 2014). Developmental research points to cognitive reappraisal as a powerful strategy used by preschool-aged children. Sala, Pons, and Molina (2014) examined the use of cognitive reappraisal in a preschool-aged sample. Importantly, this study found that children as young as five years old displayed an ability to use cognitive reappraisal when narrating endings to emotional stories. The researchers also found that older children used a greater variety of

regulation strategies, supporting that children expand and diversify their repertoire of autonomous emotion regulation strategies as a function of age.

Preschoolers' emotion regulation skills have also been examined through processes categorized more broadly under self-regulation. Carlson and Wang (2007), for example, found a relation between self-regulation and emotion regulation on the basis that they both involve inhibitory control — or the ability to suppress thoughts or actions that may not be relevant to the immediate task at hand. Preschoolers who could inhibit the urge to touch a toy could also inhibit the expression of a negative emotion upon receiving an undesired gift. On the other hand, children who could not resist the temptation to touch the toy also could not suppress their unfavorable display of emotion. Therefore, developmental research ties the preschool age to when children begin to acquire self-control skills and learn to regulate their emotions. More research is required to understand and identify particular situations or settings that may aid in the development of these important emotion regulation skills.

**Pretend Play and Emotion Regulation**

Pretend play may serve as one particularly convenient space where children may foster their emotion regulation skills. This statement is grounded in the theory that pretend play involves two important affective processes, namely, the expression of emotion and the modulation of emotion (Russ, 2014). Children may use play to reenact arousing events, display their emotions freely, and work through their negative feelings (Hoffman & Russ, 2012). Indeed, pretend play may serve as a vehicle through which children can express their emotions, experiment with ideas and fantasy, and resolve conflicts and problems—all of which naturally relate to emotion regulation (Russ, 2014). Some research has provided evidence of a link between pretend play and emotion regulation. For example, children who scored highly on a

parent-report measure of emotion regulation were found to express more affect and imagination in their play, compared to children who scored lower on these reports (Hoffman & Russ, 2016). Other studies on pretend play have investigated specific emotion regulation skills, such as coping flexibility (Marcelo & Yates, 2014). Coping flexibility— or the ability to employ various different strategies when negotiating a challenge— is a critical adaptive mechanism for preschool-aged children. Exploring the connection between play and coping behavior, Marcelo and Yates (2014) found that preschoolers who demonstrated more fantastical and affective expression in their play also showed greater coping flexibility during a delay of gratification task. Indeed, those who showed more fantasy and affect also demonstrated the use of numerous different coping strategies (i.e., distraction, support-seeking, and positive self-talk) when trying to resist the urge to touch a toy car. Coping flexibility was also found to relate to improved behavioral adjustment a year later. This correlational research suggests that by routinely expressing emotions in play, children may become more comfortable with the coping skills and emotion regulation strategies they need to handle unpleasant experiences in real-life.

A similar link between pretend play and coping skills has been found among a slightly older, elementary-aged sample (Fiorelli & Russ, 2012). After scoring children on their imagination in play, the researchers asked participants how they would respond to a series of hypothetical, stressful school scenarios. The researchers found that children who demonstrated greater imagination in their play generated a greater number of coping responses, compared to those who demonstrated less imagination in their play. This study is important because it highlights the link between pretend play and the regulation of emotions related to stress and discomfort. Therefore, pretend play may be a particularly useful tool to help children reevaluate

negative stimuli and regulate their negative emotions around distress, worry, uncertainty, and anxiety.

**Pretend Play and Anxiety Regulation**

Erikson (1963) most famously theorized about the link between pretend play and emotion regulation around negative feelings and unpleasant experiences. Indeed, he writes that, "…play remains an indispensable harbor for the overhauling of shattered emotions after periods of rough-going in the social sees" (p. 221) Drawing from his ideas, Russ and Fehr (2016) aimed to understand more about how make-believe contexts can help children gain mastery over traumatic events and emotional realities. Focusing on the clinical setting, this research conceptualized four broad functions of play that may be responsible for driving change in children undergoing therapy. One theoretical function of play in therapy is to provide a safe space for children to practice working through situational or developmental traumas (Russ & Fehr, 2016). By expressing their emotions about a stressful or traumatic experience, children may resolve their emotional conflict and reduce their negative affect. Related to this, another important theoretical function of pretend play in therapy is to offer a space for the rehearsal of various ideas and behaviors without the pressure or consequences of the real-world (Russ & Fehr, 2016). Applying different coping strategies then, children practice reappraisal by learning to change the narrative around their negative emotional experience.

Child psychotherapy research provides ample support for the use of pretend play to help young children overcome negative emotions and to restructure a traumatic memory. Gaensbauer and Seigel (1995), for example, used reenactment in play to help a toddler (Cody) overcome his post-traumatic reactions and achieve therapeutic resolution. In this case study, Cody re-played his experiences of being bitten by a dog and taken to the hospital with toys related to the scene

(i.e., dolls and a dog figurine). Communicating his feelings in play, he successfully built a new narrative around his traumatic experience and overtime, reduced his fear of animals. Pretend play therefore, may be an important vehicle for conflict resolution in therapeutic settings.

Longitudinal research provides additional support for the use of therapeutic play interventions to benefit traumatized children. Patterson, Dorsey, and Stutey (2018), for example, conducted a six-week series of play interventions for elementary-aged children identified to be living in poverty and experiencing adverse childhood conditions (e.g., violence, drug abuse). These interventions followed the non-directive child-centered play (CCPT) model, which is designed to give children control in the playroom and the freedom to work through stressors at their own pace. The therapist was simply asked to provide children with therapeutic toys and to allow them to take the lead. The researchers found that after a six-week period of play interventions, children experienced significant reductions in general worry and negative thought patterns.

Similar results were found in a study involving a sample of preschool children enrolled in Head Start—a program for children with low socio-economic status and who have been identified as at risk for developing behavioral problems (Goldstein & Lerner, 2016). These classroom play interventions centered around dramatic pretend play and role play games, asking children to, for example, be chefs and prepare meals for the group. The researchers compared participants' pre- and post-intervention emotional control improvements, and compared these improvements to those of children in the control group (i.e., block building). After 24 sessions, children in the dramatic role play condition showed significant improvements in emotional control, specifically around the display of personal distress. Indeed, these children were better able to inhibit their negative reactions to, observations of, or discussions about distress.

Additionally, their improvements in emotional control were greater than those of the control group. Taken together, these studies support play therapy as a context where children can learn to regulate negative affect and overcome their anxiety.

Some research has examined how pretend play may be used to benefit typically-developing children struggling with anxieties specific to the preschool age. For example, Milos & Reiss (1982) focused on parent-child separation, examining how four different kinds of play may affect preschool children with pre-reported separation anxiety. Results indicated that after a series of interventions, children who had played with toys relevant to their separation anxiety experienced significantly greater reductions in their anxiety levels than children who had played with non-relevant toys. This study suggests that the most effective play intervention—or the one that best engages emotion regulation processes—incorporates toys that are related to the negative stimulus. Most research has investigated pretend play and emotion regulation among populations with pre-existing anxieties, or with a clinical diagnosis.

A limited amount of research has explored how play interventions may be used with children outside of special populations or clinical settings. Christian, Russ, and Short (2011) experimentally-induced anxiety in a sample of children and compared their play behavior with a neutral mood condition. To induce anxiety, the researchers asked children to think of a time when they were "really scared." Interestingly, children in the anxious mood condition showed more positive affect in their play than children in the neutral condition. Interpreting this result, the researchers suggest that the anxious children may have been using play to cope with their emotions and to regulate their mood. First and foremost, this study provides additional support for the link between pretend play and anxiety regulation. This study also emphasizes the

importance of conducting more research on how typically-developing children manage a more, "in-the-moment" experience of anxiety.

Indeed, little research has attempted to induce anxiety for the purpose of examining relations between emotion regulation and pretend play. For this reason, less is known about the most effective ways of provoking temporary worry within a preschool population. Barnett and Storm (1981) provide what may be perhaps, the most replicable method of examining how preschoolers alleviate their anxiety in play. In this study, children viewed a stressful scene from the television show, *Lassie,* where Lassie's owner falls from a cliff and is knocked unconscious. To induce worry and uncertainty among the sample, the researchers stopped the clip at this troubling and unresolved ending. The study also included a control condition, which viewed the full scene with its resolved ending. After measuring the participants' physiological anxiety with a sweat index, the researchers observed children playing with toys related to the distressing movie scene (i.e., Lassie dolls). Results indicated that after a period of free play, children in the anxious condition significantly reduced their physiological anxiety. Children who viewed the conflict-inducing segment were also reliably more anxious than the neutral condition. Importantly, this study conveys that within pretend play, children may relieve the tensions of an unpleasant experience and overcome their feelings of worry.

In the current study, I drew heavily on this method, but aimed to address an unanswered question. Indeed, Barnett and Storm (1981) engaged children in the same pretend play scenario, examining differences in children's pre- and post-play anxiety scores. This research leaves one to wonder if it was the make-believe and imaginary nature of the play that led to the reductions in child anxiety. In other words, would the anxious children still have reduced their anxiety had they worked on a more structured play task (e.g., block building) rather than playing freely with

the Lassie dolls? To understand if the kind of play matters to emotion regulation, in the current study I compared the effects of two different play interventions. I staged both a pretend free-play activity and a structured, non-pretend play activity (i.e., puzzle building), to examine which type of play is responsible for facilitating preschoolers' emotion regulation processes.

**Creativity as a Mediator**

Though a relation between pretend play and anxiety regulation is supported, little is known about the mechanisms underlying this connection. Investigating this gap in the literature, the current study considered creative thinking as a potential mediator. Creativity and pretend play are theoretically connected on the grounds that they both involve free, flexible, and exploratory thought (Hoffman & Russ, 2012). Indeed, pretend play is an open-ended space, affording children the opportunity to engage their imaginations, to express various ideas, emotions, and symbols, and to compose novel and fantastical stories (Russ & Wallace, 2013). One major cognitive process involved in both creativity and pretend play is divergent thinking—or the ability to generate a variety of ideas and novel solutions to problems (Russ, 2014; Russ & Kaugars, 2001). Divergent problems, as opposed to convergent problems, do not have a single right answer and thus encourage the investigator to explore numerous creative solutions (White, 2012).

Children in play engage in divergent thinking by making up alternative story endings to their fictional narratives and using props in multiple different ways (Hoffman & Russ, 2016). For example, a child may pretend to be a pirate, using a stick as both his paddle and his sword. Indeed, considerable research supports that divergent thinking patterns are exercised during pretend play (Danksy, 1980; Hoffman & Russ, 2016; Wallace & Russ, 2015). Dansky (1980) was the first to experimentally support this theory, finding that children who engaged in make-

believe free play performed better on an alternative uses task (a common measure of divergent thinking), than children participating in more realistic types of play.

Pretend play research has also linked divergent thinking to creative story-telling, and both divergent thinking and story-telling to pretend play (Hoffman & Russ, 2016; Russ & Fehr, 2016). Preschoolers who scored high on a divergent thinking task were also found to score high on a creative story-telling task (Russ and Fehr, 2016). Results of this study further indicated that both story-telling and divergent thinking positively correlated with the amount of affect expressed in play. Therefore, there is evidence to support that these two creative processes (i.e., divergent thinking and story-telling) are linked to each other, and to pretend play. Interestingly, Vandenberg (1980) weaves together the processes of pretend play, creativity, and problem-solving—all of which, he theorizes, require insight abilities and a search for various novel solutions. Conceptually, if a pretend player can creatively generate many uses for a single object, then he should also be able to creatively generate many novel solutions to a problem.

Creativity is the mechanism proposed to be driving the relation between pretend play and anxiety regulation. Pretend play has been supported as an exercise in divergent thinking, meaning that children are thinking in unique and free ways, coming up with new and creative ideas for their play. With this creative thinking already underway, children in pretend play may be more prepared to think creatively about possible solutions to a problem than children who do not pretend play. Therefore, it is expected that pretend play will help children resolve the anxiety-provoking dilemma and thus, ease their condition of distress.

**Overview of the Current Study**

The current study aimed to expand the research on the relation between pretend play and emotion regulation. Specifically, it examined how preschoolers cope with their feelings of worry,

anxiety, and uncertainty through pretend play. Previous research has linked pretend play to emotion regulation skills (Hoffman & Russ, 2016) and to coping ability (Russ, Robins, Christiano, 1999; Marcelo & Yates, 2014; Fiorelli & Russ, 2012). Psychotherapy research has shown that pretend play interventions can help young children express their emotions and resolve their anxieties associated with a traumatic event (Gaensbauer & Seigel, 1995; Patterson, Dorsey, Stutey, 2018). A limited amount of research has explored how typically-developing children use play to regulate their more common, everyday, and immediate experiences of anxiety (Barnet & Storm, 1980). This research leaves an important question unanswered — Is it pretend play, specifically, that helps children resolve their feelings of worry and distress?

The present study was the first to examine two different play conditions (i.e., pretend play and structured, non-pretend play), in an effort to understand how a preschooler's play relates to his ability to cope with anxiety. It was predicted that after experiencing a mildly arousing situation of worry and uncertainty, children who engage in pretend play would show greater reductions in their anxiety levels than children who engage in non-pretend play. In addition, the study drew on the relations among pretend play, creative problem-solving, and creative story-telling in order to explore creative thinking as a potential mediator. It included a story-ending narration activity —a creative performance task that blends both problem-solving and story-telling. In this task, children were reminded of the unresolved movie scene that they had previously viewed, before being asked to narrate a story about what may happen next (Gaensbaur & Siegel, 1995). Theoretically, the children who had just exercised divergent thinking processes in pretend play should be more apt to consider many creative resolutions to the movie's conflict, thus resolving their feelings of anxiety. Therefore, creativity was predicted to mediate the relation between play type and anxiety level, such that pretend players would

score higher on a creativity measure and show greater reductions in their anxiety, compared to non-pretend players.

## Method

### Participants

Thirteen participants (8 boys, 5 girls), ranging in age from 4 to 7 years ($M$ = 4.7, $SD$ = 1.03) were recruited for the study from the Clinton Early Learning Center (CELC), a local organization offering preschool and after-school child care. Children's parents/guardians were notified about the study through flyers and parent information letters, which were distributed with the take-home materials at the CELC. Participants were also recruited from the Hamilton College campus using an email that was sent to all faculty and staff. These children participated in the study in the college's child development lab. Parents/guardians were asked to complete consent forms if they agreed to allow their child to participate and assent was obtained from the children. Participants came from nearby towns within Oneida County and were all White. No monetary compensation was provided, as the study occurred during a normal school day. However, children received a small prize for their participation.

### Measures

**Heart rate.** Heart rate is a well-researched, noninvasive method of physiologically measuring a stress response. Increases in heart rate reflect changes in sympathetic and parasympathetic nervous system activity to indicate emotional arousal. The Apple Watch Series 4 was used to measure heart rate at the following phases: baseline phase, post-film, and post-play. The Series 4 has an FDA approved EKG feature, which tracks heart rate by the wrist. The Apple Watch has been confirmed as a reliable and valid ambulatory monitor, and has been used to derive heart rate information in studies monitoring stress (Hernando, Roca, Sancho, Alesanco,

& Bailon, 2018). Children wore the Apple Watch for the duration of the study, which was strapped on securely with a child sized adjustable watchband. The researcher asked the child to sit still at each of the three time points, checked their heart rate on the heart rate app, and recorded the data manually. Increases in heart rate from baseline indicated the condition of stress.

**Affect in Play-Brief Rating Scale.** An adapted version of the APS-BR (Affect in Play Scale—Brief Rating) was used to assess children's affect in play (Sacha Cordiano, Russ, & Short, 2008). Russ (1993) originally designed the Affect in Play Scale (APS), to code pretend play for its imaginative elements, organization of plotline, and frequency of affective themes (Russ, 1993, as cited in Russ, 2004). The APS, as well as its brief version (APS-BR), are widely regarded as reliable and valid ways of measuring emotion in pretend play, and have been used in various credible studies (Christian, Rush, & Short, 2011; Fiorelli & Russ, 2012; Hoffman & Russ, 2012; Russ & Kaugars, 2001; Sacha Cordiano, Russ, & Short, 2008).

The first component of the APS-BR involves the observation of a standardized 5-minute puppet play task, without the use of video-recording. Rather than puppets, the current study involved stuffed animals and toys relevant to the film. The stuffed animals included two dogs and a cat, which represent the film's characters— Chance, Shadow and Sassy. The gallon-sized bucket was chosen to resemble the large hole featured in the film and the blocks were chosen to stimulate more interest in play.

The APS-BR also includes a coding system, where the observer rates play on five constructs. The coding system was adapted to include three of these constructs, including imagination (novelty and uniqueness of plotline), organization (complexity of plotline), and comfort (involvement in play). The fourth construct, positive/negative tone of affect expression,

was modified to become "frequency of positive/negative affective expressions." These four constructs are rated on a 4-point Likert-type scale, where higher numbers denote greater strength of the construct. For Organization, (1) indicates unrelated and disjointed events in play and (4) indicates a thorough plotline. For Imagination, play can range from (1) no symbols or fantasy to (4) many novel fantasy elements. For Comfort, (1) indicates child distress and hesitation in play and (4) indicates being comfortable and involved in play. The Positive/Negative Affect construct is scored by estimating the number of times negative emotions (such as aggression, anxiety/fear, sadness/hurt, frustration/disappointment) and positive emotion (such as happiness, affection, excitement) are expressed. These categories were chosen because they relate to either the unresolved worry from the movie (aggression, anxiety, sadness, frustration) or some resolution of this uncertainty (affection, happiness, excitement). Both positive and negative expressions are estimated in number and scored, where (1) indicates 0 to 2 affect units and (4) indicates more than 15 units. A unit of affect expression is defined as one scorable expression by the participant or the toy held by the participant (e.g., "this is fun"). Expressions can be verbal (e.g., "I love you") or non-verbal (e.g., "stuffed animals/toys hugging each other"). The result is a score representing negative affect and a score representing positive affect. This measure was included to check for correlations between expression of affect in play and child anxiety level. The single scores derived from each subscale were left as single units representing the individual construct (see Appendix A for complete APS-BR scoring manual).

**Story-Telling Creativity Scale.** Story endings, as provided by the child, were measured for their creativity based on an adapted version of the scoring system posed by Hennessey and Amabile (1998). This system is designed to score full story-telling narratives based on ten constructs (i.e., creativity, liking, novelty, logic, emotion, grammar, detail, vocabulary,

straightforwardness, and imagination). The adapted version (Hoffman & Russ, 2012) includes four of these constructs, which have been shown to load highly on a creativity factor (Hennessey & Amabile, 1998). These variables include creativity (novelty and usefulness of imaginative elements), imagination (amount of extra information added to the story), and novelty (originality of imaginative elements). They are scored on a 5-point Likert-type scale, where (1) indicates low creativity and (5) indicates high creativity. The researcher was not given criteria, but scored the four variables subjectively. A final composite score was generated by summing the total scores of each subscale (see Appendix B for full script and scale).

**Mood-check rating.** A self-report measure of anxiety was used to supplement the physiological measure to further validate the anxiety-induction phase. Children were asked to answer two standard questions about their feelings of worry and nervousness at the post-film and post-resolution phases. Participants responded to the following two questions on a 4-point scale:

> Do you feel worried about Shadow and his friends?
>
> Are you nervous about what will happen to Shadow and his friends, or if they aren't going to make it home? (See Appendix C for full scale).

A composite score representing how worried the child felt was later derived by averaging the scores from the two questions.

**The NIH Toolbox Picture Vocabulary Test.** The NIH Toolbox Picture Vocabulary Test was used to assess children's vocabulary abilities. This receptive vocabulary measure is administered in a computerized adaptive format, where the participant receives the next question based on his/her previous response. In this task, the participant receives an audio recording of a word along with four corresponding images, and is asked to choose the picture that best matches the meaning of the word. The test is about four minutes long and has been approved for children

as young as three years old (Slotkin et al., 2012). This measure was included to control for differences in vocabulary level among participants, which may affect their performances on the story-telling task. The program calculates a composite score for each participant.

**Emotion regulation parent questionnaire.** Parents of participating children completed a brief questionnaire about their child's emotion regulation skills, which was attached to the demographics form. This measure was included to check for correlations among parent-reported emotion regulation skills, the child's play behavior (in the experimental condition), and the child's anxiety scores on both the physiological measure and the mood-check rating (see Appendix F for full questionnaire).

**Procedure**

Consent to conduct the study was first obtained from the Clinton Early Learning Center (CELC), from parents/guardians (Appendix D), and assent from the children involved (Appendix E). Parents also completed a demographics form and a short questionnaire about their children's emotion regulation (Appendix F). In the weeks prior to the testing phase, the researcher volunteered in a CELC classroom over the course of a one month period. The researcher's visits were intended to build comfort and familiarity with potential participants.

Beginning the testing portion, participants were randomly assigned into the play experimental condition or the "no-play" control condition. The individualized testing sessions occurred once, and lasted approximately 15-20 minutes. The first measure administered was the vocabulary test, which offered an index of the participants' vocabulary skills. The researcher then showed the child a picture of Shadow, and if they liked Shadow and if they were worried about Shadow. Baseline physiological measures of children's state anxiety were then taken using the

Apple Watch and recorded. Next, all children were read a standard script prefacing the 3-minute movie clip:

> Okay, [child's name], we are going to do a few activities today. The first activity that we are going to do is watch a short scene from the movie, *Homeward Bound*. This is an older movie about a dog, Shadow, and his friends, who are very far from home and are trying to find their way back. Throughout their journey, they have to face a lot of hard things. In the scene you're about to watch, the three friends run into some trouble when trying to cross the railroad tracks safely. Do you feel okay with watching this video? *(If child says yes then proceed)*. Great, let's sit down and watch it.

A scene from the G-rated movie, *Homeward Bound (1993)*, was shown to children to induce mild feelings of worry and uncertainty. In this clip, the main character (Shadow) falls into a large hole and struggles to get out. His friends, Sassy and Chance, express their concern and nervousness for him but are unable to help. There is some ominous music played and it seems unlikely that Shadow will be able to continue the journey. After viewing the scene, participants were read the following script in an effort to maximize the worrying effect of the video:

> *Oh no! Shadow is in trouble! He looks so scared and hurt. There is no one around to help him, except for his two friends. His friends look really worried, and like they don't how to help him. I feel pretty worried and nervous about how Shadow is going to get better and get home. What if he and his friends can't make it back?*

Children's physiological stress levels were recorded for a second time, and children self-reported on their feelings (Appendix C). Next, children in the experimental condition were given toys

relevant to the movie's plot line, including the stuffed animals, a gallon-sized bucket, and wooden blocks. Children were read the following standard script with instructions for play:

> *Please play with these toys however you would like. There are no rules here, so you can make anything up. Please use your voice when you play and make the stuffed animals talk. You can do whatever you want with the toys! You will receive a small prize after you play for five minutes.*

Children then played for 5 minutes and were scored on their affective expression using the APS-BR (Appendix A). Children in the control condition were tasked with working on a puzzle, receiving the following instructions:

> *I am here to learn about how you figure things out. Can you please work on this puzzle for 5 minutes? You do not have to finish it. Just do the best you can! When the 5 minutes is over, you'll get a small prize.*

An age-appropriate puzzle, as recommended and provided by the CELC, was pre-prepared on a table for the child to work on individually after viewing the movie. There was no pressure for the children to complete the puzzle and they received the same small prize as the children in the experimental condition, regardless of their performance. Following the 5-minute play intervention, children's physiological anxiety levels were measured for a third time using the Apple Watch.

A story-telling task was then administered to measure creative problem-solving in both conditions (Fehr & Russ, 2017; Hoffman & Russ, 2012). Children were reminded of the video they had previously watched and were asked to tell a story about what happens next (Gaensbaur & Siegel, 1995). Children were read the following standard script:

*I am still worried about Shadow and his friends from the video and would like to know what happened to them. Can you please tell me what you think happened to Shadow, Sassy, and Chance next?*

Children were then rated on the creativity of the story endings (Appendix B). Afterwards, participants were shown the happy ending of the video to resolve their uncertainty. The researcher also measured the children's physiological stress and delivered the mood self-report for the last time after they had seen the movie's happy ending. Finally, children were thanked and debriefed, given a small prize, and led back to their regular classroom (Appendix G). Parents of the experimental group (Appendix H) and of the control group (Appendix I) were offered a debriefing letter and an opportunity to ask questions if they had any concerns.

## Results

### Preliminary Analyses

Preliminary analyses showed that the values of skewness and kurtosis for all continuous variables, including age, vocabulary score, heart rate, self-reported worry, and creativity were within the acceptable bounds of -3 and 3 (Byrne, 2010; Hair, Black, Babin, & Anderson, 2010). One exception was noted on the parent-report emotion regulation measure. The item, "My child watches movies with conflict" was non-normally distributed, with skewness of -1.61 ($SE = 0.62$) and kurtosis of 4.59 ($SE = 1.19$). This item was later eliminated from the data. Data across the continuous variables followed a normal distribution. A preliminary, independent samples *t*-test further revealed that there were no significant differences between conditions on the variables of age, vocabulary, emotion regulation, heart rate (Time 1 and Time 2), and self-reported worry at Time 2 ($p > .05$). A chi-square also showed no significant differences between conditions on the variables of gender, race, if children initially liked Shadow, and if children were initially worried

about Shadow ($p > .05$). Random assignment to condition was successful. See Table 1 for descriptive statistics and correlations among variables.

Table 1.

*Descriptive Statistics and Correlations for All Variables*

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | *M* | *SD* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Age | — | .66* | -.24 | -.35 | -.28 | -.38 | -.02 | -.11 | .21 | 4.69 | 1.03 |
| 2. Vocabulary | — | — | -.25 | -.11 | -.18 | -.23 | .28 | .21 | .00 | 68.23 | 8.91 |
| 3. Emotion Regulation | — | — | — | -.06 | -.04 | .31 | .38 | .21 | .49 | 2.46 | 0.56 |
| 4. Heart rate Time 1 | — | — | — | — | .85** | .76** | -.37 | -.32 | -.44 | 89.46 | 10.59 |
| 5. Heart rate Time 2 | — | — | — | — | — | .83** | -.38 | -.37 | -.39 | 104.77 | 9.36 |
| 6. Heart rate Time 3 | — | — | — | — | — | — | -.12 | -.06 | -.23 | 93.69 | 10.35 |
| 7. Worry Time 2 | — | — | — | — | — | — | — | .73** | .29 | 2.08 | 0.70 |
| 8. Worry Time 3 | — | — | — | — | — | — | — | — | -.15 | 1.85 | 0.47 |
| 9. Creativity | — | — | — | — | — | — | — | — | — | 7.31 | 3.99 |

Note. *$p < .05$. **$p < .01$

Bivariate correlations were conducted with the variables of age, heart rate, self-reported worry, emotion regulation, and creativity. One important finding was that two items measuring emotion regulation, "My child communicates their emotions well" ($M = 2.54$, $SD = 0.52$) and "My child talks about feelings at home" *(*$M = 2.38$, $SD = 0.65$) were significantly positively correlated, $r(11) = .82$, $p = .001$. These two items were averaged to create a composite score representing emotion regulation ($M = 2.46$, $SD = 0.56$) and used it in the main analyses. A second important finding was that the two items on the worry self-report scale, "Are you worried about Shadow?" ($M = 2.15$, $SD = 0.69$) and "Are you nervous if Shadow is going to make it home?" ($M = 2.00$, $SD = 0.82$) were significantly positively correlated post-manipulation, $r(11) = .74$, $p = .004$ but not post-intervention, $r(11) = .46$, $p = .115$. These two items were averaged at both time points to create a composite score for the child's degree of worry at both Time 2 ($M = 2.08$, $SD = 0.70$) and Time 3 ($M = 1.85$, $SD = 0.47$). These two composite scores representing the child's worry were used in the main analyses. Correlation analyses reveled low internal consistency for the quality of play measure and this measure was not included in main analyses.

**Main Hypotheses**

**Anxiety.** A repeated-measures ANOVA was conducted to assess differences in heart rate at Times 1, 2, and 3. The pretend play condition was predicted to show a lower mean heart rate at Time 3 (post-intervention), compared to the control. As shown in Figure 1, results showed a significant main effect of time on heart rate $F(2, 22) = 36.05$, $p < .001$, $\eta_p^2 = 0.80$, but no significant interaction between heart rate and condition $F(2, 22) = .07$, $p = .935$, $\eta_p^2 = 0.01$. Follow-up comparisons showed that this effect reflects a difference between Times 1 and 2 ($p < .001$) and Times 2 and 3 ($p < .001$). Regardless of condition, participants' heart rates increased after viewing the movie, meaning the manipulation was successful. There was no main effect of

condition on heart rate $F(1, 11) = .10$, $p = .757$, $\eta_p^2 = 0.01$, meaning the mean heart rate of the pretend play condition did not significantly differ from that of the control condition on average.

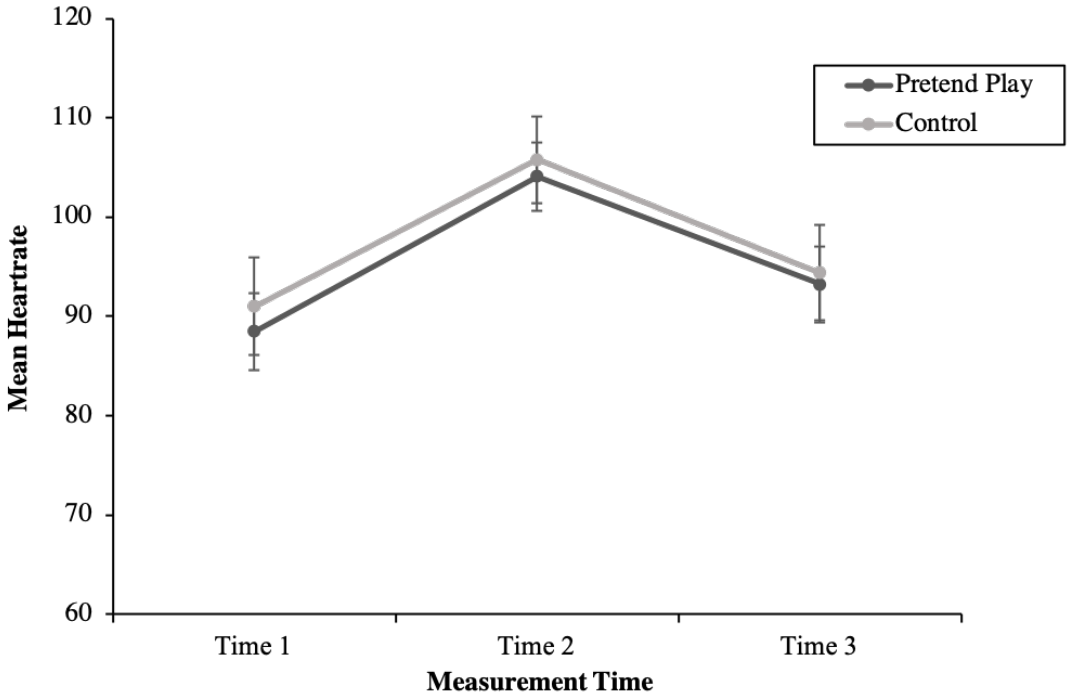


*Figure 1*. A main effect of time on heart rate was found, such that heart rates were highest at Time 2. There was no main effect of condition and no significant interaction. Conditions did not differ on heart rate at Time 1, Time 2, or Time 3. The error bars represent standard error.

A repeated-measures ANOVA was also used to assess differences in how worried children felt at Time 2 and Time 3. The pretend play condition was predicted to report feeling less worried at Time 3, compared to the control. As shown in Figure 2, there was no significant main effect of time on self-reported worry $F(1, 11) = 2.16$, $p = .17$, $\eta_p^2 = 0.16$, and no significant

interaction between self-reported worry and condition $F(1, 11) = .57, p = .465, \eta_p^2 = 0.05$. Therefore, children in both conditions did not feel less worried after the intervention. There was no main effect of condition on self-reported worry $F(1, 11) = .96, p = .349, \eta_p^2 = 0.08$, meaning the pretend play and control groups did not differ on how worried they felt on average. Follow-up planned comparisons revealed a large effect size of pretend play at Time 3, $t(11) = 1.63, p = .132, d = .93$. This preliminary finding suggests that pretend play may have had some effect on how worried children felt after the play intervention.

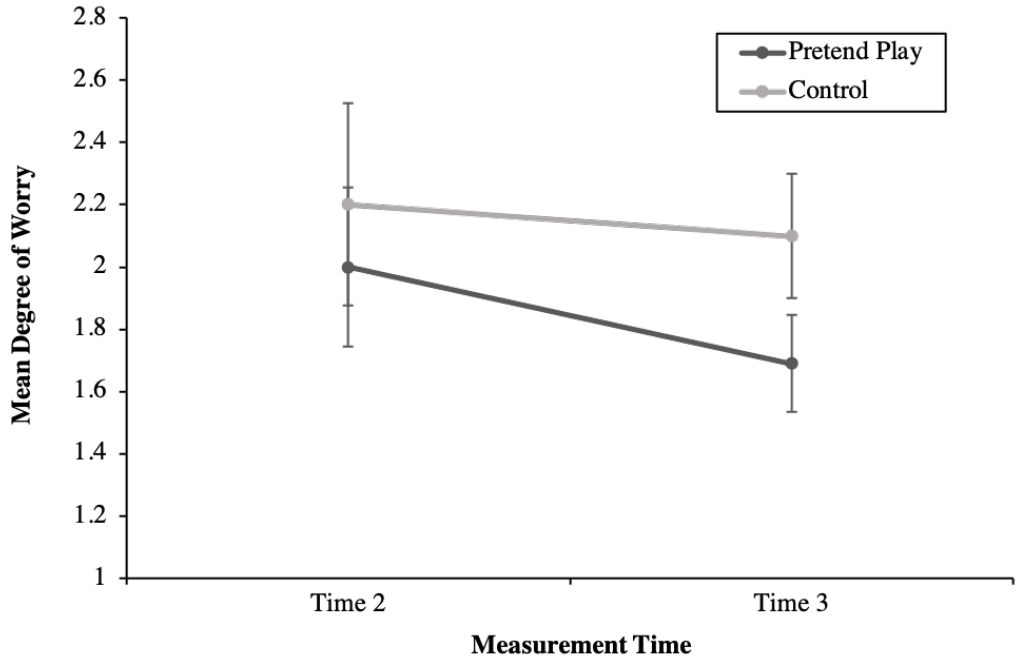


*Figure 2*. No main effects of time or condition on self-reported worry, and no significant interaction were found. Participants did not significantly differ on how worried they felt at Time 2 or Time 3. The error bars represent standard error.

**Creativity.** An independent samples *t*-test was performed to assess differences between conditions on the measure of creativity. The pretend play group was predicted to show stronger creativity than the control. As shown in Figure 3 and as predicted, pretend players were significantly more creative in their story-telling ($M = 9.38$, $SD = 3.66$) than children in the control group ($M = 4.00$, $SD = 1.41$); $t(11) = -3.01$, $p < .05$. After controlling for the variables of age and vocabulary with an ANCOVA, differences remained between the two conditions' creativity scores, $F(1, 9) = 9.01$, $p = .015$ This result indicates a relation between pretend play and creativity.

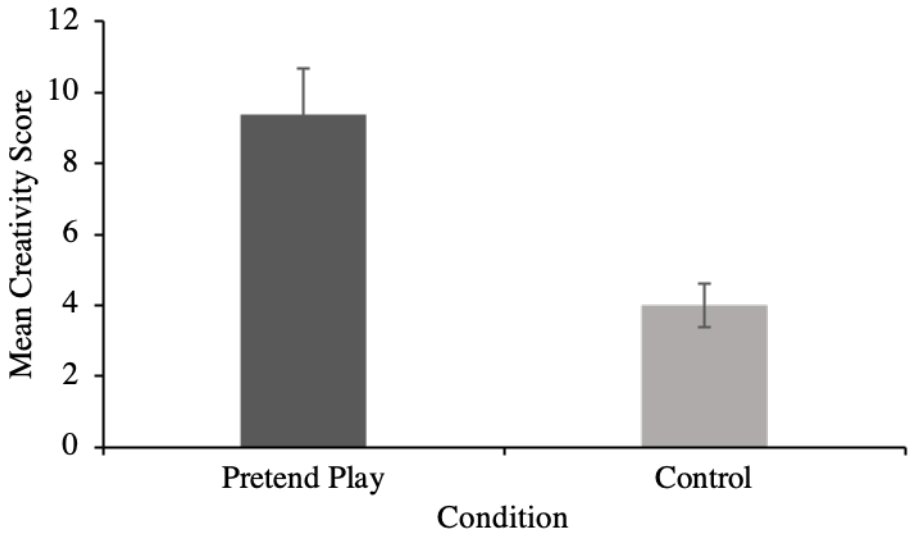


*Figure 3*. Mean creativity demonstrated on the story-telling task by the pretend play and control conditions. The error bars attached to each figure represent standard error.

**Mediation analyses.** The Hayes Process Model for SPSS was used to examine the hypothesis that creativity mediated the relation between pretend play and worry at Time 3, controlling for how worried children felt at Time 2 (Hayes, 2018). Results of bias corrected bootstrapping tests with 10,000 replications indicated that pretend play did not predict worry, $b$ = -.32, $p$ =.102, 95% CI [-0.72, 0.08]. Pretend play predicted creativity, $b$ = 5.8, $p$ < .05, 95% CI [2.36, 9.29] however, creativity did not predict worry, $b$ = -.03, $p$ = .371, 95% CI [-0.12, 0.05]. The indirect coefficient was non-significant, $b$ = -.20, 95% CI [-0.70, 0.27], concluding that creativity did not mediate the relation between play and worry (see Figure 4).

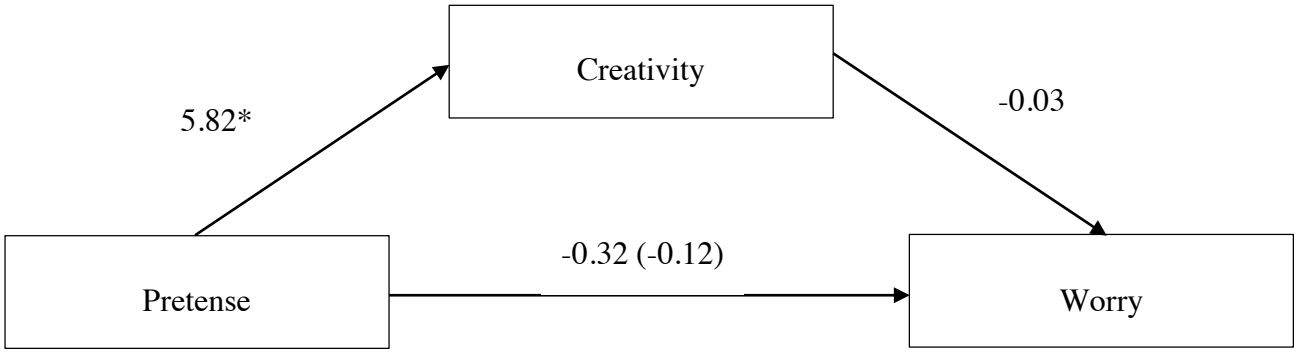


*Figure 4*. Regression analysis controlling for baseline levels of worry. Pretend play does not predict the degree of worry felt directly, or indirectly through creativity. Values represent unstandardized beta values. *$p$ < .05.

## Discussion

The first notable finding of the current study is that the participants' heart rates increased after watching the stressful movie, and then decreased after the play intervention. This finding is consistent with past research that has used a video to provoke a physiological stress response among young children (Barnett and Storm, 1981). Previous research has used a sweat index to measure changes in physiological anxiety after the participants viewed a worrisome, unresolved movie clip. My study shows that a similar manipulation (i.e., an unresolved movie scene) can be used to raise heart rate too—a different measure of physiological anxiety. However, the self-report measure of anxiety yielded a different result. Participants did not report feeling less worried after the intervention than they had before. This finding is inconsistent with previous play research, which has found that young children made to feel anxious self-report a return of positive feelings after play (Christian, Russ, & Short, 2011). However, the large effect size of pretend play on self-reported worry must be considered, because it indicates that conditions differed to some extent in how worried they felt after the intervention. The average amount of worry reported by pretend players trended lower than that of non-players. It is possible that this effect size simply did not reach significance due to the small sample size of 13 children. Though just a preliminary finding, the evidence that pretend play and anxiety regulation may be associated suggests that pretend play could benefit children learning to manage immediate feelings of worry or uncertainty.

One reason that may explain the discrepancy between the effects of the two dependent variables is the reliability of the self-report measure. Results showed that the two items comprising this measure were correlated at Time 2, but not at Time 3. Given its low internal consistency, the results of the self-report can only be interpreted cautiously. Still, it is important

to note that on this 4-point scale, the mean value representing how worried children felt at Time 2 was high, $M = 2.07$, showing that the majority did indeed, report feeling worried after viewing the movie. A second reason that may account for the non-significant changes in self-reported worry may be potential demand effects. It is possible that young children recalled how they responded to the self-report questions at Time 2, and simply carried over their answer so as to respond in the same way at Time 3. In this sense, children may have been more cognizant of how they had previously reported than how they were currently feeling.

Second, the play and control conditions did not differ from each other on the level of their physiological anxiety after the play intervention. This finding is inconsistent with previous play research that has examined the effect of play on child anxiety. For example, Milos and Reiss (1982) found that preschoolers who partook in one of three different kinds of thematic play showed less anxiety after the intervention compared to the control group who did not play. Theoretically, we would expect pretend play to have served children the same "working through" function that these researchers point to in their discussion. It is quite possible however, that the results did not align due to differences in how anxiety was measured. Whereas the present study used self-report and a physiological index of anxiety, Milos and Reiss (1982) measured how often the child stuttered and showed other speech disturbances when retelling an anxious experience.

At the same time, the research by Milos and Reiss (1982) also points to a possible reason for why the two conditions showed relatively equal reductions in physiological anxiety at Time 3. As in our study, the researchers did not find differences in anxiety among the three different play-type groups after the intervention. This suggests that simply having the opportunity to play—whether that be pretend play or play with a puzzle—fueled the participants' decreases in

anxiety. Including a control condition that works on a task completely unrelated to play or games may help to improve the current method. This would require additional research to avoid the potential introduction of a confound to the study. A second reason to account for the reduced physiological anxiety of both conditions may be explained by the experience of comfort. Christiano and Russ (1996) support this theory in their study, which examined the relations among play, coping, and distress in the context of a stressful dental procedure. Children who showed a high quality of play also showed stronger use of coping strategies to deal with their distress. To explain this finding, the researchers point to the positive correlation between the degree of comfort shown during the play task, and the frequency and variety of coping strategies employed. Therefore, it is possible that comfort served as a mediator for both conditions, allowing children to relax into a context they were familiar with and enjoyed.

Third, children who pretend played showed higher creativity in their storytelling compared to the control. It is likely that pretend players could think more creatively about what would happen to Shadow next, because they had just freely and openly engaged their imaginations (Russ & Wallace, 2013). In other words, the exploratory world of pretend play primed children with the creative thinking needed to respond to the question. This finding aligns with a robust body of literature supporting that pretend play stimulates creative-thinking processes (Danksy, 1980; Hoffman & Russ, 2016; Wallace & Russ, 2015). For example, Dansky (1980) found that children who involved make-believe elements in their free play showed stronger creative thinking than children who did not play, such that they could propose many more potential uses for a simple object like a screwdriver. However, it is important to acknowledge the possibility that pretend players told more creative stories simply because Shadow's circumstance was more recent and more available in mind. These children remained

physically connected to the context of the movie by playing with related toys, whereas those in the control were separated with a puzzle task. The memory of the movie was therefore more distant to the control, which may have made it more difficult for them to think creatively about Shadow's problem.

Finally, creativity was not related to children's anxiety levels after the play intervention. Theoretically, the creative thinking that was shown to be stimulated during pretend play did not help children manage their emotions. This suggests that pretend play may have facilitated creative-thinking processes, but not the more specific, creative problem-solving processes that we would expect to be necessary to cope with or resolve negative emotions. It is possible that the creative story-telling script did not adequately stimulate problem solving. Rather than asking children, "What do you think happens to Shadow next?," we may consider posing a question more along the lines of, "How would you help Shadow get home?," which may better engage problem-solving efforts. Overall, my study points to the need for a better measure of creative problem solving in play research, perhaps one that differs from the most commonly used alternative uses task (Dansky, 1980; Wallace & Russ, 2015). This task measures a child's creativity based on the number of different uses they can propose for simple objects, such as a cup or a paper towel (Danksy, 1980). Perhaps a model that would be more appropriate for research on play and anxiety would be one adapted from the "School Coping Scale," which asks children to propose various different ways they could deal with a series of potential problems (Russ & Kaugars, 2001). A measure with a similar design would likely provoke creative thinking that relates more directly to problem-solving processes.

A second reason for why pretend play might not have stimulated creative thinking is rooted in the nature of the play intervention. Wyver and Spence (1999) examined the relations

between different forms of play and divergent problem solving. One interesting finding from this study was that play forms such as sociodramatic and thematic play were associated with problem-solving skills, but object-dependent play was not. This result leads us to question if the pretend play intervention of the current study may have been more effective if it was not "object-dependent," or in other words, the toys used were not directly related to the theme of *Homeward Bound (1993)*. Although inconsistent with Barnett and Storm (1981), researchers may consider revising the intervention to provide completely unrelated toys to engage children in play with an unrelated theme.

**Implications**

The current study expands the limited research showing that we can examine the effects of pretend play by inducing an anxious state. Much of the research on play and anxiety regulation comes from special populations (Gaensbauer & Seigel, 1995; Goldstein & Lerner, 2016; Patterson, Dorsey, & Stutey, 2018), with little from normative samples (Barnett & Storm, 1981; Christian, Russ, & Short, 2011). Because this study's manipulation was successful, it can serve as a platform for future researchers examining how children regulate their emotions in response to an immediate stimulus. Future researchers may consider examining if this effect holds for an anxiety manipulation that is more relevant to the child's life. They may consider using a video about a child getting lost in a grocery store or at the park for example, as these experiences may be more familiar and relevant to a young child.

Second, the finding of the large effect size of pretend play on self-reported worry carries potential implications for the structure of the preschool and kindergarten classrooms. This study suggests that teachers should prioritize child-directed, free, pretend play in early-education, as opposed to a more structured, academic, and content-based approach. Integration of pretend play

in early education would help children gain the practice they need with emotion regulation strategies before entering grade school. One of the best examples of a curriculum that integrates pretend play in a way that is consistent with the current study is "Tools of the Mind" (Tools of the Mind). This is a Vygotskian intervention that blends academic activities with child-directed, sociodramatic pretend play to advance academic learning, socioemotional competence, and emotion regulation skills (Tools of the Mind). Blair and Raver (2014) confirmed the effectiveness of the Tools of the Mind program longitudinally, finding that kindergarteners in participating schools performed better on measures of self-regulation and academic learning over the course of the school year than those in control schools. Researchers can help teachers integrate pretend play for socioemotional growth by developing more pretend play-based curricula such as Tools of the Mind.

Finally, the finding that creative thinking is involved in pretend play provides additional implications regarding the structure of the preschool classroom and the design of pretend play interventions. Because pretend play and creativity are related, improving play skills should improve creative-thinking skills. Play intervention research supports that we can in fact, enhance a child's play skills in developmentally beneficial ways. Moore and Russ (2008), for example, found that an imagination-focused intervention improved children's scores on a measure of play quality (APS), and that these improvements were stable overtime. The results of the current study indicate that interventions should target pretend play skills, because improving these skills should also improve creative-thinking skills. Furthermore, the creative-thinking measure was grounded in creative story-telling, meaning pretend play should theoretically help to develop creative writing abilities too. Therefore, future researchers should examine the use of pretend play interventions to enhance the creative writing skills required for later elementary years.

**Limitations**

A major limitation of the present study is the small sample size of 13 children. With low power to detect main effects, the major findings were non-significant. The small sample size may also explain the low internal consistency of the quality of play measure and the emotion regulation parent report. With non-significant correlations among items, the study could not reliably derive information about how certain pretend play qualities or emotion regulation abilities may impact a child's ability to cope with anxiety. Furthermore, two items on the self-report anxiety measure were not significantly correlated at Time 3, meaning that the composite scores and the effect size of pretend play must be interpreted cautiously. Overall, a larger sample size may help to bring correlations and effects to significance. A more heterogenous sample would also improve the generalizability of the study's findings, allowing the results to be used to benefit a more diverse population of young children. Finally, the difficulty of administering a self-report measure reliably to a young age group is acknowledged. However, the self-report measure remained the best option given the limited resource availability and the difficulty of measuring state anxiety in a brief period of time.

A second major limitation is the potential influence of experimenter bias. A single experimenter independently performed the study and coded the results. Sessions were not video-recorded, meaning that the experimenter rated each participant during the session based on one observation. In this case, experimenter bias had the potential to influence the results on the quality of play scale and the measure of creativity. Collecting all data in the moment, the experimenter may have overlooked certain aspects of the child's play and elements of their storytelling, which may have otherwise led to different scores on the constructs. The quality of play measure also requires the rater to score the play of the current child relative to that of prior

participants. In the current study, the independent rater scored children relative to others by her own subjective opinion, whereas in past studies, multiple coders were involved to provide additional interpretations (Sacha Cordiano, Russ, & Short, 2008). Finally, the experimenter was aware of assignment to condition, which may have further impacted her scoring on the creativity measure. Therefore, experimenter bias may have interfered with the overall accuracy of the ratings and the validity of the results. However, the use of a solo experimenter was in the study's best interest, as the presence of additional coders in the testing room could present the influence of a confound and potentially make children uncomfortable.

A third major limitation of the current study is that there was no way to control for the passing of time. Indeed, the drop in physiological anxiety may be explained by either play or time lapse, because both conditions showed this trend. However, the passing of time cannot explain the trends in how worried children felt, given the large effect size revealed on the self-report measure. Because conditions differed to some extent in how worried they felt, the potential influence of pretend play on anxiety cannot be entirely excused by the sheer passing of time. Still, researchers may obtain stronger experimental control across the variables by re-testing the study around the occurrence of an anticipated stressor. Previous research has analyzed how pretend play relates to a child's coping skills and experience of distress before a stressful dental procedure (Christiano & Russ, 1996). The current study was interested in examining a more typical experience of distress, or one that an average child may expect to encounter on a regular day. Using Christiano and Russ (1996) as a model, a longitudinal pretend play intervention could be implemented in a second or third grade classroom before each testing day over the course of the school year. The children could be randomly assigned to a play or no-play condition before taking each test. After play, an experimenter could administer a mood self-

report and the "School Coping Scale" (Russ & Kaugars, 2001). The experimenter could then compare the child's performance outcomes on the days he had the play intervention to the days he did not. Significant results would provide a stronger impetus to focus on improving play skills in early education in order to improve later coping abilities.

**Future Directions**

My study encourages play researchers to continue to examine how pretend play helps children deal with negative emotions. There is research to confirm that pretend play and anxiety regulation are related, and my study is suggestive of this link too (Barnett & Storm, 1981; Christian, Russ, & Short, 2011; Goldstein & Lerner, 2016; Milos & Reiss, 1982). However, there is less research to explain the mechanisms through which pretend play may impact anxiety regulation and a child's ability to cope with their emotions. For whom pretend play can be developmentally advantageous is also open for additional research. Certain play skills, executive function skills, or coping abilities for example, may serve as moderators in the relation between pretend play and anxiety regulation (Carlson & White, 2013; Fiorelli & Russ, 2012; Hoffman & Russ, 2016). Future researchers should examine these gaps, in addition to improving upon the discussed limitations of the current study.

Given the low power of the current study to detect effects, the possibility that creative thinking is part of the process that links pretend play to anxiety regulation cannot be ruled out. However, another potential mechanism that my study did not examine is coping strategy. Research has linked pretend play to coping behavior, but has not measured inter-relations among play, coping behavior, and anxiety regulation in a normative sample (Christiano & Russ, 1996; ; Fiorelli & Russ, 2012; Marcelo & Yates, 2014). Future researchers could examine this gap by testing coping ability as a moderator in the current study. Perhaps with a slightly older

population, they could create an age-appropriate measure of the "The School Coping Scale," so as to obtain an index of the child's repertoire of coping strategies (Russ & Kaugars, 2001). We would expect a child with a strong ability to cope to derive the most benefit from play. A second variable that researchers should examine as a moderator is pre-reported emotion regulation skills. Researchers could build upon our 4-item parent report and include a teacher report with it, so as to create a more expansive and comprehensive measure. As with coping ability, we may expect children with strong pre-reported emotion regulation skills to benefit most from play.

Future researchers should also consider exploring which forms of play have the strongest tie to anxiety regulation for a normative sample. They may consider comparing sociodramatic, thematic, and constructive play groups, in addition to the current study's pretend play group (Milos & Reiss, 1982). It is also worth examining the influence of peers, so as to compare, for example, social play and solitary play. Li, Hestenes, and Wang (2016) found that social pretend play was positively related to skills such as self-control, cooperativeness, and assertiveness. The effect of pretend play on the development of self-regulation and emotion regulation skills may therefore differ depending on whether or not the child is playing with friends. Additional research on how play type and peer involvement influence pretend players' anxiety regulation would help play interventions understand the play skills and social contexts they should target. Similarly, researchers may consider examining if certain demographic groups within a normative sample respond differently to each of these play forms. We may find that certain play forms benefit children of a particular background more so than others. Teachers and parents would benefit from this information, learning to facilitate the kind of play that will best develop the adaptive functions their specific child needs to handle stressful situations in the future.

## Conclusion

We all experience stress, worry, and anxiety through our developmental years and into adulthood. These emotions are natural, but we can control them. Preschool is the age when children begin to develop emotion regulation skills. These skills help children cope efficiently with stressful situations they may expect to encounter entering and progressing through grade school. Pretend play is a crucial component of the preschool years, because it provides a context where young children can strengthen the adaptive functions needed to cope with stress. The current study suggests that pretend play and anxiety regulation are associated, and that with additional research, we can begin to use play as a tool for dealing with negative emotions.

If my study findings are brought to significance, they could have the potential to inform the play research agenda. First, we could design interventions to improve the play skills linked to the adaptive functions that help children cope. Second, we could use pretend play interventions before an anticipated stressful situation to mitigate or prevent an experience of distress. And third, we could arrange a pretend play setting following a stressful experience to offer the implicated child a comfortable and familiar context to express and work through his emotions. Pretend play is fun, accessible, and developmentally beneficial for young children. Parents, teachers, and researchers have much to gain from additional study of the intersections among pretend play, coping, and anxiety regulation.

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# Appendix A

## APS-BR Scoring Manual (Sacha Cordiano, Russ, & Short, 2008)

Script:

*[Experimenter]: I am here to learn about how you play. Please play with these toys however you would like. There are no rules here, so you can make anything up. Please use your voice when you play and make the characters talk. You can have the toys do whatever you want! You will receive a small prize after you play for five minutes.*

The APS-BR Play Task:

Children are given five minutes of free play time with toys related to the *Homeward Bound* movie scene, including two stuffed animal dogs, one stuffed animal cat, wooden blocks, and a gallon-sized bucket.

The APS-BR Rating Scale:

Rates the following three constructs of play on a 4-Point Likert Type Scale:

- Organization: The quality of the plot and story complexity
  1= unrelated, disjointed events and simply story
  4= integrated plot with beginning, middle, and end, and story is complex
- Imagination: The novelty and uniqueness of play, and the ability to use pretend and fantasy
  1= No make-believe, transformations, or fantasy
  4= many transformations, many novel fantasy events, and some unusual characters or plot twists
- Comfort: comfort and enjoyment during play
  1= Distressed and uninvolved; stops and starts
  4= Comfortable, involved, and enjoying play

Measures the frequency of positive and negative affect expression by counting each unit of positive affective expression and each unit of negative affective expression. The tally should be an estimation. A unit of affect is defined as one scorable verbal expression of affect (e.g., this is fun) or physical expression of affect (e.g., hugging) by a toy/character. Negative affect consists of the following categories:

- Aggression: anger, fighting, destruction, or harm
- Anxiety/Fear: expressions of fear and anxiety; actions of fleeing or hiding
- Sadness: Expression of illness, pain, sadness, and loneliness
- Frustration/Dislike: expressions of disappointment and frustration with objects or limitations

Positive affect consists of the following categories:

- Affection: empathy or sympathy with another character
- Happiness: expression of positive affect, enjoyment, contentedness
- Excitement: enthusiastic exclamations

Positive affect and negative affect are both rated on a 4-point scale:

1= low (0-2units)
2= Mild (<8 affect units present
3= Moderate (8-15 affect units present)
4= High (>15 affect units present)

A single score was obtained from each of the four subscales.

# Appendix B

## Story-Telling Scoring Manual (Hennessey & Amabile, 1998)

Dimensions (Hoffman & Russ, 2012):

1. Creativity – using your own subjective definition of creativity, the degree to which each story is creative
2. Novelty- the degree to which the plot is novel
3. Imagination – the degree to which the plot is imaginative and adds extra information

5 – Point Likert-type scale:

1 = lowest degree
5 = highest degree

Scoring:

Total scores of each dimension are summed to create one final composite score representing creativity.

# Appendix C

## Mood-Check Rating

The following questions will be delivered to children in both conditions after first viewing the movie, and then again after viewing the resolved ending. These questions are designed to check the effectiveness of the anxiety-induction, and to supplement the physiological anxiety measure. They are rated on a 4-point scale:

1. Did you feel worried about Shadow and his friends after the movie?

   If yes: Did you feel really worried, or did you feel just a little bit worried?

   Really worried  A little bit worried

   If no: Did you feel not worried at all, or did you feel a little bit worried?

   Not at all worried  A little bit worried

2. Were you nervous about what was going to happen to Shadow and his friends, or if they weren't going to make it home?

   If yes: Did you feel really nervous, or did you feel just a little bit nervous?

   Really nervous  A little bit nervous

   If no: Did you feel not nervous at all, or did you feel a little bit nervous?

   Not at all nervous  A little bit nervous

Appendix D: Parent/Guardian Consent Form

***Hamilton College***
***198 College Hill Rd.***
***Clinton, NY 13323***
***Psychology Department***

## Consent Form

**Purpose:**
The purpose of this study is to examine how pretend play could help young children cope with their worry and uncertainty. The study is part of Grace Heller's senior thesis in psychology, under the supervision of Professor Rachel White.

**Procedure:**
If you agree to be in this study, you will be asked to do the following:
Fill out a consent form and complete a brief survey on your child's demographics and experiences managing his/her emotions.

Your child will be asked to do the following:
1. Wear an Apply Watch to monitor his/her heart rate
2. Complete a computerized pre-school vocabulary test (The NIH Toolbox Picture Vocabulary Test)
3. Report on the emotions/mood that he/she is experiencing.
4. View a 5 minute scene from the movie, *Homeward Bound*.
5. Either play with stuffed animals and blocks, or work on a puzzle.
6. Create and narrate their own ending to the movie scene.

*The total time required to complete the study should be approximately 15-30 minutes. Children who complete the study at the CELC will receive a small prize.*

**Benefits/Risks to Participant:**
*Risks include any discomfort your child may feel around the video's unresolved crisis. The study is designed, however, to resolve any lingering feelings of discomfort. Your child may also choose to stop the video or end the testing at any time.*

**Voluntary Nature of the Study/Confidentiality:**
Your child's participation in this study is entirely voluntary and he/she may terminate the study at any point, or refuse to answer any questions with which he/she is uncomfortable. Your child may also ask the researcher any questions he/she may have at any time. Your child's name will not be connected to the results or to his/her responses on the questionnaires; instead, a number will be used for identification purposes. Information that would make it possible to identify participants will never be included in any sort of report. The data will be accessible only to those working on the project.

**Contacts and Questions:**
At this time you may ask any questions you may have regarding this study. If you have questions later, you may contact Grace Heller at 203-628-6528 or gheller@hamilton.edu, or her faculty supervisor, Professor Rachel White at 315-859-4518 or rewhite@hamilton.edu. Questions or concerns about institutional approval should be directed to Jeff Ritchie, Chair of the Institutional Review Board for Human Subjects iboard@hamilton.edu.

**Statement of Consent:**
I have read the above information. I have asked any questions I had regarding the experimental procedure and they have been answered to my satisfaction. I consent to participate in this study.

Name of Guardian: _____Date: _____
(please print)

Signature of Guardian: _____

Child's Name: _____

Child's Age: _____

*Thanks for your participation!*

## Appendix E

## Assent Script

Experimenter: Hi, [child's name]! My name is Grace! Today, you and I are going to watch part of a movie, play with a few toys, and make-up some stories. Before we do any of these activities, I will ask you to tell me a little about how you're feeling. You might not know for sure how you feel, and that is okay! I would just like for you to do your best. The video that we are going to watch is only about 2 minutes long, and the playtime and story-telling game will be about 10 minutes. If at anytime you would like me to stop the movie or you would like to stop playing, that is okay. You can take a break and start again as many times as you would like. If you would like to stop everything and not continue at all, that is okay too. If you have any questions about what we are doing during our time together, please ask me at any time. Playing is totally up to you! When we're done you will get to choose a small prize (*child will receive a prize whether or not they finish the study)*. Does this sound good to you? (*If the child says yes, proceed with the study)*.

Appendix F

Demographics & Child Emotion Regulation Questionnaire

Child's name: _____ Your relationship to child: _____

Child's date of birth: ____/____/_____ Child's gender (please circle one): M / F / Other

Child's race/ethnicity (please check all that apply):

- ☐ American Indian
- ☐ African American
- ☐ Asian
- ☐ Hispanic or Latinx
- ☐ Native Hawaiian or Pacific Islander
- ☐ White
- ☐ Other (please specify):
- ☐ Prefer not to answer

Please rate your child on each of the following items. Ratings should be based on your observations of your child's behavior **during the past three months.**

My Child…

| My Child… | Never | Rarely | Sometimes | Often |
|---|---|---|---|---|
| Watches movies/TV shows with uncertainty and conflict | | | | |
| Shows lingering discomfort after stressful movies/TV shows | | | | |
| Communicates his/her emotions well | | | | |
| Talks about his/her feelings at home | | | | |

## Appendix G

## Child Debriefing Script

All children will be read the following script after the story-telling task:

[Experimenter]: Great job today, [child's name]! I had so much fun watching you play! You've given me some great suggestions about what you think might have happened to Shadow, but don't you want to know what really happened? Let's go see how Shadow and his friends end up. (*The experimenter brings child back into video-viewing room and plays the resolution video-clip)*. Look at Shadow! He's okay after all, and he looks so happy! Now that we know Shadow is okay, how are you feeling? *(Child reports on the Mood-Check Rating, and researcher measures physiological anxiety and checks for any evidence of lingering uncertainty)*. Do you have any questions about Shadow and his friends, or the movie in the general? (*Child asks any questions)*. Do you have any questions about your playtime (puzzle task for control condition) or story-telling? (*Child asks questions)*. Okay, well I'm so glad we got to spend some time together today, and hmmm I remember promising you a small prize. Should we go get that now? (*Experimenter gives child small prize)*.

Appendix H

Debriefing Handout for Parent/Guardian of Experimental Condition

Dear Parent or Guardian,

Thank you for your participation in my study on preschool children's emotion regulation skills. I am very appreciative of your help in my senior thesis project.

For my senior thesis, I am interested in exploring how children cope with their emotions through pretend play. Before beginning my experiment, I first volunteered in your child's classroom to build comfort and familiarity. During the testing phase, I asked your child to wear an Apple Watch to track his/her heart rate and emotional arousal. As the first activity, your child watched a moderately stressful scene from the movie, *Homeward Bound,* where the main character, Shadow, falls into a hole and struggles to get out. After reporting on his/her mood, your child played freely with stuffed animals and blocks for five minutes. Your child was then asked to tell the experimenter what he/she thought happened to Shadow and his friends, before viewing the movie's real happy ending. Finally, I asked your child a few questions to make sure he/she understood that Shadow was okay in the end, and made sure any feelings of worry or uncertainty were resolved.

Your child's participation in my study has helped to inform our understanding about how pretend play can be used to improve a child's coping skills. If you have any questions regarding this study, I encourage you to reach me by phone at 203-628-6528 or by email at gheller@hamilton.edu. Thank you again for making this important research possible!

Sincerely,

Grace Heller
Hamilton College '19

# Appendix I

## Debriefing Handout for Parent/Guardian of Control Condition

Dear Parent or Guardian,

Thank you for your participation in my study on preschool children's emotion regulation skills. I am very appreciative of your help in my senior thesis project.

For my senior thesis, I am interested in exploring how children cope with their emotions through pretend play. Before beginning my experiment, I first volunteered in your child's classroom to build comfort and familiarity. During the testing phase, I asked your child to wear an Apple Watch to track his/her heart rate and emotional arousal. As the first activity, your child watched a moderately stressful scene from the movie, *Homeward Bound,* where the main character, Shadow, falls into a hole and struggles to get out. After reporting on his/her mood, your child worked on a puzzle for five minutes. Your child was then asked to tell the experimenter what he/she thought happened to Shadow and his friends, before viewing the movie's real happy ending. Finally, I asked your child a few questions to make sure he/she understood that Shadow was okay in the end, and made sure any feelings of worry or uncertainty were resolved.

Your child's participation in my study has helped to inform our understanding about how pretend play can be used to improve a child's coping skills. If you have any questions regarding this study, I encourage you to reach me by phone at 203-628-6528 or by email at gheller@hamilton.edu. Thank you again for making this important research possible!

Sincerely,
Grace Heller
Hamilton College '19