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Motivational Effects of Non-contingent Reinforcement in Children

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Abstract

Non-contingent reinforcement is random and non-informative feedback. Berglas and Jones (1978) first reported that non-contingent reinforcement leads to self-handicapping in adult males. Self-handicapping can be described as a premeditated adaptive behavior that protects against negative attributions to the self after failure. The purpose of this study is to explore whether or not the same effect will be found in children of both sexes. Participants (children in first and second grade) received contingent (informative) or non-contingent (non-informative) reinforcement while playing the children's game "I Never Forget a Face." Children were given the opportunity to self-handicap immediately after reinforcement. After the opportunity to self-handicap, the children then played a more difficult game ("Shoot the Moon") and their efforts with the second game were recorded. Data did not support the hypotheses but trends were in the predicted direction.

Motivational Effects of Non-contingent Reinforcement in Children

It has been quite common that entire sports teams or classrooms receive trophies and gold stars just for being present perhaps so that children feel happy, worthy, smart, and effective, despite poor participation or performance. Dweck (2008) discusses how random praise has become so common. In order to encourage participation during school, or perhaps to increase self-esteem in children, teachers often praise whatever participatory behavior a child displays, whether the child's behavior is accurate, incorrect, or inappropriate. She writes that quite often, people are inclined to think that a child's lack of self-esteem is the basis for that child's lack of success in school, which is why random rewards may be given. A teacher might say "Good!" or "Good Answer" regardless of what the student has offered as a solution if for no other reason than to avoid hurting the child's feelings.

Skinner (1947) was one of the first to investigate the phenomenon of non-contingent reinforcement. Non-contingent reinforcement is encouragement, praise, or other positive feedback that occurs randomly. It is not based upon how well one performs and there is no feedback on the level of competence that an individual has (Rosenfield, Folger, Adelman, 1980; Berglas and Jones, 1978). It may occur when one is doing the correct thing, when one is doing the wrong thing, or even when one is doing nothing. It is non-informative. Non-contingent reinforcement can lead to superstitious behavior because random behavior occurring during reinforcement becomes associated with the reinforcement and is thus superstitiously acted out in order to receive rewards again.

The question is whether or not these practices are good, bad, or neutral for children. Berglas and Jones (1978) were the first to document the effects of non-contingent reinforcement

(success feedback) on “self-handicapping.” Self-handicapping is self-protective behavior that might provide an excuse for future failures. It occurs before the performance takes place and is a way of avoiding negative attributions to the self because of failure (Midgley & Urdan, 1995). For example, when a student goes out drinking the night before a big exam, he or she will have a prepared excuse if exam performance is below expectations. It is a way of externalizing, rather than internalizing, poor performance: “The liquor and subsequent hangover caused the poor exam performance. It could not have been my fault.” Self-handicapping might also enhance the self. Tice (1991) found that when adults succeed beyond the premeditated barrier, it makes them seem to be even more competent than normal because they did well despite the likelihood of failing. For example, when an athlete stays awake all night before a big game the next day, there is a prepared excuse for not performing well in the game and the failure is externalized. However, if this athlete does well in the big game, the self is enhanced, and this success is internalized. The athlete did well despite the likelihood of being too tired to perform.

As demonstrated in the original study, reinforcement that is random, rather than directed to encourage correct performance, leads to self-handicapping (at least in men), and subsequent research confirms the effect in a number of contexts (Alter & Forgas, 2006; Brown & Kimble, 2009; Siegal, Scillitoe, & Parks-Yancy, 2005). More recent studies use adults as participants and investigate such topics as gender differences, effects of mood induction, and so on. There is little-to-no documentation about non-contingent reinforcement and self-handicapping in children. Although this is so, a meta-analytic review of academic performance across grades shows a predictable negative relationship between self-handicapping and academic performance, documented in elementary and middle-school students (Schwinger, Wirthwein, Lemmer, & Steinmayr, 2014). Data suggest clearly that non-contingent reinforcements have no value for

adults, and they can lead to maladaptive behavior. It may be that the pattern is the same for children.

Brown and Kimble (2009) write that self-handicapping stems from non-contingent reinforcement because the praise leaves the person uncertain about what processes led to achievement. They write that a person is thus not certain about what process he or she should utilize to achieve once more. Uncertainty then births the protective behavior of self-handicapping. Dweck raises concerns about the targets of non-contingent reinforcement. She writes that kids' self-esteem becomes fragile due to *intelligence* praise (e.g., "You're so smart") and their motivation is undermined. Too much praise about intelligence leads to what Dweck calls a fixed intelligence mindset – that one is only so smart and cannot get smarter. This then leads children to feel that when they are criticized, it is deeply related to the self and cannot be changed. Children start to view mistakes as unacceptable and view constructive criticism as negative. Dweck finds that random praise, especially about intelligence, leads children to lack the motivation to face challenges and activities that require effort, if for nothing but to avoid being critiqued. Children who are praised for their *effort* (e.g., "You really tried hard"), Dweck explains, have a growth intelligence mindset, in contrast to a fixed intelligence mindset. When these children are criticized, it is not attributed to their inner selves, but rather attributed to the amount of effort they exert. The child feels that he or she can always try harder and learn more, so criticism is not a threat. According to Dweck, praise for self-esteem can negatively influence a child's effort and motivation and so self-esteem should not be the central concern.

The debate about self-esteem is not resolved. For example, Dawes (1994) states that effort and motivation are better predictors of success (failure) than is self-esteem, and he argues further that self-esteem is an effect (of success or failure) rather than a causal factor.

Nonetheless, self-esteem is related to self-handicapping. Tice (1991), for example, found that self-esteem influences the motivation behind an adult's self-handicapping. More specifically, adults with high self-esteem self-handicap for enhancement reasons (they succeed beyond a barrier and thus enhance the competence attributed to them) and adults with low self-esteem self-handicap for protection (they can blame the barrier for their failure, and thus still be evaluated as competent).

The effects of non-contingent reinforcement are broad. In addition to deflating academic performance, random praise has been shown to have other negative impacts, narcissism for example, on children (Brummelman, Thomaes, Nelemans, Orobio de Castro, Overbeek, & Bushman, 2015). Being that there are various effects of non-contingent reinforcement on children, it is of high importance that its ramifications are studied. A recent meta-analysis concludes "it seems necessary to develop adequate educational interventions against self-handicapping. To date, specific trainings that focus explicitly on reducing self-handicapping are barely available" (Schwinger et al., 2014, p. 757). If non-contingent reinforcement leads to self-handicapping in children, as it does in adults, we see a possible link between those reinforcements and inferior academic effort and performance. The importance of investigating the motivational effects of non-contingent reinforcement in children is that it has been relatively unexplored to date and has real-world application. Our topic relates to the majority of children who receive formal education, and the applied significance of this project may have implications for our classrooms. We predict there to be a negative influence on children's motivation after they receive non-contingent reinforcement. We also predict that children will self-handicap due to non-contingent reinforcement. We explore the possible fit of self-esteem within this project and predict that self-esteem motivates the purpose of children's self-handicapping.

Method

Participants

After IRB review of the research proposal, and after parental and site-supervisor consent, thirty-four children participated. Seven boys and nine girls from first grade and thirteen boys and five girls from second grade completed the experiment. All of the participants were gathered from schools and community centers in the greater Saint Paul, Minnesota area.

Procedure

All children first completed *Harter's Pictorial Scale of Perceived Competence and Social Acceptance for Young Children*. Children were encouraged not to worry about their answers being recorded.

The children were randomly assigned to one of two conditions before playing the memory-matching game "I Never Forget a Face." In the contingent reinforcement condition, children received verbal praise every time that they made a correct match. The experimenter stayed silent otherwise. In the non-contingent reinforcement condition, children were given random praise every 10 seconds, regardless of their performance. The praise words in each condition consisted of such phrases as "good/nice/great job" and "good/nice/great work."

After playing "I Never Forget a Face" participants were asked if they would like to listen to tips to play the next game better, or if they would rather sit and wait for a minute-and-a-half. If children chose to take the tips, they listened to an audio recording that offered tips to play "Shoot

the Moon” (see Appendix). After either listening to the tips or waiting to play the next game, each participant was shown a demonstration of how to play the game “Shoot the Moon.” Each child was then given six minutes to play this game. Time played and the number of attempts made at the game were recorded.

Finally, when participants were finished playing, they were given a questionnaire (see Appendix). There were two questionnaires, one for the participants who took the tips, and one for the participants who did not take the tips. The purpose of this questionnaire was to gauge potential motivations behind self-handicapping. It also allowed an analysis of self-attributions made by the children. Children who did not take the tips were asked an additional question on their questionnaire. This question was based on their self-analysis. If they thought that they did well, they were asked whether or not avoiding the tips was an enhancing behavior; if they thought that they did badly, they were asked whether or not avoiding the tips was a protective behavior.

Results

The data did not support the hypothesis of a negative impact on motivation after non-contingent reinforcement. There were no main effects for gender, grade, reinforcement, or self-handicapping. However, the data are in the right direction – contingent reinforcement led to more attempts at Shoot the Moon and non-contingent reinforcement led to fewer attempts at Shoot the Moon (See Table 1). The data did not support the hypothesis that children will self-handicap after receiving non-contingent reinforcement. Most children, 76.47%, did not self-handicap.

An ANOVA revealed a significant interaction between the type of reinforcement and self-handicapping ($F_{1,22} = 6.84$, $p = .016$ (See Figure 1)). Contingent reinforcement resulted in more attempts at Shoot the Moon for children who took the tips. Non-contingent reinforcement resulted in more attempts for children who engaged in self-handicapping (did not take tips).

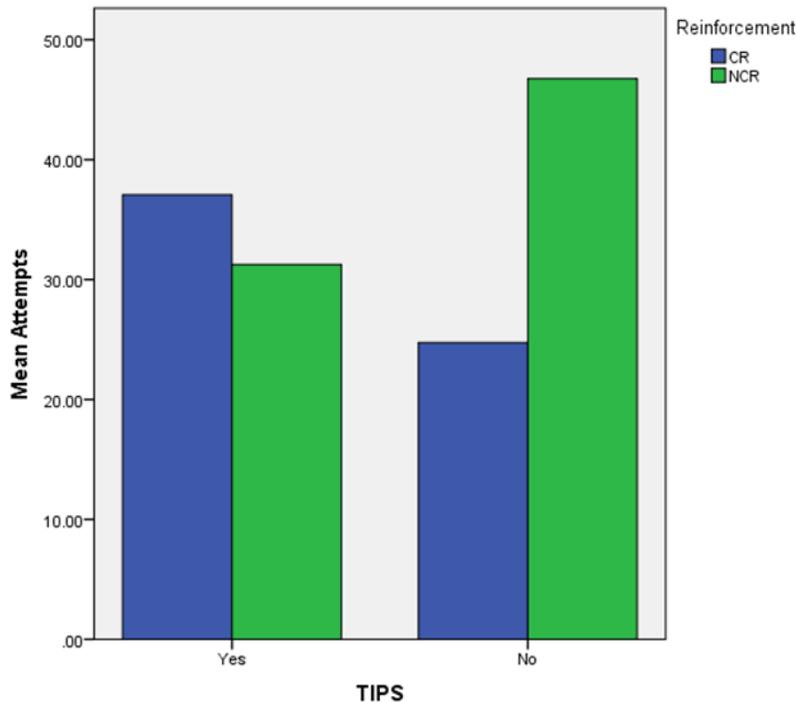


Figure 1. Interaction of type of reinforcement and self-handicapping ($p = .016$).

There was also a three-way interaction between gender, grade, and the type of reinforcement that approached significance ($F_{1,22} = 3.58$, $p = .07$ (See Figure 2)). Among first graders, boys responded to contingent reinforcement with more attempts at Shoot the Moon and girls responded to non-contingent reinforcement with more attempts at Shoot the Moon. This difference did not appear in second graders.

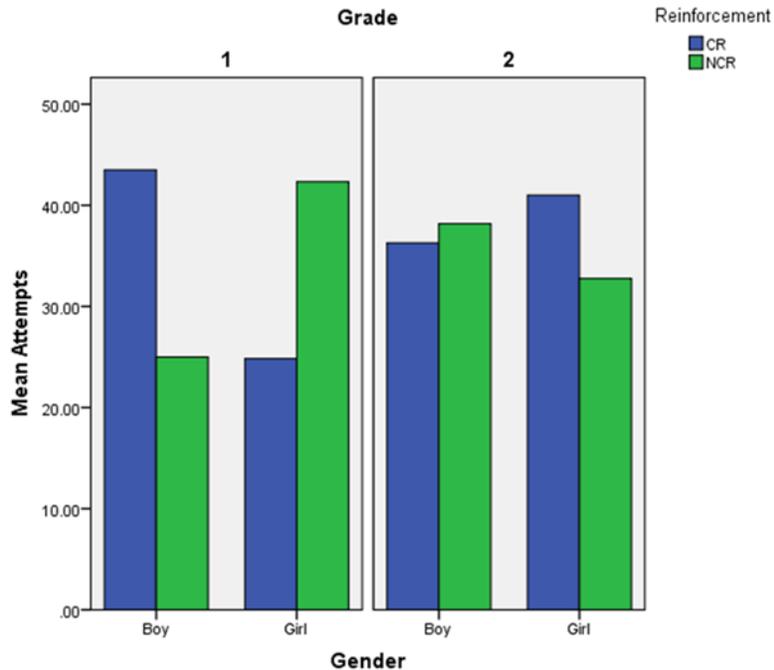


Figure 2. Three-way interaction between gender, grade, and the type of reinforcement ($p = .07$).

Discussion

Although there were no main effects for reinforcement, motivation, self-handicapping and self-esteem, the trends were in the predicted direction. This suggests that with a larger sample size and more statistical power, our hypotheses could be supported. Furthermore, this suggests that the type of reinforcement young children receive impacts both their levels of motivation and their tendency to self-handicap.

We did find a significant interaction between the type of reinforcement and self-handicapping. We found that children given contingent reinforcement and who took the tips (did not self-handicap) made more attempts at Shoot the Moon and children given non-contingent

reinforcement and did not take the tips (self-handicapped) made more attempts at Shoot the Moon. Furthermore, we found an interaction that approaches significance between gender, grade, and type of reinforcement. Our results showed that first grade boys given contingent reinforcement made more attempts at Shoot the Moon and first grade girls given non-contingent reinforcement made more attempts at Shoot the Moon. There are two possible explanations that may relate to this finding.

The first explanation is rooted in developmental differences surrounding young children. Sax (2001) writes that there are salient developmental differences between young boys and young girls that lead to both differences in school readiness and differences in academic self-concept. Sax writes that boys are not developmentally qualified for the verbal and reasoning skills that kindergarten now involves, and that their entry at the same time as girls leads to more instances of failure or feeling unprepared. These things can lead to both a negative outlook on the academic experience and expectations of failure. Sax also writes that this self-concept can lead to an external attribution style, which can explain why boys might respond when given contingent feedback since they are being given direction that they might want and need but do not expect. That boys have a negative academic self-concept can possibly be the reason that boys respond to informative feedback in the way that this study found. Boys feel that they are succeeding and because they have a negative self-concept they take positive informative feedback as motivating. On the other end of the spectrum, Sax writes that girls are receiving an education suited to their abilities and thus are likely to have a more positive academic outlook. The results for first grade girls might be explained by this. Since girls are in a more positive and confident position, non-contingent reinforcement can be motivating by affirming their actions while contingent reinforcement is more expected and leaves less affirmation. Developmental

differences lead to different academic outlooks, which then lead to differential necessity and responsiveness to reinforcement type.

The second explanation for our finding is a sociological explanation surrounding socialization. Children in the United States, and in many other countries, are socialized in gender norms and other social norms from birth. Renzetti, Curran, and Maier (2012) write that: “little boys are taught independence, problem-solving abilities, assertiveness, and curiosity about their environment – skills that are highly valued in our society. In contrast, little girls are taught dependence, passivity, and domesticity – traits that our society devalues” (p. 98). Differences in socialization might explain the differences in response to contingent and non-contingent reinforcement in first graders. Boys often given more assertive lessons might be given contingent feedback more often and respond to the guided feedback with increased motivation. Girls, on the other hand, are often given softer lessons and might be given non-contingent feedback more often since assertiveness is not a part of their socialization. The softer lessons and softer feedback lead to a higher responsiveness to this reinforcement type and increased motivation. A difference in what attributes are typically supported by the mainstream society might lead girls to feel a need for and react more to any positive feedback with more motivation whereas boys, whose attributes are valued much more in the mainstream, are socialized to react to more assertive and informative feedback and thus try harder.

The age group studied in this project tends to be excluded from the literature that explores motivation, non-contingent reinforcement, and self-handicapping. Children in first and second grade are having their first academic experiences and being set up for how they will maneuver their academic careers. Trends were in the right direction for this project which implies that this topic could have significant meaning among this age group and that further

study is needed. It is important to understand how motivation, non-contingent reinforcement and self-handicapping fit into the academic picture of first and second graders because non-contingent reinforcement could potentially be setting them up for failure.

Further study might include not only a larger sample size, but a control for an even more thorough comparison among groups. This control could be a group that receives no feedback whatsoever. Another possibility is that children should be exposed to playing the memory game and then have the chance to self-handicap before playing the memory game a second time. Rather than the chance to self-handicap before a game they have not played yet (Shoot the Moon), having the chance to self-handicap before a familiar game could have different results. Natural curiosity or excitement could lead a child to want to know more about an unfamiliar game and lead them to take the tips regardless of reinforcement received. Alternatively, having the chance to protect or enhance attributions before a familiar game might lead to instances of self-handicapping. Further study could explore this possibility. Further study might include exploration into differences in development through assessment of school readiness and academic self-concept, and assessment of differences in socialization and gender norms between boys and girls through giving a demographic questionnaire to guardians that also asks about socialization in this area and explore if these differences impact motivational reactions to contingent and non-contingent reinforcement. Lastly, including third and fourth graders, since some studies exclude this age group as well, might be telling. We could find the age at which varied reinforcement has an effect since we know differences exist in adults.

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Table 1

Tests of Between-Subjects Effects

Dependent Variable: Attempts

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2121.759 ^a	11	192.887	2.842	.018
Intercept	27198.449	1	27198.449	400.700	.000
Gender	.025	1	.025	.000	.985
Grade	29.445	1	29.445	.434	.517
Reinforcement	146.988	1	146.988	2.165	.155
TIPS	13.433	1	13.433	.198	.661
Gender * Grade	11.233	1	11.233	.165	.688
Gender * Reinforcement	121.271	1	121.271	1.787	.195
Gender * TIPS	.000	0	.	.	.
Grade * Reinforcement	.011	1	.011	.000	.990
Grade * TIPS	.000	0	.	.	.
Reinforcement * TIPS	464.352	1	464.352	6.841	.016
Gender * Grade * Reinforcement	242.969	1	242.969	3.580	.072
Gender * Grade * TIPS	.000	0	.	.	.
Gender * Reinforcement * TIPS	.000	0	.	.	.
Grade * Reinforcement * TIPS	.000	0	.	.	.
Gender * Grade * Reinforcement * TIPS	.000	0	.	.	.
Error	1493.300	22	67.877		
Total	44568.000	34			
Corrected Total	3615.059	33			

a. R Squared = .587 (Adjusted R Squared = .380)

4- way ANOVA with gender, grade, reinforcement, and tips.

Appendix

Hello,

You will be playing a game called Shoot the Moon.

You play this game by moving two metal poles apart to get a ball rolling.

The goal is to get the ball to move up the two poles to the highest scoring spot.

Here are some tips to play better:

The first tip: To get the ball rolling, slowly move the two poles apart far enough so the ball begins moving, but does not fall off of the poles.

The second tip: Hold the poles steady and keep your eye on the ball – you must be careful and quick by moving the ball with the poles, without dropping the ball into a lower scoring spot.

The third tip: As the ball is moving, try to squeeze the ball between the two poles to cause it to move towards the moon. You can slightly twist the poles inward to do this.

The fourth tip: Move the poles together and apart enough to keep the ball moving, but not drop it.

The fifth tip: When the ball reaches the spot you want it to fall in, quickly move the poles apart, and the ball will drop into the spot.

Good luck!

Took Tips

How well do you think you played Shoot the Moon?

1	2	3	4	5	6	7
Very Bad	Kind of Bad	Bad	I Did Okay	Well	Kind of Well	Very Well

If I played Shoot the Moon well (4+) it was because (please select one):

I took the tips

I have played Shoot the Moon before

I am good at playing games

If I played Shoot the Moon badly (3-) it was because (please select one):

I took the tips

I did not get to practice

I am bad at playing games

Did Not Take Tips

How well do you think you played Shoot the Moon?

1	2	3	4	5	6	7
Very	Kind	Bad	I	Well	Kind	Very
Bad	of		Did		of	Well
	Bad		Okay		Well	

If I played Shoot the Moon well (4+) it was because (please select one):

- I did not take the tips
- I have played Shoot the Moon before
- I am good at playing games

If I played Shoot the Moon badly (3-) it was because (please select one):

- I did not take the tips
- I did not get to practice
- I am bad at playing games

If I played well and did not listen to the tips, that means I am good at playing games Y/N

If I played badly and did not listen to the tips, it is because I did not listen to the tips Y/N