# The Role of Positive Peer Mediation in Tootling and Social Skills Development

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## DEDICATION

This dissertation is dedicated to my incredible support system, including my parents, Paula and Steve, my siblings Logan and Jack, and my wonderful fellow graduate students, Keri Keller, Addison Welch, and the late Caroline Cole. My success throughout my graduate school career would not be possible without the love, encouragement, and support I've received from them, near and far.

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## ABSTRACT

Elementary students quickly learn and develop multiple social skills, and these skills are often mediated by their peers. Tootling is a peer-mediated intervention that trains students to acknowledge, engage in, and report targeted prosocial behaviors. Peers play a role in the Tootling Intervention through various peer-mediated strategies. This dissertation consists of four chapters. Chapter I provides an overview and literature review of social skill development, peer-mediated interventions, and the Tootling Intervention. Chapter II describes a study where researchers examine the correlational relationship between second grade students' engagement in a target prosocial behavior and prompting their peers to engage in or report the behavior while participating in a Tootling Intervention. Chapter III describes a study where a peer confederate modeled novel prosocial behaviors during the Tootling Intervention to determine if other group members would begin to engage in the behavior. Chapter IV discusses the implications, limitations, and opportunities for future research of peers' role in the Tootling Intervention.

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# CHAPTER I

## Review of the Literature: Social Skill Development, Peer-Mediated Interventions, and Tootling Interventions

## Social Skill Development

From an early age, children begin engaging in social interactions with both adults and peers, with these interactions becoming more frequent and complex as they grow older (Brown et al., 1996). Through these interactions, most children quickly begin to develop social skills through a variety of mechanisms to communicate and engage with others appropriately across various contexts. Social skills are defined as a network of learned behaviors that enable individuals to engage with others in a socially appropriate and effective manner (Gresham, 1998). These skills are frequently evaluated by others to determine if a student's social skills are satisfactory relative to peers to build and maintain social relationships. Adequate social skill development is associated with improved friendships and peer acceptance and may facilitate positive adjustment to the school environment (Gresham et al., 2001). Conversely, deficits in social skills have been linked to poor mental health, social isolation, reduced social competence, a negative self-concept, decreased peer acceptance, and limited opportunities for personal growth (Campbell, 1991; Henricsson & Rydell, 2006).

To enhance social development, social skill interventions are frequently applied in school settings, where students have consistent opportunities to engage with peers and practice these skills in naturalistic environments (Gresham, 2016). Social skills can be developed in classroom environments because students consistently and repeatedly interact in classrooms (Muller & Zurbriggen, 2016), and teachers can provide structured opportunities to have peers demonstrate, practice, and reinforce the performance of social skills (Hank & Huber, 2024). There is some evidence that teacher-delivered social skill training (SST) can allow students to acquire social skills (Ang & Hughes, 2002; Beelmann et al., 1994; Wright et al., 2022). However, students may not maintain or generalize those skills by engaging in those skills outside the SST context

(Crewdson et al., 2024; Lösel & Beelmann, 2003; Mathur et al., 1998; Wright et al., 2021). Thus, several social skill interventions in the classroom include some component of peer involvement which may enhance generalization and maintenance of desired social behaviors (Wang et al., 2022).

Children can successfully learn from their peers if they have adequate timing, modality, intensity, and consistency of peer influence to make long-lasting changes to their social behavior (Brown et al, 2008, Wang et al., 2022). Performance of recently trained social skills in classroom environments allows peers to influence and shape each other's social behavior, which should enhance discrimination, generalization, and adaptation of recently trained social skills (Fowler, 2023). Peers can also influence each other's ability to discriminate, generalize, and adapt social skills in more natural social contexts than the SST (Fowler, 2023; Wright et al., 2022). The salience of these factors can be directly influenced explicitly by adults supervising such peers, including teachers (Hank & Huber, 2024). Peer-mediated interventions (PMI) can intentionally influence students to attend to, model, and reinforce each other's desired social behavior in classrooms.

## Peer Mediated Interventions

A PMI is defined as a practice where teachers or other professionals instruct a socially competent or high-status peer on ways to engage students with social skill deficits in positive social behaviors (Zhang et al., 2022). Peer-mediated interventions may be an effective method to help children with social skills deficits perform recently acquired social skills across social contexts (Crewdson et al., 2023; Hank & Huber, 2024; Wang et al, 2022). There are several types of peer-mediated interventions, many of which often include multiple components such as modeling, prompting, and peer reinforcement (Wang et al., 2022).

Peer modeling is a PMI that often involves having a peer who is proficient in a target social behavior demonstrate or model skills while in the proximity of a student who has not developed proficiency with a skill (Chang & Locke, 2016; Hunter et al., 2021; King et al., 2016). Peer modeling allows target students to observe the appropriate social skills in the desired environment (Bandura, 1971; Crewdson et al., 2023). Thus, adults often have peer models sit in proximity to the target student and encourage them to demonstrate a desired behavior within proximity (Hunter et al., 2021). Peer modeling has been shown to increase engagement in desired prosocial behaviors across students, including those with autism spectrum disorder, emotional and behavioral disorders, and other developmental disabilities (King et al., 2021).

Researchers have found social skills can be further enhanced when combining peer modeling with other PMIs, such as peer prompting and reinforcement (Wang et al., 2022). Peer prompting and reinforcement typically involve teaching and reinforcing a peer or group of peers when to prompt and reinforce (e.g., social praise) others' desired behaviors (Harris et al, 2009; Wang et al, 2022). Pairing peer prompting and reinforcement with structured activities, which provide clear opportunities for students to engage in the specific prosocial behavior and for peers to prompt and reinforce those behavior, can increase students' rate of target behavior performance and enhance social skill development (Busching & Krahé, 2020; Chang & Locke, 2016; Crewdson et al., 2023; Martinez et al., 2021; Wang et al, 2022; Watkins et al., 2015). Prompting peers to engage in recently trained social behaviors may initially seem unnatural or ingenuine. For example, a student may tell their peer "Give me a compliment!" (Kilpatrick et al., 2019). However, peer prompting has been found to increase the maintenance and generalization of prosocial behaviors outside of the structured environment where the skills were taught (Blake et al, 2000; Wang et al, 2022).

Both peer modeling and prompting serve as effective PMIs that can enhance students' social skill development via social learning theory (Bandura, 1971). When used in combination, modeling and prompting create a dynamic system of peer reinforcement that not only increases the frequency of desired behaviors but also fosters a more supportive and socially engaged classroom environment (Wang et al., 2022). Given their effectiveness in promoting social skill development, particularly among students with social skill deficits, these PMI interventions are valuable tools for improving student outcomes in the classroom setting. One structured, school-based PMI that provides opportunities for modeling, prompting, and reinforcement is Tootling.

## Tootling Interventions

The Tootling Intervention (TI) is a PMI that teaches and encourages students to attend to and report their classmates' prosocial behaviors during typical classroom procedures via positive peer reporting (Skinner et al., 2000). Positive Peer Reporting (PPR) is a peer-based strategy in which students recognize and document their classmates' prosocial behaviors. Research has shown that PPR interventions can enhance social interactions and foster greater peer acceptance (Jones et al., 2000; Smith et al., 2009). The TI also uses an interdependent group contingency to provide class-wide reinforcement for completing written PPR slips quietly and independently during the session (Skinner et al., 2000; Skinner et al., 2002). Researchers have found TIs can decrease several undesired classroom behaviors, including out-of-seat, calling out, and social aggression (Cihak et al., 2009; Kilpatrick et al., 2019; Lambert et al., 2015; Lum et al., 2017; Lum et al., 2019; McHugh et al., 2016). Following SST, TIs have also been shown to enhance students' performance of the recently trained prosocial behaviors. With these TIs, students are reinforced for monitoring and reporting peers' engagement in specific prosocial behavior (Wright et al., 2021). Researchers have found that TI interventions have enhanced a variety of prosocial

behaviors (e.g., complimenting, encouraging, saying thank you) across diverse groups of elementary students and social activities (Crewdson et al., 2023; Crewdson et al., 2024; Fowler, 2023; Wright et al., 2022).

Several mechanisms may explain why TIs increase prosocial behavior in the classroom. Tootling interventions (TIs) reinforce both the observing and performing prosocial behaviors through the application of interdependent group-oriented rewards (Skinner et al., 2000). By encouraging students to report their peers' positive behaviors, TIs not only reinforce the act of reporting but also increase the likelihood that students will engage in the desired behaviors themselves (Skinner et al., 2002).

TIs were originally developed to shift students' focus away from inappropriate behaviors by increasing their awareness of prosocial behaviors among their peers (Skinner et al., 2002). This heightened attention to positive behaviors enhances opportunities for social learning, as students are more likely to acquire new social skills through observation of their peers (Bandura, 1971; Brown & Schulte, 1987). Peer-mediated interventions, such as TIs, provide increased opportunities for students to observe modeled social behaviors in natural contexts, as opposed to the SST context, which can enhance behavior generalization and maintenance, increasing the likelihood that students will generalize learned social skills across different social settings (Crewdson et al., 2023; Skinner et al., 2002). Given that social skills training (SST) is most effective when paired with real-world application, the structured nature of TIs provides students with consistent opportunities to practice, reinforce, and internalize prosocial behaviors, making them a valuable tool for improving classroom social dynamics (Crewdson et al., 2023). While researchers have demonstrated TIs are effective PMIs in decreasing negative classroom

behaviors and promoting prosocial behaviors, there is little research directly examining the role of peer mediation while tootling.

## Purpose of Current Study

Researchers have demonstrated that classroom-based PMIs can enhance social skill acquisition, maintenance, and generalize across students and social contexts (Crewdson et al., 2023; Hank & Huber, 2024; Wang et al, 2022; Zhang et al., 2022). TIs are PMIs that are associated with higher rates of prosocial behaviors and decreases in negative classroom behaviors in classroom settings (Cihak et al., 2009; Crewdson et al., 2023; Fowler, 2023; Kilpatrick et al., 2019; Lambert et al., 2015; Lum et al., 2017; Wright et al., 2021). Several researchers have attributed the success of TIs to various peer-mediated mechanisms; however, no previous studies have directly manipulated or evaluated the impact of peer-mediated mechanisms. Thus, the two current studies were designed to extend the research on the effectiveness of TIs on a small group of diverse second-grade students in the classroom setting. Specifically, the purpose of these studies was to directly examine the role of peer mediation while completing TIs after social skills training for prosocial behaviors.

The first study examined the correlation between a desired prosocial behavior (i.e., complimenting) and prompting peers to engage in or report the prosocial behavior while a TI was applied. Using an A-B-A-B withdrawal design, five second-grade students participated in a TI while completing a cooperative math bingo game after receiving an SST on the desired behavior (complimenting). Researchers observed and used partial interval recording to measure complimenting and peer prompting across baseline, implementation, withdrawal, and re-implementation phases. These data were used to determine if the TI was effective at increasing

complimenting. Importantly, these data were used to determine if there was a relationship between peer prompting and complimenting when the TI was implemented.

Given the results of the first study, the second study was designed to directly examine the role of peer modeling while tootling. A multiple baseline across behaviors design was used to examine the complimenting in group members after the behavior was modeled by a high-status peer. A peer confederate was taught to administer target compliments while participating in a TI during the same cooperative math activity. Partial interval recording was then used to determine if the use of the target compliments by the confederate resulted in other group members using the target compliment while tootling.

# CHAPTER II

## Study I: The Relationship of Tootling on Complimenting and Peer Prompting in Second-Grade Students

**Abstract**

After students acquire social skills, Tootling Interventions have been used to enhance students' social skill performance outside the social skill training environment. With Tootling interventions, group-oriented rewards are delivered contingent upon the number of reports students provide of their peers' engagement in prosocial behavior(s). The current study replicated and extended this research by evaluating the effects of Tootling on complimenting and peer prompting as a group of five second-grade students played a math bingo game. Visual and effect size analysis of our withdrawal design data showed higher rates of complimenting and peer-prompting when the Tootling intervention was applied. Also, across intervention sessions, complimenting and peer prompting were positively correlated and this correlation was statistically significant. These results show students prompt their peers more when participating in a Tootling intervention, suggesting that positive peer mediation (e.g., prompting) may further increase the performance of recently trained social skills while tootling. Discussion focuses on future research designed to enhance the impacts of Tootling interventions, positive peer mediation, and students' social skill development.

*Keywords*: Tootling interventions, peer prompting, social skill performance, social skills development.

**The Effects of Tootling on Complimenting and Peer Prompting in Second-Grade Students**

Children begin to socially interact with adults and peers at an early age, with interactions increasing in frequency and complexity as they get older (Brown et al., 1996). During these interactions, students develop social skills that may allow them to form friendships, enhance peer relationships, and aid in their adjustment to school (Wilkerson et al., 2013). Alternatively, social skills deficits are associated with poor mental health, social isolation, a negative self-concept, and restricted opportunities for growth (Henricsson & Rydell, 2006; Jaureguizar et al., 2018).

Teacher-directed social skill training (SST) can allow students to acquire social skills (Ang & Hughes, 2002; Wright et al., 2022); however, students may not perform skills outside the structured SST context (de Mooij et al., 2020; Wright et al., 2021). Performance of social skills across social contexts may be necessary for students to develop the ability to discriminate, generalize, and adapt social skills (Crewdson et al., 2023; Fowler, 2023; Gresham et al., 2001). For example, students must learn to discriminate which context it is appropriate to scream praise (e.g., scream "you the man" at a wrestling match) and which context to quietly offer words of encouragement (e.g., saying "you can do this" as a peer attempts to complete a difficult academic task). Also, people must learn to generalize (e.g., screaming at a rock concert versus talking quietly during a chamber music performance) these behaviors across contexts. Finally, they must learn to adapt social skills (e.g., a fist pump instead of a handshake when finishing a tennis match during flu season) to a new social context.

**Peer-Mediation**

After acquiring social skills, interacting with peers influences children's social skills development (Hank & Huber, 2024; Wang et al., 2022). Peers can mediate each other's prosocial behaviors through modeling, prompting, and differential reinforcement (Flood et al., 2002;

Wang, 2022). When peers mediate each other's social behavior across social activities and contexts, students can develop more advanced social skills, including discrimination, generalization, and adaptation (Bandura, 1971; Brown et al., 2008; Crewdson, Skinner et al., 2023; Gresham et al., 2001).

In schools, students interact with each other across social contexts and activities (Muller & Zurbriggen, 2016), so teachers can directly influence peer mediation by providing opportunities for peers to mediate (demonstrate, prompt, labeled praise) the performance of social skills (Hank & Huber, 2024). Thus, school-based peer-mediated interventions may be an effective strategy for enhancing students' appropriate performance of recently acquired social skills across social contexts (Crewdson, Richardson, et al., 2023; Hank & Huber, 2024). While there are many types of peer-mediated interventions (Wang et al., 2022), peer prompting and reinforcement are common procedures for promoting the maintenance and generalization of prosocial behaviors outside of the structured SST environment (Blake et al, 2000; Flood et al., 2002; Simpson & Lewis, 2021Wang et al, 2022).

Peer prompting has been used to encourage students to engage in recently trained social skills (Chang & Locke, 2016; Martinez et al., 2021; Wang et al, 2022; Watkins et al., 2015). These prompts can be very direct and intentional. For example, a peer may say "Give me a compliment" (Kirkpatrick et al., 2019). They can also be more subtle and unintentional, such as when a student models complimenting behavior without any additional cues (Brown et al., 2008). When recently trained social skills are performed, peers can socially reinforce those behaviors (e.g., labeled praise such as "Thank you, that was a really cool compliment").

Educators can teach and encourage students to prompt and reinforce students' engagement in recently trained social skills (Harris et al., 2009; Wang et al., 2022). Additionally,

assigning structured activities that provide numerous clear opportunities to engage in recently acquired prosocial behaviors can enhance peer mediation and students' rate of engagement in recently trained social skills, which enhances social skill development (Busching & Krahé, 2020; Chang & Locke, 2016; Crewdson et al., 2023; Martinez et al., 2021; Wang et al, 2022; Watkins et al., 2015). For example, many cooperative learning strategies include social skill training, learning activities that provide opportunities for students to socially interact and engage in prosocial behaviors, and reward structures (e.g., interdependent group rewards) designed to indirectly reinforce those desired social behaviors (Hank & Huber, 2024; Johnson & Johnson, 2002; Richardson et al., 2022; Slavin, 1991).

**Tootling Interventions**

Tootling interventions (TIs) employ interdependent group-oriented rewards to encourage positive peer reporting (Skinner et al., 2000; Skinner et al., 2002). Positive peer reporting (PPR) is a peer-mediated intervention where students report classmates' desired behaviors. PPR interventions have the potential to enhance positive social interactions and foster peer acceptance (Jones et al., 2000; Smith et al., 2009). With Tootling interventions (TIs), all students in a group (e.g., class or small group) receive an interdependent group-oriented reward when the group provides enough PPRs (i.e., "tootles") to meet a criterion (Cashwell et al., 2001).

The first TI was developed in response to a teacher's concern that her elementary students engaged in high rates of tattling, which consisted of observing and reporting their classmates' undesired behaviors across the school day (Skinner et al., 2000). Thus, rather than trying to decrease tattling, researchers attempted to increase students' monitoring and reporting of classmates' prosocial behaviors. Because reporting a peer's prosocial behavior may not result in the reporter's behavior being reinforced, researchers used the interdependent group-oriented

reward to reinforce reporting behaviors (Skinner et al., 2002). Initially, TI researchers trained students to report student-helping-student (SHS) behavior and showed that interdependent group-oriented rewards were necessary to maintain students' PPR (Cashwell et al., 2001; Skinner et al., 2000). Later studies showed that similar TIs targeting SHS behaviors could be used to enhance on-task behavior and decrease common undesired classroom behaviors, including out-of-seat behavior, calling out, and social aggression (Cihak et al., 2009; Kilpatrick et al, 2019; Lambert et al., 2015; Lum et al., 2017; Lum et al., 2019; McHugh et al., 2016).

Wright et al. (2021) conducted the first study that showed TIs could increase students' performance of the behavior being reported (Crewdson, Richardson et al., 2023). Wright et al. first provided social skills training on complimenting, then installed a Tootling intervention where groups of students were rewarded for reporting peers who provided compliments. Results showed that the TI increased students' complimenting peers. Similar results were found across students and activities for providing encouragement and saying thank you (Crewdson et al., 2024; Crewdson, Skinner et al., 2023; Fowler, 2023; Wright et al., 2022).

The interdependent group-orient reward applied during TIs was designed to directly reinforce observing and reporting peers' prosocial behaviors (Skinner et al., 2000). As these reports are typically occasioned by peers engaging in the desired behavior, TIs indirectly reinforce engaging in the desired behaviors that are being reported (Skinner et al., 2002). The interdependent reward also may indirectly reinforce students' prompting each other's engagement in desired behaviors and reporting these behaviors. Prompting peers to report prosocial behaviors may enhance students' awareness of different (e.g., novel) prosocial behaviors and contexts when these behaviors are appropriate (Brown, 2008). Thus, TIs may

enhance social skill acquisition, generalization, discrimination, maintenance, and adaptation (Crewdson, Richardson et al., 2023).

### Purpose

Previous literature TIs may directly and indirectly reinforce student engagement in recently trained social skills (Crewdson, Richardson et al., 2023; Skinner et al., 2000; Skinner et al., 2002). Peer mediation may also influence this engagement. Specifically, the interdependent group contingency may influence students to prompt peers to engage in recently trained prosocial behaviors and to report those behaviors. The current study was designed to replicate and extend previous TI researchers that showed that TIs could enhance students' engagement in a recently trained social skill, complimenting peers (e.g., Wright et al., 2021). The current study was designed to extend this research by evaluating the effects of a TI on students' prompting of their peers to compliment and report complimenting behaviors. Finally, we examined the relationship between the number of peer prompts and the group's engagement in complimenting behaviors across intervention sessions. We hypothesized that the rates of both complimenting and peer prompting would be higher when TI procedures were implemented, and that rates of these behaviors would be positively correlated.

## Method

### Participants and Setting

Participants were recruited from a second-grade classroom in an urban K-5 school in the southeastern United States. The study occurred during the last 30 min of the school day, which was allotted for reading skill remediation provided under the school's multi-tiered systems of support (MTSS). Consent and assent to participate were solicited and obtained from all five students (three boys, two girls; three Black, one Asian, and one multi-racial) who did not receive

small group reading remediation services at this time. All five students came from low-income families and received free or reduced lunch.

The study was conducted three to four days a week. As the general education teacher worked with other students at the front of the classroom on early reading skills, these five students would work with the primary researcher, a white female Ph.D. student who had experience conducting TI research. Upon arrival, the primary researcher would lead the group of participants to a table in the general education classroom away from the remedial reading activities and setting up materials. Researchers sat at the table alongside the students to administer procedures.

**Materials**

Materials included Bingo printout cards generated from "myfreebingocards.com" (see Appendix B). Bingo spaces consisted of addition and subtraction math problems. The students' general education teacher selected these problems to give students additional practice with second-grade math standards. The primary researcher created peer reporting slips of paper with each participant's name, an image of children complimenting one another, and a header titled "I caught a compliment!" with the text "Who complimented?" above the students' names (see Appendix B). Six of these reporting slips were printed on one 8.5 x 11-inch piece of printer paper and cut into slips.

A shoe box wrapped in colorful paper with an opening on the top of the box was used to hold completed positive peer reports. The researcher used a random number generator to select the reward criteria each day. The number selected by the generator was written on a piece of white paper prior to each session and placed in a 5x3 orange envelope with a question mark written on the front side. Numbers initially ranged from 5-25 tootles. However, the range of

numbers was increased to between 25-65 tootles after a larger-than-expected number of PPR slips were filled out by group members following the first intervention phase. The teacher selected a small piece of candy as a reward that all students in the class would receive in their backpacks when the small group earned a reward. The teacher reported that this had been an effective reinforcer for other behaviors in the past.

**Design, Independent Variables, and Dependent Variables**

An A-B-A-B withdrawal design was used to evaluate the effects of the TI on the number of intervals scored with a compliment and the number of intervals scored with peer prompting while students played a cooperative math Bingo game (Kazdin, 2020). Phase changes were not considered until there were at least three data points per phase. Then, decisions regarding when to change phase were response-guided and based on visual analysis of the group's observed complimenting and prompting behavior plotted on a repeated-measures graph, with a focus on within-phase trends, variability, and outliers (Kratochwill et al., 2013).

To conduct this study, students were trained to give and receive compliments, provide positive peer reports, and play a cooperative Math Bingo game. All training occurred prior to implementing the TI. The TI consisted of providing group rewards contingent upon students meeting an unknown criterion for the number of tootles (i.e., reports of participants providing a compliment) as they engaged in the Math Bingo game. Complimenting was selected as the target behavior by the general education teacher and was consistent with school goals to enhance prosocial behaviors.

There were two dependent variables for this study, the average number of intervals scored with a compliment and the average number of intervals scored with a student prompting a peer(s) to tootle (i.e., report a compliment) or provide a compliment per student. To collect this data, a

group of five participants was observed for 10 min while playing cooperative Math Bingo. For both complimenting and prompting, over each 10 min session, partial interval data was scored for each student using 10-s intervals. For each session, the primary dependent variable was the average number of intervals scored per student who participated in that session. Data was not collected for a particular student if they were absent for that session.

The operational definition of a compliment was similar to the definition used by Wright et al. (2021). A compliment was defined as a positive verbal statement that demonstrated approval of another student's characteristics or another student's completed action. Some examples of compliments approving a student personally included "I like your shoes" and "You are a kind friend". Examples of compliments expressing approval of a student's completed action include "Good job!" or "You worked so hard on that problem". Non-examples of compliments given included "You got this" and "You can do this", as these are encouragements. Celebratory responses, such as "Yay!" or "Woohoo!" were also not scored because the statements were not directed at another peer. Also, compliments were not scored when they were directed towards a teacher, researcher, or students outside the group.

Peer prompting was operationally defined as a verbal statement from a student that encouraged a classmate to give a compliment (e.g., "Give Sally a compliment") or complete a tootling slip (e.g., Jane just complimented Sally, we need to fill out a slip). Prompts were also scored when a student provided an observational statement of a compliment (i.e., "Bill just gave a compliment", "Awesome is a compliment"). Observational statements were included as prompts because the primary experimenter participated in previous research and noticed students prompting peers to report using similar verbal behaviors.

Compliments and prompts were recorded if they were at an audible level that researchers could hear during the cooperative bingo game. Nonverbal compliments or prompts, including giving a student a thumbs up or clapping after another student's turn were not scored. Nonverbal behaviors were excluded because they were often ambiguous (e.g., clapping may be celebratory for the group as a whole).

## Procedures

After obtaining approval from university and school system research offices, the primary researcher spent time observing the classroom and allowing the students to become familiar with the researcher. The researcher also consulted with the teacher to discuss the goals and procedures of the current study. After participants were identified, parent consent and student assent were collected, and procedures were applied three to four times per week. Data were not collected on days when less than three group members were present.

Next, the primary researcher met with the participants, described the cooperative Math Bingo activity, and collected baseline data as they played Math Bingo. After five baseline sessions, the primary researcher provided social skills training on complimenting peers, followed by TI training. The TI was then applied for six sessions, withdrawn for three sessions, and re-applied for three more sessions. Sessions ceased as the end-of-term activities altered schedules.

### *Baseline Phase and Assessment Procedures*

Before baseline data was collected, the researcher explained the rules of cooperative Math Bingo. Each student took a turn pulling a slip of paper from a mug, which contained the letter "B". "I", "N", "G", or "O" and a number one through five. The student who drew the slip then found the corresponding spot on the Bingo board (e.g., the third box in the "O" column for "O3") and the math problem they were to attempt to complete. Paper and a pencil were provided

for students to solve problems. The student could answer the math problem verbally or in writing. When the student answered the math problem correctly, the researcher crossed off the corresponding spot on the bingo board. The remaining students performed the same procedures individually in a clockwise circle until they had collectively completed enough problems to earn a bingo. The researcher recorded the time taken to obtain a Bingo and told the students to try and beat their previous time the next time they played.

While students were playing the bingo game, the researcher(s) recorded data for compliments and prompts. Partial interval recording with 10-s intervals was used to record the verbal behavior of the students. For each student, an interval was scored if that student delivered a verbal compliment. An interval was also scored if a student provided a verbal prompt within the interval. After the 10-min session, the students cleaned up group materials and began packing up for classroom dismissal.

### *Social Skills Training*

Following baseline data collection, the primary research provided one day of social skills training at the beginning of the small group session (see Appendix B for SST protocols). The training consisted of defining compliments, asking students to provide examples of compliments, providing examples and non-examples, and modeling how and when to compliment. The students were also asked how giving and receiving compliments feels to them. The researcher provided praise and corrective feedback to the students' responses throughout the social skills training.

### *Tootling Intervention Training*

On the next session the primary researcher provided training on the TI (see Appendix B for Tootling training protocols). The TI was introduced as the Tootling "game" and the rules for

playing the game were described. Participants were trained to report compliments from their peers using PPR slips while they played Math Bingo. Students were told not to report their own compliments, compliments given to adults (e.g., the researcher), or compliments to students outside their group. Next, students were shown the PPR slips and taught how to complete the slips and submit the slips. The researcher instructed students to circle the peer who provided a compliment on their slip and place the slip into a decorated shoe box placed in the middle of the group's table. The researcher explained that one name should be circled on each slip. Slips completed incorrectly, such as those with no name or multiple names circled, were not counted towards the goal and did not help students win the game.

After teaching the students to complete PPR slips, the primary researcher described how to win the Tootling game. The researcher showed the student an envelope with a question mark on the front, which served as the goal envelope. Students were told that the goal envelope would contain a randomly selected criterion of PPR needed to win the game for that day. Criteria ranged from 5-65 PPR slips, but students were told the number of tootles would be a mystery until the end of the day. Also, students were not told the criterion range.

The researcher then explained that after each session, all slips filled out by the group would be counted to determine if the number of tootles exceeded the randomly selected "mystery goal" for the day. If the number of slips met or exceeded the daily goal, the students were told that the entire class would receive a reward. The researcher emphasized that this was a class-wide reward, so either everyone won, or no one won, depending on how the small group performed.

***Treatment Phases***

At the beginning of each day in the TI phases, the primary researcher reminded students that they would be playing the Tootle game during that time. The researcher would select a criterion using a random number generator on their phone. The researcher then wrote that number on a slip of paper out of sight of the students and placed the slip into the mystery goal envelope. The students were reminded that tootles would be counted after their time in the group, and if their goal was met with the whole class at the end of the school day. Students were allowed to ask clarifying questions during this time. After any questions were answered, the students began playing the cooperative bingo game using the same procedures as in the baseline phase while the researcher(s) collected data. The student completed Tootle forms during the bingo game and placed slips in the box throughout the session.

After 10 min of playing cooperative bingo while the TI was applied, the researcher collected materials and counted the number of correctly completed PPR slips. At the end of the school day, while all students in the class sat on the rug waiting for dismissal, the researcher took out the slip containing the goal for the day and announced if the small group met or exceeded the goal number of PPR slips. If the small group met or exceeded their goal, the researcher gave each student in the class a small piece of candy to take home with them at dismissal. If the small group did not meet their goal that day, the students were encouraged by the primary researcher to try to meet their goal the next time the researcher came to play bingo. After the first intervention session, the number of peer report slips was well above the highest criterion set by the researcher. Thus, the criterion was raised from 5-25 to 25-65 to challenge the group to maintain or increase the number of PPR slips completed.

### *Withdrawal Phase*

After the first treatment phase ended, baseline conditions were reinstated. The PPR slips were removed, and the researcher announced that they would not be participating in the game and would therefore be unable to earn a reward for reporting compliments. However, students would still be playing the cooperative Bingo game.

Researchers continued to collect partial interval data on complimenting and peer prompting.

### *Treatment Reimplementation Phase*

After the withdrawal phase, the Tootle game with the interdependent group contingency was reimplemented in identical procedures from the first treatment phase. Direct observation data were collected in an identical manner to the other phases. Due to time constraints at the end of the school year, only three data points were collected during the second treatment phase.

### *Social Validity*

Following the last session of the treatment phase, the primary researcher collected social validity data from the students in the group. The researcher read aloud five yes or no questions identical to those used in Crewdson et al. (2024) study (see Appendix D). Students responded to items by circling “yes” or “no” to items while following along with the researcher. The teacher also completed social validity measures by rating 6 statements identical to those used in Crewdson et al. (2024) from “strongly disagree” to “strongly agree” (See Appendix E).

## Data Analysis

For each student, the average number of intervals scored with a compliment or a prompt per student was calculated for each session. These data were then plotted on a repeated measures graph and interpreted using visual analysis of within and across-phase levels, variability, and trends. Visual analysis was also used to evaluate the immediacy of changes across phases.

Across-phase comparisons were also made by calculating Tau or Tau-U effect sizes. Finally, the relationship between intervals scored with prompts and intervals scored with compliments across all TI sessions (i.e., both B phases) was analyzed using a Spearman's rho correlation.

**Procedural Integrity and Interobserver Agreement**

Two separate independent observers recorded procedural integrity data for social skills and TI training (see Appendix C for integrity checklists). Procedural integrity was 100% for both trainings. Treatment integrity was collected once at each of the two treatment phases implemented in the study, for a total of two (22.2%) sessions (see Appendix C). Treatment integrity was 100% each day that data was collected.

The primary researcher and one of two independent observers collected dependent variable data once during each phase. Interobserver agreement (IOA) was calculated for on an interval-by-interval basis for each student's behavior. The number of agreements was then divided by the number of total intervals observed and multiplied by 100. During both baseline phases, the IOA for compliments and peer prompts was 100%. In the first treatment phase, the mean IOA for compliments was 97% (Range = 94-100%) and 95% for peer prompts (Range = 92-100%). The mean IOA for compliments in the second treatment phase was 96% (Range = 94-100%) and the mean IOA for peer prompts was 95% (Range = 91-100%).

## Results

**Figure 1** displays the average number of intervals scored with a compliment per student. During the baseline phase, no compliments were observed in four of the five sessions. In the fourth session in the baseline phase, two intervals were scored with a compliment. Intervals scored with a compliment averaged 0.40 during this session. On the first day the TI was applied, there was an immediate increase in the average number of intervals scored with a compliment

per student. Across the six intervention sessions, there was an increasing trend, followed by a decreasing trend until the final data point in this phase. During the intervention phase, scores were highly variable, ranging from 0.33 to 3.67 intervals with a compliment per student. The mean intervals observed with a compliment were 2.19, *SD* = 1.14.

Once the TI was withdrawn, the average number of intervals scored with a compliment per student immediately decreased to 0.00 and remained there for the other two withdrawal phase sessions. When the TI was reimplemented, the average number of intervals scored with a compliment immediately increased to 2.50 per student and was 3.00 intervals per student in the final two sessions. During the second TI phase (i.e., reimplementation phase), data were more stable than the first TI phase, with a higher mean of 2.80 per student, and a smaller *SD* of 0.28.

**Figure 2** shows the average number of intervals scored with a prompt to compliment or to report a peers' behavior per student. During the baseline phase, all students engaged in no prompts. On the first intervention session, an average of 0.50 intervals with prompts were scored per student. During the intervention phase, the average prompting data was similar to complimenting data (see **Figure 1).** There was an increasing trend, followed by a decreasing trend, and finishing with a substantial increase in prompts on the final day of the intervention phase. The average intervals scored with prompts range from 0.00 to 2.80 per student with a mean of 1.24, *SD* = 1.09

When the intervention was withdrawn, prompting returned to 0.00 for all three sessions. After the intervention was reimplemented, the average number of intervals with an observed prompt to compliment or report complimenting immediately increased to 3.50 per student. During reimplementation, the average number of intervals scored for prompting pe student

remained higher than the initial intervention phase and ranged from 2.00 to 3.50 ($M$ = 2.50, $SD$ = 0.71).

Vannest and colleagues' (2016) web-based calculator was used to compute Tau effect size coefficients and their corresponding p-values across adjacent phases. Tau scores, rather than Tau-U scores, were used as no trends requiring correction emerged (Parker et al., 2011; Vannest & Ninci, 2015). The criteria established by Vannest and Ninci (2015) were applied to interpret the Tau scores. Tau analyses are presented in **Table 4** and showed a large (ES > 0.80) increase from baseline to treatment phase and withdrawal to reimplementation phases for both complimenting and prompting. We also found large decreases in complimenting and prompting from the intervention to the withdrawal phase. Across all comparisons, $p$ values were < 0.05.

**Table 1** provides group-wide descriptive statistics for each phase, indicating the mean number of intervals scored with a compliment and a prompt per student. As partial interval recording data was collected, these data display the minimum compliments and prompts delivered in a 10 min session per student. These data show that during the implementation and re-implementation phase, average compliments increased to 2.19 and 2.83 intervals per student. Assuming five students were present for the session, these means suggest at least 10.95 to 14.15 compliments were observed during a ten-minute session. Thus, when the TI was applied, compliments were delivered at a rate of more than once per min. When TI was applied, prompts increased to 1.24 (more than one prompt every 2 min) during the intervention phase and 2.50 (more than one prompt per min) during the re-implementation phase.

Descriptive statistics for individual student complimenting data per attended session across treatment phases are presented in **Table 2**. These data demonstrate that four of the five students engaged in notably more compliments during the first implementation phase compared

to baseline phase, with means ranging from 2.33-3.80 intervals for these students. Student 3 showed smaller increases, with their mean increasing from 0 to 0.33 during the TI phase. All five students engaged in zero compliments once the TI was withdrawn. Upon reimplementation, students 1 and 4 engaged in higher average intervals with a compliment than the first treatment phase, with an average of 6.67 and 4.00 intervals per session, respectively. Student 5 engaged in fewer intervals with an average of 0.67, ranging from 0.00-2.00 intervals per session. Student 3 did not demonstrate a treatment effect during reimplementation, engaging in zero compliments. Student 2 withdrew from the study before reimplementation due to relocating schools.

**Table 3** shows the average intervals scored with a prompt per session for the five participating students. None of the five students prompted their peers to compliment or report prosocial behaviors in both baseline and withdrawal phases. All students had higher average intervals with a prompt in the first treatment phase, ranging from 0.33 (Student 3) to 3.80 (Student 1) intervals per session. In the reimplementation, students 1, 4, and 5 all engaged in higher rates of prompting than in the first intervention phase, averaging between 1.33 to 4.67 intervals with a prompt per session. Student 3 again failed to show a treatment effect and engaged in 0 prompts during reimplementation. Prompting data could not be collected for student 2 due to withdrawing from the study.

During the TI phases, prompting tended to occur at lower levels than complimenting. Visual analysis comparing **Figures 1** and **2** shows that the changes in levels and trends across TI (i.e., treatment and re-implementation phases) sessions were similar. Visual analysis was supported by Spearman's rho, which revealed a statistically significant positive correlation between per student average intervals scored with a compliment and with a prompt across treatment and reimplementation sessions, ($r_s$) = 0.76), p = 0.016).

## Social Validity

Student acceptability data was collected with all participating students present. Acceptability responses for group members were 100% across the five dichotomous (agree or disagree), with all students responding “yes” to all presented questions (see Appendix D for items and response summary). All students reported that their peers were nicer to them when playing the game, and all students also reported that Tootling helped them learn to give compliments. All students reported liking Tootling and that they were nicer to their peers when playing the game. The students agreed they would want Tootling to take place in all their classes.

Teacher acceptability data was collected with the classroom’s general education teacher. The teacher rated six statements from “1” (strongly disagree) to “6” (strongly agree). Acceptability responses from the teacher were ratings of "6” across all six statements provided (see Appendix E for items and response summary). The teacher reported she strongly agreed that the Tootling Intervention was a good intervention and that students were nicer and had fewer disagreements during the intervention. She reported the Tootling Intervention is feasible to use in the classroom and would recommend it to other teachers.

# Discussion

The current study was designed to evaluate the effects of SST and a TI on students’ complimenting one another and prompting peers to compliment or report compliments as they engage in a small-group math activity. Visual analyses of repeated measures graphs showed that after SST and the application of the TI, the average number of intervals scored per student across both dependent variables (compliments and prompts) immediately increased. After the TI was withdrawn, the average intervals per student for both dependent variables immediately decreased, then immediately increased when the TI was re-introduced. Effect size analyses

supported the conclusions based on our visual analysis. These findings are consistent with previous researchers who found evidence that SST, followed by TIs, can increase students' performance of recently trained social skills (Crewdson et al., 2023; Crewdson et al., 2024; Fowler, 2023; Wright et al., 2021; Wright et al., 2022).

A statistically significant positive correlation was found between the number of intervals scored with a compliment and the number of intervals scored with a prompt across TI sessions. This relationship between TIs and peer prompting is consistent with researchers who have found evidence that peer mediation can enhance prosocial behaviors (Flood et al., 2003; Simpson & Lewis, 2021; Wang et al., 2022). Responses on the acceptability scale also support previous research which suggests that students and teachers find TIs acceptable.

These results have several theoretical and applied implications. TIs are complex and researchers have identified several causal mechanisms that may explain why TI are effective (Skinner et al., 2002). With TIs, positive peer reporting is rewarded; however, these reports are occasioned by students observing their peers engaging in prosocial behavior. Thus, the interdependent group-oriented reward may directly reinforce peer reporting and indirectly reinforce students for engaging in the behavior being reported (Skinner et al., 2000). TIs were also designed to decrease students' monitoring and reporting of peers' undesired behaviors (i.e., tattling) by monitoring and reporting their desired behavior (Cashwell et al., 2001). Thus, TIs may enhance students' perceptions of each other by increasing their awareness of peers' engagement in prosocial, as opposed to antisocial behavior. These enhance perceptions may enhance complimenting behaviors (Cashwell et al., 2001; Skinner et al., 2000; Skinner et al., 2002).

The current findings extended previous research by demonstrating that more peer prompting occurred during TI phases. Results also revealed a statistically significant positive relationship between peer prompting and the performance of prosocial behaviors (e.g., complimenting) while participating in the TI. These results suggest another plausible causal mechanism to explain why TIs enhanced students' engagement in prosocial behaviors. These results suggest that TIs may enhance students' prompting peers to engage in the behavior being reported, which in turn increases student engagement in the behaviors being prompted. Specifically, the interdependent group reward that is used to reinforce PPR means that all members of the group are more likely to earn a reward when they provide PPR and their peers provide PPR (Crewdson, Richardson et al., 2023; Skinner et al., 2002). This contingency should indirectly reinforce peers to engage in positive peer mediation, including prompting each other to engage and report prosocial behaviors.

While our current results provide some support for the hypothesis that TIs may occasion peer prompting, which increases students' performance of the prosocial behaviors being reported, there are several reasons why additional studies are needed before any causal conclusions are drawn. This was the first TI study to measure peer prompting, and it was conducted with only a small group of students. The effects of the TI were only measured on one prosocial behavior, complimenting. Also, this study was only conducted in one social context, a small-group cooperative math activity. Additional research is needed across students (e.g., students with autism), prosocial behaviors (sharing, encouraging), and contexts (e.g., other activities) before any firm conclusions regarding the relationship between TIs, peer-prompting, and prosocial behaviors are drawn.

There are other reasons why casual relationships between TIs, peer prompting, and engagement in recently trained social skills require additional research. While the correlation between prompting and complimenting was statistically significant and in the expected direction, it is merely a correlation that does not allow for causal conclusions (Robinson, 2009). To better evaluate this causal mechanism, researchers should conduct experimental studies where peer prompting is controlled and manipulated. Also, we did not distinguish between prompts to compliment and prompts to report an observed compliment. Because there were no structured opportunities to report prosocial behavior, we cannot conclusively demonstrate a treatment effect for TIs on prompting behavior. Future researchers should conduct studies where they distinguish between prompt types.

Researchers should also investigate other mechanisms that may explain why TIs enhance prosocial behaviors. TIs may enhance awareness of peers' prosocial behaviors (Cashwell et al., 2001), which may increase the probability of students learning new prosocial behaviors (e.g., social learning) and engaging in those behaviors (Bandura, 1971; Brown et al., 2008; Hank & Huber, 2024). Another causal mechanism is the application of the group-oriented reward. In this study and in others, applying group-oriented rewards typically results in all students receiving more frequent reinforcement for desired behaviors, which may enhance the classroom climate, student-teacher relationships, and compliance with teacher direction and expectations (Richardson et al., 2022; Skinner et al., 2023). This, increased rates of reinforcement caused by the group reward component of TIs may account for the TIs causing an increase in on-task behavior and decreases in common disruptive classroom behaviors that are not consistent with teacher expectations, including out-of-seat and calling-out behaviors (Cihak et al., 2009; Lambert et al., 2015; Lum et al., 2017; Lum et al., 2019; McHugh et al., 2016). In the current study, the

primary research trained students in compliment and delivered group rewards. Thus, the delivery of group rewards may have increased the probability of students engaging in the recently trained social skill.

Descriptive statistics for individual student data demonstrated that the TI was more successful at increasing rates of complimenting and peer prompting for some students more than others. In particular, Student 3 showed a smaller or no increase in either dependent variable across sessions. This student was reported to by shy during the all-academic activities, per observation and teacher report. Future researchers should implement an interdependent group contingency based on the number of students who tootles, rather than the number of tootles to determine if TIs are effective for students who are shy or quiet in group settings.

Another limitation of the current study was one outlier within the first intervention phase, where only 1.67 intervals were scored with a compliment and 0 intervals were observed with a prompt. This may have been caused by attendance. Informal observations suggested that Student 1 was absent during this session, and they provided prompts at higher rates than other students on average. This suggests that future researchers should determine if one or a few students' prompting can moderate the effects of TIs on student engagement in and reporting of prosocial behaviors. Before any strong conclusions are drawn regarding why TIs are effective future research should conduct more controlled studies where peer mediation is controlled, and causal mechanisms can be studied in isolation and combination.

## Conclusion

After acquiring social skills, performing those behaviors across contexts may allow peers to mediate those behaviors and enhance social skill acquisition, the ability to determine when and when not to perform specific skills (i.e., discrimination and generalization), and allow

students to alter or adapt those skills to novel contexts. The current study showed that students engage in two important classes of prosocial behavior while participating in TIs: performing the behavior in the social context and prompting peers to perform or report prosocial behavior in a more naturalistic context. The findings on prompting are encouraging as social behaviors, both prosocial and anti-social behaviors, are often influenced by peers. Additionally, prompting peers to record may enhance students' awareness of different prosocial behaviors and the context in which it was performed, which may enhance social skill development (Brown, 2008; Crewdson, Richardson et al., 2023). Therefore, the current study may have heuristic value and encourage others to continue to investigate the relationships between SST, TIs, positive peer mediation (e.g., peer prompting), and student engagement in recently trained prosocial behaviors. As Tootling interventions have been associated with a variety of desired behavioral outcomes, we also hope that this study will encourage the continued investigations of TIs.

# CHAPTER III

## Study II: Peer Modeling while Tootling may Enhance Social Skills Acquisition and Maintenance in Elementary Students

**Abstract**

Social skills training, followed by Tootling interventions, have been used to enhance students' engagement in prosocial behaviors. Tootling interventions include interdependent group rewards to reinforce students reporting classmates' prosocial behaviors. These rewards may enhance students' awareness of peers' prosocial behavior, which could enhance their acquisition and performance of novel prosocial behaviors. A multiple baseline across behaviors design was used to determine if a peer confederate modeling three previously unused compliments ("brill," "bonzer," and "ace") while a Tootling intervention was applied would increase other group members' performance and maintenance of these compliments. Results provided three demonstrations of a treatment effect as student engagement in these behaviors increased after the peer-confederate engaged in those behaviors. Maintenance was also established, as students continued to perform these novel compliments after new compliments were introduced. These findings suggest that peer modeling of prosocial behavior while Tootling Interventions are applied may be an effective strategy for promoting social skill acquisition and maintenance. Future research on the effects of Tootling intervention on prosocial behavior acquisition, performance, and maintenance are discussed.

*Keywords:* Tootling, peer modeling, social skills training, prosocial behavior, interdependent group contingency, positive peer reporting, classroom interventions, peer-mediated interventions

## Peer Modeling while Tootling may Enhance Social Skills Acquisition and Development in Elementary Students

As children develop, they begin to interact socially with adults and other children. These interactions begin with adult caregivers primarily to meet the child's needs and/or wants but rapidly become more nuanced as children begin to age and interact with peer groups in education settings (Brown et al., 1996). Through these peer interactions, young children begin to develop social skills that can result in numerous desired outcomes. Social skills development in children is associated with increased peer acceptance, improved adjustment to school, and stronger friendships (Gresham et al., 2001; Wentzel & Muenks, 2016). Alternatively, children with poorly developed social skills are more likely to have lower academic achievement, poorer mental health, and be rejected or neglected by peers (Campbell, 1991; Henricsson & Rydell, 2006).

There are several theories that explain how peers influence the acquisition, generalization, and maintenance of social skills (Bandura, 1971; Chung et al., 2007; Mathews et al., 2018). Via modeling, social skills are often acquired unknowingly from those around us, dependent on the level of attention, retention, reinforcement, and motivation to engage in an observed behavior (Bandura, 1971). While researchers have found that children may learn social skills from parents, teachers, or other adults, there is strong evidence that a child's acquisition and engagement in social behaviors are influenced by their peers (Gifford-Smith et al., 2005; Rubin & Ross, 2012). Further, children are more likely to model the behavior of peers who have high social status, are popular, and can influence other students' behaviors (Newcomb et al., 1993; Yee et al., 2022).

Peer influences on social behaviors are enhanced when there are consistent opportunities to interact over time. Thus, social skills can be developed in classroom environments because

students consistently and repeatedly interact in classrooms (Brown et al., 2008; Muller & Zurbriggen, 2016; Wang et al., 2022). Teachers can provide structured opportunities (e.g., teacher-led social skills training) that allow students to acquire and practice social skills as teachers provide feedback and reinforcement contingent upon their behaviors. Also, in the classroom, peer-mediated interventions (PMI) can be used to promote social skill development (Hank & Huber, 2024; Wang et al., 2022). Teachers can apply strategies and interventions that allow peers to model or demonstrate desired social behaviors and prompt and praise each other for engaging in these behaviors (Hank & Huber, 2024).

**Peer Mediated Interventions**

Peer-mediated interventions (PMI), including peer demonstration and modeling, peer prompting, and peer praise, may enhance students' social skill acquisition (Hank & Huber, 2024; Wang et al., 2022). Additionally, as children interact with each other, PMI can increase a student's engagement of newly taught social skills within their natural social environments (Chang & Locke, 2016; Martinez et al., 2021; Watkins et al., 2015); thereby promoting generalization and maintenance of prosocial behaviors across social context (Crewdson et al., 2023; Wang et al., 2022). Also, peer-mediated interventions may allow students to adapt social behaviors to new social contexts.

Peer modeling is a PMI that often involves having a peer who is proficient in a target social behavior demonstrate or model skills while in the proximity of a student who has not developed proficiency with a skill (Chang & Locke, 2016; Hunter et al., 2021; King et al., 2016). Peer modeling has been used in general and special education settings to increase desired social behaviors across students, including students with autism spectrum disorder, emotional behavior disorders, and developmental disabilities (Chang & Locke, 2016; Hunter et al., 2021; King et al.,

2021). Peer modeling may enhance social skill development by increasing the target student's attention to the social behavior and allowing them to discriminate context when behavior is appropriate via social learning (Bandura, 1971; Crewdson et al., 2023).

Although peer modeling can be effective, researchers have found that peer modeling alone may not sufficiently reinforce target students to demonstrate the desired behavior across contexts (Banda et al., 2010). Therefore, peer modeling is often paired with additional PMIs (e.g., peer prompting and praise) to help target students increase their attention to the behavior, provide opportunities to engage in prosocial behaviors, and reinforce target behaviors. One intervention that may enhance peer awareness of prosocial behaviors, peer prompting, and reinforcement for prosocial behavior is the Tootling intervention.

**Tootling**

Tootling is a peer-mediated intervention that uses interdependent group-oriented rewards to promote positive peer reporting (Skinner et al., 2000; Skinner et al., 2002). Positive peer reporting (PPR) is a peer-mediated strategy in which students acknowledge and report their classmates' prosocial behaviors. PPR interventions can improve social interactions and increase peer acceptance (Jones et al., 2000; Smith et al., 2009). During Tootling interventions (TIs), all members of a group (e.g., a class or small group) earn an interdependent group-oriented reward when the total number of PPRs (i.e., "tootles") reaches a criterion (Cashwell et al., 2001; Skinner et al., 2000).

Researchers have demonstrated that TIs can improve on-task behavior while reducing prevalent classroom disruptions, such as out-of-seat behavior, calling out, and social aggression (Cihak et al., 2009; Kilpatrick et al., 2019; Lambert et al., 2015; Lum et al., 2017; Lum et al., 2019; McHugh et al., 2016). Wright et al. (2021) also determined TIs can increase target

prosocial behaviors by providing social skills training on prosocial behavior (i.e., complimenting) and then having students complete PPR slips for the target behavior. Subsequent studies found similar results across various students and activities for providing encouragement and saying thank you (Crewdson et al., 2024; Crewdson, Skinner et al., 2023; Fowler, 2023; Wright et al., 2022).

The interdependent group-oriented reward system used in Tootling interventions (TIs) is designed to directly reinforce students for observing and reporting their peers' prosocial behaviors (Skinner et al., 2000). Since these reports are generally prompted by peers demonstrating the desired behaviors, TIs also indirectly reinforce students for engaging in those behaviors (Skinner et al., 2002). Additionally, the interdependent reward system encourages students to prompt one another to engage in prosocial behaviors and to report these behaviors. Researchers have found there is a statistically significant positive correlational relationship between the rate of target behavior engagement and peer prompting of the behavior (See study 1). Thus, TIs may encourage and reward students for engaging in peer prompting, a form of positive peer mediation that may enhance engagement in prosocial behaviors.

**Purpose**

Researchers have found that TIs may promote student engagement in recently trained prosocial behaviors (Crewdson et al., 2023). The first TIs were developed, in part, to shift students' attention away from peers' inappropriate behavior by enhancing their attention to and awareness of their peers' prosocial behaviors (Skinner et al., 2002). This enhanced awareness should enhance the probability of students acquiring new social skills by observing peers engaging in those skills (Bandura 1971; Brown 1996). However, no studies have directly

examined the influence of peer modeling on the engagement of novel prosocial behaviors while participating in a TI.

The current study was designed to replicate and extend research on TIs to determine if students could acquire novel social skills while a TI was being applied. One purpose was to replicate previous research, which demonstrated that following SST a TI could increase students complimenting their peers. This study was designed to expand upon previous research by determining if having a peer confederate model novel compliments during a TI would increase other group members' use of the novel compliments. Finally, we also sought to determine if students would maintain their use of these novel compliments as new compliments were introduced.

## Method

### Participants

Participants were drawn from a second-grade class at a K-5 school located in an urban area of the southeastern United States. Study procedures occurred during the final 30 min of the school day during the period designated for Response to Intervention (RtI) services focusing on reading skills. Informed consent and assent were obtained from six students: three boys and three girls. Two students were Middle Eastern, two were Black, and two were Hispanic. Participants did not participate in small-group RTI services during this time and typically completed independent work. All participants came from low-income households and qualified for free or reduced lunch programs. The teacher was asked to nominate one student who had influence over their peers. This black male served as the peer confederate in this study and introduced the novel compliments while the group was Tootling. Two students, including the confederate, had

participated in a similar study using TI procedures with the primary researcher the previous semester.

The study took place three days per week: Monday, Wednesday, and Friday. The six participants worked separately with the primary researcher as the general education teacher provided phonetic RtI instruction to the other students at the front of the classroom. After the primary researcher arrived in the classroom and prepared the necessary materials, she guided the group to a designated table within the general education classroom. The table was positioned away from the RTI instruction. The researcher(s) sat at the table next to the students to implement the procedures and collect data.

**Materials**

The materials for the study included Bingo cards generated through "myfreebingocards.com" (See Supplemental Materials). Each Bingo space featured addition and subtraction problems selected by the general education teacher to provide extra practice with second-grade math standards. The primary researcher created reporting slips with participants' names to collect positive peer reports or tootles. Slips included an illustration of children giving compliments and a header titled "I caught a compliment!" above the question "Who complimented?" (refer to supplemental materials for form). Six of these slips were printed on a single 8.5 x 11-inch sheet of paper and cut into individual slips. A shoebox, decorated with colorful paper and an opening at the top, was used to collect completed peer reports.

Each day, a random criterion generator app was used to determine the reward threshold, which was written on a piece of white paper and placed in a 5x3" blue envelope marked with a question mark. The criterion for PPR slips ranged from 25 to 65 Tootles. The teacher and

researcher selected a reward that would appeal to most students, a small, individually wrapped piece of candy, based on previous success using this reinforcer for other behaviors.

**Design, Independent Variable, and Dependent Variables**

A multiple baseline across three behaviors design was used to evaluate the effect of peer modeling on the average number of intervals scored with any of the three target compliments per student, excluding the confederate. Prior to the baseline phase, students were taught to participate in a cooperative Bingo game. Before the baseline phase, students also received an SST on complimenting. Then, students were taught tootling procedures and how to earn group contingent rewards through tootling. The Tootling intervention involved offering group rewards based on students achieving an undisclosed criterion for the number of tootles (i.e., instances of participants complimenting one another) during the Math Bingo activity. The target behavior of complimenting was selected by the researcher after classroom observation and discussion with the general education teacher, who wished to decrease negative statements in the classroom.

Students participated in the TI across all sessions in the study. While completing the TI, students were engaged in a cooperative, turn-based math Bingo game. Phase changes were not initiated until each phase contained a minimum of three data points. Subsequent decisions to shift phases were response guided. Specifically, a visual inspection of the group's complimenting and prompting behaviors was displayed on a repeated measures graph. Then, decisions were made based on trends, variability, and the presence of outliers within each baseline and intervention phase (Kazdin, 2020). Researchers used partial-interval recording (10 s intervals) to record each group member's, excluding the confederate, use of the three selected unfamiliar compliments (i.e., "brill," "bonzer," and "ace") heard during the 10-minute intervention period.

The dependent variable for this study was the average number of intervals scored with each of the three target compliments implemented by the peer model (i.e., “brill,” “bonzer,” and “ace”). These compliments were selected by the primary researcher because they are primarily used in foreign, English-speaking dialects (i.e., British and Australian), and it was unlikely that participants had heard these compliments used appropriately prior to the research study. A discussion with the teacher before implementing study procedures confirmed that these compliments were not previously heard in the school setting. Data was not recorded on the confederate’s use of the target compliments. To collect this data, the participants were observed simultaneously for 10 minutes while engaging in the math Bingo activity. Given that compliments often lack a distinct beginning or end point (Hintze et al.., 2002; Skinner & Keller, in press), partial interval recording with 10-second intervals was employed to document compliments and target compliments from each student. Data was excluded for any student who was absent during a session.

When using any of the three target words modeled by the confederate (“brill”, “bonzer”, and “ace”), the students were not required to use the word with correct semantics or grammar. If the target compliment was used in a way to convey intent that aligns with the operational definition of a compliment, that target word was scored. Intervals with the target word were not scored if the student simply repeated the peer model or said the target word without directing it to another peer. Target compliments were scored only if they were directed toward other students within the group and were audible to the researchers during the cooperative Bingo game. As a result, target compliments addressed to the researcher, teacher, or students outside the group were excluded from the data.

## Procedures

Prior to study implementation, the primary researcher observed classroom procedures, introduced herself to students and teachers, built rapport with students, and collaborated with the general education teacher on goals and procedures for the study. The teacher and researcher determined participants and the peer confederate for the study collaboratively. The peer confederate was selected as an influential peer in the classroom by the teacher. Next, parent consent and student assent were administered and collected, then implementation of study procedures began. Sessions were held three times a week. If fewer than three group members were present, observational data was not collected as typical procedures were implemented. Additionally, if the peer confederate was absent, data was also not collected, but typical study procedures were run.

### *Baseline Phase and Assessment Procedures*

Before baseline data collection, the researcher implemented a training on the rules of cooperative math Bingo. Each student took turns drawing a slip of paper from a mug with the letters "B", "I", "N", "G", or "O" and a number between one and five. The student who drew the slip located the corresponding space on the Bingo board (e.g., "B4" referred to the fourth box in the "B" column) and completed the respective math problem. Students could either answer the math problem verbally or use scratch paper and a pencil to solve it. After providing a correct answer, the primary researcher marked the corresponding space on the Bingo board. This process continued with each student taking turns in a clockwise direction until enough math problems were solved to achieve a Bingo together. The researcher also recorded the time it took for the group to complete the game and encouraged the students to improve their speed in future sessions.

During the Bingo activity, the primary researcher and an assistant collected baseline data on target compliments using 10-s partial interval recording on a data recording sheet (see supplemental materials for an example of data recording sheets). Target compliments (“brill”, “bonzer”, or “ace”) were recorded for each interval in which a student gave a target compliment to a peer. If a student gave multiple target compliments (e.g., brill and ace) within the same interval directed towards another peer, both target compliments were recorded for that interval. After the 10-m session, the students cleaned up their materials and prepared for classroom dismissal.

***Social Skills Training***

Prior to baseline data collection, the primary researcher conducted a one-day social skills training session at the start of the small group activity (see Appendix C for treatment integrity checklist). This training involved defining compliments, asking students to generate examples, and providing both examples and non-examples. During social skills training, students learned about compliments using definitions that aligned with those provided by Wright et al. (2021). A compliment was characterized as a positive verbal statement that conveyed approval of another student's traits or actions. Examples of compliments directed toward a student's characteristics included statements such as "I like your shoes" and "You are a kind friend." Compliments acknowledging a student's actions included phrases like "Good job!" or "You worked so hard on that problem" were also included. Non-examples of compliments included phrases such as "You got this" and "You can do this," as these were classified as encouragement according to Wright et al. Additionally, celebratory remarks like "Yay!" or "Woohoo!" were considered non-examples since they were not specifically addressed to a peer.

The researcher also modeled how and when to give compliments and prompted students to reflect on how giving and receiving compliments made them feel. Throughout the training, the researcher offered praise and corrective feedback in response to the students' participation.

***Tootling Training***

After social skills training but prior to baseline data collection, the primary researcher introduced the Tootling intervention at the beginning of the group session. (see Appendix B for training procedures) Students were familiarized with the rules of the Tootling game and trained to report peer compliments using Positive Peer Reporting (PPR) slips. Instructions emphasized that students should only report compliments given by their peers during the group session and should not submit slips for themselves, students outside of the group, or adults (e.g., teachers or researchers).

The students were then taught how to correctly fill out the PPR slips, which involved circling the name of the peer who gave the compliment and placing the slip into a decorated shoebox positioned in the center of the table. The researcher explained that only one peer's name should be circled per slip, and any incorrectly completed slips would not count toward their daily goal. Examples and non-examples of Tootles were provided to clarify the process.

Next, the primary researcher explained how to win the Tootling game. The students were introduced to a goal envelope marked with a question mark, which contained the randomly selected daily criterion for the number of compliments required to win the game. This criterion ranged from 25 to 65 PPR slips, but students were informed that the specific number would remain a mystery until the end of each session. The researcher did not tell students what the criterion range would be and told students they would not know their goal for the day until the end of the Tootling session.

At the conclusion of each session, the researcher counted all completed slips to determine if the group's total exceeded the randomly selected goal for the day. If the number of tootles surpassed the goal, the entire class earned a reward. The researcher emphasized that the reward was class-wide, meaning that the participants' performance determined whether everyone received the reward that day or not. Detailed TI training protocols can be found in Supplemental Materials.

**Treatment Phases**

At the beginning of each treatment phase, the confederate was taken aside by the researcher and asked to help gather materials for the session. Other group members helped collect materials on days when phases did not change. Once other group members were out of earshot, the primary researcher taught one unfamiliar compliment ("brill", then "bonzer", then "ace"). The confederate was asked to use the new compliment about three to five times while playing the math Bingo game. After providing examples of when to use the compliment and answering any clarifying questions, the researcher and confederate gathered students for the group and completed the math Bingo activity while implementing TI procedures. While participating in the TI, the confederate delivered the target compliment after a peer had successfully completed a math problem for the Bingo game between three to five times within the 10-m session. The primary researcher occasionally provided a nonverbal cue (e.g., making eye contact with the student or tapping him on the shoulder) in the latter half of the 10-m session to provide a reminder if the target compliment was not used by the confederate enough times at that point in the session. A brief reminder to use the intended target compliment was provided to the confederate each session where other group members could not hear. Treatment phases were altered as each new compliment was introduced and delivered by the confederate. Due to time

constraints at the conclusion of the school year, researchers were unable to determine a stable trend for the final target compliment, “ace”.

**Social Validity**

At the conclusion of the treatment phase, the primary researcher collected social validity data from the group of students and the general education teacher. The researcher read five yes or no questions, identical to those employed by Crewdson et al. (2024) (see Appendix E). The researcher asked these questions aloud before the students departed from their final group session. Students indicated their responses by circling “yes” or “no” as they followed along with the researcher. The teacher completed five different “yes” or “no” questions independently.

**Procedural Integrity, Treatment Integrity, and Interobserver Agreement**

One independent researcher observed social skills and TI training (see Appendix C for integrity checklists) and collected procedural integrity data for both procedures. Both trainings had 100% procedural integrity. The same researcher also recorded treatment integrity data to ensure TI procedures were accurately implemented. Treatment integrity data was collected once in the baseline phase and once across all three treatment phases, for a total of four (23.5%) sessions (See Appendix C). Across all observed sessions, treatment integrity was 100%.

Interobserver agreement (IOA) was calculated on an interval-by-interval basis for each student’s engagement of target complements once across the baseline phase and once across each intervention phase. This data was calculated by dividing the number of agreements on target compliments heard, divided by the number of agreements plus the number of disagreements, and then multiplying by 100. Interobserver agreement was 97% across 23.5% of sessions observed.

## Results

**Figure 1** demonstrates the average number of intervals each participant (excluding the confederate) used “brill”, “bonzer”, and “ace” as a compliment towards a group member while completing the TI. The scale on the vertical axis ranges from 0 to 10 intervals. During the baseline phase, all group members averaged zero intervals with any of the target compliments, which was stable across all four baseline data sessions (M = 0.00; SD = 0.00).

Immediately after the confederate introduced the first compliment (“brill”) in the fifth session, the average number of intervals other group members used “brill” as a compliment increased to 0.60 intervals. The average number of intervals group members used “brill” demonstrated a slight increasing trend in sessions five through eight, with the highest number of 4.33 average intervals with “brill” per student occurring in the eighth session. As the second target compliment was introduced (“bonzer”) in session nine, the average number “brill” was used decreased to an average of two intervals per group member. Even though compliments from the confederate were not used for data interpretation, it was noted that the confederate still used “brill” as a compliment during sessions he modeled “bonzer” and “ace”. After this decrease, target compliments ranged from an average of 1.80-4.25 intervals per group member, even as the third target compliment (“ace”) was introduced. The mean average number of intervals each group member used “brill” across treatment phases was 2.96, SD = 1.09.

The average number of intervals each group member used “bonzer” as a compliment was also 0.00 across all eight baseline sessions. After the peer confederate modeled “bonzer” during the TI, the average number of intervals increased to 1.80 per group member. Similar to “brill”, the average intervals with “bonzer” showed an increasing trend in the three subsequent sessions from implementation, ranging from 3.00-4.20 intervals per group member. As the third target

compliment, “ace”, was introduced, the average number of intervals immediately decreased to 0.75 intervals per group member. After this session, the average number of intervals each group member used “bonzer” remained relatively stable for the remainder of the study, ranging from 2.25 – 3.25 intervals (M= 2.71; SD= 0.98).

Across all twelve baseline sessions, the average number of intervals each group member used “ace” remained stable at 0.00. As the peer confederate modeled the target compliment in session thirteen, an immediate increase of 2.50 intervals per group member was observed. A decrease in average intervals that each group member used “ace” occurred in session fourteen, followed by an increasing trend in the remaining sessions (range=0.50 – 6.33 intervals per student) with a large outlier in session sixteen of 6.33. This was the largest average number of intervals per group member across treatment sessions for all three target compliments. The mean average intervals using “ace” per group member across treatment phases was 2.77, SD = 1.93.

Vannest and colleagues (2016) created a web-based calculator used to compute Tau effect size coefficients and their corresponding p-values across adjacent phases. Tau scores were used rather than Tau-U scores as no trend requiring correction emerged (Parker et al., 2011; Vannest & Ninci, 2015). Vannest and Ninci (2015) established criteria that were used to interpret the Tau scores, with 0.20 to 0.60 indicating a moderate change, 0.60 to 0.80 signifying a large change, and scores above 0.80 representing a large to very large change. **Table 2** displays Tau analyses for the study. The Tau effect size for each of the three compliments was 1, indicating a very large effect size for all target compliments.

**Table 1** shows the means, standard deviations, and ranges for the average number of intervals scored with each target compliments and across all phases per group member. For all three compliments, phase means increased after the peer confederate modeled the target

compliment throughout the TI. On the first treatment phase for each new compliment, a decrease in the previously modeled compliment occurred. However, the average number of intervals with target compliments per group member remained relatively stable across treatment phases, with previously learned compliments maintained as new compliments were modeled. Thus, when the high-status peer confederate modeled a new compliment, other group members immediately began to use the compliment and kept using the compliment while participating in the TI. Data showed that in a 10-min session, each group member (excluding the confederate) used each target compliment an average minimum of about 2.7 times after that compliment was introduced by a high-status peer.

***Social Validity***

Student acceptability data was collected with all participating students present. Acceptability responses for group members were 100% across the five dichotomous (agree or disagree) items, with all students responding "yes" to every question (see Appendix D for items and response summary). All students indicated that their peers were nicer to them while playing the game, and all also reported that Tootling helped them learn to give compliments. Additionally, every student stated that they liked Tootling and felt they were nicer to their peers during the game. The students unanimously agreed that they would like Tootling to be implemented in all their classes.

Teacher acceptability data was collected from the classroom's general education teacher, who rated six statements on a scale from "1" (strongly disagree) to "6" (strongly agree). The teacher provided a rating of "6" for all six statements (see Appendix E for items and response summary). She strongly agreed that the Tootling intervention was an effective strategy and noted that students were kinder to one another and had fewer disagreements during its implementation.

Additionally, she reported that the intervention was feasible for classroom use and stated that she would recommend it to other teachers.

## Discussion

The purpose of the current study was to replicate and extend research on TIs and students' performance of recently trained social skills. Visual analysis of group-wide data demonstrates that group members began to provide previously unused compliments after their peers provided these compliments. Tau effect size calculations indicated that each of these three increases was very large. Thus, visual and statistical analysis supported three instances of a treatment effect.

These results support previous researchers who found that following SST, TIs can increase students' performance in a target social skill (Crewdson et al., 2023; Crewdson et al., 2024; Fowler, 2023; Wright et al., 2021; Wright et al., 2022). The current study extended previous research by showing that students increased their use of novel social skills after they were modeled by a peer confederate. Also, as new target compliments were introduced by the peer confederate, previous target compliments were maintained by other group members and used throughout the TI. These findings have both theoretical and applied implications.

The TI was initially developed to alter students' peer monitoring and reporting. Specifically, it was developed to reward monitoring and reporting peers' prosocial behaviors (i.e., tootling); thereby decreasing their tattling or monitoring and reporting peers' undesired behaviors (Cashwell et al., 2001; Skinner et al., 2000). This increased monitoring and awareness of desired social behaviors should enhance the probability of students modeling these behaviors (Bandura, 1971; Brown et al., 1996). Although the current results suggest that TI may promote

students' acquisition and performance of new social skills via peer modeling, additional studies are needed before any conclusions regarding causal mechanisms are drawn.

During the current study, numerous intervention components, including SST, the application of Tootling, and peer modeling may account for the behavior change. Consequently, it is not possible to discern the impact of any specific component. Researchers could conduct similar studies to determine whether adding a TI to a modeling intervention increases the probability of students modeling a peer confederate's novel prosocial behaviors. Additionally, there are numerous challenges associated with discerning causal mechanisms associated with each intervention component. For example, TIs may enhance students' engagement in the behaviors being reported because these behaviors are indirectly reinforced, peers prompt each other to perform those behaviors, students are more aware of peers' prosocial behaviors, and modeling or social learning. Also, enhanced peer perceptions, an improved classroom climate, and teachers providing more frequent rewards may promote desired social behaviors. Thus, additional studies are needed to evaluate the effects of these causal mechanisms in isolation and combination.

There are other limitations associated with the current study. While the teacher nominated a peer confederate whom she felt had high social status and was influential, no formal analysis was conducted to confirm this nomination. Future research should consider the use of objective measures, such as peer nomination and ranking, to ensure the confederate holds a large influence over his/her peers. Additionally, future researchers should determine if applying TIs could enhance a student's social status or influence. For example, consider a student with strong complimenting skills but low social status. Applying a similar TI may enhance this student's

influence over peers, the probability of them modeling this student's behavior, and their social status.

There are numerous threats to external validity associated with the current study that should be addressed. This research study was the first to directly influence modeling via peer confederate while tootling, with only six participants. These participants were the only students in the classroom not receiving academic remediation for reading skills; thus, they may have stronger academic skills than their peers. The peer confederate only modeled one type of prosocial behavior, complimenting peers. Data for this study was also only collected in one social context, a cooperative math activity conducted in a small group setting. Researchers should conduct study procedures with different students (e.g., students with autism, emotional-behavioral disorders, or intellectual disability), peer models (e.g., older students, students outside of the classroom), modeled prosocial behaviors (e.g., encouragements), and context (e.g., additional activities or classroom settings) before any generalizable conclusions can be drawn.

The current study showed that students maintained their engagement in a novel social skill after the confederate modeled a new compliment. However, these behaviors were only measured when the TI was being applied. Future research is needed to establish and measure the performance of newly acquired social skills outside the TI context. Researchers may find that the group reward component of the TI is required to reinforce student engagement in these newly acquired social skills (Banda et al., 2010; Skinner et al., 2000).

## Conclusion

While social skills development is an ongoing process, much of this occurs when students enter school and begin interacting with larger and often more diverse groups of students (Hank & Huber, 2024). This development includes acquiring new social skills, performing those skills,

and then learning when to apply those skills (i.e., generalization and discrimination) and adaptation or learning to alter skills across social contexts (Crewdson et al., 2024). Previous researchers have shown how TIs could be used to enhance students' performance of recently trained social skills (Crewdson et al., 2024; Fowler, 2023). Although the current study does not allow for firm conclusions regarding causal mechanisms, results suggest that TI may enhance students' awareness of peers' prosocial behaviors which can lead to the acquisition, performance, and maintenance of new social skills via social learning or modeling.

Social skills development in children is associated with many positive outcomes, including higher levels of peer acceptance, stronger friendships, better mental health, improved adjustment to schools, and better academic performance (Campbell, 1991; Gresham et al., 2001; Henricsson & Rydell, 2006; Wentzel & Muenks, 2016). Recently, researchers have shown that TI could increase students' performance of recently trained social skills (Fowler, 2023). Although no firm causal conclusions can be drawn from our multi-component study, results are consistent with social learning theories and suggest that TI may enhance students' social skills learning, including acquisition, performance, and maintenance. Thus, researchers should continue to conduct studies on TIs and other strategies designed to enhance students' awareness of classmates' prosocial behaviors.

# CHAPTER IV

## A General Discussion: The Role of Positive Peer Mediation in Tootling and Social Skills Development

## Purpose

Peer Mediated Interventions (PMIs), including Tootling Interventions (TIs), can enhance the acquisition, generalization, and maintenance of prosocial behaviors (Cihak et al., 2009; Crewdson et al., 2023; Fowler, 2023; Hank & Huber, 2024; Wang et al, 2022; Zhang et al., 2022). Although various peer-mediated mechanisms may contribute to the success of TIs, no researchers have directly evaluated peer mediation during TI. The purpose of these studies was to explicitly observe and evaluate the role of peer mediation while TIs were applied. In study 1, an ABAB design was used to examine the relationship between students engaging in a target behavior (i.e., complimenting peers) and prompting their peers to engage in and/or report the behavior. The second study directly manipulated the role of peer modeling to determine if peer modeling of a target behavior would result in other members of the group also engaging in the behavior. Results from both studies provide some evidence that peer mediation enhances tootling procedures.

## Study 1

The first study was designed to determine the relationship between students complimenting one another and prompting peers to compliment or report compliments while tootling during a small group math activity. Visual analyses demonstrated that after an SST and the application of the TI the average number of intervals scored per student for complimenting increased and students also began prompting peers to compliment or report compliments. After the TI was withdrawn, the average intervals scored per student for both dependent variables immediately decreased to zero, then immediately increased when TI procedures were reimplemented. Results from this study provided two demonstrations of a treatment effect and three demonstrations of experimental control for engaging in complimenting. Tau effect size

analyses supported the conclusions based on our visual analysis. Because differentiation between prompts to compliment and prompts to report compliments was not made, treatment effects for prompting were not calculated. Intervals scored with a prompt were higher when the TI was applied. Also, a statistically significant positive correlation was found between the number of intervals scored with a compliment and the number of intervals scored with a prompt during TI phases.

These findings support previous researchers who found evidence that SST, followed by TIs, can increase students' performance of recently trained social skills (Crewdson et al., 2023; Crewdson et al., 2024; Fowler, 2023; Wright et al., 2021; Wright et al., 2022). With TIs, positive peer reporting is rewarded; however, these reports are occasioned by students observing their peers engaging in prosocial behavior. TIs include an interdependent group-oriented reward to directly reinforce peer reporting and indirectly reinforce students for engaging in the behavior being reported (Skinner et al., 2000).

This relationship between TIs and peer-prompting supports previous researchers (Flood et al., 2003; Simpson & Lewis, 2021; Wang et al., 2022). The interdependent group contingency used to reinforce positive peer reporting means that all members of a group are more likely to earn a reward when they and their peers positively report one another's behaviors (Crewdson, Richardson et al., 2023; Skinner et al., 2002). This contingency should indirectly reinforce peers to engage in positive peer mediation, including prompting each other to engage and report prosocial behaviors.

## Study 2

Visual analysis of group-wide data from the second study demonstrated that group members began to provide previously unused compliments after a teacher-nominated peer provided these compliments. Tau effect size calculations indicated that each of these three increases were very large. Thus, visual and statistical analysis supported three instances of a treatment effect and suggests that while a TI was applied, peer modeling of target compliments increased the other group members' use of the target compliment. Results from the study also suggest that as new target compliments were introduced by the peer confederate, previous target compliments were maintained by other group members and used throughout the TI.

The second study extended the work of previous researchers by showing that peer modeling of novel prosocial behavior, such as new compliments, can increase the engagement of the target behavior in other group members while TI procedures are applied (see Study 1). We also found that as new target compliments were introduced, previous compliments were maintained during the TI. These findings suggest an additional potential causal mechanism that may explain why TIs increase students' performance of recently trained prosocial behaviors. Specifically, these results support the hypothesis that TIs enhance student's attention to peers' prosocial behavior, which may promote social learning or modeling (Bandura, 1971; Brown et al., 1996). Additionally, TIs provide delayed reinforcement from the interdependent group contingency. This study's findings also suggest that TI provides continued opportunities to attend to and reinforce prosocial behaviors, which led to the maintenance of these behaviors throughout the duration of the intervention.

## Limitations and Future Research

These studies support the importance of peer mediation during a TI to increase group members' acquisition and maintenance of the skill; however, additional research is needed before strong conclusions are drawn. These studies were the first to measure the role of peers directly during a TI, and participants only included a small group of 4-6 students. Additionally, these peers were the only students in the classroom not receiving academic remediation for reading skills, suggesting that they were amongst the strongest academically. Across both studies, students were only trained and reinforced for one type of prosocial behavior, complimenting peers. Data for these studies were also only collected in one social context, a cooperative math activity conducted in a small group setting.

Future researchers should conduct similar studies across students (e.g., students with autism, emotional-behavioral disorders, or intellectual disability), prosocial behaviors (e.g., encouragements), and contexts (e.g., additional activities or classroom settings) before any definite conclusions are drawn. Additionally, current results demonstrate that compliments were maintained during TI procedures; however, no data was collected to determine if compliments were generalized to other settings or maintained after the TI concluded. Future studies should examine the role of peer modeling, prompting, and reinforcement for behaviors taught during TIs on the maintenance and generalization of those prosocial behaviors.

There is previous research supporting that students engage in prosocial behaviors and report their peers' use of these behaviors when participating in a TI (Crewdson et al., 2024; Fowler, 2023). Researchers have also found that once a TI is withdrawn, students' engagement in the target behavior decreases (see Study 1; Crewdson et al., 2024). Based on previous literature, we measured peer mediation (i.e., peer modeling and peer prompting) and prosocial behaviors

(i.e., complimenting) simultaneously in the current studies (Crewdson et al., 2024; Fowler, 2023). In Study 1, an ABAB design was used, and prompting was measured. However, causal inferences cannot be drawn because we did not provide opportunities to prompt positive peer reporting during the withdrawal phase. In Study 2, peer modeling and the T1 were never presented in isolation. Consequently, no conclusions regarding the causal relationship of either peer modeling or the TI can be drawn. Future researchers should run component analyses to determine if peer-mediated interventions isolated from TIs are sufficient to increase prosocial engagement for students and compare the effects of PMIs, TIs, and using the two interventions in tandem.

Additional studies on peer mediation, and engagement of a target prosocial behavior should be conducted, including selection of the peer confederate. In the first study, we established a relationship between engagement and prompting of prosocial behaviors; however, prompting was not directly manipulated by researchers. Further, no distinction between peer prompting to engage in the behavior and peer prompting to report the behavior was made. Thus, no strong causal conclusions can be made regarding if prompting increases the rate of complimenting because students were unable to prompt recording of the behavior during the withdrawal phase. Researchers should conduct studies observing the relationship between complimenting and prompting while differentiating between the function of prompts to determine if prompting results in increased engagement of complimenting. Future research should also determine if direct manipulation of rates of prompting from peers via peer confederate leads to increased engagement in target skills by group members.

In Study I, descriptive statistics for individual student data indicated that the TI was more effective in increasing rates of complimenting and peer prompting for some students than for

others. Notably, Student 3 exhibited little to no increase in either dependent variable across sessions. Observations and teacher reports indicated that this student was generally shy during all academic activities. Future researchers should consider implementing an interdependent group contingency based on the number of students who participate in Tootling rather than the total number of tootles, to assess whether TIs are effective for students who are shy or quiet in group settings.

In the second study, only one peer confederate was utilized, and the peer was selected based on anecdotal observation and discussion between the primary researcher and classroom teacher for having high status with peers. No formal evaluation procedures for selecting the peer model were conducted; thus, future researchers should have students determine high-status peers via anonymous ranking or other formalized procedures to determine which peers hold high status to use as a confederate. Further, only one high-status peer was used to model all three target compliments. Future researchers should use students with various influences over peers (e.g., a student who is not disliked but quiet) to directly measure if the peer status of the model influences other group members' engagement in the skill.

In Study 2, target compliments were selected from other English-speaking dialects to decrease the probability that the behaviors were not already being used by participants. However, the novelty of target compliments themselves may have influenced students to attend to the compliments being given by their peers more than a compliment commonly used in the students' environment. The additional attention provided by the novelty of the compliment itself may have enhanced the probability of students engaging in the prosocial behavior. Future studies should determine if the novelty of the target behavior being modeled directly influences students' engagement in the behavior.

## Conclusion

After elementary students acquire prosocial behaviors, demonstrating these behaviors in common social contexts may enable peers to mediate them, enhancing one another's ability to discern when to engage in specific behaviors (i.e., discrimination and generalization) as well as to modify or adapt those skills to new situations. Peers may mediate these skills directly through modeling, prompting, and praising the target behavior. The current studies suggest that TI procedures may promote positive peer mediation (prompting and social learning), which may enhance engagement in recently trained prosocial behaviors as students engage in small group cooperative tasks. The first study demonstrates there is a positive correlation between engagement in target behavior and prompting to perform and/or report the target behavior while tootling. The second study showed that using a peer to model a novel target behavior resulted in other group members engaging in the behavior during TI procedures.

These findings are encouraging to researchers and educators alike. Results demonstrate that while TIs are being run, peers can directly and indirectly influence the prosocial behaviors of group members. TIs were developed, in part, to enhance students' awareness of peers' prosocial behavior, which may enhance their modeling of those desired behaviors. The independent group reward was also designed, in part, to increase the probability that students encourage one another (e.g., prompt) to engage in and report those behaviors. This, modeling and prompting while TIs are applied may also raise students' awareness of various appropriate behaviors and contexts when it is appropriate to perform those behaviors, which may enhance social skill development, including discrimination, generalization, and adaptation (Brown, 2008; Crewdson, Richardson, et al., 2023). Thus, the presented studies may have heuristic value, inspiring further exploration of the relationships among SST, TIs, positive peer mediation, and students' engagement in prosocial

behaviors. Given the association between TIs and various positive behavioral outcomes, we hope this study fosters continued research on the use of TIs in various classroom environments.

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# APPENDICES

## Appendix A: Figures and Tables

**Table 1**

*Study I - Descriptive Statistics for Average Number of Intervals Scored with Compliments and Prompts per Student*

| | Baseline | Intervention | Withdrawal | Reimplementation |
|---|---|---|---|---|
| | *M (SD)* *[Range]* | *M (SD)* *[Range]* | *M (SD)* *[Range]* | *M (SD)* *[Range]* |
| Whole Group | | | | |
| Compliments | 0.08 (0.16) [0.00-0.4] | 2.19 (1.14) [0.33-3.67] | 0.00 (0.00) [0.00-0.00] | 2.83 (0.24) [2.50-3.00] |
| Prompts | 0.00 (0.00) [0.00-0.00] | 1.24 (1.09) [0.00-2.80] | 0.00 (0.00) [0.00-0.00] | 2.50 (0.71) [2.00-3.50] |

**Table 2**

*Study I - Descriptive Statistics for Average Number of Intervals Scored with Compliments per Session Attended for Each Student*

| | Baseline | Intervention | Withdrawal | Reimplementation |
|---|---|---|---|---|
| | *M (SD)* *[Range]* | *M (SD)* *[Range]* | *M (SD)* *[Range]* | *M (SD)* *[Range]* |
| Whole Group | | | | |
| Student 1 | 0.00 (0.00) [0.00-0.00] | 3.80 (2.32) [1.00-7.00] | 0.00 (0.00) [0.00-0.00] | 6.67 (0.94) [6.00-8.00] |
| Student 2 | 0.33 (0.47) [0.00-1.00] | 2.67 (0.47) [2.00-3.00] | 0.00 (0.00) [0.00-0.00] | NA |
| Student 3 | 0.00 (0.00) [0.00-0.00] | 0.33 (0.47) [0.00-1.00] | 0.00 (0.00) [0.00-0.00] | 0.00 (0.00) [0.00-0.00] |
| Student 4 | 0.00 (0.00) [0.00-0.00] | 2.33 (1.70) [0.00-4.00] | 0.00 (0.00) [0.00-0.00] | 4.00 (0.00) [4.00-4.00] |
| Student 5 | 0.20 (0.40) [0.00-1.00] | 2.33 (1.80) [0.00-5.00] | 0.00 (0.00) [0.00-0.00] | 0.67 (0.94) [0.00-2.00] |

**Table 3**

*Study I - Descriptive Statistics for Average Number of Intervals Scored with Prompts per Session Attended for Each Student*

| | Baseline | Intervention | Withdrawal | Reimplementation |
|---|---|---|---|---|
| | *M (SD)* *[Range]* | *M (SD)* *[Range]* | *M (SD)* *[Range]* | *M (SD)* *[Range]* |
| Whole Group | | | | |
| Student 1 | 0.00 (0.00) [0.00-0.00] | 2.80 (1.98) [1.00-6.00] | 0.00 (0.00) [0.00-0.00] | 4.00 (0.82) [3.00-5.00] |
| Student 2 | 0.00 (0.00) [0.00-0.00] | 2.33 (1.25) [1.00-4.00] | 0.00 (0.00) [0.00-0.00] | NA |
| Student 3 | 0.00 (0.00) [0.00-0.00] | 0.33 (0.75) [0.00-2.00] | 0.00 (0.00) [0.00-0.00] | 0.00 (0.00) [0.00-0.00] |
| Student 4 | 0.00 (0.00) [0.00-0.00] | 1.00 (1.41) [0.00-3.00] | 0.00 (0.00) [0.00-0.00] | 1.33 (1.25) [0.00-3.00] |
| Student 5 | 0.00 (0.00) [0.00-0.00] | 0.83 (1.07) [0.00-3.00] | 0.00 (0.00) [0.00-0.00] | 4.67 (0.94) [4.00-6.00] |

**Table 4**

*Study I - Tau Effect Size Coefficients and Corresponding p-values for Average Number of Intervals Scored with a Compliment and Prompt per Student*

| | Baseline vs. Intervention Tau [*p*-value] | Withdrawal vs. Re-impl. Tau [*p*-value] | Intervention vs. Withdrawal Tau [*p*-value] |
|---|---|---|---|
| Groupwide Compliments | 0.93* [0.01] | 1.00* [0.049] | -1.00* [0.02] |
| Groupwide Prompts | 0.83* [0.02] | 1.00* [.049] | -.083* [0.01] |

* Significant results at $p < .05$.

**Table 5**

*Study II - Descriptive Statistics for Number of Intervals Scored with Target Compliments per Student*

| | Baseline<br>*M (SD)*<br>*[Range]* | Intervention<br>*M (SD)*<br>*[Range]* |
|---|---|---|
| "Brill" | 0.00 (0.00)<br>[0.00-0.00] | 2.96 (1.09)<br>[0.06-4.33] |
| "Bonzer" | 0.00 (0.00)<br>[0.00-0.00] | 2.71 (0.98)<br>[0.75-4.20] |
| "Ace" | 0.00 (0.00)<br>[0.00-0.00] | 2.77 (1.93)<br>[0.00-6.33] |

**Table 6**

*Study II - Tau Effect Size Coefficients and Corresponding p-values for Number of Intervals Scored with a Target Compliments*

| | "Brill" Baseline vs. Intervention Tau [*p*-value] | "Bonzer" Baseline vs. Intervention Tau [*p*-value] | "Ace" Baseline vs. Intervention Tau [*p*-value] |
|---|---|---|---|
| Compliments Per Group Member | 1.00* [0.0087] | 1.00* [0.0005] | 1.00* [0.0016] |
| **Weighted Average** | **1.00* [0.000]** | | |

* Significant results at $p < .05$.

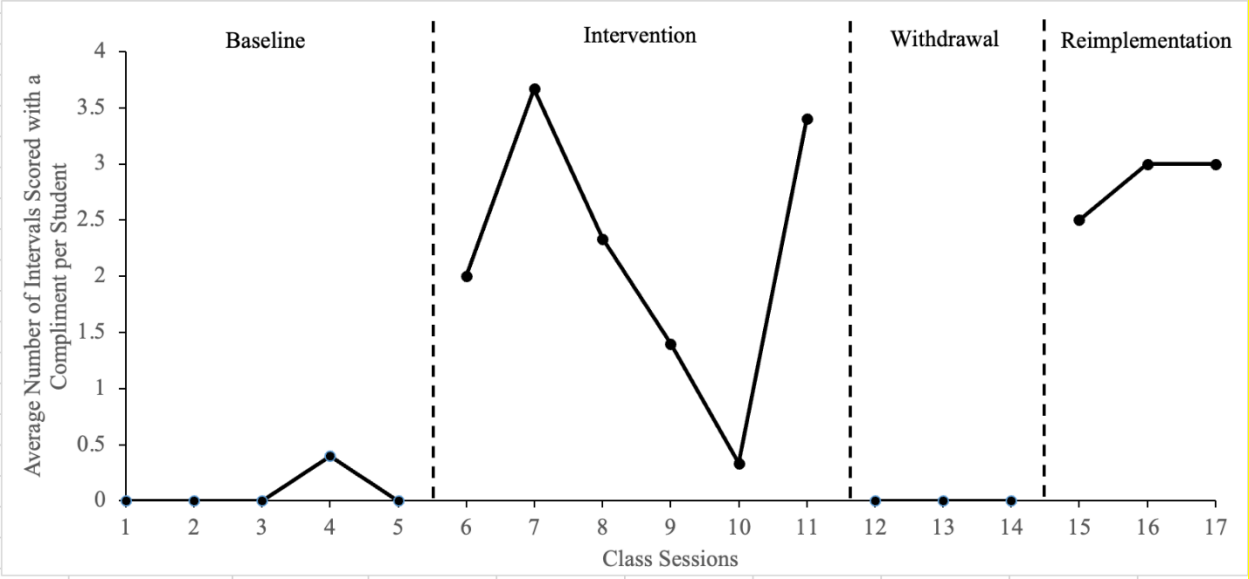



**Figure 1**

*Study I - Average intervals scored with compliments per student for each 10-minute session.*

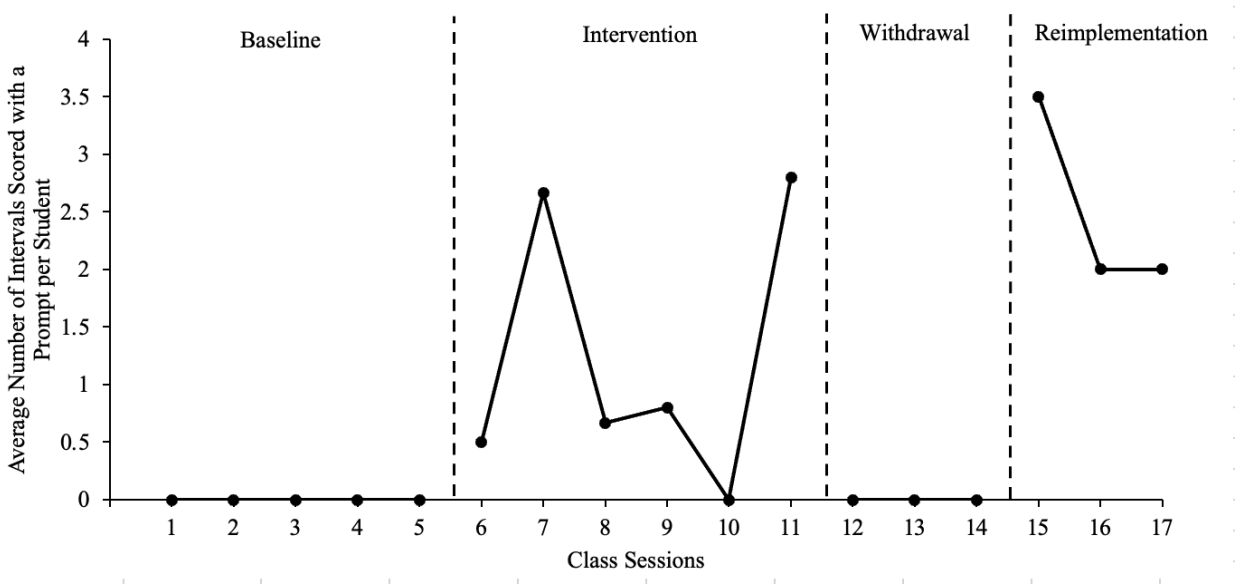



**Figure 2**

*Study I - Average intervals scored with a peer prompt per student for each 10-min session.*

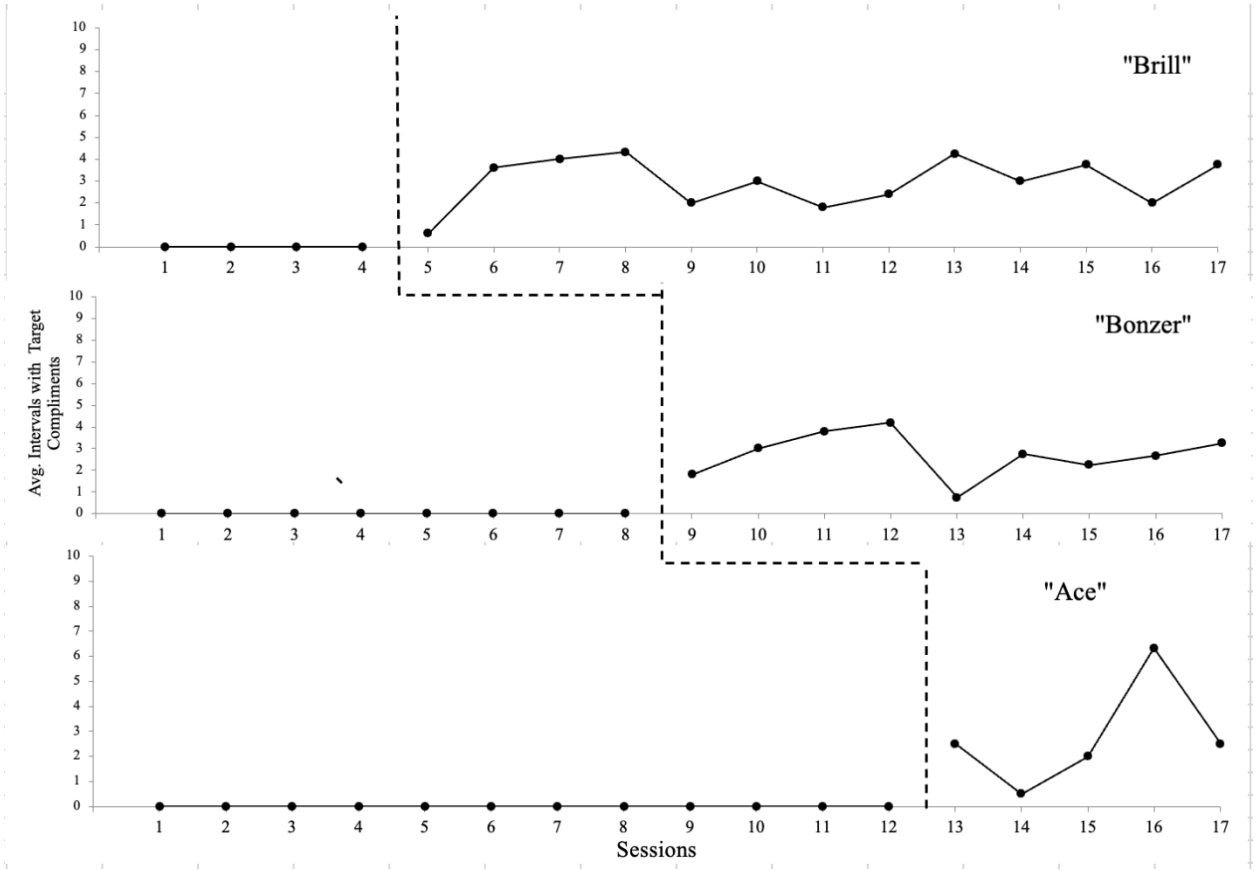



**Figure 3.**
*Study II - Average number of intervals scored with three target compliments per student (excluding the confederate) across sessions.*

**Appendix B: Supplemental Materials for Studies I and II**

# Permission for Research Participation of a Minor

**Research Study Title:** PBIS at [redacted]

**Researcher(s):**

Dr. Chris Skinner
University of Tennessee
School Psychology Professor [redacted]

Ms. Carsyn Poppe
University of Tennessee
School Psychology Doctoral Student [redacted]

## Why is my child being asked to be in this research study?

We are asking your child to be in this research study because the promotion of appropriate behavior and the reduction of inappropriate behavior are important to us at [redacted]. Teachers at [redacted] are working with researchers from the University of Tennessee to help our students do their best in our program. Our common goal is that student behavior improves so that they can learn all they can from our program.

## What is this research study about?

The purpose of the research study is to examine how elementary students engage in positive behaviors with their peers and teachers. We are interested to see if asking students to report their peers' good behaviors will increase how often the class compliments and praises while playing a cooperative game.

## How long will my child be in the research study?

If you give permission for your child to be in the study, and your child agrees, their participation will last for 30 minutes a day, three to four days a week, for approximately 5-6 weeks.

## What will happen if I say "Yes, I want my child to be in this research study"?

If you give permission for your child to be in this study, we will ask your child to play a cooperative game with other students for the last 30 minutes of the day. During this time, your child will be asked to report if he/she finds other students complimenting during this time. If the group exceeds their daily goal of reported compliments, the class will win a small reward, such as a piece of candy.

## What happens if I say "No, I do not want my child to be in this research study"?

Your child's being in this study is up to you. You can say no now or leave the study later. Either way, your decision won't affect your child's relationship with the researchers or the University of Tennessee.

## What happens if I say "Yes" but change my mind later?

Even if you decide to allow your child to be in the study now, you can change your mind and stop at any time.

If you decide to stop before the study is completed, please reach out to your child's teacher or either of the researchers listed at the top of this form.

## Are there any possible risks to my child?

We don't know of any risks to your child from being in the study.

## Are there any benefits to being in this research study?

There is a possibility that your child may benefit from being in the study, but there is no guarantee that will happen. Possible benefits include your child learning and engaging in positive behaviors more often. Even if your child doesn't benefit from being in the study, their participation may help us to learn more about how classmates influence each other's behavior. We hope the knowledge gained from this study will benefit others in the future.

## Who can see or use the information collected for this research study?

We will protect the confidentiality of your child's information by removing any identifying information before analyzing or presenting results from the study. If information from this study is published or presented at scientific meetings, your child's name and other personal information will not be used.

We will make every effort to prevent anyone who is not on the research team from knowing that your child gave us information or what information came from your child. Although it is unlikely, there are times when others may need to see the information we collect about your child. These include:

- People at the University of Tennessee, Knoxville who oversee research to make sure it is conducted properly.

## What will happen to my child's information after this study is over?

We may keep your child's information to use for future research. Your child's name and other information that can directly identify them will be kept secure and stored separately from their research data collected as part of the study.

## Who can answer my questions about this research study?

If you have questions or concerns about this study, or have experienced a research-related problem or injury, contact the researchers using the contact information below:

Dr. Chris Skinner
University of Tennessee
School Psychology Professor [redacted]

Ms. Carsyn Poppe
University of Tennessee
School Psychology Doctoral Student [redacted]

For questions or concerns about your rights or to speak with someone other than the research team about the study, please contact:

Institutional Review Board
The University of Tennessee, Knoxville
[redacted]

## STATEMENT OF PERMISSION

I have read this form and the research study has been explained to me. I have been given the chance to ask questions and my questions have been answered. If I have more questions, I have been told who to contact. By signing this document, I am giving permission for my child to be in this study. I will receive a copy of this document after I sign it.

Child's Name (printed) _____

Parent's Name (printed) _____

Parent's Signature _____ Date _____

**Assent to Participate in Research**

*Using Tootling to Enhance Prosocial Behaviors*

1. Hello, my name is (examiner's name). I'm a researcher at the University of Tennessee.

2. Your guardian/parent and your teacher say you might be willing to help me with a research project. We are asking you to take part in our research study because we are trying to learn more about new ways to help students behave appropriately in the classroom.

3. If you agree to be in this study, you will be playing a catching compliments game with me for 30 minutes at the end of the school day. If your group catches more compliments than the goal for the day, you and your class will get to take a small prize home!

4. If you don't meet the goal number of compliments for the day, you may feel sad or disappointed, but you will get the opportunity to try again the next day!

5. My hope is that by playing this game, you and your group will learn new appropriate behaviors and use them in the classroom.

6. Please talk this over with your parents before you decide whether or not to participate. We will also ask your parents to give their permission for you to take part in this study. But even if your parents say "yes" you can still decide not to do this.

7. If you don't want to be in this study, you don't have to participate. Remember, being in this study is up to you and no one will be upset if you don't want to participate or even if you change your mind later and want to stop.

8. You can ask any questions that you have about the study. If you have a question later that you didn't think of now ask me next time.

9. Signing your name at the bottom means that you agree to be in this study. You and your parents will be given a copy of this form after you have signed it.

If you sign this form, it means you have decided to help me with this research project.

_____ _____

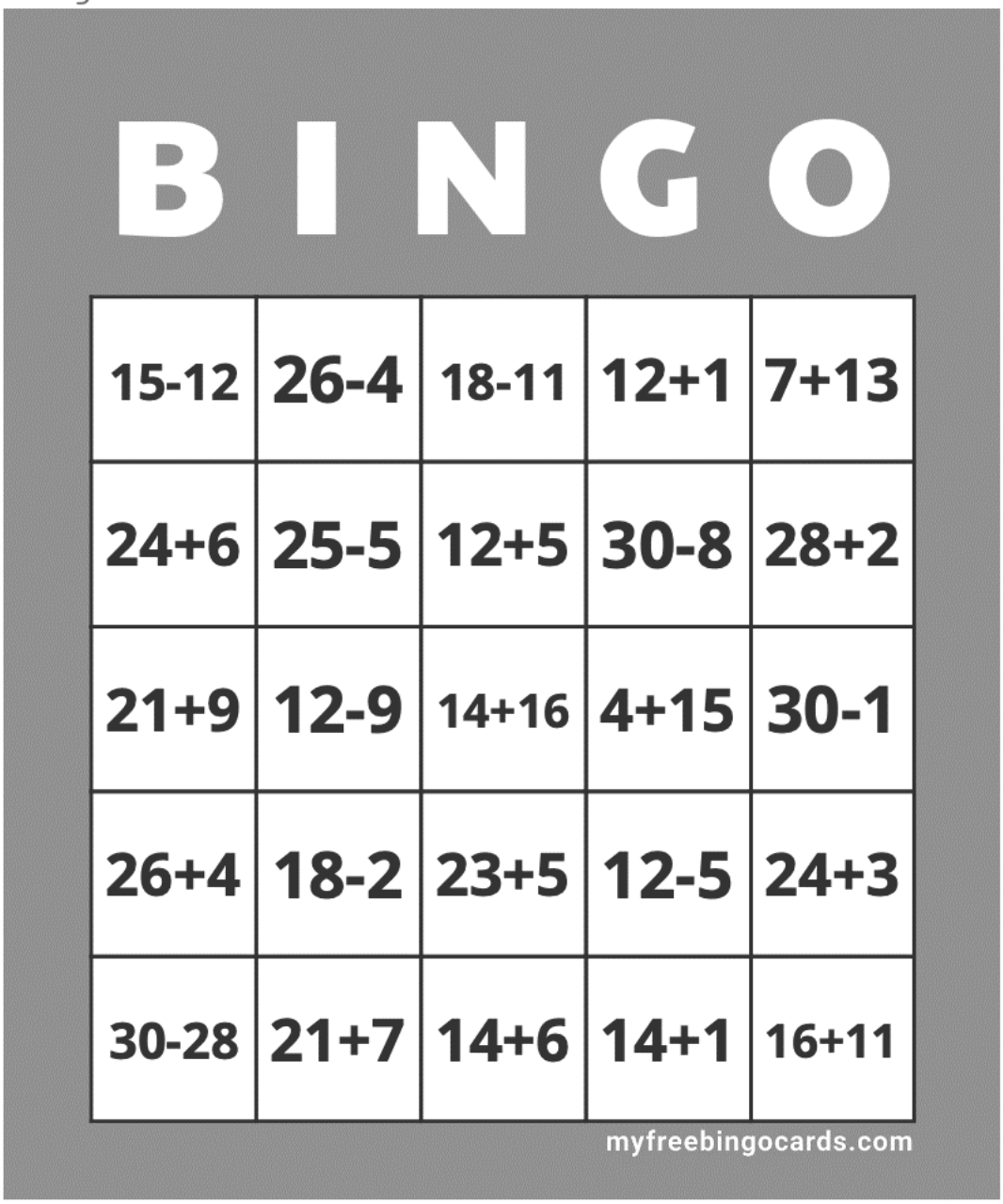
Signature of student Date

_____

Signature of researcher

**Sample Math Bingo Worksheet**

Bingo Card ID 001



**Positive Peer Reporting Slips**

I caught a compliment!



Who complimented?

Tyler Jamie

Peyton Sam Zoey

**Tootling Intervention Training Protocol[1]**

*"Hello! I'm Miss Carsyn and I am a student at the University of Tennessee. You have probably seen me and some of my friends in your class the past few weeks. I'm here today to tell you all about a game that I would like you to play during our Bingo group. The game is called Tootling 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 to 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 our group is over. On these pieces of paper, it will have "I caught a compliment" on the top of the sheet and a place to circle your classmates' names on the bottom. You will circle the name of someone in your group who you saw giving a compliment. After you have finished, you will put the pieces of paper in this box.* (show box). *While you work with me on Bingo, you will be using these slips and watching for others in your group to give compliments. At the end of our group, I will count up how many slips you all turned in. Then I will tell you all what our secret goal was. If you get that goal or higher, then everyone in the class will win a reward! Remember, we won't know how many tootles you need until the end.*

[1]Adapted from Crewdson et al. (2021)

## Appendix C: Integrity Checklists for Studies I and II

**Procedural Integrity for Social Skills Lesson[1]:** 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 | | |

Number of steps completed: __ **/9** Percentage of steps completed: __ Comments:

**Integrity for Peer Reporting Training[1]:** 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:

**Treatment Integrity for Tootling Game[3]** 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 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 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: ____**/8** Percentage of steps completed: ____ Comments:

[1]Adapted from Crewdson et al. (2021)

## Appendix D: Student Acceptability Form[2] – Study I and II

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

[2]Adapted from Wright et al. (2021)

## Appendix E: Teacher Acceptability Form[2] – Study I and II

| | Strongly Disagree | Disagree | Slightly Disagree | Slightly Agree | Agree | Strongly Agree |
|---|---|---|---|---|---|---|
| 1. Tootling was a good intervention. | 1 | 2 | 3 | 4 | 5 | **6** |
| 2. I noticed that students were nicer to each other when playing Tootling. | 1 | 2 | 3 | 4 | 5 | **6** |
| 3. Tootling 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 Tootling. | 1 | 2 | 3 | 4 | 5 | **6** |
| 5. There were less disagreements when the students played Tootling. | 1 | 2 | 3 | 4 | 5 | **6** |
| 6. I would recommend Tootling to other teachers. | 1 | 2 | 3 | 4 | 5 | **6** |

[2]Adapted from Wright et al. (2021)

# VITA

Carsyn Elaine Poppe was born to Steve and Paula Poppe in Grand Island, Nebraska. She attended the University of Nebraska-Lincoln, where she graduated with a Bachelor of Arts degree in Psychology and minors in Biological Science and Humanities in Medicine. Carsyn began the School Psychology doctoral program at the University of Tennessee, Knoxville in August 2021. She received her Master of Science degree in Applied Behavior Analysis from the University of Tennessee, Knoxville in 2023. Carsyn will begin her predoctoral internship at the Munroe Meyer Institute through the Nebraska Internship Consortium in Professional Psychology in the summer of 2025. Following completion of her internship in the summer of 2026, Carsyn will have completed her doctoral requirements.