Enhancing Social Skill Performance In Vivo: An Investigation of Tootling Across Activity Structures

A Dissertation Presented for the

Doctor of Philosophy

Degree

The University of Tennessee, Knoxville

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August 2022

Acknowledgements

In developing and writing this dissertation, I have received an enormous amount of support from many people. First, I would like to thank Dr. Chris Skinner for his constant support, supervision and encouragement throughout the entire process. Dr. Skinner has served as my research advisor, mentor, professor, and committee chair. Thank you so much for guiding me through the process of developing research studies, collecting data, analyzing data, and writing publishable papers. Your expertise, support, and encouragement has made my journey not only possible, but fun. Working with you has been enlightening and rewarding, and without you, this dissertation would not have been possible. Next, I would like to thank my co-chair Dr. Robert Richardson for his hard work and constant support throughout my journey. Dr. Richardson provided thought-provoking feedback that challenged me to think critically and deeply about my research, as well as constant encouragement and support. I would also like to thank my other committee members, Dr. Brian Wilhoit and Dr. David Cihak for taking the time to provide valuable feedback and support throughout this process. To the staff at the elementary school where I conducted my research, thank you so much for your flexibility and willingness to allow me to conduct research in your classrooms.

I would also like to thank my colleagues, peers, and friends for their constant support. Shelby Wright, thank you so much for being an amazing peer mentor to me and guiding me through the process of conducting research. Your constant encouragement, support, and feedback made my dissertation possible. Kristen Fowler and Chelsea Wilson, thank you so much for your generous support, hard work, and for all of the time you spent with me in the classrooms collecting data and trouble-shooting any obstacles that came our way. I am so grateful for your helpful input and willingness to help me along the way, as well as for making this process more

fun. Allison Pannell, thank you for standing by me throughout my time in the program, giving me encouragement when I needed it most, and supporting me endlessly. Without you, my entire journey would have been a lot more stressful and a lot less fun.

To my parents, Robert and Tami Crewdson, thank you for your constant love and support throughout my academic journey. You all have taught me to never give up, always chase my dreams, and have showed me endless love and support. Without you, I never would have made it to where I am today. To my loving grandmother, Mama, thank you for your unconditional love, encouragement, and support. From sending me "gifts of love" during stressful times, to reading all of my papers and poster presentations, your love and faith have lifted me up when I needed it most. To my sisters, Mary Holt and Kathryn Claire, thank you for dealing with all of the late-night texts and phone calls and the stressed-out version of me you both so patiently loved and supported. I could never have done this without you two.

Abstract

Tootling is a class-wide intervention where students provide written positive peer reports of classmates' prosocial behaviors, which are then reinforced with interdependent group-oriented contingencies. This dissertation includes four chapters. The first three chapters are written as intact papers. The first paper provides both a review of tootling research and a description of how educators can apply a tootling intervention in their classrooms. The next two chapters describe empirical studies conducted with elementary students in an after-school program. In Chapter Two, a withdrawal design was used to evaluate the effects of a tootling intervention that simultaneously targeted two recently taught social skills: encouraging and complimenting peers. Results suggest that the tootling intervention increased student engagement in both of these recently trained social skills while the students played a small group game. The next study, Chapter Three, was designed to investigate the effects of the structure of the activity that students engage in while tootling on levels of complimenting and encouraging. Results suggest that the tootling intervention was more effective in enhancing students' complimenting and encouraging their peers when they engaged in a cooperative activity, as opposed to a parallel play activity or an activity that involved individual competition. Together, these studies suggest that tootling can be used to enhance student performance of recently taught social skills in natural social contexts. Additionally, these results suggest that to maximize students' performance of recently taught social skills, educators should consider structuring classroom activities so that they provide more opportunities for engagement in those specific social skills. Chapter Four provides directions for future researchers. Specifically, this chapter focuses on longitudinal research evaluating the effects of supplementing social skills training with tootling on the development of socially

competent children and the broad and meaningful psychological, social, and academic benefits associated with this social competence.

Table of Contents

CHAPTER I Introduction 1
- Vignette 2
- Enhance Desired Behavior 3
- Tootling Interventions 4
- How to Implement a Basic Tootling Intervention 5
  - I. Identify Target Behavior 5
  - II. Peer Report Training 6
  - III. Chose Group Criteria 6
  - IV. Choose Group Rewards 7
  - V. Describe the Tootling Game 8
  - VI. Install Tootling 8
- Evidence of Effectiveness 9
  - Reducing Disruptive Behaviors and Enhancing Academic Engagement 9
  - Reducing Antisocial Behaviors and Enhancing Social Skills 10
- Tootling: Characteristics, Procedures, and Effects 12
  - Indirect Target Behaviors 12
  - Interdependent Group Rewards 12
  - Written Peer Reports 14
- Implications, Applications, and Modifications 15
  - Target Behaviors 15
  - Criteria 16
  - Rewards 17
  - Teacher Involvement and Support 18
- Conclusion 18

CHAPTER II Study I: Supplementing Social Skills Training with Tootling to Simultaneously Enhance First-Grade Students Social Skill Performance 20
- Abstract 21
- Literature Review 22
  - Social Skills Training and Performance 22
  - Peer Mediation 24
  - Tootling 24
  - Purpose 27
- Method 28
  - Participants and Setting 28
  - Materials 29
  - Independent and Dependent Variables 29
  - Design 31
  - Procedures 31
    - Jenga® and Social Skills Training 32
    - Practice 33
    - Baseline Phase and Assessment Procedures 33
    - Tootling Training 33
    - Tootling Intervention Phase 35

Withdrawal Phase 35
Re-Implementation Phase 36
Acceptability 36
Analysis Procedures 37
Procedural Integrity and Interobserver Agreement 37
Results 38
Statistical Analysis 40
Acceptability 41
Discussion 41
Applied Implications 43
Causal Mechanisms 44
Limitations and Future Research 45
Conclusions 47

CHAPTER III Study II: The Interaction of Tootling and Activities on Social Skill Engagement 48
Abstract 49
Literature Review 50
Social Skills Training 50
Tootling and Positive Peer Reporting 51
Combining Tootling with Social Skills Training 52
Task and Reward Structure 53
Purpose 55
Method 55
Participants and Setting 55
Materials 57
Independent and Dependent Variables 57
Design 59
Procedures 60
Social Skills Trainings 60
Baseline phase and assessment procedures 61
Tootling Training 61
Yeti® Training and Treatment Phase 62
Legos® and Treatment 64
Bingo 64
Analysis Procedures 65
Procedural Integrity and Interobserver Agreement 65
Results 66
Discussion 67
Implication for Practice 71
Limitations and Future Research 73
Conclusions 74

CHAPTER IV Future Directions for Research on Tootling and Social Skills Development 77
Literature Review 78
Current Results 79

Maintenance and Generalization 80
Developing Social Competence 81

List of References 83

Appendices 93
Appendix A: Tables and Figures 94
Appendix B: Sample PPR Slip 105
Appendix C: Jenga® Training Script 106
Appendix D: Tootling Training Script 107
Appendix E: Social Skills Lesson Script 108
Appendix F: Tootling Game Script 110
Appendix G: Yeti® Training Script 111
Appendix H: Social Skills Lesson Procedural Integrity 112
Appendix I: Peer Reporting Training Procedural Integrity 113
Appendix J: Tootling Game Procedural Integrity 114
Appendix K: Yeti® Procedural Integrity 115
Appendix L: Study I Student Acceptability 116
Appendix M: Study I Teacher Acceptability 117

Vita 118

List of Abbreviations

ADHD	Attention Deficit/Hyperactive Disorder
ASD	Autism Spectrum Disorder
IOA	Interobserver Agreement
PPR	Positive Peer Reporting
S-H-S	Student-Helping-Student
SST	Social Skills Training
UACS	University-Assisted Community School

Chapter I

Tootling: A Class-wide Peer-Mediated Intervention for Decreasing Antisocial and Disruptive Behavior and Enhancing Prosocial Behaviors and Academic Engagement

Vignette

An elementary school teacher, Ms. Yang, is concerned that her students too often engage in common inappropriate classroom behaviors including out of seat and calling out (Lambert, 2014; Lambert, et al., 2015; Lipscomb et al., 2018; Lum et al, 2017; McHugh et al., 2016). Additionally, students are frequently mean to each other, including name-calling and making fun of other students (Kirkpatrick et al., 2019). Ms. Yang is particularly concerned that students are mean to their peers. The students are often mean to students with weaker social skills and who have disabilities (e.g., students with Autism Spectrum Disorder, a Learning Disability, and attention problems). For example, last week a student called a peer diagnosed with a Learning Disability "dumb" for not understanding the new math lesson. In order to reduce these potentially hurtful verbal behaviors, Ms. Yang has installed a response-cost system (Cooper et al., 2007) i.w., taking points from students who engage in these undesired behaviors, with students losing privileges (e.g., lose access to recess or computer time) when a certain number of points are lost.

Ms. Yang does not feel that the response cost system is working. She spends so much time monitoring and responding to these disruptive behaviors (e.g., taking away points while describing the behavior that resulted in point loss), that it has taken away significant time from her teaching. Additionally, she finds it difficult to take points consistently because these behaviors occur at high rates, resulting in more disruptive behavior as students complain that she is not being fair. Furthermore, because these behaviors are punished, students who are mean to other students have become sneaky and engage in these behaviors when she is not looking. When classmates report these mean behaviors (tattle), Ms. Yang must investigate (e.g., interview

students), form a judgement (e.g., decide if a student engaged in the reported inappropriate behavior), and deliver the punishment.

Ms. Yang is spending so much of her time dealing with these inappropriate behaviors, that her time spent teaching is reduced. Additionally, she is concerned that both the disruptive behaviors (e.g., name calling and calling out) and her need to respond to these behaviors frequently interrupts the students who are engaged in learning activities (e.g. completing independent seatwork assignments) (Jaquett et al., 2020). Ms. Yang is concerned that her students' learning is suffering because her teaching quality and time, as well as the students' academic engagement and learning time are reduced by

1) the specific, distracting, undesired student behaviors (e.g., calling out, name calling),

2) her response to these behaviors (e.g., taking points while identifying the behaviors that resulted in point loss), and

3) her inconsistent application of punishment leading to negative student reactions (e.g., "that's not fair," "Carlos did the same thing and did not lose points")

4) her inadvertent reinforcement of the undesirable behaviors by giving attention to them, thus encouraging students to engage in the disruptive behavior

Enhance Desired Behaviors

To address these problems, Ms. Yang considers enhancing punishment for these undesired behaviors. However, what she really wants to accomplish is an increase in all students' desired behaviors (Hoge & Andrews, 1987; Ruggles & LeBlanc, 1985; Winett & Winkler, 1972). To do this, she begins to think about directly reinforcing the desired opposite behaviors. Figure 1-1 describes the undesired behaviors and the desired opposite behaviors she wants to increase. While considering this more positive approach, Ms. Yang worries that she may have to

develop and apply numerous supplemental reinforcement contingencies for each target behavior. Because maintaining additional reinforcement contingencies for each target behavior will take a lot of her time, she is not sure this strategy would be the best approach to increase teaching and learning time. The thought of monitoring and recording or counting all of these behaviors makes her head spin. Additionally, she wants to accomplish more. Specifically, she wants students to be treat each other nicely and use the social skills she has taught them. The students appeared to have learned these skills (e.g., in social skills training sessions they demonstrate the skills and can identify when to use them), but they do not perform these behaviors outside of the social skill training environment (Gresham, 1998; Gresham, 2001).

Tootling Interventions

Tootling is a class-wide, peer-mediated intervention that was created to encourage desired classroom behaviors and students' awareness of classmates' incidental desired behaviors (Cashwell et al., 2001; Skinner et al., 2000). This intervention was named "tootling" by combining the word "tattling," which is a type of peer reporting, and the phrase "toot your own horn," which is a way of reporting desired behaviors (Skinner et al., 2002). When tattling, peers' report classmates' antisocial or undesired behaviors. One reason students tattle is that teachers cannot observe every incidental behavior each student engages in throughout the day, so they often must rely on the students to report the behaviors. Thus, tootling interventions encourage the students to tootle or report on classmates' incidental prosocial behaviors.

Tootling interventions include positive peer-reporting and interdependent group-oriented rewards, in which either everyone or no one in the group receives the reward (McCurdy et al., 2020). With tootling, students are taught to monitor and report each other's incidental prosocial behaviors during typical classroom activities. In order to encourage students to tootle (i.e.,

monitor, observe, and report classmates desired behaviors), it is important to apply interdependent group-oriented rewards, where the entire class is reinforced if they provide enough tootles. An interdependent group-oriented reward is a reward system where either the entire group receives a reward or no one receives a reward based on the group's performance on the specified task (Litoe & Pumroy, 1985). With this interdependent group-oriented reward included in tootling, each student is more likely to receive a reward when they and their classmates tootle on each other (Cashwell et al., 2001; Skinner et al., 2002).

How To Implement a Basic Tootling Intervention

Implementing a tootling intervention requires working through six main steps (see Figure 1-2). Each of these steps is critical in having a successful tootling intervention in the classroom; however, we describe later how these steps can be modified to fit individual classroom needs.

I. Identify your target behavior

First, the teacher should select a target behavior and define it so that students can monitor and report the observed behaviors. For example, if the students are constantly mean to each other, the teacher may want to select student-helping-student (S-H-S) behavior, which can include a broad array of behaviors such as sharing, reminding, providing information to peers, and comforting a classmate (Skinner et al., 2002). Additionally, students could be trained to report recently trained social skills, such as complimenting and encouraging, as they engage in regularly scheduled classroom activities (Wright et al., 2020; Crewdson this dissertation, Chapter 2 and Chapter 3).

Regardless of the behavior to be reported, accurate reporting will require training. Training can mirror common social skills training activities, which typically include defining the behavior, providing examples and non-examples of the behavior, and soliciting examples from

the students (Gresham, 1998; Gresham et al., 2001; Mathur et al., 1998). Additionally, the context when such behaviors are appropriate can be described and solicited from students. Furthermore, when teaching prosocial behaviors, it may be useful to discuss how it feels to engage in such behavior and how it feels when classmates engage in such behaviors (i.e., how it feels to help a classmate and how it feels when a classmate helps us).

II. Peer Report Training

Next, students are taught how to report peer prosocial behaviors. Students can engage in high rates of S-H-S behaviors, even though they typically go unnoticed (Skinner et al., 2002). Consequently, providing immediate, public, verbal reports to the teacher of S-H-S behavior may be more disruptive than tattling. Thus, researchers have recommended providing written reports (Skinner et al., 2000). In the initial tootling studies, students were trained to report S-H-S behavior by writing who, what, and for whom on index cards that were later collected (Cashwell et al., 2001; Skinner et al., 2000). Note, students were taught only to report their classmates' behavior and only when they helped a fellow student, not an adult. One reason why the teacher wanted this form of reporting is that she wanted to enhance students' opportunities to enhance their writing skills. In other studies, students reported which member of their small group (who), performed what (specific prosocial behaviors) on prepared index cards with the student's names and target behaviors listed (see Appendix B; Crewdson this dissertation Chapter 2 and Chapter 3: Wright et al., 2019).

III. Choose group criteria

There are numerous strategies for selecting a criterion for the number of tootles necessary to earn a reward. As it is difficult to determine just how many tootles students can provide, initial tootling researchers employed a cumulative criterion (Cashwell et al., 2001; Skinner et al., 2000).

Thus, every student in the class earned their first reward when they provided 100 tootles (Skinner et al., 2000). The problem with this strategy is that rewards are likely delayed, which can weaken their effectiveness (Cooper et al., 2007). Additionally, cumulative criteria can cause a post-reinforcement pause, where students tootled less immediately after receiving their first reward (Skinner et al., 2000).

To address these concerns and make the tootling intervention more game-like, teachers should consider using unknown randomly selected criteria (McCurdy et al., 2018). That is, a number of different criteria representing a wide range (i.e., 1-10) are written on slips of paper. Before the class period or school day begins, the teacher randomly selects a criterion slip and places it in an envelope that she would post at the front of the room. Since the students did not know how well they would have to do, they are encouraged to do their best (Skinner & Watson, 1997). Additionally, this pool of criteria gives the students a chance to win the game, thus maintaining interest and hope, even when they have a bad start (Campbell & Skinner, 2004; VanMaaren et al., 2020).

IV. Choose group rewards

With an interdependent group reward, all students get access to the same reward when the class meets their tootling criteria. Thus, it is critical for teachers to select a variety of rewards to maximize student engagement (McCurdy et al., 2020; Skinner et al., 1996). Additionally, because this teacher is concerned about losing teaching and learning time, group rewards should take very little class time or be compatible with schoolwork. Examples of such rewards include receiving 2-min of an activity (e.g., GoNoodle® or 2-min of extra recess), listening to music during independent seat-work, having lunch in the classroom, being able to go outside for scheduled inside recess, and receiving small edible treats (McCurdy et al., 2020). Again, we

recommend the application of unknown, randomly selected rewards to make the activity more game-like. Also, as long as the reward pool contains high-quality rewards (even though the quality of the reward is idiosyncratic), all students may be highly motivated (McCurdy et al., 2018; Skinner & Watson, 1997).

V. Describe the Tootling Game

Next, the teacher must describe the tootling intervention, including the interdependent group-oriented reward. First, the teacher will show the students the goal envelope while she fills it with the students' goal criteria, so that the students can see that there are multiple possible goals that can be selected. Then, she can pick the goal and clearly state to the students that their goal for that day or class period has been selected. It is important that the students understand that the goal is unknown, or a secret, so they will not know what the goal is until the end of the game. The teacher should place the specific goal in an area of the classroom where the students cannot peak at the goal during the day or class period. However, the entire goal envelope is good to keep out in public where the students can see it as a reminder of the game. Next, she should show the students what the peer reporting slips look like, remind them how to fill them out, and show them where to turn them in. Last, the teacher will explain that at the end of the game (e.g., at the end of the school day or class period where tootling is implemented) all of the peer reporting slips will be counted, and the secret goal will be revealed to see if they met their goal. It is important that the students understand that if they meet the goal, the entire class receives the reward; however, if they do not meet the goal, then no one receives the reward.

VI. Install Tootling

Before installing the tootling game, the teacher must make sure all materials are collected and accessible. These materials include: the goal/criteria slips in the goals envelope, the peer

reporting slips, the box to turn the peer reporting slips into, and the rewards and corresponding reward slips. To install tootling, once all of the materials have been collected and created, the teacher will need to put the box where students submit their tootles in a public, easy to access place in the classroom. Next, she will need to make sure that students can access this box and additional tootle slips easily without disrupting the class.

At the beginning of the day or class period, the teacher can give students the tootling slips and randomly select a goal and reinforcer in front of the class. It is important for the teacher to remember to keep the goal and reinforcer a secret, but she can display the slips of paper in public, (e.g., put them in an envelope which is adhered to a white board in the front of the class), which may remind students to tootle throughout the day or class period. At the end of the day or class period, the teacher will count the tootles and reveal the goal to the class. If the class met the goal, they should receive their reward. If they do not reach their goal, they do not receive the reward and are encouraged to work hard the next day to receive their reward.

Evidence of Effectiveness

Reducing Disruptive Behaviors and Enhancing Academic Engagement

Cihak, et al., (2009) conducted the first study which showed that tootling interventions decreased common disruptive classroom behaviors in third graders with and without disabilities (i.e. specific learning disabilities and ADHD). In this study, disruptive behaviors included calling out, out of seat without teacher permission, and engaging in any motor behavior that interrupted another student's work. The teacher marked on a bracelet made from construction paper every time each student engaged in one of these disruptive behaviors. Researchers concluded that disruptive behaviors decreased when tootling was implemented, but no data was collected on S-H-S behaviors (Cihak, et al., 2009).

Other researchers conducted follow up studies measuring disruptive and on-task behaviors using more systematic and replicable procedures than those employed by Cihak et al. (2009). Direct observation data indicated that tootling decreased disruptive behaviors (out-of-seat, calling out) in upper elementary and middle school students (Lambert, 2015). Subsequent researchers replicated Lambert (2015) findings with lower elementary students (McHugh et al., 2016) and high school students (Lum et al., 2017; 2019).

The effects of tootling on students' academic engagement (e.g., on-task behavior) was also measured. These on-task behaviors were defined as students being oriented toward the task, and/or engaging with the teachers and/or peers regarding the task. These researchers found that tootling increased academic engagement behaviors in elementary school students (Lambert, 2015; McHugh et al., 2016), middle school students (Lambert, 2015), and high school students (Lum et al., 2017; Lum et al., 2019).

Reducing Antisocial Behaviors and Enhancing Social Skills

Researchers have recommended encouraging desired behaviors, as opposed to discouraging inappropriate behaviors (Goldiamond, 1974; Mayer, 1995; Winett & Winkler, 1972). Kirkpatrick et al. (2019) used Tootling with four teacher-nominated third grade students to successfully decrease antisocial/disrespectful interactions. These antisocial/disrespectful interactions were identified as disrespectful or aggressive behavior directed toward adults or other students (e.g., hitting, threatening, talking back, inappropriate gestures, etc.). In this study, the dependent variable was the percentage of total observed intervals with an antisocial/disrespectful interaction each day, aggregated across the students. However, the reward criteria were based on the number of students who received a tootle, as opposed to the total number of tootles submitted (Kirkpatrick et al., 2019). They concluded that the tootling

intervention decreased these antisocial/disruptive behaviors; however, there was no data collected on prosocial behaviors (Kirkpatrick et al., 2019).

To increase students' engagement in recently taught social skills in their natural social context, researchers supplemented Social Skills Training (SST) with tootling (Wright et al., 2020, 2019; Crewdson this dissertation, Chapter 2 and Chapter 3). In the first study, Wright et al., (2020), SST was provided to first-grade students on compliment giving. Research measured complimenting behavior as students engaged in a small-group math game. After baseline data was collected, students participated in an SST that included defining a compliment, describing how compliments make you feel, providing examples and non-examples of compliments, and soliciting examples from the students. After this SST, the students participated in the tootling training to learn how to report their peers' complimenting behavior. The next day, the researcher reviewed the procedures and explained to the students how they could win the game. Two days after training, tootling was implemented. When tootling was installed during the math activity, complimenting increased; but, when it was withdrawn, students stopped complimenting each other during the math activity. This study was the first to demonstrate that tootling can increase the behavior that is being tootled on, as opposed to only how many tootles are turned in. It is also the first study that targeted a specific social skill, as opposed to S-H-S behaviors. Subsequent studies, which combined SST with tootling, confirmed these results and suggest that tootling could be used to enhance student performance of multiple social skills (Crewdson this dissertation, Chapter 2; Wright et al., 2019)

Tootling: Characteristics, Procedures, and Effects

Indirect Target Behaviors

During tootling, students are reinforced for reporting on their peers' desired behavior, as opposed to being reinforced for the actual behavior being reported. This positive peer reporting has been shown to have a variety of desired indirect effects. First, it increases the behavior being reported (e.g., Crewdson this dissertation, Chapter 2 and Chapter 3; Wright et al., 2020; Wright et al., 2019). Additionally, the research described earlier shows that tootling interventions can have a variety of other desired indirect effects including increasing desired academic behavior and reducing common disruptive and antisocial (e.g., mean) behaviors (Cihak et al., 2009; Kirkpatrick et al., 2019; Lum et al., 2019). The interdependent group rewards and peer written reports may account for these indirect effects.

Interdependent Group Rewards

With interdependent group rewards, the entire classroom earns a reward together or no one earns a reward, based on their peers' behaviors. As all students or no students earn rewards, this intervention does not divide the classroom into haves and have nots, which can help to reduce undesired social side effects (Cashwell et al., 1998). Rather, this type of contingency can create a sense of camaraderie, community, and togetherness within the classroom, as they must work together to reach their common goal (Slavin, 1987). The students will likely begin to encourage each other to engage in the target behaviors and then report those behaviors in order to receive the reward (McCurdy et al., 2020). Thus, giving the students a common goal/reward to work toward may encourage students to support each other's prosocial behaviors as opposed to tattling on peers so that they get in trouble (Skinner et al., 2002).

Students are more likely to earn rewards when they report classmates' prosocial behaviors and when their classmates report these behaviors, so they are more inclined to prompt and reinforce each other to engage in targeted prosocial behaviors and report such behaviors (Skinner et al., 2000; Wright et al., 2020). This encouragement to engage in prosocial behavior is likely to increase these behaviors and students' awareness of classmates' prosocial behaviors (Crewdson this dissertation, Chapter 2 and Chapter 3; Wright et al., 2019).

Also, students may be less likely to be mean to others who are helpful. Thus, establishing classroom structures that promote desired prosocial behaviors and enhance students' awareness of how helpful their classmates are may decrease the probability of students engaging in mean behaviors. It may also decrease the probability that they focus on their classmates' incidental inappropriate behaviors (e.g., calling out) and report these behaviors (i.e., tattling) in order to cause their classmates to be punished (Cashwell et al., 2001). These effects are likely to enhance students' perceptions of both their classmates and the classroom climate (Skinner et al., 2002).

Students are not the only people who focus on classmates' incidental inappropriate behaviors. Teachers often focus on monitoring and punishing students' incidental undesired behaviors (Wentzel, 1993). When teachers begin to spend more time encouraging and reinforcing desired behaviors, students may alter their view of the teacher from a punishing agent to a reinforcing agent, which may enhance their perception of the teacher and desire to cooperate with and please the teacher (e.g., follow directions). Additionally, the process of reviewing tootles is likely to enhance teachers' awareness of students' prosocial behaviors, which may enhance the probability that incidental behaviors are reinforced when they occur.

Written Peer Reports

Having students monitor their peers' desired social behaviors has many advantages. The first is that the students are better able than teachers to continuously monitor students' social interactions across the school day. Teachers are busy splitting their time between teaching lessons, monitoring disruptive behaviors, and maintaining a well-managed classroom. Thus, they are unable to observe every student interaction and likely miss many prosocial interactions that occur. However, the students are able to easily observe their interactions with others and report prosocial interactions (Skinner et al., 2002).

Using written reports in the classroom as opposed to verbal reports of peer behavior is an important characteristic of tootling. Verbal reports can disrupt class if they are reported in real time; however, the students may forget their peers' behavior if they are not reported in real time (Skinner et al., 2002). Written reports give students the opportunity to continuously observe and report their peers' desired behaviors at any time without disruption of the entire class. This allows students to monitor their peer's desired behaviors throughout the day, as opposed to only during a time where they can make the reports. Continuous monitoring encourages continuous engagement in the desired behavior, as well as ensuring that the students can report all instances that they observe, without forgetting.

Peer monitoring and reporting can also increase the students' awareness of classmates desired behavior, which may make it more likely that they model desired behaviors. Similar to taking notes, the act of completing written peer reports may enhance the reporters' social skills by enhancing their awareness of the various forms of prosocial behaviors and the contexts in which they are appropriate (Crewdson this dissertation, Chapter 2 and Chapter 3).

Implications, Applications, and Modifications

Target Behaviors

Tootling interventions can increase targeted behaviors, as well as the behaviors being reported by peers. While tootling has targeted the same behaviors class-wide, it may be possible for teachers to target idiosyncratic or different behaviors across students. For example, a special education teacher serving students with emotional/behavioral disorders may want to target the following behavior across six different students (asking for help, joining a group activity, accepting consequences, raising hand, complimenting, and saying thank you). It may be possible to prepare index cards for each student that identifies their idiosyncratic target behaviors. This may cause peers to prompt and encourage those students to engage in those idiosyncratic behaviors. For example, a student with Autism Spectrum Disorder (ASD) may have difficulty joining group activities. One reason why may be that classmates discourage him from joining or fail to invite him to join. If that is this student's targeted idiosyncratic behavior that his peers are taught to report, then his classmates may invite or encourage him to join a group activity (Skinner, 2008) so that they can report this behavior and enhance their chance of meeting their group goal.

When targeting social skills through a tootling intervention, the teacher could align a social skills curriculum with tootling (Wright et al., 2019). An example may be having a social skill of the week. On Monday, the students are taught what the social skill is, how to use it, and when to use it. For that week, the students will be reporting and engaging in that social skill. Matching the social skills curriculum with tootling will help students not only acquire the skill, but also perform the skill in natural contexts (throughout the day, as opposed to solely during the training session). Performing social skills in the natural social context is necessary for students to

develop more nuanced and functional social skills (e.g., delivering compliments in one manner on the playground and another in class) that will allow them to develop social competence (Gresham & Elliot, 1990).

Criteria

As previously discussed, it is difficult to set a criterion for number of tootles that is challenging enough that students do not perform their best, yet not so challenging that they give up because they feel that they cannot meet the criteria for the number of tootles. Randomly selecting criteria from a pool that includes a range of criteria (e.g., easy goals, as well as difficult goals) may maximize student performance (Skinner & Watson, 1997). If the students know that they must report 10 compliments, then they may stop tootling when they feel they have reached 10 (McCurdy et al., 2020). However, if the students are unsure of the criterion they need to meet on a specific day, then they are likely to put forth their best effort in engaging in the target behavior to ensure that they receive their reward (VanMaaren et al., 2020).

However, the criteria pool can be changed. As the students' tootling performance improves, shaping procedures can be used and the criteria pool can be altered (McCurdy et al., 2020). For example, the initial pool may include a smaller range of tootles (e.g., 1-10), so that students have a good chance of winning the game. After they have won several times and become more skilled at providing tootles, shaping can be used and the criteria pools can be enhanced (e.g., 1-20, then 1-30).

Similarly with randomly selected behaviors, if the students show significant improvement in the first target behavior, the teacher can introduce a second target behavior. Now, the teacher can select a random, secret criterion as well as a random secret behavior. This encourages the students to maintain their engagement in the first target behavior and increase their engagement

in the new behavior that was added to the criteria. For example, educators could first teach complimenting and randomly select a criterion for the number of complimenting tootles turned in each day. After a week, they could teach them to encourage each other. Now, teachers can randomly select both the target behaviors (compliments or encouragement) and the criterion. This form of shaping allows educators to maintain earlier behavior and increase other desired behaviors (Popkin & Skinner, 2003; Wright et al., 2019).

While most tootling studies have employed criteria based on the number of tootles, other criteria can be used. For example, Kirkpatrick et al., (2019) did not want students to provide positive peer reports on the same few students again and again. Thus, their criteria for the class to earn a reward was based on the number of different students tootled on, as opposed to the number of tootles.

Rewards

Selecting a random reward can also keep the students from becoming bored. If the students receive the same type of candy every time they meet their goal, they may become tired of that piece of candy and lack inspiration to work toward the goal. However, if the reward is different each time, students are less likely to get tired of the reward. This can also ensure that there are rewards for tootling that are salient for each student. For example, if Johnny likes lollipops but prefers chocolate, he is likely to be more motivated if the pool of secret rewards includes chocolate (Skinner & Watson, 1997). Additionally, students may stay more engaged in the tootling intervention if they are allowed to suggest reinforcers as the intervention is being applied (McCurdy et al., 2018; Popkin & Skinner, 2003).

Teacher Involvement and Support

One of the advantages of tootling is that it does not require significant time or attention from the teacher, as the students are monitoring and reporting the behaviors. However, teacher praise is often a significant reinforcer for students. Thus, whenever the teacher observes a student engage in the target behavior, she should provide specific praise to that student. This will serve as an incidental and natural reinforcement for the students who engage in the target behavior. It will also likely prompt other students to engage in the target behavior as well. Finally, such procedures may encourage desired behavior when tootling is not being applied (Kamps et al., 2011). Teachers can also naturally prompt students to engage in the target behavior. For example, if the teacher is targeting a specific student's joining group activities behavior, then she may point out to the student when there is an opportunity to join an activity with peers.

After counting tootles, teachers can read novel, unique tootles aloud and discuss them with the entire class so that they learn different types of desired prosocial behaviors and the context in which they are appropriate. For example, when reporting S-H-S behavior, young children often report sharing (paper, pencils). If the teacher read an example of a child comforting a peer who is upset and discusses it with the class, it can reinforce the student's creative tootles and expand the repertoire of S-H-S behavior across all students (Skinner et al., 2002).

Conclusion

Tootling has been shown to have a variety of desired indirect effects on student behavior. The combination of peer reporting and interdependent group contingencies may enhance students' engagement in prosocial behaviors and their awareness of classmates' engagement in desired behaviors. Additionally, tootling interventions can occasion peer mediation, which

involves students promoting and reinforcing each other's desired behaviors over time and in natural social situations (Wright et al., 2019). Researchers have not been able to account for the effects of each tootling intervention component (e.g., training, peer written reports, interdependent group reward). However, as the tootling interventions shift students' and teachers' focus from monitoring and punishing incidental undesired behaviors to monitoring, prompting, and reinforcing desired prosocial behaviors (Cashwell et al., 2001; Wentzel, 1993; Wright et al., 2020), it appears that the classroom climate is improved, and numerous positive side effects emerge. Thus, tootling may be a single, class wide, peer-mediated intervention that addresses Returning to Ms. Yang's classroom in the earlier vignette, her goals to enhance desired prosocial behavior, to reduce disruptive and mean behaviors, and to enhance student engagement (e.g., on-task), while supplying more time for her to provide less disrupted instruction.

Chapter II

Study I: Supplementing Social Skills Training with Tootling to Simultaneously Enhance First-Grade Students Social Skill Performance

Abstract

A withdrawal design was used to determine if a modified tootling intervention could enhance first-grade students' engagement in two recently trained social skills: giving compliments and providing encouragement. First, social skills training was provided and baseline data was collected as students played a cooperative Jenga® game in small groups. In this phase, social skills training did not enhance students' performance of giving compliments and providing encouragement while playing Jenga®. In the second phase, tootling was added and students earned a group reward contingent upon their reports of peers engaging in these two social skills. After tootling was withdrawn, it was reinstated. Visual analysis of the class-wide repeated measures graph shows an immediate and sustained increase in students' performance of compliments and encouragements each time tootling was applied, and an immediate and sustained decrease when tootling was withdrawn. This suggests that the failure to perform social skills following training was not a "can't do" or acquisition problem, but a performance problem that was addressed by the modified tootling intervention. The discussion elaborates on using tootling interventions to enhance social skill performance and development in typical social contexts.

Literature Review

Social competence, a critical developmental skill, is defined as the extent to which individuals are able to create and maintain successful interpersonal relationships, gain peer acceptance, create and maintain friendships, and terminate negative interpersonal relationships (Gresham et al., 2001). Interacting positively with others is one of the most important aspects of children's development and predicts psychological and social adjustment (Gresham et al., 2001; Segrin & Flora, 2000). Social competence is positively associated with peer acceptance, successful school adaptation, and positive adult relationships (Henricsson & Rydell, 2006; Ng et al., 2018). Further, when controlling for academic behavior, prosocial behaviors, IQ, family structure, sex, ethnicity, and absences were shown to predict students' GPA and standardized test scores (Wentzel, 1993). Thus, interventions designed to enhance social competence may also enhance cognitive development and academic achievement.

Social Skills Training and Performance

Social skills facilitate the development of social competence (Gresham et al., 2001). Social skills training (SST) typically involves small group instruction during which social skills are described, demonstrated, explained, modeled and practiced while teachers provide prompts, feedback, and reinforcement (Gresham, 1998). Also, SST typically includes instruction on when specific social skills are appropriate and how they function (e.g., how it feels to compliment someone). Social skills training provides students an opportunity to learn social skills and perform them in the SST environment (e.g., Ang & Hughes, 2002). Unfortunately, research findings also suggest that such training may not enhance students' appropriate performance of these acquired skills in their natural social context (January et al., 2011; Lösel & Beelmann, 2003). Based on meta-analytic findings, Gresham et al. (2001) concluded that the biggest

weakness of SST is the lack of significantly large, maintainable, generalizable, or socially important changes in social competence. Current research on SST focuses on social skill acquisition, as opposed to social skill performance (Jonsson, et al., 2019; Radley, McHugh, & Taber, 2017; Storebo et al., 2019). A recent meta-analysis concluded that very few social skill intervention studies include maintenance and generalization data that are indicative of social skill performance, and that this area of research is vastly under-researched (Hutchins, Burke, & Bowman-Perrott, 2019).

Gresham et al., (2001) developed a social skill learning hierarchy based on Haring and Eaton's (1978) work, which includes social skill acquisition, performance, and fluency. Acquisition deficits involve an inability to perform a social skill due to lack of conceptual, procedural, or contextual knowledge. Performance deficits occur when students have acquired social skills, but do not perform those skills appropriately in a naturalistic social context. Fluency deficits involve awkward, choppy, unnatural, or labored performance of a social skill.

Most SST programs target skill acquisition and students do appear to gain knowledge of social skills and the ability to perform them within SST environments (Ang & Hughes, 2002). However, SST often does not occasion consistent and maintainable improvements across natural social contexts and over time; thus, students cannot derive the benefit from developing social competence. To address these performance deficits, Gresham (1998) recommended a contextual approach to SST, using incidental and informal strategies to promote performance of recently acquired social skills in natural environments. These strategies include providing prompting, modeling, feedback, and reinforcement of social skills across other people, natural social contexts, and different prosocial behaviors (Gresham, 1998; Robertson et al., 1984). These strategies are common components of peer-mediated interventions (Simpson & Lewis, in press).

Peer Mediation

Relative to teacher delivered interventions, peer mediated interventions have many advantages when attempting to promote recently taught social skills in natural social contexts. With respect to prosocial behaviors, teachers cannot observe all student-to-student social interactions that occur across the school day; thus, they have limited opportunities to prompt, model, or reinforce prosocial behaviors (Skinner et al., 2002). Additionally, in many instances, educators focus their attention on monitoring students for incidental antisocial behaviors; consequently, they may be less aware of students' prosocial behaviors (Skinner et al., 2000). This focus on undesirable behaviors may cause students to learn that avoiding undesired social behaviors is more important than engaging in prosocial behaviors (Cashwell et al., 2001; Wentzel, 1993).

Peers can observe each other's social behavior and provide prompts, models, and reinforcement (Skinner et al., 2000). Thus, peer-mediated interventions may provide many more incidental learning opportunities for students to develop social skills (e.g., enhance performance and fluency in natural social context) as they interact with each other across the school day in their natural context (Moore & Carey, 2005; Simpson & Lewis, in press; Watkins, et al., 2015). However, like teachers, elementary students tend to monitor classmates' incidental antisocial behaviors and tattle, or report those behaviors to the teacher (Cashwell et al., 2001).

Tootling

An intervention known as "tootling" (Cashwell et al., 2001; Skinner et al., 2000) was developed to address some of these issues. The term tootling was formed by combining the word "tattling", a type of peer reporting, and the phrase "toot your own horn" which focuses on reporting of desired behaviors (Skinner et al., 2002). tootling uses interdependent group-oriented

contingencies to reinforce positive peer reporting (PPR) or tootles. The standard PPR strategy is for students to make verbal reports of their peers' desired behaviors with the class focusing on one student at a time (Ervin et al., 1996; Johnson, 2009; Skinner et al., 2002). Skinner et al., (2000) modified this strategy to include written reports of positive peer behavior (i.e., written tootles) and rather than focusing on one student, each student could report any observed instance of any classmate helping another student. Thus, the student being helped by a classmate could report this classmate's prosocial behavior.

Skinner et al., (2000) developed the tootling intervention based on the assumption that students may not notice, respond to, or see value in incidental prosocial behavior because they spend so much time monitoring and reporting their peers' undesirable behaviors (e.g., tattling). However, student relationships and the classroom environment may be enhanced if students are more aware of their classmates' prosocial behaviors (Cashwell et al., 2001). Thus, with tootling, students are taught to monitor and report each other's incidental prosocial behaviors as they engage in typical classroom activities. One may also receive reinforcement for reporting their own desired behavior or tooting their own horn (Seymour & Stokes, 1976). Also, when a student reports a classmate's desired behavior, that classmate may receive reinforcement (e.g., teacher praise), but not the student who provided the PPR (Skinner et al., 2000). To encourage students to provide PPRs or tootles, an interdependent group-oriented rewards was applied where the entire class was reinforced when they provided enough tootles. Thus, each student was more likely to receive a reward when they and their classmates tootled (McCurdy et al., 2020; Slavin 1987). This interdependent group-oriented contingency may cause students to encourage (e.g., prompt, praise) each other to both perform and report the desired prosocial behaviors (Skinner et al., 2002, Slavin, 1991).

During the initial tootling studies, elementary students were taught to and reinforced for reporting student-helping–student (S-H-S) behaviors (Cashwell et al., 2001; Skinner et al., 2000). Results showed that the interdependent group contingencies were necessary to increase and maintain peer reporting of S-H-S behaviors. Similarly, tootling interventions decreased common disruptive classroom behaviors (e.g., calling out) and inappropriate social behaviors (e.g., name calling), while enhancing on-task behavior in subsequent studies (Cihak et al., 2009; Kirkpatrick et al., 2019; Lambert et al., 2015; Lum et al., 2017; McHugh et al., 2016).

While earlier researchers reinforced students for reports of S-H-S behaviors, Wright et al. (2020) combined SST with tootling to reinforce students for reporting a recently taught social skill, complimenting. Specifically, Wright et al. (2020) encouraged students to increase compliments through a modified tootling intervention, termed appropriately, the Catching Compliments Game. During this intervention, the class received a reward contingent upon the students providing enough written reports of peers providing compliments as they engaged in a regularly scheduled school activity (i.e., play a small group math game). This combination of SST and tootling increased students' performance of complimenting in the natural social context, and demonstrated that the tootling component was necessary to occasion and maintain these behaviors.

The Wright et al., (2020) study was the first to demonstrate that tootling can increase the occurrence of the behaviors that are being reported, as opposed to only increasing the number of reports. This is important because it is possible that tootling increases students' awareness and reports of peer's prosocial behaviors, without enhancing performance of those desired behaviors (Skinner et al., 2002). Also, the Wright et al. study suggests that combining SST with tootling may prove effective in developing social competence across the Gresham et al., (2001) social

skill hierarchy. The process of observing and reporting peers' engagement in a recently taught social skill may enhance acquisition of students' knowledge of and ability to perform (e.g., modeling) a social skill in a context where that skill is appropriate. The group contingency may address performance deficits by encouraging all students to engage in social skills, while also reinforcing classmates who encourage (e.g., prompt and reinforcing) classmates' performance of these prosocial behaviors (Skinner et al., 2009). As students engage in and report more prosocial behavior, opportunities to respond are enhanced which can address fluency deficits. Also, as students engage in and report these social behaviors across contexts, they may learn a variety of different ways to perform or express a social skill, thus enhancing skill fluency by allowing them to perform more nuanced social behaviors that are appropriate for specific contexts.

Purpose

As demonstrated by Wright et al., (2020), a modified tootling intervention may effectively address social skills performance deficits by enhancing student engagement in a recently taught social skill outside the SST environment. One limitation of the Wright et al., (2020) study is that SST and tootling were provided after the initial baseline phase, making it difficult to disentangle the effects of SST and tootling. Additionally, if tootling is to be an effective supplement to SST, it should target performance of more than one social skill. Thus, the current study was designed to replicate and extend this research by evaluating the effects of SST and tootling on the performance of two different social skills simultaneously in at-risk first graders as they engaged in a small group game.

Method

Participants and Setting

This study was conducted during the after-school program at a K-5 University-assisted community school (UACS) in an urban area of the Southeastern United States. The after-school program provides at-risk students with enrichment activities and tutoring designed to enhance academic, behavior, and social/emotional skills. Also, the program provides many other resources for the students and their families (e.g., dinner for children, English classes for families, legal and health consultation). Demand for the after-school program outstrips capacity. Hence, students are accepted to this program based on social/emotional or behavioral problems, poor attendance, academic deficits, or other risk factors. Referrals most frequently come from school staff but also come from parents and occasionally even students themselves. The afterschool program schedule includes snack time, academic hour, extracurricular activity clubs, and dinner. During academic hour, two or three days per week were devoted to academic skill development with a focus on reading, while the other two or three days included foreign language or music lessons.

Approximately 120 students were enrolled in this program with 40% Caucasian, 35% African American, 17% Hispanic, 7% Multi-Racial, 1% Hawaiian Native/Pacific Islander, and less than 1% Asian. About 45% were girls and 55% were boys and 89% came from low-income families. These students originate from about 23 countries with 19 languages other than English spoken at home.

The study was conducted two to three days per week during the academic hour in the first-grade classroom. The classroom was led by a credentialed first-grade general education teacher. During academic hour, the students were put in groups of four or five and those groups

rotated through four different stations approximately every 10-12 min. Most stations had activities designed to develop the students' early reading skills, but one station typically included a game. The primary researcher led the game-based station. At the researcher-led game station, the students played Jenga® on the carpet and researchers were able to sit in chairs to observe and record each student's behavior while they played.

There were 19 total students in this class and data were collected on 18 of those students. Approximately 63% of the students were girls and 37% were boys. One male did not provide written parental consent to participate; thus, no data were collected for this student. In the class, 47% were African American, 37% were Caucasian, 11% were Hispanic, and 5% were Pacific Islander.

Materials

Materials included Jenga® blocks provided by the primary researcher. For the positive peer reporting, the primary researcher printed the names of each student in each group, and an image of compliment-giving and an image of encouraging on 8.5 x 11-inch colored paper (see Appendix B). For each group, PPR slips were printed on different color paper and each piece of paper was cut into four slips. A shoe box decorated with colorful wrapping paper was used to store completed PPR slips of paper. The researcher also printed the random reward criteria. These criteria slips were kept in a 6 X 9-inch manila envelope with the word "Goals." When asked to select a reward that all students liked but rarely received, the teacher selected small, individually wrapped pieces of candy.

Independent and Dependent Variables

Intervention components included SST, tootling training, and the application of a modified tootling intervention applied while students played Jenga®. The intervention was

similar to that used by Wright et al., (2020). However, during the current tootling intervention, both compliments and encouragements were simultaneously targeted.

Each student was observed for approximately 10 min while their group played Jenga® and researchers used partial interval (20 s intervals) time sampling to record compliments and encouragements. Partial interval time sampling was used because there is not always a clear beginning and end to giving a compliment or providing encouragement (Hintze et al., 2002). The primary dependent variable was the percentage of total observed intervals across all students that were scored with either a compliment or an encouragement. Similar data are also collected and analyzed for each of the four groups of students.

Operational definitions of compliments were similar to those used by Wright et al., (2020). Compliments were operationally defined as positive, verbal statements that demonstrated approval of another student personally or of another student's completed action. Examples of compliments that demonstrated approval of a student personally included, "I like your hair," or "You are a good friend." Examples of compliments that demonstrated approval of another student's completed action included, "Good job," or "You picked a good block to pull out." Non-examples of compliments included "Yes!" or "Yay!" because they were often celebratory responses and not directed at a peer. Encouragements were operationally defined as positive, verbal statements that appear to support, cheer on, or boost the confidence of another student before they engage in a behavior or during the behavior. Examples of encouragements included, "You can do it" or "Keep it up." Non-examples of encouragements included, "Don't do that" and statements included in the definition of compliment giving behavior.

Compliments and encouragements were only scored if they were at an audible level and directed toward another peer in their group. Thus, a compliment or encouragement directed at a

student in another group or at an adult was not scored. Nonverbal compliments and encouragements such as high-fives and thumbs-up were not included. Singing was also not scored, even if the song included statements of encouragement or compliments. These behaviors were excluded because they were sometimes celebratory.

Design

An A-B-A-B withdrawal design was used to examine the effects of the tootling intervention on complimenting and encouraging while students played Jenga®. This design allows for three demonstrations of experimental control, including two demonstrations of a treatment effect (Kazdin, 2011). Phase-change decisions were based on visual analysis of class-wide data, our primary dependent variable, that was plotted on repeated measures graphs. Also, we followed the recommendation of some that single-subject design researchers should include at least five data points per phase (Kratochwill et al., 2010).

Procedures

Prior to beginning the study, the primary researcher and teacher met and created groups that would remain intact for the duration of the study. Group membership was based on student interactions (e.g., avoided putting students who did not get along in the same group and separating highly talkative students), and attendance (e.g., avoided putting two or more students in same group who were frequently absent).

After groups were formed, study procedures were implemented. First, in a single one hour session, students were provided two types of training: Jenga® training and SST for compliments and encouragement. Next, for two days, students practiced playing Jenga® in their small groups as the researchers provided instruction, prompts, and feedback. Following these two practice days, researchers began taking baseline data on the two dependent variables. Next,

students were trained to tootle in approximately twenty minutes, and the tooling game was described to students. Immediately after this training, the tootling intervention was installed as students continued to play Jenga®. During the next phase, the tootling game was withdrawn, and students continued to play Jenga® as researchers collected data. In the final phase, the tootling intervention was re-applied.

Jenga® and Social Skills Training. Before completing two days of practice (for both students and researchers), the primary researcher introduced the class to a modified Jenga® game and provided social skills training during their snack time before academic hour. The students were given instructions on how to build the tower, the goal of the game, and the rules. The goal of the Jenga® game was to take turns pulling out as many blocks as they could as a group. Each group kept track of how many blocks they pulled out each round and worked together to beat their high score. The rules of the Jenga® game included: no yelling, the primary researcher picks who goes first, take turns, if it is not your turn you cannot touch the blocks, and the student designated to go first will start every time the tower falls. The full training protocol for the Jenga® game can be seen in Appendix C and for the SST in Appendix E.

Next, during the same session, the researcher provided class-wide SST. The primary researcher provided definitions of compliments and encouragements. Examples and non-examples of each were also provided and modeled. The students were prompted to provide their own examples and non-examples. Additionally, examples of when each behavior would be appropriate (i.e., when to use compliments and encouragements) were provided and solicited from students. The researcher also asked the students how it feels to give and receive compliments and encouragements. Praise and feedback were provided following student responses.

Practice. After introducing the Jenga® game and providing SST, two days were spent allowing students to practice playing Jenga® and the researcher provided instructions, prompts, praises, and corrective feedback. After the two days, the children seemed to grasp the Jenga® rules and needed minimal supervision. Thus, baseline data collection began after these two practice days. During the two practice days, researchers attempted to practiced recording compliments and encouragement; however, they observed no compliments or encouragements.

Baseline phase and assessment procedures. During baseline, typical classroom procedures were applied at the Jenga® station. Data collection began once all students in the group were seated on the carpet. The primary researcher used partial-interval recording with 20 s intervals. For each student, an interval was scored if a student delivered a verbal compliment or provided verbal encouragement during that 20 s interval. Thus, every student in the group was continuously observed at the station and compliments and encouragements were scored separately for each student in that group. When the approximate 10 min allotted for the station ended, the groups rotated to the next station. This procedure was repeated for each of the four groups of students.

Tootling training. After five baseline sessions, immediately before the intervention was first implemented (i.e., during snack time), the primary researcher provided instruction on how to tootle and how the Tootling game would be played. First, each of the social skills was briefly reviewed using procedures similar to the first SST. The researcher also included a lesson on tone, specifying that the *way* statements are said is equally important to what is actually being said. The primary researcher gave examples and non-examples of appropriate tone, and had the students give their own examples and non-examples.

Next, the researcher trained the class on how to report their peers' compliments and encouragements. Students were taught to only report compliments and encouragements provided by members of their group during the Jenga® station. They were also taught not to report on their own or adult (e.g., teacher, volunteer) complimenting and encouragement giving behaviors. Next, the researcher demonstrated how to fill out the PPR slips. Students were instructed to circle the name of the peer that provided the compliment or encouragement, and then circle either the word compliment or encouragement at the bottom of the slip. Students were told to only circle one student name and one behavior per slip. The researcher specified that any slip filled out incorrectly did not count toward their goal. Once they filled out the slip, the students were instructed to place the slip into the decorated shoe box located at the Jenga® station.

Next, the primary researcher explained the procedures for the game. The researcher explained to the students that at the end of academic hour, all of the slips in the decorated box would be counted and that compliments and encouragements were counted separately. Then, the researcher showed the students the goal envelope and how a random criterion would be selected. During the first intervention phase, there were 20 criteria slips, 10 with compliment and 10 with encouragement written on them. Each of the 10 slips contained a single criterion, 1 through 10. During the second intervention phase, criteria were doubled and included 1-20 for each behavior. This modification was applied because students won the game each day during the first intervention phase and several students indicated that it was too easy.

The researcher explained that no one would know what the day's goal was until the end of academic hour. The students were told that the goal could be for either compliments or encouragements, but that would remain unknown until the end of academic hour. Once the PPR slips were counted, the researcher described how the goal would be revealed and if the students

met or exceeded that goal, each student in the class would receive a reward. It was emphasized that the reward was class-wide so either everyone won or no one won. The full protocol can be found in Appendix D.

Tootling intervention phase. During the intervention phase, before students began to move to their stations, the primary researcher announced that they would be playing the tootling game, selected a criterion from the goal envelope, and placed it on the whiteboard above the Jenga® station. Students were not told which criteria slip was selected. As each group came to the Jenga® station, the primary researcher prompted students to answer questions to review the rules of the tootling game. These questions were: "How many names do you circle on each slip?" "How many behaviors do you circle on each slip?" "Do fill out a slip for yourself?" and "When do you fill out a slip?" Once the students correctly answered these questions, the students started the Jenga® game and the researcher(s) began data collection.

At the end of academic hour, the primary researcher counted the number of correctly completed slips for compliments and encouragements separately. The researcher then took the randomly selected criteria slip from the envelope and announced to the class what their goal was for that day (e.g., 5 compliments, 7 encouragements) and asked if they think they met it. Once the researcher revealed the goal, the class would be told how many of those slips (compliments or encouragements) they turned in. If the class met their goal, the researcher gave each student a piece of candy. During this phase, the class met their goal and received their reward all five days of the intervention phase.

Withdrawal phase. During the withdrawal phase, the classroom returned to typical classroom procedures as conducted during the baseline phase. When academic hour began, the students were told that they would not be playing the tootling game. The students rotated through

stations and data was collected at the Jenga® station. The students were not provided with slips or the decorated box for positive peer reporting. If students asked where the slips were, the researcher told them they were not playing the game on that day.

Re-implementation phase. Procedures during the re-implementation phase were similar to those used during the intervention phase. The primary researcher announced that they would once again be playing the game. Based on the high number of slips the students turned in during the intervention phase, the researcher informed the students that she had added criteria slips numbered 11 to 20 for compliments and encouragements. During the reimplementation phase, the students met their goal and received their reward on three out of the six days.

On day 18 (day 3 of the reimplementation phase), an extraneous event occurred that may have impacted our study. Volunteers entered the classroom and gave each student several candy canes in the middle of academic hour, which may have devalued the quality of the reward used in our intervention. Also, the volunteers passing out candy canes resulted in students leaving their stations and activity for approximately two minutes.

Acceptability. As winter break was approaching, the teacher informed the primary researcher that the after-school schedule would be in flux due to holiday events including shows, parties, and other special events. Thus, the final session occurred about two days before holiday break. Immediately following the intervention, the primary researcher collected acceptability data. Students were given acceptability forms and the researcher read items aloud as the 15 students in attendance that day circled their responses (see Appendix L for results). The teacher was given her form which she took home, completed, and returned to the primary researcher (see Appendix M for results).

Analysis Procedures

After each day of data collection, the class average of the percent of intervals scored with compliments and encouragements was plotted on a time-series graph. To calculate this average, data from each student was used. Thus, we calculated the total number of intervals observed across all students in the class and divided the total number of intervals scored with a compliment and also with an encouragement. Visual analysis of this class-wide graph (e.g., variability, trends, level, and immediacy of effects) was used to make phase change decisions and to evaluate the effectiveness of the intervention. Additionally, intervention effects were analyzed using Tau effect size estimates (Parker et al., 2011).

Procedural Integrity and Interobserver Agreement

One independent observer took procedural integrity data for all trainings. (see Appendices H, I, and J). Procedural integrity was 100% for each training. Procedural integrity for the tootling intervention sessions was collected twice per phase for a total of four intervention days (36.3%) of the treatment sessions (see Appendix J). Procedural integrity of the intervention ranged from 87.5% to 100%. During one intervention, the primary researcher did not prompt one group to turn in their remaining slips at the end of the station, which resulted in 87.5% procedural integrity for that day. Note, the students turned them in without prompting. All other days, procedural integrity was scored 100%.

The primary researcher and a second independent observer collected data on two baseline phase sessions (40%), two intervention phase sessions (40%), one withdrawal phase session (20%), and two re-implementation phase sessions (33%). For each of these sessions, interobserver agreement (IOA) was calculated by examining each interval for each student and dividing the number of agreements by the number of agreements plus disagreements and then

multiplying by 100. During baseline, the mean IOA was 100% for compliments and 99.4% for encouragements (ranging = 99% - 99.8%). For the intervention phase, the mean IOA for compliments was 99% (ranging = 98.6% - 99.3%) and 97.5% (ranging from 96.9% - 98%) for encouragement. For the withdrawal phase, only one day of IOA data was collected and it was 99.8% for compliments and 99.4% for encouragements. For the reimplementation phase, the mean IOA for compliments was 99% (ranging from 98.5% - 99.5%) and 98.6% (ranging from 98.3% - 98.9%) for encouragements.

Results

Figure 2-1 shows the class-wide percentage of intervals scored with compliments and encouragements, separately. During baseline, the percentage of intervals scored with compliments ranged from 0.0% to 1.9%, and percent intervals scored with encouragements ranged from 2.4% to 6.9%. After tootling was introduced, the percentage of intervals scored with compliments and encouragements showed an immediate increase; compliments ranged from 14.1% to 22.7% and encouragements ranged from 13.7% to 19.8%. When tootling was withdrawn, the percentage of intervals scored with compliments and encouragements showed an immediate decrease; compliments ranged from 0% to 1.6% and encouragements ranged from 3.2% to 6.6%. When tootling was re-implemented, there was another immediate increase in percentage of intervals scored with compliments and encouragements; compliments ranged from 8.9% to 18.5% and encouragements ranged from 8.3% to 17.6%. Visual analysis of Figure 2-1 shows no clear trends in any phase.

Figures 2-2 through 2-5 display the percent intervals scored data for each group. Note, because phase-change decisions were based on class average data, these results should be interpreted with caution. Visual analysis of Group A's data (see Figure 2-2) shows an immediate

increase in intervals scored with compliments after the intervention was first applied and an immediate decrease after it was withdrawn. For encouragements, there was not an immediate increase; however, there was an increasing trend during the intervention phase and an immediate decrease after it was withdrawn. In the final re-implementation phase for compliments and encouragements, there was not an immediate increase; however, there is a clear increasing trend in percent intervals scored. Visual analysis of Group B's data (see Figure 2-3) shows that immediately after the intervention was applied in both the intervention and re-implementation phases, percent intervals scored with compliments and encouragements increased. After the intervention was withdrawn, there was an immediate decrease in intervals scored with compliments. While no clear trends are evident in the no-treatment phases for compliments and encouragements, there appears to be a decreasing trend in both intervention phases for compliments and encouragements.

Visual analysis of Group C's data (see Figure 2-4) shows immediately after the intervention was first applied, intervals scored with a compliments and encouragements increased. Also, immediately after the intervention is withdrawn, percent intervals scored with compliments and encouragements decreased and there is no clear trend during the withdrawal phase for compliments or encouragements. After the intervention was reapplied, there is an increase in intervals scored with compliments and encouragements, but the increase is not as large as the increase following the initial application of the intervention phase. No clear trends emerged in the re-implementation phase for compliments or encouragements. Visual analysis of Group D's data (see Figure 2-5) shows an immediate increase and an immediate decrease in intervals scored with compliments and encouragements after the intervention was applied and withdrawn, with no clear trends in any of the first three phases for compliments. In both baseline

and withdrawal phases, the trend is steady at 0% of intervals scored with encouragements. There was not an immediate increase in intervals scored after the intervention was re-applied, but there is some evidence of an increasing trend during this phase for encouragements.

Statistical Analysis

Table 2-1 shows the class wide and small group means, standard deviations, and ranges of the percentage of intervals scored with each social skill. For the class-wide data and for each group, mean intervals scored with a compliment and mean intervals scored with an encouragement are always higher during the treatment phases than during the no-treatment phases.

A web-based calculator designed by Vannest and colleagues (2016) was used to calculate Tau effect size coefficients and their corresponding *p*-values between baseline and intervention, withdrawal and reimplementation, and intervention and withdrawal. Another web-based calculator designed by Tarlow (2016) was used to determine if baseline corrections were necessary for the analysis; results showed that no baseline corrections were required to run the Tau analysis. Consequently, Tau, as opposed to Tau-U scores were used to estimate effect sizes across adjacent phases (Parker, et al., 2011; Vannest & Ninci, 2015). Vannest and Ninci's (2015) criteria were used to interpret Tau scores, thus 0.20 to 0.60 was considered a moderate change, 0.60 to 0.80 a large change, and above 0.80 a large to very large change.

The results of our Tau analyses are presented in Table 2-2. For the class-wide data, all changes in compliments scored and encouragements scored across adjacent phases were very large and in the anticipated direction. For compliments, similar results were found for Groups A, B, C, and D with all adjacent phases effect size estimates being large or very large and in the anticipated direction with only one exception; for Group D the effect size estimate for the

withdrawal to re-implementation effect was moderate. The encouragement effect size estimates were less consistent than the compliment estimates. For Group A encouragements, the treatments effect was large, the withdrawal effect was very large, and the re-implementation effect was moderate. For Group B encouragements, across all adjacent phases, effect size estimates were large or very large. For Group C encouragements, the treatment effect and the withdrawal effect were moderate and there was no re-implementation effect. For Group D encouragement data, the treatment effect and withdrawal effect were large to very large, and the re-implementation effect was moderate.

Acceptability

Appendices E and F show the average acceptability responses for the students and the teacher's responses. Average response for students was 85% acceptable. The teacher's average response was a score of five on a six-point Likert scale. These results suggest that both the students and the teacher found the intervention acceptable.

Discussion

The purpose of this study was to determine if supplementing SST with a modified tootling intervention would simultaneously increase student performance of two recently trained social skills in a natural context. Visual analysis of the class-wide repeated measures graph showed immediate and sustained increases in compliments and encouragements both times the tootling intervention was applied. These data provide two demonstrations of treatment effect. When the intervention was withdrawn, visual analysis indicates an immediate and sustained decrease, which provided a third demonstration of control. Tau effect size estimates support the visual analysis of class-wide data and provides repeated evidence that the tootling intervention enhanced students' performance of the two social skills outside the SST environment. Although

the small-group data is less clear, visual analysis and effect size estimates suggest that the tootling intervention was generally effective across all four small groups.

Tootling has been used to increase desirable academic behaviors (e.g., on-task) and decrease disruptive (e.g., calling out) and inappropriate social (e.g., social aggression) behaviors in elementary classrooms (e.g., Cihak, et al., 2009; Kirkpatrick, et al., 2019; McHugh, et al., 2016). Wright et al., (2020) provided evidence that a modified tootling intervention where students reported peer performance of a recently taught social skill (i.e., giving compliments), could enhance student performance of that behavior in a natural social context. The current results support the Wright et al., (2020) findings in several ways. First, tootling interventions can increase the behavior that students report. Second, the tootling procedures can be used to enhance students' social skill performance in recently taught social skills in natural social contexts. Third, the current study extended these findings by demonstrating how applying Tootling interventions with randomly selected target behaviors could increase more than one social behavior. Finally, because SST was offered prior to baseline, the current study more clearly provides evidence that the improvements in performance were occasioned by the tootling intervention, as opposed to SST.

Wright et al. (2020) did not collect social validity data. Results from our acceptability measures suggest that both the students and the teacher found the intervention acceptable. Additionally, unsolicited behaviors and comments supported the results of the acceptability measures. The teacher commented "I have noticed that outside of the game, the students have learned to compliment and encourage one another during play and center time." Thus, future researchers should consider conducting similar studies, while collecting data outside the SST environment and the environment where tootling is applied, to examine generalizability. When

the tootling intervention was withdrawn, students complained. When the tootling intervention was re-applied, the students cheered and clapped. Thus, the current study suggests that the tootling intervention was effective at increasing students' social skills performance and acceptable to the teacher and students.

Applied Implications

There are applied implications associated with the current study. Additional evidence is provided that tootling interventions could enhance social skill development by causing students to perform recently trained prosocial behaviors within their natural context (Gresham, 1998). These findings suggest that supplementing SST training with tootling has the potential to address limitations associated with providing SST alone by causing students to perform social skills in their natural social context. More research is needed before making applied recommendations.

Of note, this was only the second study we could identify where researchers supplemented social skills training with a modified tootling intervention where students were reinforced for reporting classmate's engagement in recently taught social skills. Thus, additional replication and extension studies are needed before any applied recommendations are made. Additionally, researchers should evaluate the effects of supplementing SST with tootling that target a broader array of social skills over time (Wright et al., 2020). We evaluated social skill performance, but we did not attempt to evaluate the quality of students' performance. Additional studies are needed to determine if the tootling program enhances the prosocial behavior exhibited in the appropriate context and if the behavior was exhibited in the appropriate manner.

This study was conducted in an afterschool program and data were collected during a small group activity. Additional studies are needed to determine if similar procedures can be used to enhance student engagement in recently taught social skills in more typical general and

special education settings, across the school day, and across activities and contexts. Finally, researchers need to determine if supplementing SST curricula, which targets numerous sequentially trained social skills, with tootling could enhance students' social competence and peer acceptance and occasion the numerous associated desired academic, social, behavioral, and mental health outcomes. Such studies will likely require the application of longitudinal group designs and broad measures administered over time and across students.

Causal Mechanisms

To facilitate social skill performance, Gresham (1998) recommended using incidental and informal strategies (e.g., prompting, reinforcement) during naturalistic events too. These informal strategies may have been causally related to the increase in students' giving peers compliments and encouragement. With interdependent group-oriented rewards, each student is more likely to earn a reward when they do well and their classmates do well; thus, students may attempt to influence their peers to perform better (McCurdy et al., 2020). In the current study, researchers observed students regularly prompt and encourage classmates to give compliments and encouragements (e.g., "Guys, we need to give more compliments," "Johnny, you haven't given an encouragement yet,") when tootling was applied. As this prompting can influence both social skill acquisition and performance (Gresham, 1998), researchers should evaluate the relationship between the interdependent rewards, these peer-mediated behaviors, and the increase in social skill performance after tootling was applied.

Also, teaching students to observe and report their peers' desired behaviors and reinforcing these reports (i.e., tootling) may have enhanced students' awareness of different types of compliments and encouragements and the context in which they occurred (Skinner et al., 2002). Thus, the process of peer reporting may have enhanced peer modeling or observational

learning effects. Researchers should determine if these peer modeling effects enhanced students' social skill acquisition and performance (e.g., knowledge of different types of compliments and encouragement and context when they are appropriate, Gresham, et al., 2001).

The interdependent group contingency which reinforced reports of compliments and encouragement, as opposed to engagement in those behaviors, should be evaluated. This contingency likely indirectly reinforced our two prosocial behaviors because performance of those behaviors occasioned the peer reports which were reinforced (Gresham. 1998; Robertson et al., 1984; Skinner et al., 2000; Wright et al., 2020). Also, applying interdependent group-oriented contingencies across randomly selected target behaviors (i.e., students did not know which target behavior would serve as the criterion for rewards) can occasion immediate and large changes across multiple behaviors (Campbell & Skinner, 2004; Popkin & Skinner, 2003). Researchers should determine how this application of unknown, randomly selected target behaviors and numerical criteria influenced social skill performance.

Another causal variable that may have impacted complimenting and encouraging is related to students completing the peer-reporting slips. After completing a slip, students would often inform the peer that they provided a positive report (e.g., "Amy, I filled one out for you"). This may be a form of soliciting reinforcement (Seymour & Stokes, 1976) as often peers would thank the student who tootled on them. These interactions also suggest that the tootling program enhanced students positive peer attention and interactions, which is one of the goals of the original tootling programs (Cashwell et al., 2001; Skinner et al., 2000).

Limitations and Future Research

During the current study, the baseline phase conducted after the initial SST session suggested that a single SST session did not impact performance during Jenga®. However, prior

to implementing the initial tootling intervention phase, these social skills were re-taught to ensure students knew what to report. Consequently, the increase in performance during the first phase may have been caused by cumulative effects of the two SST sessions. However, when tootling was withdrawn, complimenting and encouraging immediately decreased; and, when tootling was reapplied, these behaviors immediately increased. Thus, the final B-A-B phases provide repeated evidence (i.e., two demonstrations of experimental control) that the tootling intervention caused related increases in social skill performance (Barlow & Hersen, 1984). Regardless, research may want to address this limitation with across-participant designs where they evaluate the effects of tootling, SST, and SST combined with tootling.

Complimenting and encouraging were not maintained in the withdrawal phase. Thus, although the program was successful in enhancing student performance of the behavior in a natural setting (e.g., generalization), that performance was not maintained when the tootling intervention was withdrawn. Several strategies could be applied to enhance maintenance including fading reinforcement, shaping by sequentially adding prosocial behaviors to the contingency, using less discriminable contingencies, encouraging teachers to enhance their praise for targeted social performance, and training peers to provide prompts and praise for these behaviors (Skinner & Popkin, 2003; Stokes & Baer, 1978; Watkins et al., 2015; Wright et al., 2020). Additionally, maintenance may be enhanced when programs are run for longer periods of time, so that the desired prosocial behaviors become more automatic (Gresham, 1998; Wright et al., 2020).

There are numerous threats to external validity associated with current study that should be addressed. Specifically, researchers should conduct similar studies across students, social skills, contexts, and over longer periods of time. Additionally, researchers should attempt to

measure students' social skill development as these procedures are applied over time. Specifically, they should determine if these procedures enhance students' (a) ability to acquire new ways to express a social skill (e.g., acquire a variety of different verbal compliments), (b) ability to discriminate context when specific social skills are appropriate and inappropriate, (c) engagement in appropriate social behaviors in appropriate contexts, and (d) ability to apply these social skills fluently or in a manner that enhances peer acceptance.

Conclusions

Previous research indicates that providing students with SST alone may not cause students to perform those behaviors in a natural social context (Gresham, 1998). The current finding and those of Wright et al., (2020) suggests that tootling, a peer-mediated intervention, may enhance student performance of social skills as they interact with each other outside the SST environment. Next, researchers should consider supplementing SST curricula, which sequentially target numerous social skills, with tootling. As new social skills are acquired, tootling can be used to enhance their performance and, over time, their social skill fluency. Longitudinal studies evaluating supplementing SST curricula with tootling may show that such procedures allow educators to prevent and remedy social skills deficits and allow students to develop social skills to the point where they secure all the benefits associated with social competence.

Chapter III

The Interaction of Tootling and Activities on Social Skill Engagement

Abstract

We extended research on tootling and social skills to determine if the activities first-grade students were engaged in while tootling would influence their engagement in two specific recently trained social skills, giving compliments and providing encouragement. After receiving social skills training targeting compliments and encouragements, students engaged in two experimental small group activities: a cooperative activity (Yeti in my Spaghetti®) and a parallel play activity (playing with Legos®[1]). During both experimental activities a tootling intervention was applied. They also engaged in a typical classroom individual competition activity (playing Bingo) without tootling. The cooperative activity involved students playing a game where they took turns completing behaviors designed to meet a common goal. A two-way repeated measures ANOVA revealed significant differences in intervals scored with compliments across all three activities, with the most compliments provided during cooperative play and the least during the individual competition. For encouragement, the cooperative play activity was greater than parallel play and the individual competition. These results are consistent with the researchers' hypothesis that social skills training and tootling can enhance social skill performance; however, in order to provide opportunities for students to develop newly acquired skills, educators may need to schedule activities that provide opportunities to perform those skills. Discussion focuses on applied implications for enhancing social skill development.

Literature Review

Social competence predicts psychological and social adjustment, peer acceptance, teacher acceptance, academic achievement, cognitive development, and enjoyment of school (Gresham et al., 2001; Henricsson & Rydell, 2006; Ng et al., 2018; Segrein & Flora, 2000; Wilkerson et al., 2013). Social competence is also correlated with positive adult outcomes including adult relationships and employment outcomes (Wilkerson et al., 2013). For young children, an important step in becoming socially competent is to acquire and develop social skills.

Social Skills Training

Social skills training (SST) is a common method for teaching social skills through description, modeling, practice, and feedback (Gresham, 1998). SST is an effective method for students to learn social skills and perform them in the SST environment (Ang & Hughes, 2002; Beelmann et al., 1994). However, researchers have also found that SST is not typically effective in enhancing the students' appropriate use of the acquired social skills in a naturalistic environment (Lösel & Beelmann, 2003; Mathur et al., 1998). It is this lack of large, generalizable, and maintainable change that is most commonly cited as a limitation of SST (Gresham et al., 2001).

According to Gresham et al., (2001) children go through stages of social skill development. SST typically targets the acquisition and performance of social skills. This is an important first step in social skill development; however, the ultimate goal is for the students to fluently display social skills. Social skills fluency includes natural, easy, and appropriate performance of a social skill across many contexts. In order to achieve this fluency, after acquiring the social skills, students must repeatedly perform the social skills in natural social contexts (Gresham et al., 2001).

Tootling and Positive Peer Reporting

"Tootling" is an intervention that uses interdependent group-oriented contingencies to reinforce positive peer reporting (PPR), or tootles, in a naturalistic setting. The standard PPR strategy involves students verbally reporting desired behaviors of a specific peer (Ervin et al., 1996; Johnson, 2009; Skinner et al., 2002). With tootling, students submit written reports of positive peer behavior and are encouraged to report any observed instance of any classmates' positive behavior at any time (Skinner et al., 2000). One purpose of tootling is to shift the focus from "tattling," or students' monitoring and reporting peers undesired behavior, to recognizing and reinforcing the desired behavior of classmates. Researchers hypothesized that enhancing students' awareness of peers' prosocial behavior would enhance peer relationships and the overall classroom climate (Cashwell et al., 2001). In order to encourage students to provide PPRs, tootling researchers applied an interdependent group-oriented reward. With this contingency, the whole class receives a reward dependent upon the number of tootles submitted (i.e., PPRs) meeting a criterion (Skinner et al., 2002).

Initially, tootling researchers showed that the interdependent group-oriented rewards were necessary to increase and maintain elementary students' PPRs during tootling interventions (Cashwell et al., 2001; Skinner et al., 2000). Next, researchers demonstrated that tootling can decrease common disruptive classroom behaviors (e.g., calling out), while also improving on-task behaviors (Cihak et al., 2009; Lambert, 2014; Lambert, et al., 2015; Lum, et al., 2017; McHugh et al., 2016; Sherman, 2012). A recent study showed that tootling could decrease antisocial behaviors such as name calling (Kirkpatrick, et al., 2019).

Combining Tootling with Social Skills Training

While most tootling research involved students reporting a broad class of prosocial behaviors (i.e., students-helping-students), these behaviors themselves were not measured. Wright et al., (2019) combined SST and tootling, during which second-grade students reported classmates' performance of a specific and recently trained social skill (giving compliments) as they engaged in a typical, regularly scheduled, small-group social activity (i.e., small-group math games). Consistent with previous research (e.g., Lösel & Beelmann, 2003), merely providing SST was not sufficient to enhance and maintain complimenting while students played their math games. However, the application of a modified tootling intervention where students were reinforced for reporting classmates' complimenting behavior enhanced complimenting as students engaged in a natural social activity. Subsequent studies confirmed these findings and showed how these modified tootling interventions could be used to simultaneously promote the performance of multiple social skills such as, giving compliments, saying thank you, and providing encouragement (Crewdson. 2021; Skinner et al., 2020).

Tootling was shown to enhance student performance of the recently trained social skills that were being reported in a natural social context (Crewdson et al., 2021; Skinner et al., 2020; Wright et al., 2019). Several causal mechanisms may account for the increases in social skills performance. The group contingency may have indirectly reinforced social skill performance. By reinforcing reports of social skills, these contingencies encourage students to engage in those social skills so their classmates' can report these behaviors (Skinner et al., 2002). Also, the group contingency may influence classmates to prompt and praise each other's targeted social behaviors, which may have enhanced social skill performance (Skinner et al., 2020; Wright et al., 2019). Observing and reporting peers' engaging in recently taught social skills may improve

the observers' acquisition, knowledge of, and ability to perform social skills. Observing and reporting classmates' social skills, may have caused students to learn which specific social behaviors are appropriate for which specific context (Bandura, 1977). This ability to discriminate and generalize more nuanced social skills may enhance the development of social skill fluency (Crewdson et al., 2021; Gresham et al., 2001).

Task and Reward Structure

Many cooperative learning procedures involve students working on academic activities in small groups, where they receive rewards/recognition based on the group's performance rather than individual performance (Kagan, 1985; Slavin, 1980). With cooperative learning, as with tootling, interdependent group-oriented rewards encourage cooperation as opposed to competition (Skinner et al., 2002). With tootling interventions, this cooperation may take the form of students prompting each other to engage and report targeted prosocial behaviors and praising each other for those reports (Crewdson, 2021; Skinner et al., 2020). Cooperative learning procedures also focus on the structure of the tasks or activity. Different activity and reward structures can facilitate prosocial communication and enhance positive social relations (Kagan, 1985; Slavin, 1980).

While combining SST with tootling, researchers collected students' prosocial behavior performance data as they engaged in three different small-group activities, playing math games (Wright et al., 2019), playing with Legos® (Skinner et al., 2020), and playing Jenga® (Crewdson, 2021). Table 3-1 describes each activity and goal structures associated with these activities, including the three activities used in the current study (i.e., Yeti®, Legos®, and Bingo). During the small-group math game, individual students took turns solving a math problem on a Promethean Board (activity structure) and the small group won or lost the game as a team (goal

structure) (Wright et al., 2019). Furthermore, each group could win the game; thus, goal structures did not encourage within or across group competition. Jenga® was similar in that each student in a small group took turns and the group's goal was to remove as many blocks as possible (e.g., beat their best score) before the tower fell (Crewdson, 2021). With these two activities there was a cooperative, or interdependent, group-goal providing each student with increased opportunities to achieve a broader group goal when each member of their group performed well individually. Consequently, group members were provided opportunities to encourage the student performing the task, as they took turns, and to provide a compliment with successful completion.

When researchers were investigating the effects of SST and tootling while small groups of students played with Legos®, fewer opportunities were observed for students to provide classmates with compliments or encouragement than when they played the small-group math games (Skinner et al., 2020). When the small groups played with Legos®, they tended to engage in parallel play. There was no within-group common goal across the group. Each student's goal was self-determined, and they would build things on their own while they were on a carpet. Consequently, since the students did not know what their peers were trying to accomplish or build, it was difficult for them to encourage one another. Additionally, students busy with their own independent work may have been less aware of peers' activities. However, after a student finished or almost finished building something, peers could compliment that student (e.g., "you built an awesome car"), but these opportunities did not occur on a regular basis. Thus, researchers hypothesized that differences in activity and goal structures across the different activities may have influenced complimenting and encouraging, even when the tootling intervention was applied (Crewdson, 2021; Skinner et al., 2020).

Purpose

Previous researchers found that supplementing SST with modified tootling interventions could enhance student performance of social skills as they engaged in typical small group activities (Crewdson et al., 2021; Skinner et al., 2020; Wright et al., 2019). The current study was designed to replicate and extend this research by evaluating the effects of the small-group social activity on students' performance of recently trained social skills, while a tootling intervention was applied. Specifically, after training students to give compliments and provide encouragement, a tootling intervention was applied as they engaged in two different experimental activities, 1) playing with Legos® (a parallel play activity), and 2) playing a modified version of Yeti in My Spaghetti® (a cooperative activity which involved taking turns). Also, a control activity was applied where students engaged in their typical classroom competitive activity, playing sight word Bingo, which involved individual competition with usually only one student winning. The tootling intervention was not applied during Bingo.

Based on previous research (Crewdson et al., 2021; Kagan, 1985; Skinner et al., 2020; Slavin, 1980; Wright et al., 2019), we hypothesized that students would provide more compliments and more encouragements when tootling was applied while they played Yeti®, than when they played with Legos® and when they played Bingo. We also hypothesized that relative to Bingo, during Legos® students would provide more compliments and encouragements because the Legos® activity was supplemented with a tootling intervention, while Bingo was not.

Method

Participants and setting

This study was conducted at a kindergarten through fifth-grade University-Assisted Community School (UACS) during their after-school program in an urban area of the

Southeastern United States. The after-school program served at-risk elementary students by providing them with enrichment activities and other services designed to prevent and remedy academic, behavioral, and social/emotional problems. The program also provided the students and their families with resources such as dinner, English classes, and legal and health consultations. Students were enrolled in this program based on poor attendance, academic performance and achievement deficits, and social-emotional or behavioral problems. The schedule of this after-school program includes snack time, academic hour, extracurricular activity clubs, and dinner. The study was conducted during academic hour which was delivered two or three days each week. On the other days, foreign language or music lessons were provided during the entire academic hour.

Approximately 120 students were enrolled in this program with 40% Caucasian, 35% African American, 17% Hispanic, 7% Multi-Racial, 1% Hawaiian Native/Pacific Islander, and less than 1% Asian. About 45% of the students were girls and 55% were boys. About 89% of the students came from low-income families and received free and reduced lunch. The program included students whose families originated from about 23 countries with 19 languages other than English spoken at home.

The study was conducted during academic hour in the first-grade classroom. This classroom was led by a credentialed first-grade general education teacher. During academic hour, students were placed in four groups of three to four students and the small groups rotated through four different activity stations approximately every 10 to 12 min. Typically, three of the stations included activities (e.g., worksheets) designed to enhance the students' early reading skills and the fourth station included playing a game, Bingo. During the current study, the primary researcher led each small group as they engaged in their typical individual competition

classroom activity (i.e., Bingo), the parallel play activity (Legos®), or the cooperative activity (Yeti®) at the game-based station.

There was a total of 15 students in the class and all students had consent and assent to participate in the study. Within this classroom, 46.7% were African American or Black students, 33.3% were Caucasian, 13.3% were Hispanic, and 6.7% were Native Hawaiian or Other Pacific Islander. Approximately 40% of the students were boys and 60% were girls.

Materials

Materials included Yeti in My Spaghetti®, a game provided by the primary researcher, and Bingo and Legos®, which were both provided by the school. A researcher printed the names of each student in each group and an image of compliment-giving and an image of encouraging on 8.5 X 11-inch colored paper. These served as the positive peer reporting (PPR) slips (see Appendix B). Each piece of paper was cut into four PPR slips, and each group had a different color PPR slips. A researcher also decorated a shoe box with colorful wrapping paper for the students to turn in their completed PPR slips. Random reward criteria were printed on a different color piece of 8.5 X 11-inch piece of paper and were kept in a 6 X 9-inch manila envelope. The teacher-selected reward was small, individually wrapped pieces of candy.

Independent and Dependent Variables

The independent variable was the activity the students' participated in during the game-based station in academic hour. The cooperative activity, Yeti®, involved students playing a game where they took turns completing behaviors designed to meet a common goal. The parallel play activity involved students playing with Legos®. During both of these experimental conditions, a tootling intervention was applied. The control condition involved students engaging

in their regularly scheduled activity, playing Bingo, a group game with individual competition. During Bingo, the tootling intervention was not applied.

In order to collect data on student performance of compliments and encouragements, each group was observed for approximately 10 min during the game-based station while they played either Bingo, Legos®, or Yeti in my Spaghetti®. A partial interval (20 s intervals) time sampling procedure was used to record the students' complimenting and encouraging behaviors. The dependent variables were based on the percentage of intervals where a student was observed giving a compliment to a member of their group and the percentage of intervals where a student was observed providing encouragement to another student in their group.

Operational definitions of compliments and encouragements were developed based on those used by previous researchers (Crewdson et al., 2021; Skinner et al., 2020; Wright et al., 2019). Compliments were operationally defined as positive, verbal statements that demonstrate approval of another student's completed action or of another student personally. Examples include "I like your shoes," "You are really nice," "Good job," or "That was a good one." Non-examples include exclamations such as "Yes" or "Yay." Encouragements were operationally defined as positive, verbal statements that support, uplift, or cheer on another student before they perform a behavior or during the behavior. Examples include "You got this," "Keep it up," and "Go." Non-examples include statements that were directions or instruction such as "Don't do that" or "Pick that one."

Compliments and encouragements were scored only if they were directed at a peer in their group at an audible level. If the student directed a compliment/encouragement at a peer from another station or an adult, it was not scored. Compliments and encouragements only included verbal statements, so all nonverbal behavior such as high-fives and thumbs-up were not

scored. Even if song lyrics included compliments or encouraging statements, singing was not scored.

Design

Researchers intended to use a two phase (baseline and alternating treatments) no-treatment series alternating treatments design (Skinner et al., in press) to investigate the effects of activity structure on the students' engagement in recently taught social skills. During the baseline phase, students only played Bingo. During the alternating treatments (AT) phase, the researcher scheduled all three activities. First, Bingo was randomly assigned to a session every three or four days. For all other alternating treatment sessions, either Yeti® or Legos® was randomly selected, with one caveat; if the same experimental activity (Yeti® or Legos®) was selected two days in a row, for the next day an experimental activity was to be applied (i.e., day when Bingo was not scheduled), the other activity was automatically assigned.

Due to COVID-19 school closures, this study was interrupted. At the time the study was halted, researchers had collected three AT-phase data points for both of the experimental activities. During the AT phase, the experimenter collected one data point as students engaged in Bingo; however, three data points were collected as students played Bingo during the baseline phase. All baseline and AT phase data collection occurred after SST was provided.

As researchers were not able to collect sufficient repeated measures under the three conditions (Kratochwill et al., 2013), a two-way repeated measures ANOVA was used to test for significant differences in compliments and encouragements performed across the three different activities. Specifically, for each student, the mean number of compliments and the mean number of encouragements for each of the three experimental activity sessions (three sessions of Yeti®

and three of Legos®), served as dependent variables. For Bingo, researchers averaged the last two baseline-phase sessions and the sole AT-phase Bingo session[2].

Procedures

During typical classroom procedures, the teacher modified the groups of students regularly. After obtaining IRB approvals, informed consent, and student assent, the primary researcher met with the teacher who created four groups of three or four students that would remain intact for the duration of the study. Group membership was based on teacher judgements and she attempted to avoided putting students who do not get along in the same group. Also, she avoided putting more than one student who was frequently absent in the same group. After placing students in groups, the following activities were provided in sequence, (1) social skills training, (2) three baseline-phase data collection session were run as students played bingo without tootling, (3) tootling training and Yeti® training, and (4) an AT phase which included seven sessions.

Social skills trainings. During snack time, which occurred immediately before the academic hour began, a researcher conducted a class-wide SST session targeting compliments and encouragements. This training included providing definitions, examples and non-examples for each social skill, and how these social skills make the students feel. The students were also asked to provide their own definitions, examples, and non-examples for each social skill throughout the training to keep them engaged. Praise and feedback were provided to the students immediately after their responses during the training. The primary researcher also taught the students about appropriate tone when giving compliments and encouragements (i.e., not using sarcastic tones). The full training script can be found in Appendix E.

Baseline phase and assessment procedures. During baseline, students participated in their typical classroom activity at the game-based station, which was Bingo. Other researchers used partial-interval recording with 20 s intervals to collect data on complimenting and encouraging. Data collection began when all students in the small group were seated at the desks of the Bingo station and once all materials had been given to the students (e.g., Bingo cards and Bingo chips). Since the students typically played Bingo at this station, they did not need any instruction for the activity. An interval was scored if one of the students gave a compliment or provided encouragement to another student who was also playing Bingo. Compliments and encouragements were scored separately for each student in each group. The researchers sat with the students at the station so that all students were continuously observed during the activity. A researcher led the Bingo game and other researchers recorded direct observation data. After about 10 min, the small groups rotated stations and these procedures were repeated with each of the four groups.

Tootling training. During snack time, the primary researcher provided the students with instructions on how to tootle and the rules of the tootling game. The primary researcher taught the students how to report their peers' complimenting and encouraging. The students were instructed to only report the behavior of peers that were in their same group during this station. Also, the primary researcher instructed the students to only report peer behavior and not their own behavior or the behavior of adults in the classroom.

Next, a researcher demonstrated and described how students should fill out the PPR slips. Correctly completing these slips includes circling the name of one peer and one behavior (either the word "compliment" or "encouragement" that was printed on the slip). Students were told that

slips filled out incorrectly would not count toward their goal. Students were instructed to place their completed slips into the decorated shoe box located at this station.

Next, the primary researcher explained the procedures for the tootling game. Students were told that at the end of academic hour, the primary researcher would count all of the slips in the decorated box, with compliments and encouragements being counted separately. Next, the researcher explained how the random criterion would be selected from the goal envelope at the beginning of academic hour. There were 40 criteria slips: each with a single criterion 1 through 20 for each behavior. The researcher told the students that after randomly selecting a criterion, it would be placed inside an envelope and it would remain a secret; thus, no one would know what it was until it was revealed at the end of academic hour. The researcher emphasized that the goal could be for either compliments or encouragements. Students were told that at the end of academic hour, the goal would be revealed and if the entire class met or exceeded that goal, then they would receive a reward. The researcher emphasized that the students were working together so this reward was class-wide, meaning either every student in the class won, or no one won. The protocol for this training can be found in Appendix D.

Yeti® training and treatment phase. During snack time, on the first day of the AT phase, the primary researcher told the students that they would be playing a new game at the game-based station. First, the primary researcher demonstrated how to set up the game by placing the plastic spaghetti noodles onto the plastic bowl, and then putting the plastic yeti toy on top of the spaghetti. Next, the primary researcher explained that each student would take turns pulling out one spaghetti noodle at a time. Once the yeti falls into the bowl or when part of the yeti is touching the bowl, that round is over. Although Yeti® is designed to be an individual competition, researchers altered the game. Specifically, students were told that the goal of the

game is to see how many spaghetti noodles each group can pull out before the yeti falls into the bowl. Each group was encouraged to beat the best score. Previous researchers used similar activity alterations to make the goal structure of a Jenga® activity cooperative (Crewdson, 2021; Wright et al., 2019). The procedural integrity checklist for Yeti® can be found in Appendix K.

Next, the researcher explained to the students that she would select which student would go first each day and another student who would serve as the helper. Students were told that the helper would count the number of spaghettis pulled at the end of each round and put the spaghetti back onto the bowl so that the next round could begin. Additionally, students were informed of general station rules which included (1) no yelling, (2) the researcher assigns roles, (3) if it is not your turn, you cannot touch any of the spaghetti noodles or the yeti, (4) you must take turns, and (5) the student selected to go first that day will start every round that day. The protocol for this training can be found in Appendix G.

Once the primary researcher finished the Yeti® training, it was announced that the students would be playing the tootling game that day as well. The primary researcher selected the criterion from the goals envelope and placed it on the whiteboard by the station. As each group came to the station, the researcher reviewed the tootling rules by prompting students to answer questions including: “How many names do you circle on each slip?” “How many behaviors do you circle on each slip?” “Do fill out a slip for yourself?” and “How do you know when to fill out a slip?” Students then began playing Yeti® and completing PPR slips as researcher(s) recorded direct observation data. During the game, the primary researcher took note of how many spaghetti noodles the group was able to pull out before the yeti fell, so that the students could try to beat their own group’s high score every day they played this game.

At the end of academic hour, the primary researcher counted the correctly completed PPR slips for compliments and for encouragements. Once the students had cleaned up the classroom and gotten in line at the door with their backpacks (as instructed by the classroom teacher), the researcher would reveal and announce the class's tootling goal for that day. If the class met their goal, a piece of candy would be placed in each student's backpack. If the class did not meet their goal, then the researcher encouraged them to do better the next time they played. The students met their goal two out of three Yeti® sessions.

Legos® and treatment. At the beginning of academic hour, the primary researcher would announce to the students that they were tootling that day. Next, the primary researcher would randomly select the criterion and put it on the whiteboard next to the station. Once all of the students were seated on the carpet, the primary researcher would review the tootling game rules, place the containers of Legos® on the carpet, and begin collecting data. All students have played with Legos® during the after-school program and they were not given any instructions or prompts for playing with Legos®. The class met the tootling criterion and received candy once out of three Lego® sessions.

Bingo. During one day of the treatment phase, researchers returned to the control condition, playing Bingo. Students did not need any additional instruction on playing Bingo because that was a typical classroom activity. The Bingo station was an individual activity, where typically one student won and wining was based largely on chance. The students did not work as a group during this activity and the competition was within-group. No tootling slips of paper were provided and if asked, students were told that they were not reporting compliments or encouragement during Bingo.

Analysis Procedures

After each day of data collection, the primary researcher calculated the percent of intervals scored with a compliment and percent intervals scored with an encouragement for each student, each group, and the class as a whole. Because the study was interrupted when the school closed due to Covid-19, data was analyzed using each of the 15 students' mean scores (i.e., intervals scored with each social skill) for each activity. For Bingo, we calculated the mean for the last three days of Bingo data collection. A two-way repeated measures analysis of variance (ANOVA) was conducted to test for interactions between the different activities on the students' engagement in each social skill. All differences were considered statistically significant at the $p < 0.05$ level.

Procedural Integrity and Interobserver Agreement

A researcher took procedural integrity data for all trainings (see Appendices E, F, G, and H). Procedural integrity was 100% for each training conducted by the primary researcher. The procedural integrity for the tootling game procedures was collected for two of the three (66%) Yeti® sessions and one of the three (33%) Legos® sessions. For all of the sessions, procedural integrity was scored 100%. The tootling game was not played during Bingo sessions.

To collect interobserver agreement data, two researchers independently and simultaneously scored intervals with a compliment or encouragement for each student. Interobserver agreement was collected during one of the final three bingo sessions (33%), two of the three Yeti® sessions (66%), and one out of three Legos® sessions (33%). Interobserver agreement for all Bingo and Legos® sessions was 100% for both compliments and encouragements. For the two Yeti® sessions, average interobserver agreement was 98% for both compliments and encouragements with a range of 97%-99% across both dependent variables.

Results

Table 3-2 shows the mean percent of intervals scored with compliments and/or encouragements for each student under each condition. Of the 15 students, 11 (73%) had higher intervals scored with compliments during Yeti® than Legos® or Bingo, and 13 (87%) had higher intervals scored with encouragements during Yeti® than Legos® or Bingo.

A two-way repeated measures analysis of variance (ANOVA) revealed a main effect for the activity type, $F(2,13) = 17.334$, $p < 0.001$ with Legos® ($M = 0.010$, $SE = 0.003$) significantly higher ($p < .001$) than Bingo ($M = 0.001$, $SE = 0.001$) and Yeti in my Spaghetti® ($M = 0.071$, $SE = 0.013$) significantly higher than Legos® ($p < .001$) and Bingo ($p < .001$). There was no significant main effect for social skill, $F(1,14) = 0.069$, $p = 0.796$. We did find a significant interaction between activity type of social skill, $F(2,13) = 6.942$, $p = 0.009$.

Figure 3-1 shows the estimated marginal means for each social skill under each condition. The mean difference between compliments and encouragements for Bingo (M_D= .001, SE= .001) was not significant, F(1,14) = 1.000, p = .334. The mean difference between compliments and encouragements during Yeti® (M_D= -.015, SE= .019) was not significant, F(1,14) = .582, p = .458. The difference between compliments and encouragements during Legos® (M_D=.019, SE= .006) was significant, meaning compliments were significantly higher than encouragements during this activity, F(1,14) = 11.07, p = .005.

Least Significant Difference pairwise comparisons showed significant difference in compliments between each activity type (see Table 3-3). Percent of intervals scored with compliments while students played Yeti® ($M = 0.063$, $SE = 0.014$) were significantly higher than when students played with Legos® ($M = 0.020$, $SE = 0.006$), $p = 0.005$ and when students played Bingo ($M = 0.001$, $SE = 0.001$), $p < 0.001$. Also, the percent of intervals scored with

compliments while students played with Legos® (*M* = .020, *SE* = .006) was significantly higher than when students played Bingo (*M* = .001, *SE* = .001), *p* = 0.007. These results showed that the cooperative play activity (Yeti®) resulted in higher intervals scored with compliments than the other activities. Also, the parallel play activity (Legos®), which also including tootling, resulted in more compliments that the individual competition control condition (Bingo), which did not include tootling.

The percent of intervals scored with encouragements during Yeti® (*M* = 0.078, *SE* = 0.017) was significantly higher than Legos® (*M* = 0.001, *SE* = 0.001), *p* = 0.001 and Bingo (*M* = 0.000, *SE* = 0.000), *p* = 0.001. There was no significant difference between the mean percent of intervals scored with encouragements across Legos® and Bingo (*M* = 0.001, *SE* = 0.001), *p* = 0.334. As with compliments, encouragements where higher while students engaged in the cooperative play activity (Yeti®), but there was no difference between encouragements scored while students engaged in the individual competition (Bingo) and the parallel play activity (Legos®).

Discussion

We investigated the effect of different activities on students' engagement in recently trained social skills. Based on previous research, we formed several hypotheses (Crewdson et al., 2021; Kagan, 1985; Skinner et al., 2020; Slavin, 1980; Wright et al., 2019). Pairwise comparisons supported our hypothesis that the Yeti® activity would occasion more compliments and encouragements than the Legos® activity and the Bingo activity. As tootling was applied during both the Yeti® and Legos® activities, the current study demonstrated that the social activities that students engage in while tootling impacts the performance of specific social skills.

Because Bingo was not supplemented with tootling, we also hypothesized that it would result in the lowest levels of compliments and encouragements. Pairwise comparisons supported our hypothesis that the Legos® activity would occasion more compliments than the Bingo activity, but did not support our hypothesis that the Lego® activity would occasion more encouragements than the Bingo activity. Mean scores showed that neither Bingo nor Legos® occasioned many encouragements. Additionally, within-activity pairwise comparisons showed that during Legos®, students provided significantly more compliments than encouragements. These findings have implications for practice and future research.

While students can acquire social skills during SST, this training may not enhance their performance of those social skills in natural social contexts (Gresham, 1998; Lösel & Beelmann, 2003; Mathur et al., 1998). A modified tootling program was implemented across three different studies to address this concern. Interdependent group-oriented rewards were delivered contingent upon peer reports of classmates performing recently trained social skills, while engaged in three different small-group activities including playing math games, playing with Legos®, and playing Jenga® (Crewdson et al., 2021; Skinner et al., 2020; Wright et al., 2019). Results from the current study demonstrated that the activity students are involved in can have a significant impact on social skill performance while tootling is applied. Activity and goal structures associated with each activity may have accounted for these difference (Kagan, 1985; Slavin, 1980).

In the current study, while small groups played Yeti®, they took turns performing similar behaviors (activity structure), tried to meet an interdependent group goal (goal structure), while removing as many spaghettis as possible before the Yeti® fell (known, common goal). Thus, Yeti® provided many opportunities for group members to encourage a peer when it was their turn

(i.e., group members observed the student and knew what they were trying to accomplish) and compliment that peer when they succeeded. Additionally, the interdependent group-oriented reward delivered contingent upon class-wide peer reports (i.e., the tootling intervention) likely enhanced complimenting and encouraging. Specifically, indirect reinforcement (i.e., while student reports were reinforced, these reports were occasioned by peers' complimenting and encouraging each other) and students prompting and praising peers for complimenting and encouraging may have enhanced these behaviors (Crewdson et al., 2021; Skinner et al., 2002; Skinner et al., 2020; Wright et al., 2019).

Even though the identical tootling program was run during the Legos® and Yeti® activities, Legos® resulted in fewer compliments and encouragements than the Yeti® activity. Both activity and goal structures may explain these findings. While playing Yeti®, each small group has a common, known, interdependent group goal. While playing with Legos®, there was no common goal. Thus, the interdependent, known, group goal associated with Yeti® may account for the higher levels of compliments and encouragements (Crewdson et al., 2021; Skinner et al., 2002; Skinner et al., 2020; Slavin, 1985; Wright et al., 2019).

Legos® activities were self-directed and typically students engaged in parallel play as each student built objects with Legos® independently. While each student may have had an idiosyncratic goal, (e.g., for one student building a car, for another student building a castle), peers could only provide encouragement if the student told them what they were building. Additionally, during Legos®, students were working on their own, as opposed to taking turns. Thus, there was not a clear cue for students to attend to and encourage classmates' behaviors. Finally, while engaged in the Legos® activity, each student's attention was focused on their own work, not their classmates; thus, competing responses may have accounted for lower levels of

encouragement during Legos® relative to the Yeti® activities. However, with Yeti®, students took turns which served as a cue to attend to the student whose turn has begun. Consequently, differences in both goal and activity structures may account for students engaging in more complimenting and encouraging when playing Yeti® than when playing with Legos®.

Bingo was an individual competition (goal structure) and students did not have the opportunity to encourage peers to perform an activity (success was based largely on luck and students could not easily observe peers performing the behaviors). Thus, neither the activity nor goal structures associated with Bingo facilitated students encouraging or complimenting classmates. Also, the Bingo activity was not supplemented with tootling. These factors may be why the Bingo activity without tootling results in fewer compliments than the two experimental activities (Legos® and Yeti®) that were supplemented with tootling.

There was no significant difference in encouragements between the Legos® activity with tootling and the Bingo activity which was not supplemented with tootling. As displayed in Figure 3-1, neither condition occasioned many encouragements, and while playing with Legos® students engaged in significantly more compliments than Bingo. Earlier we described activity and goal structures associated with the Legos® activity (e.g., no shared goals, no group goal, no communication regarding what students were striving to build) that may have hindered encouraging. However, Legos® did provide some opportunities to provide compliments. While playing with Legos®, when a student completed building something or neared completing something they could solicit attention from peers (e.g., say “Look at the car I built”). Peers could then respond with a compliment (e.g., “That’s a cool car”). Additionally, students who completed their building may have the opportunity to look around (i.e., they were no longer distracted by their own task) and provide compliments to peers who completed or nearly

completed their building (e.g., “That is an awesome castle you are building”). Thus, activity structures may explain why Legos® resulted in significantly more compliments than encouragements.

Implication for Practice

The current findings have implications for educators who seek to develop their students’ social skills. Previous researchers have found that SST allows students to acquire social skills, but this is merely the first step is social skill development. In order to benefit from developing social competence, students must engage in the appropriate social skills, at the appropriate time, in the appropriate context (Gresham et al., 2001). This level of skill development is nuanced. For example, the appropriateness of a compliment (e.g., how the compliment is phrased) and the appropriate timing of the compliment (e.g., immediately after the activity or later) may depend on what behavior was being complimented and in what context. Consider a compliment given to a high-school peer during a playground basketball game versus the compliment given to the same peer after they receive a prestigious academic achievement award at a formal banquet. In order to develop such nuanced skills, people must perform these social behaviors over time and across context so that they can be shaped (Gresham et al., 2001; Wright et al., 2019). Additionally, they can learn these nuanced skills by observing others perform similar behaviors across contexts (Crewdson, 2021).

While SST and tootling have been shown to enhance social skill performance (Crewdson et al., 2021; Skinner et al., 2020; Wright et al., 2019), the current study clearly demonstrates that these procedures alone may not enhance student performance of recently trained social skills (e.g., see the almost absence of encouragements during Legos®). Rather, students must engage in activities that are structured, (e.g., activity and goal structures) in a manner that provides

opportunities for students to perform recently taught social skills. In the current study, we altered the typical Yeti® game structure from competitive to cooperative by establishing the goal of each group removing as many spaghettis as possible in order to beat their best score. The activity structure with Yeti® also involved students taking turns. Because of the cooperative goal, all group members were more likely to meet their goal (e.g., beat their best team score) when their peers did well on their turn. Thus, when each student's turn arrived, it provided an opportunity for all other group members to encourage the student (Crewdson, 2021) and if the student succeeded, there was an opportunity to provide compliments (Wright et al., 2019). Thus, the combination of goal and activity structures provided multiple opportunities for students to engage in the recently trained social skills.

After training specific social skills, educators may need to plan activities that provide opportunities for students to engage in those skills. Some teacher-led activities provide numerous opportunities for students to perform recently trained social skills (e.g., small group teacher-led reading instruction). During such activities, educators could prompt and praise recently learned social skills. Additionally, many cooperative learning activities provide the opportunities to engage in recently trained social skills; but, teachers may not be available to provide as much prompting and praise when they can't simultaneously monitor each group (Kagan, 1985; Slavin, 1980). In these instances, including a tootling intervention may prove effective at enhancing students' performance of recently trained social skills as it may influence the students to monitor, prompt, and praise each other's social behaviors (Crewdson et al., 2021; Skinner et al., 2020; Wright et al., 2019).

We selected and modified the Yeti® activity so that it would occasion the performance of two specific social skills, complimenting and encouraging. Other activities may be more

effective with other recently trained social skills. Thus, teachers should consider not just training specific social skills, but also selecting or developing activities that students can engage in that will allow them opportunities to perform these social skills in more natural social contexts (e.g., less teacher supervision). If SST curricula were supplemented with activities that would provide opportunities for students to perform specific social skills, shortly after they were acquired, educators may be able to bridge the gap between social skill acquisition and the development of fluent social skills by promoting social skill performance (Wright et al., 2019). Adding peer-mediated tootling interventions may further serve to enhance social skill performance and development by allowing students to learn more nuanced social skills by observing and reporting their peers' performance of these prosocial behaviors (Crewdson, 2021; Skinner et al., 2020; Wright et al., 2019).

Limitations and Future Research

This study was interrupted by schools closing due to Covid-19. Thus, researchers were unable to conduct more sessions across the three conditions, which hinders our ability to evaluate trends and variability (Kazdin, 2011). Additionally, we only collected one Bingo data point during the AT phase. Future research should conduct similar studies using more repeated measures, over longer periods of time, and include more assessments of control conditions during the intervention phase (Skinner et al., in press).

Another limitation is the lack of data to examine the maintenance and generalization of these social skills. Maintenance would likely be enhanced if the intervention was implemented for a longer period of time, and future research could collect data to support this hypothesis (Gresham, 1998; Wright et al., 2019). Additionally, to assess generalization, researchers should

collect data outside the experimental conditions while students engage in activities with structures that facilitate the recently trained social skills.

As this was the first study to investigate the interaction of SST plus tootling by social activities, replication and extension studies are needed to provide further evidence for the importance of the activity structures on the performance of recently taught social skills. Also, researchers should conduct component analysis studies. For example, while tootling has been shown to increase social skill performance, there may be activities that are so suited to specific social skills that the tootling intervention may be unnecessary. Alternatively, some social skills may require tootling to increase their performance, regardless of activities provided.

In the current study, a different activity was used for the parallel play (Legos®), individual competition (Bingo), and the cooperative (Yeti®) activities. Thus, we are unable to determine the degree that different activities versus different activity structures influenced the performance of social skills. Researchers should extend the current research by holding the activity constant and only changing one element of the goal or task structure. For example, in one condition, Yeti® could be played as an individual competition, which is consistent with game rules. In another condition Yeti® and could be played as a cooperative game with a group goal, as we did in this study.

Conclusions

While providing students with SST alone may not enhance their use of the recently trained social skills in a natural context (Gresham, 1998; Mathur et al., 1998), combining SST with tootling interventions has shown promising results for increasing students' engagement in social skills in a natural context (Crewdson, 2021; Skinner et al., 2000; Wright et al., 2019). The current study examined the importance of providing the students with activities that fostered

opportunities to use recently trained social skills while the tootling intervention was implemented. Results supported researchers' hypothesis that a small group activity that involved a common, known, cooperative goal and students taking turns would occasion more complimenting and encouraging than a parallel play activity or individual competition activity. Researchers should continue to investigate characteristics of activities that may enhance student engagement in specific social skills. Such research could allow educators to assign activities that provide opportunities for students to develop recently acquired social skills (i.e., enhance performance which may lead to fluency) and foster positive social interaction between students.

Footnote

[1] The Legos® activity was a free play activity where the students were given boxes of Legos® to play with in any manner. This study did not use Legos® therapy that is seen in social skills research with students with ASD (LeGoff, 2004; LeGoff et al., 2014; Owens et al., 2008).

[2] We used the final three Bingo data points because it equated data points across conditions and allowed use of the data that occurred closest in time. However, because students never encouraged or complimented peers during Bingo, it would not have mattered which Bingo data points were selected for analysis.

Chapter IV

Future Directions for Research on Tootling and Social Skills Development

Literature Review

Social competence in children predicts peer acceptance, successful school adaptation, positive adult relationships, and psychological and social adjustment (Gresham et al., 2001; Henricsson & Rydell, 2006; Ng et al., 2018; Segrin & Flora, 2000). By controlling for various other factors, Wentzel (1993) provided evidence that developing social competence may enhance cognitive development and academic achievement in students. For children, acquiring and developing social skills is a crucial element in becoming socially competent (Gresham et al., 2001). Social Skills Training (SST) is the most common method for teaching children social skills; however, researchers have found that different SSTs typically do not cause large, generalizable, and maintainable changes in social skill performance in naturalistic social settings (Gresham, 1998; Gresham et al., 2001; Lösel & Beelmann, 2003; Mathur et al., 1998). SSTs do not typically generalize to spontaneous use in natural uncontrolled settings; consequently, SSTs cannot be expected to enhance social skill fluency, which is necessary to develop social competence (Gresham et al., 2001). In addition to building social skill fluency, it is also important for social skills to become habitual for children. Once social skills are fluent, then they can become a habit which requires less thinking and more automatization (Duhigg, 2012). In order to build a habit, there must be a cue, a fluent behavior that is engaged in as a result of the cue, and then positive reinforcement for that behavior (Duhigg, 2012). This habit loop is provided by tootling, as the PPR slips and tootling intervention act as the cue, the engagement in the social skill is the fluent behavior, and the interdependent group contingency acts as the positive reinforcement. Students do not typically practice the skills until they are fluent and can be applied automatically to a variety of settings with only SST. Thus, SSTs alone may not allow students to accrue the benefits associated with developing social competence. Therefore, a

fluency building component, such as tootling, is necessary to increase students' fluency and automatization of social skills.

Current Results

Tootling, a positive peer reporting intervention, was created to shift the focus of students from tattling on one another to recognizing their peers' desired behaviors. Researchers hypothesized that enhancing this awareness would also subsequently enhance peer relationships and classroom climate (Cashwell et al., 2001). Study I replicated and extended research showing that tootling could be used to enhance students' performance of recently trained social skills in naturalistic settings. Results demonstrated that children as young as first grade can simultaneously learn two social skills (i.e., compliments and encouragements) and report those behaviors. Additionally, increases in these two social skills only occurred in naturalistic settings when the tootling intervention was applied, but were not maintained when it was withdrawn.

Study II examined the effects of the activity structure on the students' engagement in the recently taught social skills. Cooperative learning typically involves students working in small groups and has an emphasis on the different types of activity structures (Kagan, 1985; Slavin, 1980). Different types of activity structures can facilitate prosocial communication and enhance positive social interactions between students (Kagan, 1985; Slavin, 1980). Study II used a no-treatment series alternating treatments design to compare the effects of a control condition (competitive game), a parallel play condition (Legos®), and a cooperative activity condition (Yeti®) on first graders' engagement in recently taught social skills during a tootling intervention. Results demonstrated that the students were more likely to engage in compliments than encouragements during the parallel play activity. Additionally, students engaged in higher rates of both compliments and encouragements in the cooperative activity compared to the

parallel play and control conditions. Thus, these data demonstratted that activity structures of the task influenced the students' engagement in each of these social skills during a tootling intervention.

Maintenance and Generalization

The primary limitation associated with SSTs is that these trainings do not lead to generalizable and maintainable changes in social skill performance in naturalistic social settings (Gresham, 1998; Gresham et al., 2001; Lösel & Beelmann, 2003; Mathur et al., 1998). Although researchers have shown that tootling can increase student performance of recently trained social skills in natural environments, these increases were not maintained when the interventions were withdrawn (Study I; Wright et al., 2020). Thus, more research is needed to address generalization and maintenance of social skill performance and social skill development.

Future researchers should conduct longitudinal studies similar to Study I applying tootling interventions are applied over longer periods of time and targeting more social skills. Providing the intervention over long periods of time may enhance students' social skill fluency and maintenance (Haring & Eaton, 1978). As students' social skills performance becomes more automatic, they may continue to perform them when tootling interventions are withdrawn (Gresham, 1990). This more permanent automatization of engaging in social skills may be due to habit formation once the students establish social skill fluency (Duhigg, 2012). Future research can examine habit formation in the maintenance of social skills once the external contingency in tootling interventions is removed. Making these social skills a more permanent part of children's repertoires may increase the likelihood that they will accrue the benefits in developing social competence.

Also, the generalization of the effects of tootling on recently taught social skills should be investigated. If tootling increases a recently taught social skill(s) in one context, as it did in studies I and II, would those effects transfer over to other social contexts? To address generalization, researchers should implement tootling in one context and collect data on the students' engagement in the social skills in another context. Results from Study II suggest that activity structure may influence generalization. Thus, when assessing generalization, researchers could compare generalization when activities are similar to those that are being applied while students are tootling and those that are different. Such studies may inform teachers and practitioners of the best way to structure their classroom activities to enhance student engagement in the recently taught social skills across contexts. For example, to encourage generalization, teachers could provide activities that allow students to perform recently taught social skills.

Developing Social Competence

If future research provides clear evidence of maintenance and generalization, then more critical longitudinal studies should be conducted. Social competence in children is associated with peer acceptance, academic achievement, adult relationships, and psychological and social adjustment (Gresham et al., 2001; Henricsson & Rydell, 2006; Ng et al., 2018; Segrin & Flora, 2000). The development of social competence hinges on students acquiring social skills and performing those social skills in natural social environments (Gresham et al., 2001). SSTs can allow students to acquire social skills and the current studies suggest that tootling can enhance their performance of these social skills. Performing these behaviors in natural social environments allows for social skills to be shaped and refined. Thus, students can learn which specific social skills are appropriate for which specific context. Additionally, this shaping should

allow them to perform these behaviors fluently (Gresham et al., 1990) in a way that is required for social competence. Thus, longitudinal studies are needed to determine if combining SSTs with tootling over time and across social skills could be used to allow students to develop social competence and accrue the benefits associated with social competence.

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Appendices

Appendix A

Tables and Figures

Table 2-1
Means, standard deviations, and ranges for Effects of Catching Compliments on percent of intervals scored with Compliments (Comp.) and Encouragements (Enc.).

	Baseline	Intervention	Withdraw	Re-Implementation
	M (SD) ***[Range]***	*M (SD)* ***[Range]***	*M (SD)* ***[Range]***	*M (SD)* ***[Range]***
Class wide	5.36 (1.90) **[4.70]**	34.18 (4.95) **[11.50]**	5.72 (1.66) **[3.9]**	24.35 (6.76) **[18.5]**
Group A	5.10 (3.80) **[10.3]**	22.30 (10.30) **[27.8]**	2.70 (2.90) **[6.80]**	20.25 (13.08) **[38.30]**
Group B	7.80 (3.34) **[8.40]**	37.60 (13.86) **[33.70]**	8.50 (4.42) **[12.00]**	45.53 (26.39) **[67]**
Group C	5.20 (4.63) **[12.00]**	34.00 (9.71) **[21.90]**	6.10 (4.89) **[12.50]**	16.82 (8.04) **[18.50]**
Group D	3.90 (3.45) **[9.50]**	43.70 (14.24) **[35.4]**	5.70 (2.60) **[6.30]**	10.45 (6.36) **[14.60]**

Table 2-2

Tau effect size coefficients and corresponding p-values for percent of intervals scored with each social skill

	Baseline vs. Intervention **Tau** [*p*-value]	Withdrawal vs. Re-impl. **Tau** [*p*-value]	Intervention vs. Withdrawal **Tau** [*p*-value]
Classwide	**1*** [.01]	**1*** [.01]	**-1*** [.01]
Group A	**.92*** [.02]	**.93*** [.01]	**-1*** [.01]
Group B	**1*** [.01]	**1*** [.01]	**-1*** [.01]
Group C	**1*** [.01]	**.73*** [.04]	**-1*** [.01]
Group D	**1*** [.01]	**.53** [.14]	**-1*** [.01]

* Significant results at $p < .05$.

Table 3-1

Goals Structures, Activity Structures and Supplemental Tootling (Supp Toot) for different activities used in previous studies and the current study and their hypothesized effects on students' performance of encouragements (E) and compliments (C).

Activity	Goal Structure	Goal Effect	Activity Structure	Activity Effect	Supp Toot	tootling Effect
1. Yeti* 2. Math games 3. Jenga	Cooperative Shared known goal	Increase E Increase C Increase E Increase C	Take Turns Performing Similar Tasks	Increase E Increase C	Yes	Increase E Increase C
Legos*	Individual Self-directed unshared	Neutral E Neutral C Decrease E Decrease C	Individual Simultaneous	Decrease E Decrease C Decrease E Decrease C	Yes	Increase E Increase C
Bingo*	Individual competition One winner	Decrease E Decrease C Decrease E Decrease C	Individual Simultaneous	Decrease E Decrease C Decrease E Decrease C	No	

* Indicates conditions used in the current research.

Table 3-2
Means of percent intervals scored with compliments and/or encouragements for each student under each condition

Student	*Control*		*Legos®*		Yeti®	
	Comp.	*Enc.*	*Comp.*	*Enc.*	*Comp.*	*Enc.*
Student 1	0.0	0.0	0.0	0.0	3.1	1.0
Student 2	0.0	0.0	0.0	0.0	6.3	2.0
Student 3	0.0	0.0	0.0	0.0	1.6	5.6
Student 4	0.0	0.0	0.0	0.0	1.6	20.4
Student 5	0.0	0.0	1.2	0.0	0.0	4.8
Student 6	0.0	0.0	0.0	0.0	1.5	0.0
Student 7	0.0	0.0	5.0	0.0	4.6	5.7
Student 8	0.0	0.0	5.0	0.0	10.8	8.7
Student 9	0.0	0.0	1.1	0.0	9.7	4.6
Student 10	0.0	0.0	1.7	0.0	0.0	1.5
Student 11	0.0	0.0	0.0	0.0	5.0	20.6
Student 12	0.0	0.0	6.7	0.0	6.1	0.0
Student 13	0.0	0.0	2.1	0.0	17.0	9.2
Student 14	0.0	0.0	3.7	1.0	12.5	16.8
Student 15	2.0	0.0	3.0	0.0	14.6	9.9

Table 3-3
Doubly Repeated Measures Analysis of Variance Pairwise Comparisons for Effects of Each Condition on Each Social Skill

		Compliments		**Encouragements**	
Condition 1	Condition 2	*Mean Diff.*	*Sig.*	*Mean Diff.*	*Sig.*
Bingo	Legos®	-.02	.01	-.00	.33
	Yeti®	-.06	.00	-.08	.00
Legos®	Bingo	.02	.01	.00	.33
	Yeti®	-.04	.01	-.08	.00
Yeti®	Bingo	.06	.00	.08	.00
	Legos®	.04	.01	.08	.00

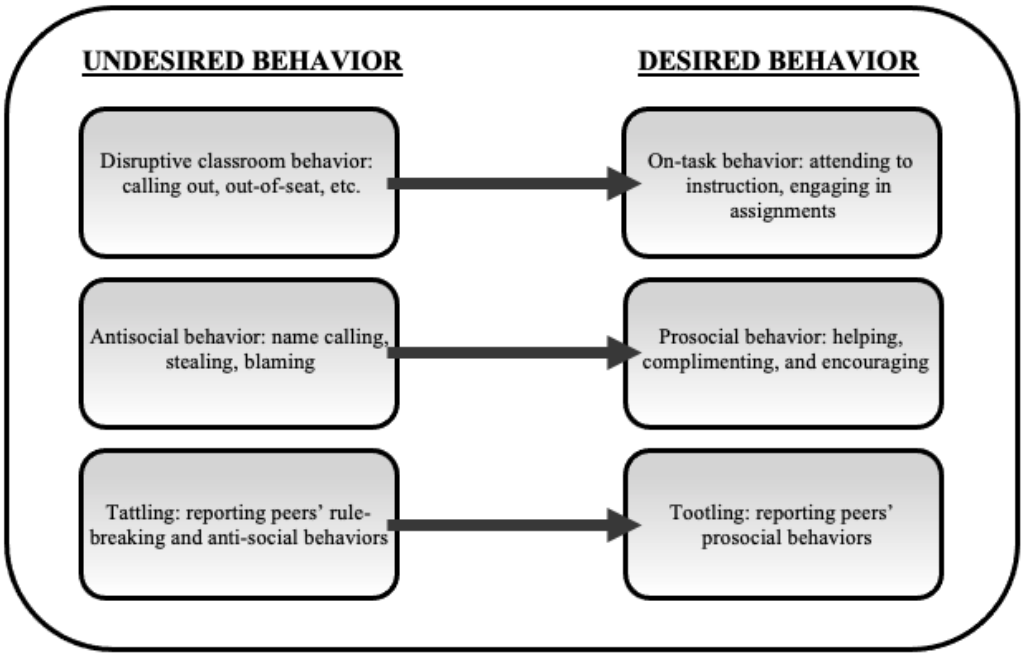


Figure 1-1. Undesired behaviors and their opposite desired behaviors.

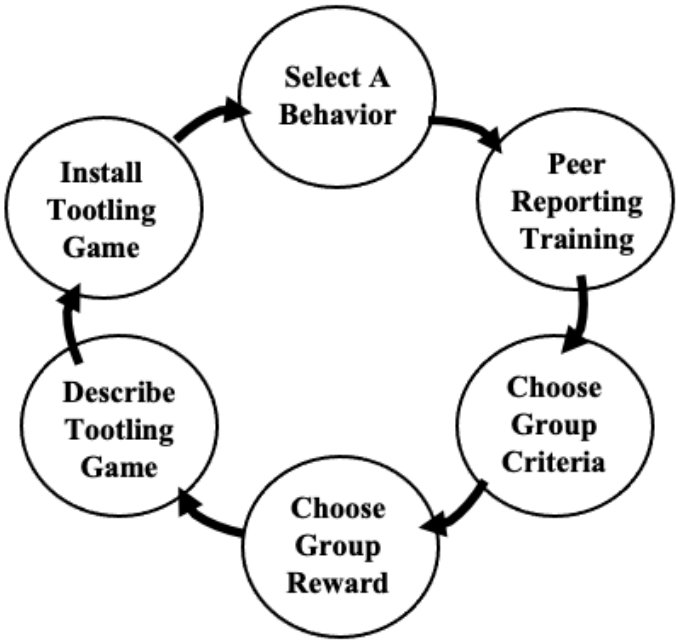


Figure 1-2. The six main steps of tootling.

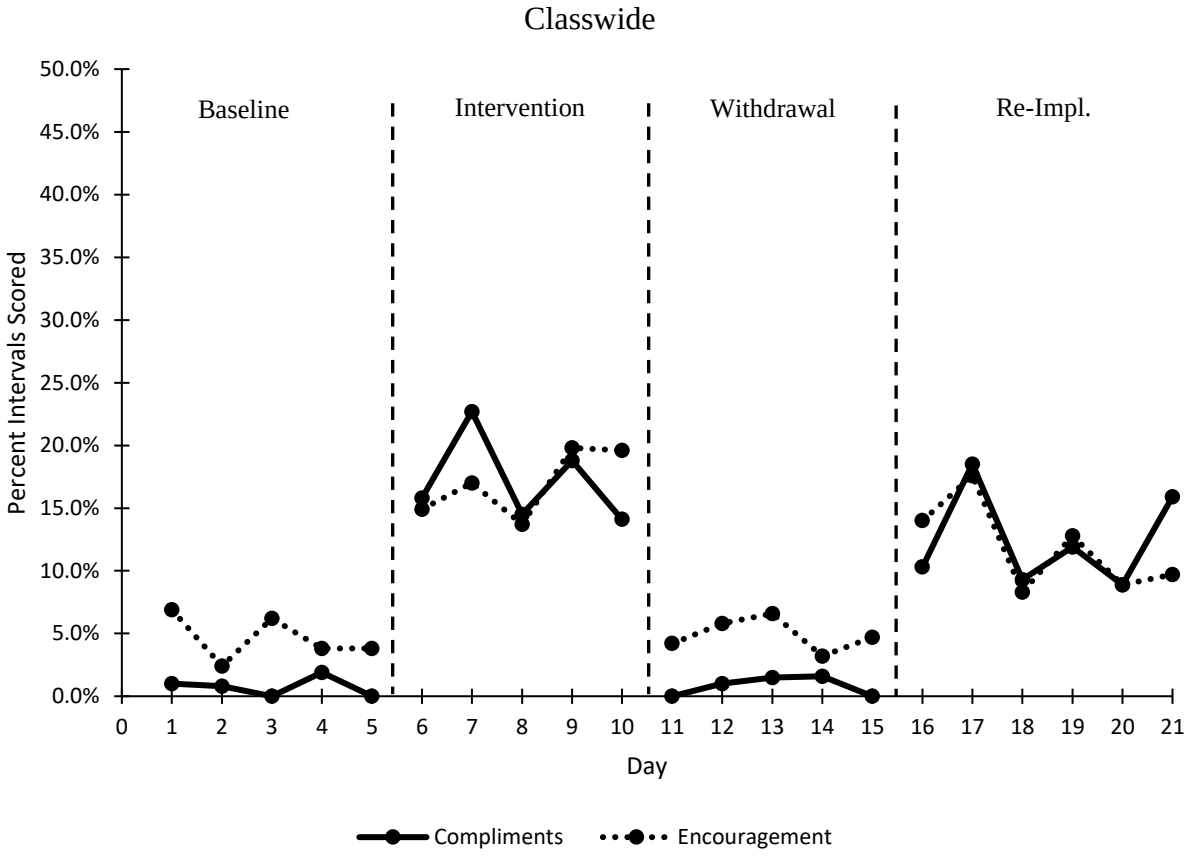


Figure 2-1
Class wide percentage of intervals scored with compliments and/or encouragements.

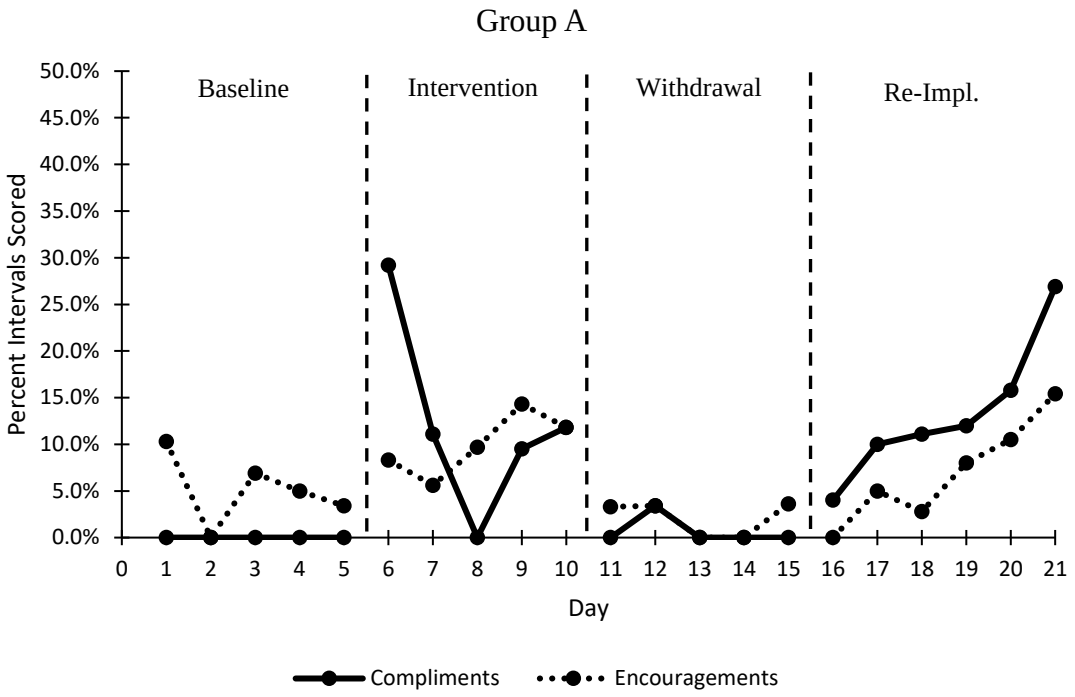


Figure 2-2
Group A percentage of intervals scored with compliments and/or encouragements.

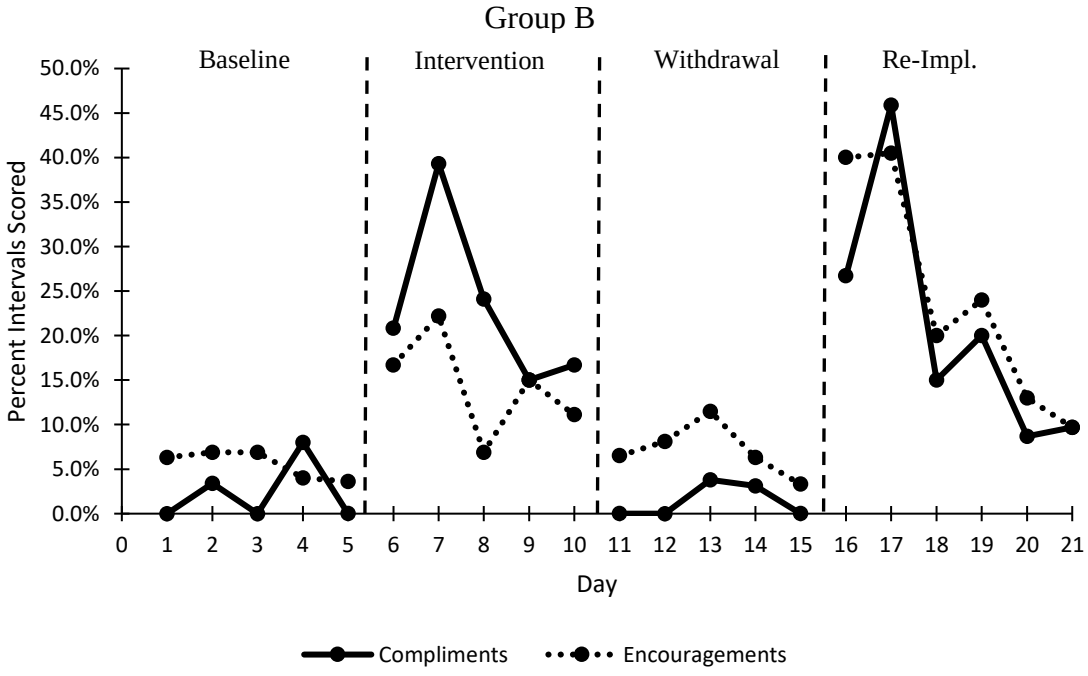


Figure 2-3
Group B percentage of intervals scored with compliments and/or encouragements.

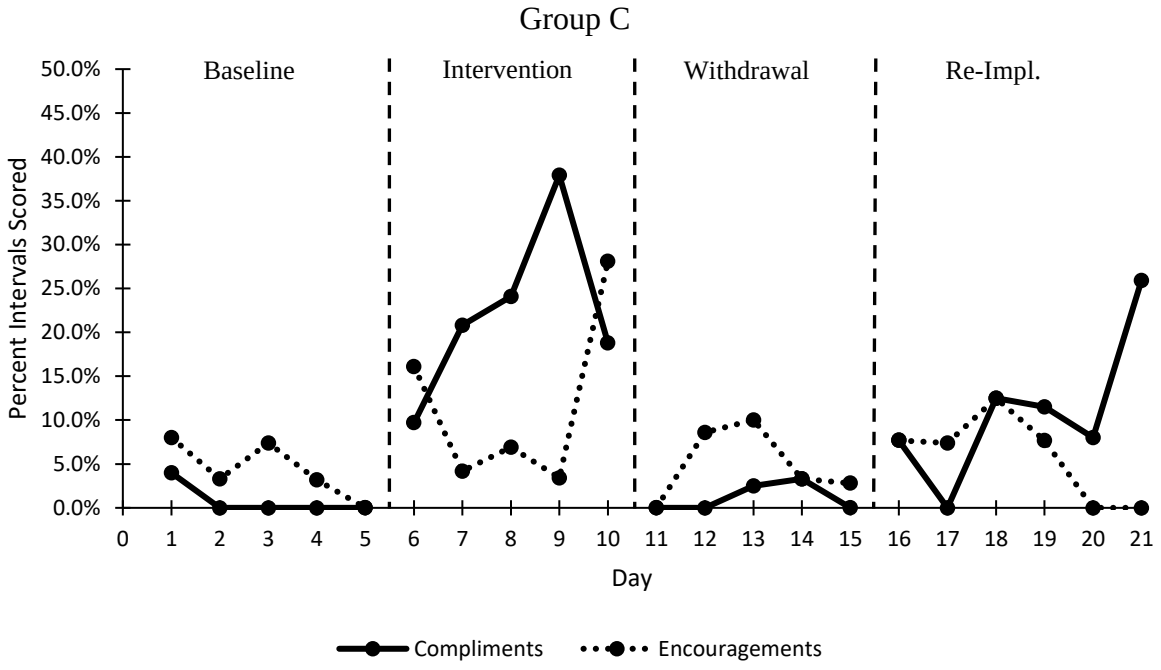


Figure 2-4
Group C percentage of intervals scored with compliments and/or encouragements.

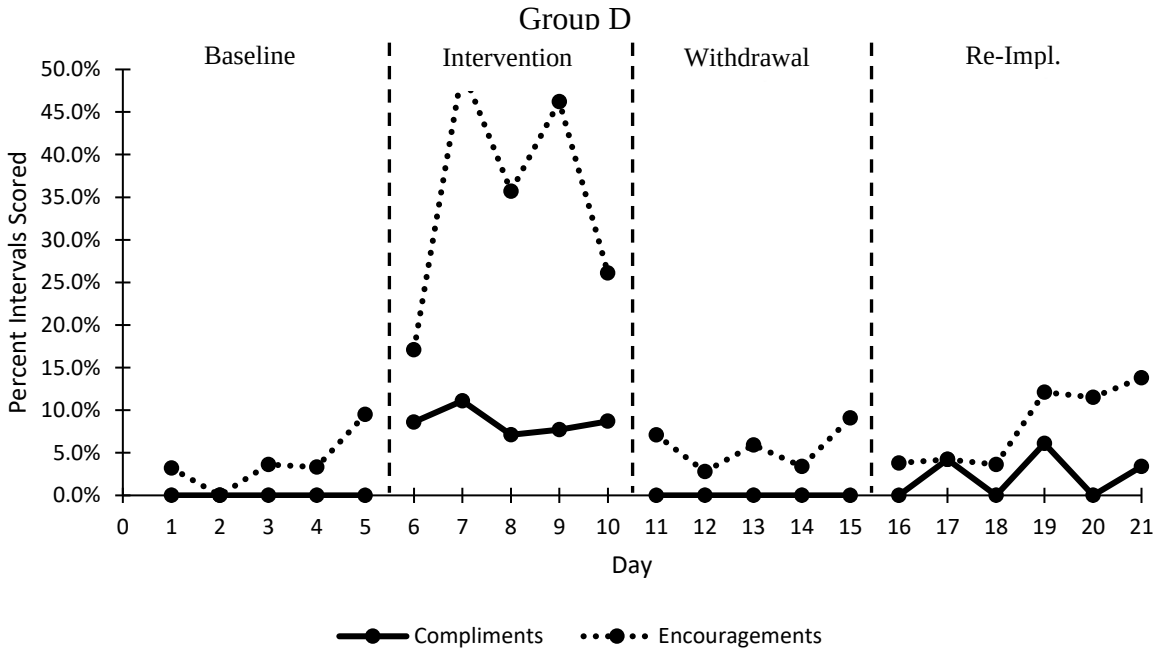


Figure 2-5
Group D percentage of intervals scored with compliments and/or encouragements.

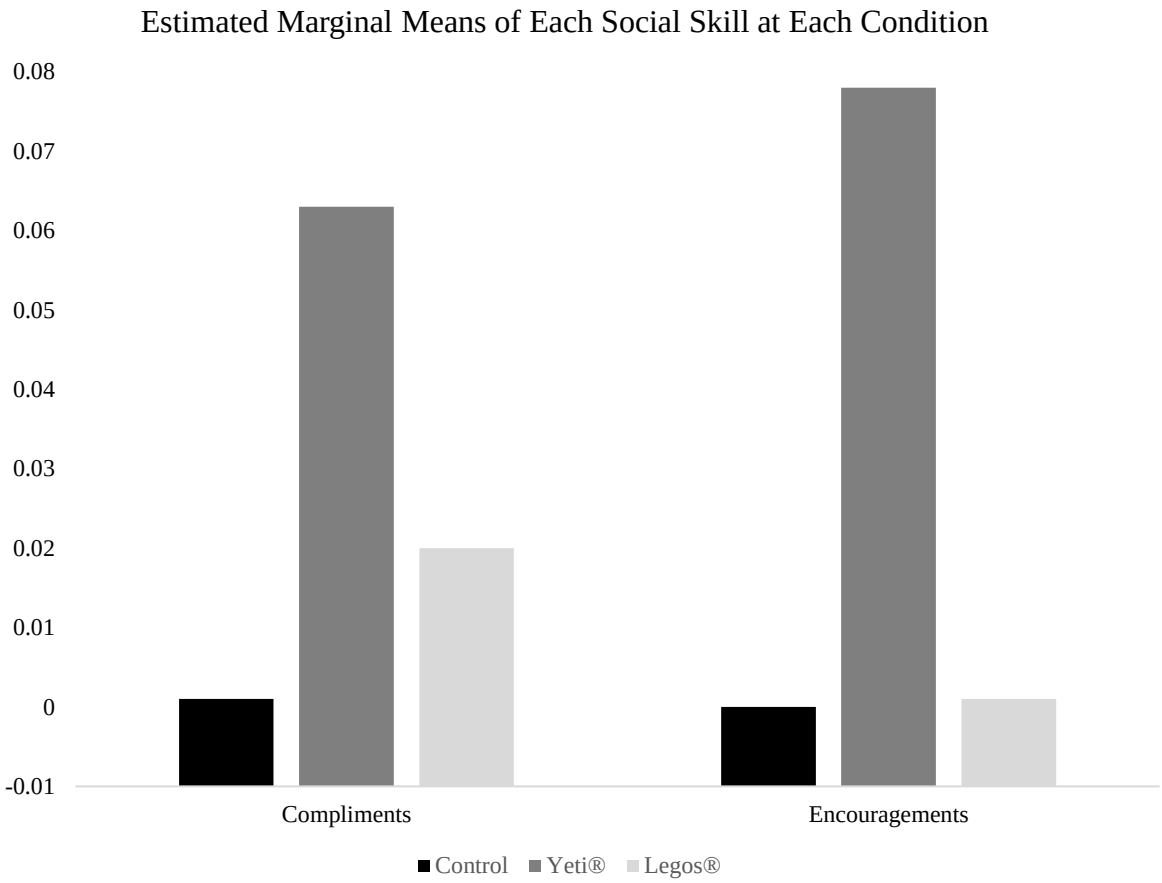


Figure 3-1
Estimated Marginal Means for each social skill under each condition

Appendix B: Sample PPR Slip

Circle 1:

Student 1 Student 2 Student 3 Student 4





Compliment Encouragement

Circle 1:

Student 1 Student 2 Student 3 Student 4





Compliment Encouragement

Circle 1:

Student 1 Student 2 Student 3 Student 4





Compliment Encouragement

Circle 1:

Student 1 Student 2 Student 3 Student 4





Compliment Encouragement

Appendix C: Jenga® Training Script

Introduction

Hello! I'm Miss Margaret and I am a student at the University of Tennessee. Today, I am going to teach you guys a game to play at the carpet station during academic hour. The game is called Miss XXX's Jenga®.

Building the Tower

Some of you may have played Jenga® before but I am going to teach you new rules to play Miss XXX's Jenga®. When you are at the carpet station during academic hour, each group will build the Jenga® tower. To build the Jenga® tower, you will put 3 blocks next to each other and then stack 3 more blocks on top of those going in the opposite direction. ****Demonstrate****

Playing the Game

Once the Jenga® tower is built, you will each take turns pulling a block out of the tower. Be careful which block you pull because you don't want to knock over the tower! The goal will be to pull out as many blocks as you can <u>as a group</u> before the tower falls. If the tower falls, you all will rebuild your tower and try again. Each day we play this game, you will try to beat your group's score from the day before. So remember, you are working <u>as a group</u> to pull as many blocks out of the tower as you can!

Rules

1. *No yelling (we need to be quiet while peers are working at other stations)*
2. *I pick who goes first and if you ask if you can go first then you will go last*
3. *If it is not your turn, you cannot touch any of the blocks*
4. *Take turns!*
5. *Start with the first person every time the tower falls (restart the order)*

Does anyone have any questions?

Appendix D: Tootling Training Script

"Hello! I'm Miss Margaret and I am a student at the University of Tennessee. I'm sure you have seen me in your class the past few weeks. I'm here today to tell you guys about a game that I would like you all to play in academic hour. The game is called Catching Compliments and everyone in the class gets to play."

Explain game:
*For this game, we are going to report on our other classmates when we see them giving a compliment or encouraging someone. The way we will do that is by using these slips of paper (*Show examples). *First, I will pull a goal out of this envelope* (show goals envelope). *This goal will be a secret until academic hour is over. On these pieces of paper, it will have your classmates' names on the top and a picture of two people giving a compliment on the bottom and a picture of one person holding a sign that says "You can do it!" for encouragements. You will start by circling the name of someone in your group who you saw giving a compliment or encouragement* (circle name). *Then you will circle the picture at the bottom* (circle picture) *showing if that person gave a compliment or encouragement. After you have finished, you will put the pieces of paper in this box.* (show kids box). *When it's your groups turn to play Jenga at the carpet, you will use be using these slips and watching for others in your group to give compliments and encouragements. When it is time to switch groups, you will turn your slips of paper into this box. At the end of academic hour, I will count up how many slips you all turned in for compliments and encouragements. Then I will tell you all what our secret goal was. If you get that goal or higher, then you will win a reward! Remember, we won't know if the goal is for compliments or encouragements or how many you need until the end. You will be playing this game during academic hour.*

Appendix E: Social Skills Lesson Script

Compliments

"Hello! I'm Miss Margaret and I am a student at the University of Tennessee. I'm sure you have seen me in your class the past few weeks. I'm here today to give a quick lesson on some important skills. Many of these skills are things you already know and are a part of your school's rule: Be respectful.

Ask students to explain.

I want to talk to you about giving compliments. Can anyone tell me what a compliment is?

Give definition of a compliment: *A compliment is something nice we say to a friend. We can give compliments about the way that somebody acts, the way somebody looks, or anything good that a person does.*

Discuss how compliments make us feel: *How do compliments make us feel?* Call on students to give examples. *We give compliments to our friends because we want them to feel good*.

Ask students for examples.

Can anyone tell me some examples of a compliment?
I really like those examples you guys gave. Here are a few examples I came up with.

Give examples:

I can compliment a person because I like something about them. For example, _____ I like the shirt you are wearing. Or, _____ I like the way your hair is styled.
I can also give someone a compliment because they did a good job. For example, _____ good job solving that math problem! Or Nice job spelling that word correctly!
Even if one of my friends gets an answer wrong, I can give them a compliment by saying "Nice try!" or "You worked really hard on that answer".

Give non-examples:

What are some things that are not compliments?
That's right, those are mean or not nice things to say. Some other things are that are not compliments are "You're wrong!" or "Shut up", or "You're stupid for thinking that's the answer".

Ask students for suggestions.

When are some times that we can give each other compliments?
Those are all great examples; we can give compliments to each other throughout the day. You can give compliments during in class, during games, on the playground, and in the cafeteria.

Discuss the tone of compliments.

Compliments are not just about <u>what</u> we say, but <u>how</u> we say it. It is important to use a nice and friendly tone when you give your friends compliments.

Give examples and non-examples of compliments using an appropriate and inappropriate tone.
"Nice going" "Good job" "Cool shoes" "Way to go"

Ask students for examples and non-examples of compliments using an appropriate and inappropriate tone.
Great examples! Do you all see how the way you say something makes a difference on how the other person feels?

Encouragement

Ask students to explain.
Now I want to talk to you about encouragement. Can anyone tell me what encouragement is?

Give definition of encouragement: *Encouragement is when you say something to someone to help them feel hopeful, such as "keep trying". So encouragement is something we say to one another before an activity to help them feel good about what they are trying to do, cheer them up, let them know you support them, and that you are their friend.*

Discuss how encouragement make us feel: *How does encouragement make us feel?* Call on students to give examples. *We give encouragement to our friends because we want them to feel good* or better.

Ask students for examples.
Can anyone tell me some examples of encouragement?
I really like those examples you guys gave. Here are a few examples I came up with.

Give examples:
I can encourage a person because they are working hard on something "You can do it".
I can encourage someone who is very close to finishing a problem "You're close, keep trying".
Even if one of my friends feels doubtful or feels like they can't do something "Try your best, I know you can do it"

Give non-examples:
What are some things that are not encouragement?
That's right, those are mean or not nice things to say. Some other things are that are not encouragement are "There's no way you can do that" or "I can do that better than you"

Ask students for suggestions.
When are some times that we can give each other encouragement?
Those are all great examples; we can give encouragement to each other throughout the day. You can give encouragement during in class, during games, on the playground, and in the cafeteria.

Appendix F: Tootling Game Script

"Hello! I'm Miss Margaret and I am a student at the University of Tennessee. I'm sure you have seen me in your class the past few weeks. I'm here today to tell you guys about a game that I would like you all to play in academic hour. The game is called the tootling Game and everyone in the class gets to play."

Ask students for examples of compliments and encouragement to refresh their memory from the social skills training.

Can anyone tell me some examples of a compliment?
I really like those examples you guys gave. Here are a few examples I came up with:
I can compliment a person because I like something about them. For example, _____ I like the shirt you are wearing. Or, _____ I like the way your hair is styled.
I can also give someone a compliment because they did a good job. For example, _____ good job solving that math problem! Or Nice job spelling that word correctly!
Even if one of my friends gets an answer wrong, I can give them a compliment by saying "Nice try!" or "You worked really hard on that answer".

Can anyone tell me some examples of encouragement?
Those are really good examples! Here are a few examples I came up with:
I can encourage a person because they are working hard on something "You can do it".
I can encourage someone who is very close to finishing a problem "You're close, keep trying".
Even if one of my friends feels doubtful or feels like they can't do something "Try your best, I know you can do it"

Explain game:
*For this game, we are going to report on our other classmates when we see them giving a compliment or encouraging someone. The way we will do that is by using these slips of paper (*Show examples). *First, I will pull a goal out of this envelope* (show goals envelope). *This goal will be a secret until academic hour is over. On these pieces of paper, it will have your classmates' names on the top and a picture of two people giving a compliment on the bottom and a picture of one person holding a sign that says "You can do it!" for encouragements. You will start by circling the name of someone in your group who you saw giving a compliment or encouragement* (circle name). *Then you will circle the picture at the bottom* (circle picture) *showing if that person gave a compliment or encouragement. After you have finished, you will put the pieces of paper in this box.* (show kids box). *When it's your groups turn to play at my station, you will use be using these slips and watching for others in your group to give compliments and encouragements. When it is time to switch groups, you will turn your slips of paper into this box. At the end of academic hour, I will count up how many slips you all turned in for compliments and encouragements. Then I will tell you all what our secret goal was. If you get that goal or higher, then you will win a reward! Remember, we won't know if the goal is for compliments or encouragements or how many you need until the end. You will be playing this game during academic hour.*

Appendix G: Yeti® Training Script

Introduction
Today, I am going to teach you guys a new game to play at the carpet station during academic hour. The game is called Yeti in my Spaghetti.

Setting Up the Game
You will put the spaghetti onto the bowl and then put the yeti toy on top of the spaghetti. ****Demonstrate****

Playing the Game
Each person at the station will pull out one spaghetti at a time, taking turns. Once the yeti falls into the bowl, that round is over. The goal is to see how many spaghettis you guys can pull out as a group before the yeti falls into the bowl. ***Demonstrate***
Every time we play this game, I will pick who goes first and who is the helper. The helper will be the person that puts the spaghetti back onto the bowl at the beginning of each round. No one else should touch the spaghetti or put them back on top of the bowl. The helper will also count how many spaghettis the group pulled out during that round.

Rules
1. *No yelling (we need to be quiet while peers are working at other stations)*
2. *I pick who goes first and who the helper is*
3. *If it is not your turn, you cannot touch any of the spaghetti strands or the yeti*
4. *Take turns!*
5. *Start with the first person every time the yeti falls into the bowl*

Does anyone have any questions?

Appendix H: Social Skills Lesson Procedural Integrity

Date: _____
Observer: _____

		Yes	**No**
1	Introduction to a lesson on social skills		
2	Defines Compliments		
3	Ask students to give examples of compliments		
4	Class discussion of examples and non-examples of compliments		
5	Discuss the tone of compliments		
6	Class discussion of examples of appropriate and inappropriate tone		
7	Defines Encouragement		
8	Ask students to give examples of encouragement		
9	Class discussion of examples and non-examples of encouragement		

Number of steps completed: **/9**

Percentage of steps completed:

Comments:

Appendix I: Peer Reporting Training Procedural Integrity

Date: _____
Observer: _____

		Yes	**No**
1	Introduction to a new game to be implemented in class		
2	Go over rules of games		
3	Explain game procedures		
4	Explain where to put peer reports and when they can do it		
5	Explain how to win the game		
6	Answer any questions from the students		

Number of steps completed: **/6**

Percentage of steps completed:

Comments:

Appendix J: Tootling Game Procedural Integrity[1]

Date: _____
Observer: _____

		Yes	**No**
1	Review game instructions and answer any student questions		
2	Select a criterion from the "Goals" envelope		
3	Provide social skills slips to students at the Jenga© station		
4	Collect behavioral partial interval data		
5	At the end of each station rotation, prompt students to turn in their slips		
6	Add up the total number of turned in compliment and encouragement slips for the day and record in data sheet		
7	Provide feedback to the class in regards to if they met their goal		
8	Provide a piece of candy to the entire class if their goal was met		

Number of steps completed: ____
Percentage of steps completed: ____
Comments:

[1]Adapted from Lambert, A. M., Tingstrom, D. H., Sterling, H. E., Dufrene, B. A., & Lynne, S. (2015). Effects of Tootling on classwide disruptive and appropriate behavior of upper-elementary students. *Behavior Modification, 39,* 413-430.

Appendix K: Yeti® Procedural Integrity

Date: _____
Observer: _____

		Yes	**No**
1	Introduction to the game		
2	Demonstrate the game set up		
3	Go over the rules of how to play		
4	Go over the rules for the station		
5	Explain who goes first and who picks up the sticks		
6	Answer any student questions		

Number of steps completed: **/6**

Percentage of steps completed:

Comments:

Appendix L: Study I Student Acceptability

Catching Compliments Game

1. I liked the Catching Compliments Game.	 **Yes – 100%**	 **No – 0%**
2. I would like to have the Catching Compliments Game in all of my classes.	 **Yes – 80%**	 **No – 20%**
3. My classmates were nice to me when we played Catching Compliments.	 **Yes – 66.7%**	 **No – 33.3%**
4. I was nice to my classmates when we played Catching Compliments.	 **Yes – 80%**	 **No – 20%**
5. The Catching Compliments game helped me learn to compliment and encourage my classmates.	 **Yes – 100%**	 **No – 0%**

Appendix M: Study I Teacher Acceptability

Catching Compliments

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1. Catching compliments was a good intervention.	1	2	3	4	**5**	6
2. I noticed that students were nicer to each other when playing Catching Compliments.	1	2	3	4	**5**	6
3. Catching Compliments is feasible for a teacher to use in the classroom.	1	2	3	4	**5**	6
4. I noticed that the students were not as nice to each other when they were not playing Catching Compliments.	1	2	3	4	**5**	6
5. There were less disagreements when the students played Catching Compliments.	1	2	3	4	**5**	6
6. I would recommend Catching Compliments to other teachers.	1	2	3	4	**5**	6

Vita

Margaret Crewdson was born and raised in Atlanta, Georgia to Robert and Tami Crewdson. She is the second of three daughters, Mary Holt and Kathryn Claire. She attended the University of Miami in Miami, Florida where she graduated Magna Cum Laude in 2017 with a Bachelor of Arts degree in Psychology, and minors in Spanish, Sports Medicine, Education, and Human and Social Development. In the Fall of 2017, she began the School Psychology PhD program at the University of Tennessee, Knoxville. She earned a Master of Science in Applied Behavior Analysis in December 2019. In August of 2021, Margaret will begin her internship and will completed her doctorate degree in August of 2022.