

EFFORTFUL CONTROL AND SPONTANEOUS REGULATION OF
EMOTIONAL BEHAVIOR IN CHILDREN

A Senior Honors Thesis

by

JESSICA E. KIERAS

Submitted to the Office of Honors Programs
& Academic Scholarships
Texas A&M University
in partial fulfillment of the requirements of the

UNIVERSITY UNDERGRADUATE
RESEARCH FELLOWS

April 2002

Group: Psychology 1

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April 2002

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ABSTRACT

Effortful Control and Spontaneous Regulation of
Emotional Behavior in Children. (April 2002)

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The development of Effortful Control and Regulation of Emotion in children was examined in this study. Of particular interest was the relationship between self-regulation and responses to social norms. Participants were between ages three and five and their parents. Regulation of emotion was measured by observational coding of children's reactions to receiving gifts of varied desirability. Effortful control functions included slowing down motor activity, and suppressing/initiating motor response to signal. A linear regression revealed a significant relationship between Effortful Control scores and Emotional Regulation after receiving an undesirable gift. Furthermore, this relationship was stronger when only the tasks involving suppressing/initiating motor response to signal were used to measure Effortful Control.

This thesis is dedicated to the children of Sheltering Arms.
Their resiliency has been my inspiration through times thick and thin.

ACKNOWLEDGMENTS

I would like to acknowledge William Graziano for his dedication and assistance with this project. In addition, I would like to thank Renée Tobin for her encouragement and support. Finally, I wish to acknowledge the undergraduate research assistants who assisted in the data collection phase of this project.

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INTRODUCTION

Beginning at birth, children develop a variety of skills that allow them to understand and interact effectively with the world around them. As children grow older, individual differences emerge in the use of these skills. It is not completely clear what causes these individual differences, but most theorists agree that temperament and socialization are two major contributors.

Temperament refers to the early appearing individual differences in responses to the environment. In theory, temperament is the early-appearing precursor to personality. Because temperament appears early in infancy, researchers assume that temperament can influence life experiences. In particular, it may predispose children to receive certain kinds of treatment during development. For example, adults will treat the happy child who seeks cuddling in a way different from the irritable child who tries to avoid close conflict.

In Rothbart's (2000) approach to temperament, one of the most important aspects is "Effortful Control". Effortful control is a kind of master temperament that is connected to self-regulation, and is defined as the ability to suppress a dominant response in favor of a subdominant response (Kochanska, Murray, & Harlan, 2000).

Although Effortful Control, like other aspects of temperament, has a genetic component, it can also be moderated by the environment (Rothbart, Ahadi, & Evans,

This thesis follows the style and format of the Developmental Psychology

2000). For example, as Effortful Control emerges between the ages of 6 and 12 months, individual differences appear to be linked with the functioning of the anterior attention network (Rothbart, Derryberry, & Posner, 1994), but later seem to be effected by environmental factors, such as maternal responsiveness (Kochanska et al., 2000).

Supporting this view, Kochanska et al., (2000) found that attentional focus predicts Effortful Control in children up to 22 months in age. However, when the same sample was tested again at 33 months, Effortful Control was no longer predicted by attentional focus, but was predicted instead by Maternal Responsiveness.

In addition, Effortful Control is a predictor of fear, guilt/shame, and empathy, (Rothbart, et al., 2000), and modulation of both joy and anger (Kochanska, et al., 2000).

These qualities are important to children as they develop because they influence the internalization of social norms. For example, children who are high in fear of punishment are more likely to follow rules, and therefore more likely to behave in ways that are consistent with social expectations. The process of internalizing social norms is generally referred to as socialization.

As children develop, they learn that certain types of behavior are appropriate in certain situations, whereas others are not. A certain set of rules that deal specifically with the appropriateness of expressive behavior are known as display rules. These standards are learned during childhood (Saarni, 1984). Their purpose is to help individuals regulate their emotional-affective behavior in ways that are appropriate according to social norms.

To study the internalization of display rules as an aspect of child development, Saarni designed the Disappointment Paradigm (also known as the Mistaken Gift Paradigm). In this paradigm, which was later refined by Cole, children were put in a

situation where their facial expressions could be observed as they received gifts of varied desirability (Cole, 1986; Saarni, 1984).

Both Saarni and Cole observed sex differences in display of emotion after receiving an undesirable gift. Saarni (1984) found that females displayed significantly less negative affect than did boys, while Cole (1986) found that girls displayed significantly more positive affect than did boys.

In addition to sex differences, Saarni (1984) found significant age effects. Older children displayed both more positive and less negative behavior after receiving the undesirable gift. This finding suggests that as children grow older, they are more likely to display behavior that is socially appropriate.

Interest has arisen in the relationship between research done on socialization and research done on temperament. Children who are low in effortful control are generally less fearful and more impulsive and are therefore less likely to plan ahead or respond to the threat of punishment. This makes them significantly more difficult to socialize. This may have important implications for children in many settings, including peer relations and paying attention in school.

Research in this area may lead to a better understanding of how effortful control is developed and its role in governing behavior in a social context.

OBJECTIVE

The present study examined the relationship between Effortful Control and children's abilities to regulate their emotional behavior according to display rules. From a broader perspective, a relationship between these two concepts will support the theoretical relationship between temperament and socialization.

We predicted that children who scored high on the Effortful Control measures would display more positive affect and less negative affect after receiving an undesirable gift. That is to say that children who are generally more self-regulated will respond more effectively to social expectations that require regulation of emotional behavior.

In addition, we predicted that older children would score higher on both Effortful Control and Emotional Regulation than younger children, and that girls would score higher than boys on both variables.

Method

Participants

Participants were 62 children between the ages of three and five years who came to our laboratory with one of their parents. Each child was tested individually in the social psychology laboratory and received three small toys for participating. Parents received \$20 for their participation.

Procedure

Mistaken Gift Paradigm

Establishing Positive Expectancies.

Following the paradigm used by Ward (1990) the experimenter began by telling the child, “We want to see what kind of books children your age like and the reasons they like them.” The research assistant then pressed record on a video camera and said, “the camera is here so that later we can see the choices you make and the reasons you like your favorite books.” The child was then presented with 8 different toys and was asked to arrange them in order from most to least liked. The child was told that he or she could earn a toy by helping the experimenter.

After the child arranged the toys, the research assistant noted the most liked and the least liked toy, and cleared all of the toys off of the table.

Inducing Positive and Negative Moods.

The research assistant and the child looked at four different pairs of books. For each pair, the child was given a brief description of each book and was asked which book he or she preferred and why.

After answering this question for each of the four book pairs, the research assistant remarked that the child had been very helpful and gave the child a gift-wrapped box containing the child’s previously determined favorite toy. After the child unwrapped the

box, the experimenter remained silent and neutral in expression for 20 seconds while the child's reactions were captured on videotape.

After receiving the toy, the child was presented with another four pairs of books, which were rated in the same manner as the first four pairs. The research assistant once again remarked that the child had been very helpful, and gave the child another gift-wrapped box, this time containing his or her least favorite toy. Again, the child unwrapped the box while the research assistant remained silent and neutral in expression for 20 seconds while the child reacted to the undesirable toy. After 20 seconds the research assistant looked at the child and said, "Oh, that wasn't one of your favorite gifts was it? Let me see if I can do something about that."

The research assistant will left the room for 30 seconds and returned with a gift containing the child's second favorite toy. Once again, the research assistant remained neutral in expression for 20 seconds while the child reacted to the toy.

Effortful Control Measures

Slowing Down Motor Activity Tasks.

These tasks consisted of testing each participant's ability to perform a motor task slowly. To test this, each child was asked to perform a motor task (e.g. walking down a tape on the floor) at a normal speed, and then again as slowly as possible. The time it took for the child to complete the task in the slow trial was compared to the amount of time it took the child to complete the baseline trial. Each participant was assessed on 5 different Slowing Down Motor Activity tasks. These tasks included walking down a tape on the floor, drawing a circle and star, and connecting two points in a drawing.

Suppressing/Initiating Response to Signal.

These tasks involved participant's abilities to wait for a correct signal before responding. To test this, all trials used a "Pinball Game" machine. Participants were

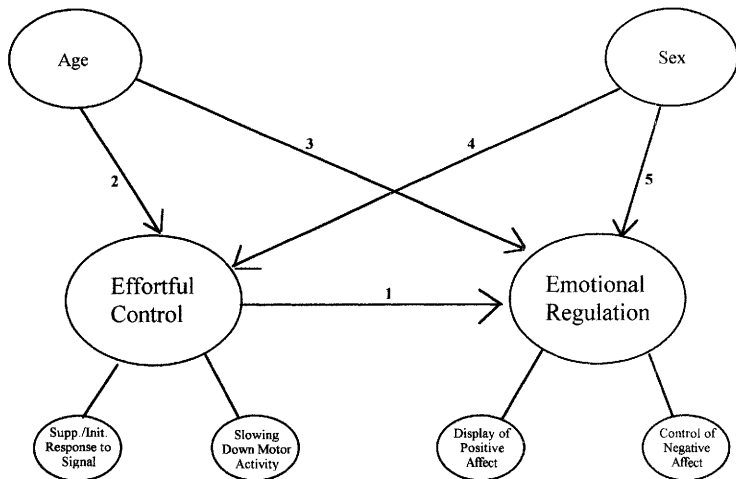


Figure 1. Hypotheses and Conceptual Model.
 Hypothesized relationships are illustrated by arrows connecting circles

Scoring and Measures

Emotional Regulation Scores.

Unless otherwise mentioned, internal consistency was assessed using Cronbach's alpha.

Emotional regulation scores were computed in terms of positive and negative affect. Participants' reactions were examined in two ways. First, participants' reactions to the desirable and undesirable gift were examined separately and scores for positive and negative affect for each gift were constructed.

The negative affect measure was a composite score that included ratings on disappointment, disgust, anger, and overall negative affect. The internal consistency across these different dimensions was .73 after the desirable gift, and .92 after the undesirable gift.

The positive affect measure was a composite score that included a score for general positive affect and a score for smiling. The smiling score was based on the frequency and size of smiles displayed. The internal consistency across these two dimensions was .87 after the desirable gift and .89 after the undesirable gift.

Second, in order to control for individual differences in children's expressiveness, we computed scores for positive and negative affect in terms of the difference between each participant's reaction to the desirable and undesirable gifts.

To facilitate comparisons between different variables, all scores were standardized as z-scores.

Effortful Control Scores.

The two subscales of the Effortful Control measure were scored separately.

The Slowing Down Motor Activity tasks were scored as follows. Each participant's baseline trial time was subtracted from his or her slow trial time. Scores were

standardized as z-scores and averaged to create a Slowing Down Motor Activity composite score. Internal consistency across tasks was .90.

Scoring on the Suppression/Initiating Response to Signal (SIRS) tasks differed depending on which “game” was being played. In “Game A” scores were the amount of time before the participant let go of the lever, relative to the amount of time before the experimenter gave (or would have given) the signal.

In “Game B”, scores consisted of a number of points allocated to each participant for each trial. Points were based on the amount of time the child held onto the lever, and whether he or she successfully held onto the lever when the experimenter gave the incorrect signal. Again, scores were standardized as z-scores and averaged to create a SIRS composite score. Internal consistency for SIRS tasks was .93

Finally, the Suppression/Initiating Response to Signal (SIMR) score and Slowing Down Motor Activity Score (SDMA) were averaged and standardized as z-scores to create a composite Effortful Control (EC) score. Internal consistency across all tasks was .87.

Table 1. shows the intercorrelations between the following variables: Effortful Control (All EC), Suppressing/Initiating Response to Signal Effortful Control subscale (SIRS EC), the Difference in Positive Affect between the two gifts, the Difference in Smiling between the two gifts, the Difference in Negative Affect between the two gifts, age, and sex.

Table 1.

Intercorrelations Between Variables

Variable	1	2	3	4	5	6	7
1. All EC	--	.89**	.20	.26*	.07	.41**	.22
2. SIRS EC		--	.26*	.33**	.09	.26*	.20
3. Diff. Pos Affect			--	.93**	.46**	.31*	.15
4. Diff. Smiling				--	.36**	.27*	.08
5. Diff. Neg Affect					--	.12	.18
6. Age						--	.26*
7. Sex							--

* $p < .05$; ** $p < .01$

Systematic Evaluation of Hypotheses

Effortful Control

Age.

We conducted a one-way analysis of variance (ANOVA), with Effortful Control as the dependent variable and found a significant main effect for age $F(2,59)=6.14$, $p < .01$, such that older children were higher in Effortful Control than younger children. Using Scheffe's test as a follow up, we found that the difference was significant ($p < .01$), only when comparing three year olds ($M = -.44$, $SD = 1.15$) with five year olds ($M = .72$, $SD = .77$).

Sex.

We used an independent samples t-test to test the difference between males and females on Effortful Control. A marginally significant effect was found for sex ($t = -1.72$, $p = .09$), such that female ($M = .83$, $SD = .14$) demonstrated greater Effortful Control than did males ($M = -.24$, $SD = 1.15$).

Emotional Regulation

Dependent variables examined were: (1) positive affect after the desirable gift, (2) negative affect after the desirable gift, (3) positive affect after the undesirable gift, (4) negative affect after the undesirable gift, (5) difference in positive affect between the two gifts, and (6) difference in negative affect between the two gifts.

Desirability of Gift.

In order to examine the assumption that children were regulating their behavior after receiving the undesirable gift, we conducted independent sample t-tests to compare the means for positive affect displayed after receiving the two gifts, and the means for negative affect after receiving the two gifts. Children displayed significantly more positive affect after receiving the desirable gift than after the undesirable gift ($t = 5.88$,

$p < .01$). Children also displayed significantly less negative affect after receiving the desirable gift than after the undesirable gift ($t = -9.32$, $p < .01$).

Age and Sex.

We conducted two, two-factor sex (2) x age (3) multivariate analyses of variance (MANOVAs). The first examined the effects of age and sex on dependent variables involving positive displays. The second tested the effects of age and sex on negative display variables. Next, we conducted univariate analyses of variance (ANOVAs) in order to examine the effects of age and sex on each dependent variable.

For positive display scores, the overall multivariate F (Wilks's lambda) showed a significant main effect for age $F(4,110) = 3.19$, $p < .05$ and a significant Age x Sex interaction $F(4,110) = 3.81$, $p = .01$.

Difference in Positive Affect between the two gifts was a significant contributor to both overall multivariate effects. Univariate analyses of variance (ANOVAs) indicated a significant main effect for age $F(2,59) = 3.22$, $p = .05$ and a significant age x sex interaction $F(2,56) = 5.13$, $p = .01$, such that 3 and 4 year olds displayed a smaller decrease in positive affect between the two gifts than 3 and 4 year old boys, and five year-old girls displayed a larger decrease in positive affect between the two gifts than did five year-old boys (see figure 2.)

In addition, positive affect displayed after receiving the undesirable gift contributed significantly to the overall multivariate effect for the age x sex interaction $F(2,56) = 5.72$, $p = .01$ in the same manner as the Difference in Positive Affect variable.

Negative affect was not predicted by age or sex in our sample.

An additional univariate analysis of variance (ANOVA) revealed a significant age x desirability of gift interaction $F(2,59) = 3.21$, $p = .05$, such that younger children showed

more positive affect than older children when the gift was desirable, but less positive affect than older children when the gift was undesirable.

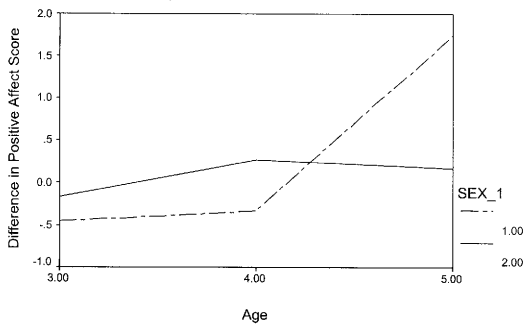
Effortful Control And Emotional Regulation

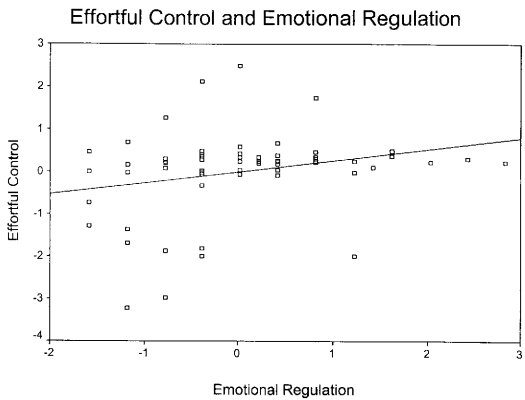
To examine the relationship between Effortful Control and Emotional Regulation, we conducted a linear regression for each of the dependent variables, using Effortful Control as the independent variable. The only one of these that approached significance was the Difference in Positive Affect between the two gifts measure $F(1,60)=2.48$, $p=.12$.

To further examine this relationship, we conducted additional linear regressions for the Effortful Control subscales and the subscales of the Difference in Positive Affect measure. Of these, several relationships were found to be significant: (1) Effortful Control and scores on the Smiling subscale, $F(1,60)=4.48$, $p < .05$ (see figure 3); (2) the Suppression/Initiating Response to Signal Effortful Control subscale and Difference in Positive Affect, $F(1,60)=4.47$, $p < .05$; (3) the Suppression/Initiating Response to Signal Effortful Control subscale and scores of the Smiling subscale, $F(1,60)=7.22$, $p=.01$.

Regulation of Emotion

Age x Sex Interaction





DISCUSSION

The results of this study make specific contributions to research done on (1) the development of self-regulation, specifically Effortful Control, (2) the development of emotional expression, and (3) the influence of temperament on the incorporation of social standards.

Effortful Control

The findings of the present study replicated previous research indicating that Effortful Control increases with age (Kochanska, et al., 2000). As children develop, attentional focus improves and children are able to selectively attend to detailed aspects of their environment, such as following rules that pertain to a particular situation (Kopp, 1987).

The present study failed to replicate previous findings that females perform better Effortful Control than males. Although a mean difference was found, the results were not significant. It is possible that the finding was not replicated due to a sample size that was small relative to previous studies measuring Effortful Control.

Emotional Regulation

The findings for the relationship between age and display of positive affect reported by Saarni (1984) were only partially replicated. While Saarni (1984) found that older children displayed less negative behavior and more positive behavior after receiving the undesirable gift, we found that age was not a predictor of negative affect for participants in our sample. However, our sample did manage to replicate the Saarni (1984) effects for positive behavior. More specifically, when comparing children's reaction to the two gifts, older children displayed a smaller decrease in positive behavior after receiving the undesirable gift.

Although, we did not find main effects for sex differences, as previous researchers have (Cole, 1986; Saarni, 1984), we did find an age x sex interaction, such that the

relationship between age and display of positive affect depended on the sex of the participant. Specifically, 5 year-old males displayed more positive affect than did 5 year-old girls, and 3 and 4 year-old girls displayed more positive affect than did 3 and 4 year-old boys. It appears that between ages 4 and 5, a change occurs in terms of positive expressiveness by males versus females. Perhaps, as children become more self-regulated, females use this ability to regulate emotion in a different way than males. More specifically, it is possible that males replace their negative emotions with high levels of positive affect, whereas females simply show less emotion.

Also of interest was a significant age x desirability interaction, such that older children displayed more positive affect than younger children when the gift was undesirable, but when the gift was desirable, younger children displayed more positive affect. It appears that as children grow older they are regulating their positive behavior in accordance with the socially appropriate response associated with receiving a gift. This finding is consistent with the idea that children are expected to regulate their positive (approach) behavior as well as their negative behavior (Kochanska, et al., 2000).

Effortful Control and Emotional Regulation

While the expected relationship between Effortful Control and Emotional Regulation was found, it was significant only when Emotional Regulation was assessed using the Smiling subscale. Given the strong relationship between scores on positive affect and those on the Smiling subscale, this result is surprising. However, work done by Rothbart et al., (2000) suggests that Smiling may be a behavior that is particularly important to compliance with social norms.

In a factor analysis done by Rothbart et al., (2000), most positive displays were found to load on the extraversion factor. However, smiling and laughing were found to be more strongly associated with the Effortful Control factor. This was found to be true for

American and Japanese children, but not for Chinese children (Ahadi, Rothbart, & Yc, 1993). Rothbart and colleagues speculate that this may be a result of the social expectations that are specific to a particular society.

Perhaps smiling is the proper response for receiving a gift. Other positive displays may be more related to Extraversion and therefore are not more likely to be displayed by children who are high in Effortful Control.

The strongest relationship was found between scores on the Smiling subscale and the Suppression/Initiating Response to Signal (SIRS) subscale of Effortful Control. It is not clear why this relationship is stronger than the relationship with the other Effortful Control items that were used in the present study.

One possibility is that the difference between tasks on the SIRS subscale may be different from those on the Slowing Down Motor Activity subscale in a way that directly affects the relationship with Emotional Regulation in the Disappointing gift situation.

Kopp (1982) discusses the role of self-control in the context of delay. According to this view, children who are lower in self-control are more “stimulus bound”, and are unable to create diversionary thoughts in order to suppress impulses. In the case of the SIRS Effortful Control tasks, children are put in a situation where they are stimulated to react, but are told to wait for a particular signal.

The SIRS tasks differ from the task in the Slowing Down Motor Activity (SDMA) subscale in that the SDMA tasks involve a more continuous form of self-control. In this case, the dominant response is to move at a normal rate; whereas in the SIRS tasks, the dominant response is to release the pinball machine lever.

In the Mistaken Gift situation, the “signal” is the undesirable gift. The dominant response is to communicate distaste for the gift, and the subdominant response is to smile. Every time the child looks down and is reminded that he or she has just received

an undesirable gift, the child is stimulated to frown, complain, or otherwise express distaste. The children who are higher in the ability to Suppress or Initiate a Response to a Signal are better equipped to replace their dominant response with a subdominant response and smile.

Implications

The present study has examined children's regulation of emotional expression in order to comply with social norms. The results have important implications for research done on the relationship between temperament and socialization.

Past research has indicated that Effortful Control can be moderated by environmental factors, particularly maternal responsiveness (Kochanska, et al., 2000) Further research in this area could aid parents in teaching their children how to be more self-regulated.

Previous research suggests that children who are high in Effortful Control are easier to socialize (Kochanska et al., 2000), and are therefore more likely to comply with social expectations. Children who are able to comply with these expectations will be better at interacting with their peers. Past research lends support to the assumption that there are negative consequences associated with low peer acceptance (for a review, see Putallaz & Gottman, 1981).

Beyond peer acceptance, however, there are other consequences for children who are not well socialized. One rule children learn early in school is not to talk when the teacher is speaking. A child who is unable to consistently follow this rule will miss out on educational opportunities that another, better-socialized child may have.

In addition to being able to follow rules when in the presence of an authority figure, well-socialized children have internalized these rules and are able to comply with them without the presence of external enforcement. This is increasingly important as the child grows older and more autonomous.

CONCLUSION

The findings of the present study are consistent with those of past research, and make contributions to research done on the development of self-regulation, the development of emotional expression, and the influence of temperament on the incorporation of social standards.

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APPENDIX A

Effortful Control Task Script

Hand child pencil and say: Can you hold that for me for a second? Is that the hand that you write with? *If the child seems unsure, have them draw a small circle on scrap paper with both hands and see which looks easier*

1. E1: OK! Now we are going to play a game! Look at this tape on the floor. *(point to tape on the floor)* Let's pretend it is a path and see if you can walk down this path without stepping over the sides. *(put ONE foot on the path—to demonstrate)*

2. Baseline. E1: Ok. Now you walk down the path starting here. Go all the way down the path and stop here. *(show child where to stop exactly)* Try not to step over the sides! Start when I say "GO!"
GO!

Slow 1. E1: Very good! Let's try again. Start down here. *(point to start end of ribbon and wait for child to come down to that end)* But this time, pretend you are the slowest person in the world. Walk as slowly as you possibly can. Go!

Slow 2. E1: Very good! Let's try once more. Start down here. Remember to be really slow. GO!

2. E1: Now we're going to play another game. *(place drawing in front of child)* See this little turtle. S/he wants to go for a walk. His/her mommy says s/he has to stay on the path that goes around the house so s/he won't get lost. This is the path. See, it goes all the way around the house.

Baseline E1: Now take this turtle for a walk. Start here. Go this way *(counterclockwise)* and draw all the way around to right here. Be sure to stay on the path. *(hand child turtle pencil)*

GO! *(at start and (when circle is complete)* OK!. Very Good!

Slow 1. Now try again! But now the turtle is really tired, and s/he will walk real slow. Remember, stay on the path and go as slow as you can.

GO!...OK! *(when complete)*Very Good!

Slow 2. You did so well, let me see it again. Try again, as slow as you can, and be sure to stay on the path.

GO!..... OK! *(when complete)* Very Good!

3. E1: Now we're going to play a drawing game! Do you know how to use a ruler? I am going to draw a straight line using this ruler (*draw a line on a piece of scratch paper with a ruler*) Very Good!

Let's play the game. See these telephone poles? All the wires are missing here. These squirrels need wires for them to play on. Let's draw the wires for them to play.

(Order that wires should be drawn in: BL) pink dot F) Green Dot. S) Red dot.

Trial 1: (Baseline) First, draw one for this squirrel. Start here at the pink dot (*opposite side from hand child writes with*) *Point to the Pink Dot!* then go all the way over to this other pink dot and stop. (*Point out other pink dot*) Be sure to draw a straight line. Start when I say "Go"! *hand child neutral pencil.*

GO! At the end: Good!

Trial 2: (Fast) Now you will draw the missing wire for this squirrel. This squirrel is the fastest squirrel in the world, so it wants you to draw as fast as you can. Be sure to draw a straight line, and remember to draw as fast as you possibly can. Start here at the green dot (*point to green dot*). And stop here at this other green dot. (*point out other green dot*) Use this bunny pencil, because bunnies are very fast. *Hand child bunny pencil.*

GO! At the end: Good! You are really good at this!

Trial 3: (slow) Now you will draw a wire for this squirrel. And you know what: this one is the slowest squirrel in the world, so it wants you to draw as slow as you possible can. Be sure to draw a straight line. Remember to be very slow. Start at the red dot. (*Point out red dot*) and stop at this other red dot (*point out other red dot*) Use the turtle pencil, because turtles are slow. *Hand child turtle pencil.*

Go! At the end: Good!

5. Drawing—Circle

E1: Now we're going to draw some pictures. I'll give you a picture of a circle and then I want you to see if you can draw the shape staying between the lines.

Trial 1 (Baseline)

E1: Here is a drawing of a circle. (*Give the child the picture.*) I want you to try to draw the circle by drawing a line in **between the lines** (*point to the lines*). Start here at the dot. Don't start until I say go!. OK. *hand child neutral pencil* GO!

Trial 2 (slow)

E1: Good! That was a good circle! Let's do that again. Except, let's do it a little bit differently this time draw it as slowly as you can. Remember to stay between the lines (*point to lines*) and don't start until I say Go! OK., Let's see how slowly

you can draw this circle. Use this turtle pencil because turtles are slow.. Are you ready? *Hand child turtle pencil GO!*

Trial 3 (fast)

E1: Good! That was a good try at drawing the circle slowly! Let's do it one more time. I want you to draw the same circle again, but this time draw it as fast as you can. Remember to stay between the lines (*point to lines*) and don't start until I say GO! Let's see how quickly you can draw this circle. Use this bunny pencil because bunnies are fast.. Are you ready? *Hand child bunny pencil Go!*

6. Drawing—Star

E1: Now we are going to draw some pictures. I'll give you a picture of a star this time and then I want you to see if you can draw the shape staying between the lines.

Trial 1 (baseline)

E1: Here is a drawing of a star. (*give the child the picture*). I want you to try to draw the star by drawing a line in **between these lines** (*point to the lines*). Start here at the dot. Don't start until I say Go!. OK, *hand child neutral pencil GO!*

Trial 2 (fast)

Good! That was a good star! Let's do that again. Except, let's do it a little bit differently this time. I want you to draw the same star, but this time draw it as fast as you can. Remember to stay between the lines (*point to the lines*) Don't start until I say, Go!. Let's see how fast you can draw this star. Use this bunny pencil because bunnies are fast. Are you ready? *Hand child bunny pencil Go!*

Trial 3 (slow)

Good! You did a good job drawing the star fast! Let's do this one more time. I want you to draw the same star again, but this time, draw it as slowly as you can. Remember to stay in between the lines (*point to the lines*) like you did last time and don't start until I say, Go! OK, let's see how slowly you can draw this star. Use this turtle pencil because turtles are slow. Are you ready? *Hand child turtle pencil Go!*

Note: Script is modified from the Effortful Control protocol used in Kochanska et al., (2000).

Curriculum Vitae

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Honors and Awards

- Academic Excellence Award Scholarship (1999 & 2001)
- Summer University Undergraduate Research Fellows Scholarship (2001)
- Honors Undergraduate Research Fellowship (2001-2002)
- Sigma Xi Associate Member
- Varsity Athletic Scholarship (Swimming) (1998-2000)
- Big XII Academic All American (1998-2000)

Research & Professional Experience

- Research assistant in Professor Jeffrey Simpson's lab (Fall 1999 - Summer 2000)
- Research assistant in Professor Lowell Gaertner's lab (Fall 2000)
- Research assistant in Professor William Graziano's lab (Fall 2000-Summer 2001)
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