The Effectiveness of an Intervention Designed to Increase the Positive to Negative Ratio of Instructor Interactions During After-School Programming

Rikki K. Wheatley

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THE EFFECTIVENESS OF AN INTERVENTION DESIGNED TO INCREASE THE
POSITIVE TO NEGATIVE RATIO OF INSTRUCTOR INTERACTIONS
DURING AFTER-SCHOOL PROGRAMMING

by

Rikki K. Wheatley

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Special Education

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2015
ABSTRACT

The Effectiveness of an Intervention Designed to Increase the Positive to Negative Ratio of Instructor Interactions During After-School Programming

by

Rikki K. Wheatley, Master of Science
Utah State University, 2015

Major Professor: Richard P. West, Ph.D.
Department: Special Education and Rehabilitation

Correlational research has shown the ratio of positive to negative interactions (PN ratio) between students and teachers may have an effect on the frequency and type of student behavior displayed in the context of teaching. Based on this research, PN ratio has become a prominent feature of many school improvement and teacher evaluation measures. While a variety of correlational data show a positive relationship between high PN ratios and improved student behavior in the classroom, there is little evidence assessing the extent to which instructors will increase PN ratios following didactic workshop training (relatively passive, one-session workshops with few opportunities for skill building). Additionally, the limited amount of available data suggests that increasing these ratios may be more difficult than expected. The purpose of this research was to assess the effectiveness of two interventions used to train after-school instructors to increase PN ratios. The first intervention (workshop training) followed a didactic
workshop-training model. The second intervention (coaching) included the components of the didactic workshop model with the addition of modeling, role-play, and performance feedback. In this study four instructors in an after-school program were randomly assigned to one of two groups to participate in training programs. These programs were designed to help them increase PN ratios when interacting with students during homework time in the after-school program. Group 1 received only the workshop training, and Group 2 received the workshop training as well as the coaching intervention. Instructor behaviors were recorded during 15-minute observation sessions, and PN ratios were calculated for each instructor. All observation sessions took place in the context of homework time during regularly scheduled after-school programming. The study used AB/ABC design to assess the success of the two training models. Instructors in Group 1 showed no increases in the frequency of positive interactions or PN ratios. Instructors in Group 2 showed an increased frequency of positive interactions and increased PN ratios in the coaching condition. Results are discussed in terms of increases and decreases in the daily frequency of positive and negative interactions as well as the overall increases in PN ratio.

(70 pages)
PUBLIC ABSTRACT

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The purpose of this research was to assess the effectiveness of two interventions used to train instructors to increase PN ratios. The first intervention (workshop training) followed a didactic workshop-training model. The second intervention (coaching) included the components of the didactic workshop model with the addition of modeling, role-play, and performance feedback. In this study four instructors in an after-school program were randomly assigned to one of two groups to participate in training programs. These programs were designed to help them increase PN ratios when interacting with students during homework time in the after-school program. Group 1 received only the workshop training. Group 2 received the workshop training as well as the coaching intervention.

Instructor behaviors were recorded during 15-minute observation sessions, and PN ratios were calculated for each instructor. Student behaviors (engaged, off-task, and disruptive) were also recorded during 20-minute sessions directly following the instructor observations. All observation sessions took place in the context of homework time during
regularly scheduled after-school programming at a rural elementary school. The study used an AB/ABC design to assess the successfultness of the two training models.

Instructors in Group 1 showed no increases in the frequency of positive interactions or PN ratios. Instructors in Group 2 showed an increased frequency of positive interactions as well as increased PN ratios in the Coaching condition. In the two classrooms where instructor PN ratios increased during Coaching, Engagement was increased and Off-Task was decreased. Levels of student behavior remained relatively unchanged during Workshop Training. Results are discussed in terms of increases and decreases in the frequency of positive and negative interactions as well as the overall increases in PN ratios.
ACKNOWLEDGMENTS

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Rikki K. Wheatley
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CHAPTER I
INTRODUCTION

Positive to Negative (PN) Ratio

It is intuitive to assume interpersonal relationships characterized by a greater number of positive than negative interactions will thrive while those with a disproportionate number of negative interactions will not. This notion is supported by John Gottman’s findings that marriages with a high proportion of positive, relative to negative, interactions were more stable and less likely to end in divorce (Gottman, 1994a, 1994b). This high proportion of positive to negative interactions is known as the PN ratio. This interaction ratio is calculated by counting the frequency of positive to negative interactions for a given time period and then dividing to compute a ratio (Gottman, 1999; Simonsen, Fairbanks, Briesch, & Sugai, 2006). Positive interactions may include verbal affirmations, smiling, praise, giving tokens, making eye contact, pats on the back, and so forth. Negative interactions may include yelling, ridiculing, punishment, teasing, criticism, correction, and so forth.

Measures of PN ratio in an educational context are often accompanied by advice to increase the rate and quality of praise. While praise, one of several types of positive interactions, has been linked to successful outcomes in a variety of settings (Ferguson & Houghton, 1992; Madsen, Becker, & Thomas, 1968; Wheatley et al., 2009), the empirical literature supporting manipulations of PN ratio as an intervention strategy is sparse (Field, Nash, Handwerk, & Friman, 2004; Friman, Jones, Smith, Daly, & Larzelere,
Nevertheless, popular and lay literature continue to promote the idea of a 5:1 “magic reinforcement ratio” (Flora, 2000; Gottman, 1994b; Gottman & Levenson, 1992), and other sources suggest the PN ratio should be 8:1 or even higher (Chance, 2008; Latham, 1997; Nafpaktitis, Mayer, & Butterworth, 1985).

**PN Ratio in an Educational Setting**

The ratio of positive to negative interactions (PN ratio) between educators and students has been considered a particularly important contributor to school learning environment (Chance, 2008; Latham, 1992, 1997; Sugai, Horner, Todd, & Lewis-Palmer, 2004; Walker, Ramsey, & Gresham, 2004). In an educational context, PN ratio refers specifically to the ratio of positive to negative interactions that educators have with students. While some research has been conducted on the effects of PN ratio in an educational setting, the majority of these studies are correlational or descriptive and many are outdated (Friman et al., 1997; Hart & Risley, 1995; Madsen et al., 1968, 1970; Thomas, Presland, Grant, & Glynn, 1978).

Despite the lack of empirical evidence supporting its effective use, teachers and other educators are encouraged to focus on keeping their PN ratio high when interacting with students (Chance, 2008; Latham, 1992, 1997; Lewis, 2007, 2010; Newcomer, 2009; Sprick, 2009; Sugai et al., 2004). This is likely a result of the widespread acceptance of School-Wide Positive Behavior Support, whose proponents insist that maintaining a high ratio of positive to negative interactions (4:1 or 5:1) is an essential part of successful programs (Flora, 2000; Kincaid, 2005; Loveless, 1996; Sugai et al., 2000, 2004; Walker et al., 2004).
Because widespread acceptance of this ratio is a critical factor contributing to student success, teacher performance evaluations and observations often contain elements of the PN ratio as indicators of successful teaching environments (Forlini, Williams, & Brinkman, 2010; Kamps et al., 2011; Simonsen et al., 2006).

**PN Ratio as a Set of Teacher Behaviors**

As evidenced by these performance evaluations, educational research and professional development curricula have employed the PN ratio as a characteristic of teacher behaviors that are related to student social behaviors (Beaman & Wheldall, 2000; Chance, 2008; Madsen et al., 1968). However, the definition of positive and negative behaviors in the context of these studies varies widely in detail and mode of delivery.

Positive behaviors are defined generally as behaviors that show a positive regard for students and their behavior, such as smiling or joking (Beaman & Wheldall, 2000) and making general or specific contingent praise statements (Myers, Simonsen, & Sugai, 2011). More detailed descriptions of positive behaviors include physical affection, positive laughter, allowing requests, academic recognition, imitation, positive gestures, and positive references (Armstrong & Field, 2012). Some of the historically accepted practices may not be appropriate in today’s school setting such as embracing, kissing, patting, holding an arm or hand, or sitting on a lap (Madsen et al., 1968).

Negative behaviors have been described generally as verbal or nonverbal behaviors that reflect hostility, anger, or criticism (Beaman & Wheldall, 2000), including error corrections, reprimands, or any statement beginning with “no,” “stop,” or “don’t” (Myers et al., 2011). More detailed descriptions of negative behaviors include yelling,
reprimands, threats, timeout, denying requests, criticism, negative physical contact, negative gestures, and negative laughter (Armstrong & Field, 2012). Similar to some positive behaviors described in historical texts, some of the negative behaviors recorded several decades ago would also be unacceptable in modern schools. These behaviors include: frowning, grimacing, slapping, shaking, or forcibly holding (Madsen et al., 1968).

**Teacher Training**

For high PN ratio to work as a strategy to improve student behavior and performance, instructors and other staff members must first be trained to understand and effectively implement high PN ratios. It must then be demonstrated that trained teachers and staff can consistently reach and maintain target ratios. This is a necessary intermediary step. If instructors and other staff members cannot reach target PN ratios given the level of training and support provided then expectations are unlikely to be met and student behavior cannot be affected.

Didactic workshop training within the school system often consists of inservice and other single-session trainings that are delivered to multiple teachers at once (Chalk & Bizo, 2004; Swinson & Harrop, 2005). This type of passive training model provides very few opportunities for skill building or practicing new skills (Myers et al., 2011) and often does not produce relevant and lasting changes in staff behavior (Elmore, 2002; Fixsen, Naoom, Blase, Friedman, & Wallace, 2005; Yoon, Duncan, Lee, Scarloss, & Shapley, 2007). Similar concerns about effective training have been addressed concerning the basic use of praise:
The problem is not that praise or contingent teacher attention lacks empirical support, or that they are not effective tools for managing behavior, but rather that the conditions under which teachers are both adequately trained and supported in the development and use of these skills are lacking. (Landrum & Kauffman, 2006, p. 49)

Because training focuses on instructor behaviors, the responsibility for failure is typically placed on the instructor when he or she does not meet prescribed targets.

**Literature Review**

The author searched multiple sources for articles related to the PN ratio and its uses within the educational sphere, including the EBSCO host database (ERIC and Academic Search Premier), articles by authors who were recommended by the committee chair, reference sections from relevant related articles, teaching manuals, and college textbooks. In this process the author found several articles mentioning praise ratios but only two articles providing an attempt to systematically alter praise ratios (Armstrong & Field, 2012; Myers et al., 2011).

While it has been established that PN ratio is likely related to positive student outcomes (Beaman & Wheldall, 2000; Chance, 2008; Latham, 1992; Madsen et al., 1968, 1970; Myers et al., 2011), the literature base for supporting these expectations in most studies appears to be an extrapolation of educational research studies that are not based on manipulation of the PN ratio as an intervention. Therefore, the extent to which instructors can increase PN ratios is unknown, especially in the didactic workshop training contexts often used for professional development.

More research is needed to determine the extent to which teachers will increase
their PN ratios when provided with the training and instruction to do so. This need becomes even more pressing in the context of data from current research studies indicating that manipulation of the PN ratio may be more difficult than previously anticipated (Armstrong & Field, 2012; Myers et al., 2011).

A study conducted by Armstrong and Field (2012) implemented an intervention to increase PN ratios for interactions between mother-child dyads. At the beginning of the study the mean baseline PN ratio for mothers was 1.12:1. A primary focus of the study was to determine whether mothers could reach a 5:1 PN ratio following a brief period of instruction. Only four of the eight participants were successful. In the same study Armstrong also assessed the differences between two types of instruction on increases in PN ratio. Group A received instruction similar to that found by reading typical parenting books or articles. Group B received the same instruction with the additional components of individualized modeling, role-play, and feedback. Overall, Group B was more successful than Group A. Of the four participants who successfully increased their PN ratios to 5:1, three were from Group B, and only one was from Group A. These results indicate that while parents could increase their PN ratios, very few of them were successful with the amount of support typically available in workshop training. Additionally, although more parents were successful when provided intensive support, more than half of the participants were still unsuccessful.

In another study, Myers and colleagues (2011) indicated that one month after training in school wide positive behavior support (SWPBS), none of the teachers in their study had PN ratios of 4:1 or higher even though all of them were aware of the
recommended ratio and the school’s expectation that they meet it. In their study a response-to-intervention (RTI) model and tiered intervention for teacher training was used to help teachers reach expectations for PN ratios and specific praise. The first tier of intervention consisted of typical tier I school-wide training on SWPBS. The second tier of intervention consisted of (a) individual weekly consultation and coaching, including the use of rationales and examples, (b) collection and delivery of their classroom PN ratio data, and (c) weekly contingent praise delivered by the researcher. The third tier of intervention consisted of (a) daily presentation of PN ratio data, (b) feedback in person and via e-mail, (c) the use of praise scripts and self-prompting strategies in the classroom, and (d) prompting and modeling of praise interactions by the researcher. During the study, none of the four teachers achieved the target 4:1 PN ratio during tier 1 intervention. Two teachers achieved the target PN ratio after tier 2 intervention, and the other two teachers required tier 3 intervention to meet the 4:1 target ratio. These results indicate that while teachers could meet the ratio target, the amount of support necessary for them to do so was significantly more than provided in the typical workshop-training model. The amount of support required for the four successful participants to reach target ratios may not be practical in a typical school setting. Additionally, the authors suggested the results of their study might be optimistic. Because the teachers self-selected for the current study it is possible they had a greater investment in increasing their PN ratios than is typical of other teachers.
CHAPTER II
PURPOSE STATEMENT AND RESEARCH QUESTION

Research literature illustrates the need for continued investigation of PN ratio training models to determine the practicality of high ratio requirements in the context of didactic workshop training. Further research is also needed to identify the amount and type of support necessary to allow instructors to achieve target PN ratios.

Because classroom teachers participate in a variety of ongoing training and professional development activities that may include increasing praise rates or overall positive interactions, it may be difficult to determine the extent to which specific PN ratio training is effective independent of prior training history. Therefore, it is necessary to test the effectiveness of PN ratio training on previously untrained staff members.

To accomplish this goal, the current research will assess the effects of two training models on increases in instructor PN ratios in the context of regularly scheduled teaching interactions during after-school programming.

Research Questions addressed in this study included the following.

1. What PN ratios naturally occur between untrained instructors and their students prior to PN ratio-based instruction?

2. Is brief instruction, such as that used in a didactic workshop-training model, effective in causing a specified change in instructors’ PN ratios?

3. Which of two instruction methods—didactic workshop training or coaching—leads to closer approximations of 4:1 ratio targets?

4. To what extent is student behavior correlated with increases in PN ratios?
CHAPTER III

METHODS

Participants

There were two participant groups for this study. The primary participant group consisted of four after-school club instructors, three female and one male. All instructors were first or second year college students working part time in a city-sponsored after-school program. Instructors were selected as employees by the city parks and recreation department and placed at the elementary school and independent of principal or researcher decision prior to the study. Prior to participating in this study, participating instructors reported they did not have any formal training designed to increase praise rates or PN ratios. Hannah (24-year-old Caucasian female) was the kindergarten instructor for the after-school program. She was a second-year undergraduate student majoring in elementary education at the local university. At the time the study began she had been working with the after-school program for 4 months. Previously, she had 1 year of experience working part-time in a child care center. Linda (22-year-old Caucasian female) was the first-grade instructor for the after-school program. She was a first-year undergraduate student majoring in sociology at the local university. At the time of the study she had been working with the after-school program for 13 months. She had experience prior to that working with children in a formal setting. Saul (20-year-old Mediterranean male) was the second- and third-grade instructor for the after-school program. He was a second-year college student at the local university whose major was
undeclared. At the time of the study, he had been working with the after-school program for 4 months. He had no prior experience working with children in a formal setting. Sarah (25-year-old Caucasian female) was the fourth- and fifth-grade instructor for the after-school program. She was a third-year elementary education student at the local university. At the time of the study she had been working with the after-school program for 17 months. She had 6 months prior experience working with second-grade students in a practicum setting.

The secondary participant group consisted of approximately 60 elementary school students attending the after-school program at the participating school. Because student attendance (even after registration) is not mandatory, some students do not attend regularly or attend only two of the four scheduled after-school club sessions per week. Therefore, all student demographics are approximations based on total student registration. Of the students registered for the after-school program 48% Were female and 52% are male. Additionally, 10% have English as a second language (with Spanish being the most common first language), and 72% of students qualified for a tuition waiver scholarship based on economic status. Classrooms typically contained between 15 and 20 students. Students were selected for observation in the following manner: prior to the beginning of data collection each day, the researcher used the online Social Psychology Network Research Randomizer (Urbaniak & Plous, 2008) to randomly generate five numbers. The researcher wrote these numbers on the top of each of the data collection sheets and the observers took note of the order that students entered the classroom. Students were selected for observation if the order in which they entered the
classroom corresponded with one of the selected numbers. For example, if the numbers were 3 and 5, then the observer selected the third and fifth students to enter the classroom for observation. If the student who was being observed left the room for any reason the data collector continued data collection using the student directly to the right (or closest proximity if there was no one on the right).

Informed Consent

An official informed consent form was not required for this study. The Utah State University (USU) Institutional Review Board (IRB) determined that a Letter of Information with the option to opt-out of the study was sufficient for both the instructor and the student participants and their parents (see Appendix D). No participants opted out of the study.

Setting

The study took place during an after-school program in a rural public elementary school building. All data were collected during homework time in the context of the regularly scheduled after-school program activities. School ended at 2:30 PM daily, and the city-sponsored after-school program began at 2:35 PM. The after-school program was divided into three main activities: homework, snack and recreation, and clubs. During homework time (2:35-3:25), students were divided by grade level to complete homework and receive tutoring based on need. During snack and recreation time (3:25-4:00) students received a snack and a short recreation break on the playground or in the school
lunchroom, based on the weather. During club time (4:00-4:45) students were divided into groups and taken to different areas of the school where they participated in different clubs of their choice such as Science Club, Service Club, Music Club, and Art Club.

Observations of student and instructor behaviors took place during homework time each day (Monday-Thursday) unless there was a scheduled field trip or program. Students did not have homework time on Fridays because homework was not assigned over the weekend. The after-school instructors played a primary role in leading classroom activities and keeping students on task during homework time. In addition to the instructor, each classroom also had an assigned after-school club helper.

During homework time, students were divided by grade level as follows: kindergarten group, first-grade group, second- and third-grade combined group, and fourth- and fifth-grade combined group. Each group met daily in a designated classroom within the school. The kindergarten students met in one side of a kindergarten classroom at a square table large enough for 15 students to sit around comfortably. Because kindergarten students have very little homework, homework time in this class consisted of a guided instructional activity where students completed a homework sheet. The first-grade students met in one of the school’s computer labs. Students in this room completed their homework independently, on the desk space between computers, asking for help as needed. When their homework was complete, they were instructed to play educational computer games for the remainder of the homework period.

The second- and third-grade students met in one of the second-grade classrooms. In this classroom students sat at individual desks and completed their homework
independently. The instructor and helper circulated throughout the room checking on students and offering one-on-one support as needed.

The fourth- and fifth-grade students met in one of the fifth-grade classrooms, which were set up in a similar manner to that of the second- and third-grade classrooms. Students worked independently at desks and the instructor and helper were available if students required assistance with their homework.

During homework time, students were expected to have homework out in front of them on the desk or table and be working to complete it. Students were encouraged to raise their hands and ask questions or get help with their assignments as needed. Instructors oversaw students in each classroom, explaining expectations and instructions, checking students in and out of class, and acting as homework tutors. Instructors and helpers worked with students one-on-one or walked around the room remaining available to answer questions. When students finished their homework, they were asked to read or write quietly (or play educational computer games in the first-grade class) for the remainder of the scheduled homework time. In the majority of the classes, students did not finish their homework assignments more than a couple of minutes early.

Instructor training sessions for the intervention conditions were conducted in the music room at the school. The room had an amphitheater arrangement where the after-school instructors sat on one of four carpeted steps and the researcher stood in the center bottom focal point of the room. The room was approximately 15 m long by 20 m wide with a whiteboard, projector station, and podium at the front.
Dependent Variables

The dependent variables for this study consisted of a close adaptation of the teacher and student behaviors used by Myers and colleagues (2011).

Teacher Behaviors

Teacher behaviors included a frequency count of the number of positive and negative interactions that each instructor had with students in his or her classroom. Positive interactions included a combination of specific, contingent praise statements and general praise statements.

**Positive interactions.** Positive interactions were defined as (a) specific contingent praise statements, delivered verbally by the instructor to an individual or group, which incorporates a “praise” word or phrase (“good ___,” “I like ___,” “I appreciate ___”), a reference to the specific behavior being praised, and the student(s) being addressed. For example, “I appreciate the way that Jenny is sitting quietly;” and (b) general praise statements, delivered verbally to a student or group that contain a “praise” word but do not specify the behavior being praised or the specific student(s) being addressed. For example, “Nice job,” “Well done,” or “Excellent work!”

**Negative interactions.** Negative interactions were defined as (a) error corrections, both academic and behavioral; (b) reminders to be quiet or cues to stay on task such as “Shhhhh,” or “eyes on your work”; (c) reprimands, including use of the student’s name in a negative tone; (d) statements beginning with “no,” “stop,” or “don’t,” for example, “Stop running in the hall.”
**Student Behaviors**

Observers also conducted student observations in an attempt to assess possible effects of the intervention on student behavior. Student observations were conducted daily (Monday-Thursday) during homework time, immediately following instructor observations. Student behaviors of interest included engagement, off-task behavior, and disruptive behavior.

**Engagement.** Engagement was defined as a student (a) orienting toward his or her task or toward the teacher, depending on what was appropriate for the instructional activity, for at least three seconds; (b) following a teacher directive; (c) waiting quietly in line to talk to an adult; or (d) participating in a class activity as directed by the teacher and according to the rules.

**Off-task behavior.** Off-task behavior was defined as a student (a) not orienting toward his or her work or toward the teacher for at least 5 seconds; (b) not following a teacher directive; (c) being out of seat; (d) looking at or talking to observers after being reminded not to by the instructor; or (e) not participating for at least five seconds in an activity as directed by the teacher or according to the class rules. For example, looking out the window, fiddling with an object, or drawing when expected to be listening.

**Disruptive behavior.** Disruptive behavior was defined as a behavior that (a) had the potential to disrupt learning even if unnoticed, for example, a student waving across the room to get another student’s attention; (b) was inappropriate for the current activity; (c) was not in line with classroom expectations, for example, shouting out, talking to peers, throwing an object, or making noises; (d) disrupted another student by talking to or
distracting them after being instructed not to talk; or (e) was a failure to follow an adult’s directive. Any occurrence during a given interval was recorded.

**Measurement**

Five volunteers were recruited from university classes and projects to serve as observers for data collection. These observers were recruited by flyers distributed to classrooms, professor forwarded recruitment e-mails, departmental postings, and word of mouth. All observers completed the Collaborative Institutional Training Initiative (CITI) Certification as required by the university IRB.

Instructor observations were conducted daily (Monday-Thursday) during the first 15 minutes of homework time in after-school programming. Observers sat or stood in the classroom within hearing distance of the instructor being observed and recorded data as interactions between the instructor and the students occurred. When a positive interaction occurred, the observer placed a mark in the appropriate column on the instructor data collection sheet (Appendix A), and when a negative interaction occurred, the observer placed a mark in the appropriate column. The observer continued to observe the instructor and collect data for the full 15-minute session. If the instructor moved positions or it became difficult to hear him or her, the observer switched positions or followed at a distance that created as little distraction as possible.

Student observations took place for 20 minutes directly following instructor observations. Each day five students were observed (from a class of 15-20 students). The observer sat or stood (whichever allowed the best view of the students) in a back corner or side of the classroom and observed each of the five selected students for a total of 5
minutes, rotating between students every minute and using the 10 s partial interval recording sheet to record target behaviors (Appendix B).

**Observer Training**

All observers were trained to collect data using the 10 s partial interval and frequency recording methods. The researcher trained all observers in a single group in the conference room at the school. Training consisted of an initial 90-minute meeting to (a) introduce the partial interval recording form, (b) explain the operational definitions, and (c) practice data collection using pre-recorded classroom videos accessible on YouTube until all observers were at or above 90% agreement with the researcher. Additionally, observers practiced in sets of two for two or more sessions (until agreement was 90% or above) using the data collection form in the classroom. The observers were encouraged to write questions down on the sheet as they collected data. After each data collection session the researcher and the observers met briefly to discuss and clarify specific questions.

During training, observers were asked not to respond to students while conducting observations. They were instructed instead to attempt to blend into the classroom environment as much as possible. Because teachers, parents, and other after-school staff members often entered and exited the classroom during homework time, the students were accustomed to adults moving around the classrooms. If the observer’s presence was obviously distracting to the student he or she was asked to direct the student’s attention back to the instructor and move away from the student. Observers were asked not to engage in conversation with the students or instructors during observations under any
circumstances, except emergencies.

Reliability of Dependent Measures

Interobserver agreement (IOA) was calculated for instructor data during approximately 50% of all observation sessions for each instructor. Percent agreement was calculated for each session using the formula: \( \frac{\text{occurrence agreements}}{\text{occurrence agreements} + \text{disagreements}} \times 100\% \). For kindergarten, IOA was calculated for 50% of sessions. The mean percentage was 97% (range 95-100%) for positive interactions and 97% (range 95-100%) for negative interactions. For first grade, IOA was calculated for 47% of sessions. The mean percentage was 97% (range 91-100%) for positive interactions and 97% (range 88-100%) for negative interactions. For second and third grades, IOA was calculated for 50% of sessions. The mean percentage was 94% (range 88-100%) for positive interactions and 99% (range 97-100%) for negative interactions. For fourth and fifth grades, IOA was calculated for 53% of sessions. The mean percentage was 98% (range 93-100%) for positive interactions and 95% (range 89-100%) for negative interactions.

To calculate IOA for student data, a modified formula for weighted agreement was used (Harris & Lahey, 1978). This formula uses the occurrence agreement weighted by the average rate of nonoccurrence, plus nonoccurrence agreement weighted by the average rate of occurrence. The formula for calculating the weighted average is

\[ \text{WA} = \left( \frac{O \times U}{100} \right) + \left( \frac{N \times S}{100} \right) \]

where O is the occurrence agreement score, U is the mean proportion of unscored intervals, N is the nonoccurrence agreement score, and S is the
mean proportion of scored intervals. IOA was calculated using this formula for each behavior by grade. Results are displayed in Table 1.

**Treatment Integrity**

Both participants and the researcher completed a training checklist (Appendix C) during the workshop training session to assess treatment integrity. The checklist was used as an agenda to guide the training session as well as to verify that all components of the training were presented. Prior to the start of the training, each participant was given a checklist and asked to initial next to each item as it was presented in the workshop training. The researcher also marked off each item on the checklist during the presentation. Both the researcher and participants were asked to sign the bottom of the

Table 1

*A Summary of Interobserver Agreement Data for Student Behaviors*

<table>
<thead>
<tr>
<th>Grade</th>
<th>Behavior</th>
<th>Baseline IOA</th>
<th>Workshop training IOA</th>
<th>Coaching IOA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kindergarten</td>
<td>Engaged</td>
<td>95 (95 – 96)</td>
<td>96 (94 – 98)</td>
<td>96 (91 – 100)</td>
</tr>
<tr>
<td></td>
<td>Off task</td>
<td>95 (89 – 100)</td>
<td>96 (94 – 98)</td>
<td>98 (96 – 100)</td>
</tr>
<tr>
<td></td>
<td>Disruptive</td>
<td>94 (87 – 100)</td>
<td>92 (86 – 98)</td>
<td>88 (84 – 91)</td>
</tr>
<tr>
<td>1st grade</td>
<td>Engaged</td>
<td>89 (87 – 100)</td>
<td>92 (89 – 96)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Off task</td>
<td>92 (86 – 98)</td>
<td>94 (90 – 97)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disruptive</td>
<td>96 (94 – 100)</td>
<td>88 (83 – 92)</td>
<td></td>
</tr>
<tr>
<td>2nd-3rd grade</td>
<td>Engaged</td>
<td>94 (93 – 94)</td>
<td>94 (93 – 95)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Off task</td>
<td>97 (94 – 100)</td>
<td>96 (94 – 100)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disruptive</td>
<td>97 (93 – 100)</td>
<td>96 (93 – 100)</td>
<td></td>
</tr>
<tr>
<td>4th-5th grade</td>
<td>Engaged</td>
<td>94 (91 – 96)</td>
<td>99 (97 – 100)</td>
<td>94 (91 – 97)</td>
</tr>
<tr>
<td></td>
<td>Off task</td>
<td>93 (90 – 98)</td>
<td>97 (94 – 100)</td>
<td>98 (96 – 100)</td>
</tr>
<tr>
<td></td>
<td>Disruptive</td>
<td>90 (85 – 93)</td>
<td>88 (85 – 91)</td>
<td>96 (93 – 100)</td>
</tr>
</tbody>
</table>
checklist at the completion of the training. Upon completion of the workshop training all participants returned the checklist with initials next to each item.

**Independent Variables**

The independent variable for this study consisted of training designed to help instructors increase their PN ratio to 4:1 or greater. Data collection procedures continued across all intervention conditions in a manner identical to those used in baseline. During intervention conditions, all instructors participated in workshop training and two instructors participated in coaching. All training and coaching sessions took place in the conference room at the school.

**Baseline (Condition A)**

In baseline naturally occurring PN ratios were measured as instructors interacted with students during homework time. Baseline rates of target student behaviors were also recorded.

**Workshop Training (Condition B)**

Workshop training was delivered to all participants in a single group. The training lasted approximately 45 minutes and followed a didactic workshop-style professional development model that included: (a) introduction to the concept of PN ratio, (b) presentation of previous research on PN ratio, (c) rationale for increasing ratio in the context of teaching interactions, and (d) a discussion of strategies for increasing PN ratios (focusing on increasing behaviors on the data recording sheet). The researcher delivered
the training as a PowerPoint presentation and lecture while instructors listened passively.

The introduction to the PN ratio concept consisted of a presentation defining the PN ratio and discussing expectations for its implementation in the context of the after-school program. Rationales for the implementation of a high PN ratio were discussed, including benefits to instructors such as improved relationships with students and increases in on-task behavior resulting in increased academic performance. Instructors were given an overview of previous research and results regarding the PN ratio including examples of improved student behavior. Lastly, strategies for increasing the PN ratio in an instructional context were presented. The focus of these strategies was to help instructors increase the behaviors that were measured as part of the dependent variable. Participants were encouraged to ask follow up or clarifying questions throughout the training.

**Coaching (Condition C)**

Instructors participating in the coaching met with the researcher to receive a brief review of the information originally presented in the workshop training as necessary to provide context for the coaching session. Coaching consisted of (e) modeling, (f) role-play, and (g) performance feedback. All coaching sessions took place in the conference room at the school for individual instructors after homework time when the instructor had a break. The first coaching session with each instructor lasted approximately 20 minutes and included a review of the notes from the workshop training if the instructor needed context for the coaching discussion. The researcher then modeled different strategies for increasing the PN ratio and participated in role-play with the instructors, taking turns
pretending to be the student and providing feedback as necessary. To provide performance feedback, the researcher presented the instructor with the PN ratio data and provided praise and feedback for meeting PN ratio targets of 4:1.

**Procedures**

Prior to intervention, after-school instructors oversaw assigned classrooms, directed instruction when necessary, and assisted students with assignments during homework time. After and during the intervention conditions, the instructor’s role remained the same. The instructors reported to work at the school at approximately 2:30 PM Monday through Friday on the days school was in session. Instructors oversaw homework time in the individual classrooms to which they were assigned from approximately 2:30 PM until 3:25 PM. During homework time observers entered the classroom and collected data on instructor behaviors for the first 15 minutes and on student behaviors for the following 20 minutes. Observers then delivered the data to the researcher, who computed the PN ratios. During the baseline and workshop training conditions, the instructors then completed the rest of their day at the after-school program as was typical.

During the coaching condition, data sheets were delivered to the researcher, as in the other two conditions, and the researcher computed PN ratios for each instructor. The instructors participating in the coaching intervention then took turns daily during their breaks meeting with the researcher in the conference room for coaching. The instructors were encouraged to remember coaching content for use in the next homework session.
Observers collected data in a consistent manner during all conditions. Observers arrived at the school at 2:20 PM. They reported to a central office to pick up a clipboard, a pen or pencil, and a set of earbuds (headphones). The clipboard had been prepared by the researcher and included an instructor data collection sheet and a student data collection sheet with a set of five numbers (from the randomizer) written at the top. During initial training, each observer had downloaded two audio tracks from a shared online Dropbox account to his or her personal mobile device (smartphone or IPod). The files consisted of one instructor audio file and one student audio file. The instructor audio file was 15 minutes in length with a “Get ready” prompt and then a tone sounding each minute. The observers began data collection when they heard the first tone and ended when the last tone sounded and the prompt “stop” was heard. The student audio file consisted of a “Get ready” prompt and a series of tones presented over a 20-minute session. A long tone (similar to the one used in the instructor audio file) sounded to indicate the start of each minute. This signaled the observer to switch observation to the next student. A series of shorter tones sounded every 10 seconds to signal the observer to switch intervals on the data sheet. Observers continued data collection until both audio files had been completed.

During data collection, the observers were asked not to interact with instructors or students unless an emergency occurred. Observers entered the rooms quietly and sat or stood in a discreet location (if possible) where they could see and clearly hear the instructor with minimal distraction to the students or the classroom routine. Because there were typically several adults moving about the room at any given time to assist students
with homework, the observers caused minimal disruption.

**Data Analysis**

Instructor data were analyzed by counting the total number of positive and negative interactions that took place during each 15-minute session. The tally marks placed in the positive column and the negative column were counted and entered into a graph that plotted the daily total number of positive and negative interactions for each instructor. Additionally, PN ratios for each daily session (P/N) were calculated, and the values were plotted in a separate graph.

Student data were analyzed daily by counting the total number of intervals marked per behavior for each of the three student behaviors (engaged, off-task, and disruptive). There were a total of 120 observation intervals per day per behavior. After calculating the total number of marked intervals, a daily percent was calculated using the formula \((N/120) \times 100\). The percentage of intervals marked was then plotted as a value on the student behavior graph.

**Experimental Design**

An AB/ABC design (Cooper, Heron, & Heward, 2007) was used to assess the successfulness of two interventions designed to help instructors increase their PN ratios to at least 4:1. This study consisted of three experimental conditions, baseline, workshop training, and coaching. If one or both of the training models were successful in helping instructors achieve a PN ratio of 4:1, the researcher anticipated that the data paths would
show a nonoverlapping increase in level of PN ratio following intervention conditions. This design was selected because it allowed for a differentiation of effects across the three conditions without requiring a prolonged intervention period. Because after-school instructors are hired for a single semester at a time, there is potential for significant turnover every three to four months. A multiple baseline design was not selected because the instructor turnover rate would not allow for the extended intervention timeline required to achieve stability in all conditions.

The four participating instructors were randomly assigned to one of two treatment groups. Group 1 received the baseline and workshop training conditions only. Group 2 received all three intervention conditions: baseline, workshop training, and coaching. Participants in both groups received baseline and the workshop training simultaneously, after which only Group 2 received coaching.
CHAPTER IV
RESULTS

Data were collected daily (Monday-Thursday) during after-school homework time. Instructor and student observations were conducted independently, one following the other, during a single homework session. Instructor observations included a frequency count of positive and negative interactions over a 15-minute period. Student data were collected during a 20-minute observation session directly after instructor observation. Student observations included collecting data using a 10-second partial interval recording sheet for the three target behaviors (engaged, off-task, and disruptive). Student behaviors are reported as total percent of intervals in which the behavior occurred. The results for both instructor and student observations are reported in this section.

Figures 1 and 2 (shown and discussed later in this chapter) reflect the overall number of positive and negative interactions by teacher for Group 1 and Group 2, respectively. Figures 3 and 4 (shown and discussed later in this chapter) reflect the daily PN ratio for each instructor in Group 1 and Group 2, respectively. Figures 5 and 6 (shown and discussed later in this chapter) reflect the daily percentage of intervals for each of the three student behaviors for classrooms with instructors in Group 1 and Group 2, respectively.

Instructor Behavior

The graphs in Figure 1 represent the data for instructors in Group 1 (1st-grade classroom and 2nd/3rd-grade classrooms). These graphs show fairly stable levels of
The 2nd/3rd grade instructor left his position with the program on December 3rd.

*Figure 1.* Frequency of positive and negative interactions by instructors in Group 1.
great deal of overlap between data points across conditions. For first grade, the mean number of positive interactions is 16.4 (range 11-24) in baseline and 15.9 (range 11-26) in workshop training. The mean number of negative interactions is 11.6 (range 5-19) in baseline and 10.8 (range 6-16) in workshop training, showing slight decreases in both positive and negative behaviors from baseline to workshop training conditions. For second and third grade, the mean number of positive interactions is 12 (range 8-14) in baseline and 13.8 (range 13-18) in workshop training. The mean number of negative interactions is 20.8 (range 12-31) in baseline and 15.6 (range 11-31) in workshop training, showing a slight increase in positive behaviors and a slight decrease in negative behaviors between the baseline and workshop training conditions. The graph for second and third grade shows a slight overall increase in the number of negative interactions over the last two sessions. There is a note on the graph indicating that the instructor left his position with the after-school program early, on December 3rd. When asked why he was leaving he cited stress from final examinations and an overloaded schedule as the reasons for his early resignation.

Figure 2 displays data for instructors in Group 2 (Kindergarten and 4th/5th grade classrooms). These graphs show some significant changes in level of positive and negative interactions across conditions. Both graphs also show upward trends in positive interactions and stable trends in negative interactions during the Coaching condition. While there is a great deal of overlap in data points across conditions for negative interactions, there is no overlap of data points representing positive overlapping data points across the three conditions.
Figure 2. Frequency of positive and negative interactions by instructors in Group 2.
The graphs in Figure 3 show PN ratio data for the instructors in Group 1. The mean PN ratios for the first grade are 1.5:1 (range 1.2:1-2.2:1) in baseline and 1.6:1 (range 1.3:1-2.3:1) in workshop training. The levels of the data are stable across both conditions, there is no increase in trend, and the majority of the data points are overlapping across both conditions. The mean PN ratios for the second and third grade are 0.6:1 (range 0.4:1-1.2:1) in baseline and 1.2:1 (range 0.6:1-1.8:1) in workshop training. The levels of the data are slightly higher in workshop training, there is a downward trend across the workshop training condition, and the majority of the data points overlap across the two conditions.

The graphs in Figure 4 show PN ratio data for the instructors in Group 2. The mean PN ratio for kindergarten is 0.9:1 (range 0.6:1-1.2:1) in baseline, 1.5:1 (range 1.3:1-1.6:1) in workshop training, and 3.4:1 (range 2.7:1-4:1) in coaching. Ratio levels increase from baseline to workshop training and then increase further in coaching. The graphs show an upward trend in PN ratios across all conditions. There are no overlapping data points across the three conditions. The mean PN ratios for the fourth and fifth grade are 0.6:1 (range 0.4:1-1.8:1) in baseline, 0.9:1 (range 0.5:1-1.2:1) in workshop training, and 2.2:1 (range 1.8:1-2.6:1) in coaching. The ratio levels increase slightly from baseline to workshop training, and there is a large increase from workshop training to coaching. The data show a stable trend in baseline, a downward trend in workshop training, and a steep upward trend in coaching. There is one overlapping data point between baseline and workshop training, and there are no overlapping data points between coaching and the other two conditions.
Note. PN ratio values (on Y axis) represent the value of a ratio to 1 (N:1).

Figure 3. Ratio of positive to negative interactions for instructors in Group 1.
Note. PN ratio values (on Y axis) represent the value of a ratio to 1 (N:1).

Figure 4. Ratio of positive to negative interactions for instructors in Group 2.
Student Behavior

The graphs in Figure 5 represent the data for students in the classroom with instructors in Group 1. These graphs show fairly stable levels of behavior across all behaviors and conditions. For first grade, the mean percentage of intervals with student behavior in baseline is: engaged 84% (range 80-87%), off-task 26% (range 21-33%), disruptive 7% (range 5-11%). The mean percentage of intervals with student behavior in workshop training is: engaged 84% (range 82-90%), off-task 20% (range 15-25%), disruptive 9% (range 7-13%). For second and third grade, the mean percentage of intervals with student behavior in baseline is: engaged 78% (range 76-80%), off-task 37% (range 33-40%), disruptive 16% (range 13-20%). The mean percentage of intervals with student behavior in workshop training is: engaged 77% (range 73-82%), off-task 32% (range 28-41%), disruptive 11% (range 5-15%).

Figure 6 shows graphs representing the data for students in the classroom with instructors in Group 2. These graphs show fairly stable levels of student behaviors across all conditions. The only exception is slightly increased levels of engagement for both grades during coaching. For kindergarten, the mean percentage of intervals for student behavior in baseline is: engaged 53% (range 49-57%), off-task 46% (range 42-52%), disruptive 13% (range 10-16%). The mean percentage of intervals for student behavior in workshop training is: engaged 58% (range 56-59%), off-task 43% (range 41-45%), disruptive 10% (range 7-13%). The mean percentage of intervals with student behavior in coaching is: engaged 75% (range 73-77%), off-task 28% (range 26-31%), disruptive 8% (range 4-13%). For fourth and fifth grade, the mean percentage of intervals with
Note. The 2\textsuperscript{nd}/3\textsuperscript{rd} grade instructor left his position with the program on December 3\textsuperscript{rd}.

Figure 5. Percentage of intervals with target behaviors for students in classrooms with instructors in Group 1.
Figure 6. Percentage of intervals with target behaviors for students in classrooms with instructors in Group 2.
student behavior in baseline is: engaged 74% (range 64-73%), off-task 40% (range 37-43%), disruptive 13% (range 8-18%). The mean percentage of intervals with student behavior in workshop training is: engaged 75% (range 63-89%), off-task 33% (range 26-38%), disruptive 12% (range 8-18%). The mean percentage of intervals with student behavior in coaching is: engaged 80% (range 69-92%), off-task 22% (range 16-25%), disruptive 9% (range 6-13%).
CHAPTER V
DISCUSSION

The purpose of this study was to examine the effectiveness of two training models designed to increase instructor PN ratios in the context of homework time during after-school programming. In this study, an AB/ABC design was used to examine the effects of workshop training and coaching on PN ratios of instructor-student interactions. The data showed that daily coaching was a much more effective method for increasing instructor PN ratios than was workshop training. Overall, workshop training appears to have had little or no effect on the number of positive or negative interactions displayed by Linda and Saul, instructors in Group 1. These results are confirmed by a lack of increase in these instructors’ PN ratios between the baseline and workshop training conditions. Instructors in Group 2, Hannah and Sarah, received the daily coaching intervention as well as the workshop training. After workshop training, Sarah’s frequency of positive and negative interactions remained unchanged. During coaching, however, her frequency of negative interactions remained stable while the frequency of positive interactions steadily increased. As a result, her PN ratio also increased during coaching. While she did not ever reach the target PN ratio of 4:1 Sarah increased her PN ratio from 0.6:1 during baseline to 2.2:1 during coaching. Hannah, the other instructor in Group 2, showed a decreased frequency of both positive and negative interactions following workshop training. However, the number of negative interactions was decreased well below those of the positive interactions, so her PN ratio increased. Hannah also showed a large increase in the frequency of positive interactions during coaching. Because the
frequency of her negative interactions remained stable, her PN ratio was further increased. Hannah’s mean PN ratio during Baseline was 0.9:1, and her mean PN ratio during coaching was 3.4:1. She is the only instructor who successfully reached the target PN ratio of 4:1 throughout the course of the study. This success was only seen on one day.

It is important to note that while Hannah and Sarah both increased their PN ratios, the mechanism by which they accomplished the change was different. As shown in Figure 2, Hannah (the kindergarten instructor) increased the frequency of her positive interactions and decreased the frequency of her negative interactions. Sarah, on the other hand, had a fairly low frequency of overall interactions during baseline. To increase her PN ratio she increased the frequency of positive interactions only and did not decrease her negative interactions. Because PN ratio is calculated using the relative number of positive and negative interactions, instructors can successfully increase their PN ratios in a variety of ways. It is unknown at this time whether various methods for increasing PN ratio are linked to differences in student outcomes.

A primary focus of the study was to determine whether after-school instructors would reach a target PN ratio of 4:1 following the brief workshop training. As shown in Figure 3 and Figure 4, none of the participants met the target PN ratio after the workshop training alone. This finding is important because the workshop training model is typical of the training many educators receive. These findings indicate that current professional development models may not be sufficient for training educators to meet the high standards expected of them. This conclusion is further supported by the data from
instructors participating in the coaching condition. Although these instructors underwent considerably more training than that offered in the workshop training model, only Hannah met the target PN ratio of 4:1, and her success was only seen one day during the course of the study. It should be noted that given the increasing trend of both instructors’ PN ratios throughout the coaching condition, with more time, they might have continued to meet and exceed target ratios. While increased success for instructors in the coaching condition is not definitive evidence that coaching alone is an ideal training model for educators, it does raise an important question concerning the amount of support needed for educators to meet and exceed target PN ratios. Further research is needed concerning the practicality of providing more intensive training models for educators.

Student behavior appeared to be somewhat affected by changes in instructor behavior during the coaching condition. In the two classrooms where instructor PN ratios increased during coaching, engagement was increased (25% in one classroom and 6% in the other) and task was decreased (18% in both classrooms). Levels of disruption remained relatively unchanged from their fairly low baseline levels. Levels of student behavior also remained relatively unchanged during workshop training.

Limitations

While there are a number of potential limitations for the study, the most concerning is the number of participants involved. As a preliminary investigation this study was designed as a small-\(n\) study. Because of the small sample size, the extent to which the data can be generalized is limited because the extent to which it is
representative of the population is unknown. A replication of this study with a larger sample size could better ensure that the population is represented accurately, increasing the reliability of the data and the generalizability of the findings.

Another limitation of the study is the setting and context in which the study took place. While this intervention was designed specifically for use with after-school instructors, care should be taken when attempting to generalize the findings to other educational settings such as the classroom. After-school settings resemble the classroom in many ways (i.e., takes place in a physical classroom, homework is being completed, expectations for behavior are similar); however, there are several significant differences (i.e., number of students present, presence of certified teachers, differing instructional styles) that make generalization to regular classroom settings limited.

The schedule of after-school sessions provides another potential limitation. Because students in the after-school program only participated in homework time Monday-Thursday, the opportunities for instructors to receive and incorporate immediate feedback were limited. For example, feedback received on Thursday of one week had to be remembered for almost 4 days before the instructor had the chance to implement it the following Monday. This schedule was not ideal and it may have impacted the instructors’ effectiveness at increasing PN ratios. Coaching may be more effective in a classroom setting where opportunities to incorporate feedback are temporally closer.

The condensed time-frame in which the study was conducted is a potential limitation. However, because of the short hiring term of after-school staff members (approximately 3 months per contract), the abbreviated schedule was necessary. The
shortened time frame did not allow for long-term observation of the instructors to
determine the lasting effects of training. Both of the instructors in Group 2 showed
increasing trends in their PN ratios during coaching. It is possible that given more time in
the coaching condition, the instructors would have met or exceeded the 4:1 target PN
ratio.

**Implications**

This study raises several questions as to the practicality of setting high PN ratio
expectations for teachers, after-school instructors, and other educators when training
resources are seriously limited. The data indicate that didactic workshop training models
may not be sufficient for staff members to meet high PN ratio expectations. Because this
model is often used in an educational setting, trainers and school administrators should be
aware of its potential limitations for increasing PN ratios.

In cases where high PN ratio requirements are an integral part of staff evaluations
and professional development plans, adequate support should be provided to increase the
likelihood that staff members will successfully meet high PN ratio targets. More research
is necessary to determine the exact amount and type of support required. Because the
coaching intervention used in this study required a significant time investment from both
the trainer as well as the instructors, it may not be practical for school-wide use. It is
recommended that trainers and principals carefully consider the type of training that fits
best within their organization before setting PN ratio expectations.

In spite of the lack of empirical evidence showing changes in student behavior as
a result of increasing PN ratios, the results of this study indicate that this relationship requires more investigation as evidenced by the increases in student engagement and decreases in off-task behavior during coaching.

**Future Research**

The current study raises many considerations for future research. A review of the literature shows a need to provide a more basic understanding of PN ratio and establish empirical evidence for its positive outcomes on student behavior. Thus far, available correlational data suggest high PN ratio and improved student outcomes may be related, but there is no evidence supporting the prescription of specific target PN ratios often expected of school staff members. More research in this area could help establish precise recommendations for PN ratio requirements and lead to improved methods for successfully training staff members.

Generalizability is another important limitation of current PN ratio findings. Additional research using large-\(n\) groups, a variety of settings, and staff with various training histories would greatly improve generalizability of findings. While one goal of the current study was to assess the effects of PN ratio training on fairly naïve instructors, the majority of school staff members have received some training on the importance of positive interactions with students. Therefore, conducting PN ratio research in typical classroom settings with certified teachers would contribute to more global conclusions about the benefits of promoting high target PN ratios in an educational setting.

Another area for potential investigation is the functional relationships between
various methods for increasing PN ratio and student behaviors. As mentioned previously, instructors can increase PN ratio in a variety of ways (i.e., increasing positive interactions only, decreasing negative interactions only, or increasing positive interactions and decreasing negative interactions). Because instructor behaviors involved in using the different methods for increasing PN ratio are functionally different, it is possible they result in varying effects on student behavior. These differences could account for at least part of the variation in student outcomes found in the research literature.

**Conclusion**

Data for this study were collected from four after-school program instructors and approximately 60 students served by the program. Baseline observations were followed by workshop training (didactic, lecture-based one-time session) for all four instructors and coaching (modeling, role-play, and daily performance feedback) for two of the instructors. Student observations were also conducted throughout the study to measure levels of engagement, on-task, and disruptive behaviors.

After workshop training, none of the instructors showed increases in the overall frequency of positive interactions or PN ratios; however, the two instructors who participated in coaching showed increases in both measures. Of the two coaching participants, one instructor met the target PN ratio of 4:1 and only on a single occasion. These results provide evidence that didactic workshop training models may not be an effective method for training instructors to increase PN ratios. Additionally, while approximations of PN ratio targets are greatly improved during coaching, most
instructors did not reach the 4:1 target.

Following workshop training, levels of student behavior remained relatively unchanged compared to baseline with no more than a 5% difference for any of the three behaviors. In classrooms where the instructor participated in coaching, engagement was increased (25% in one classroom and 6% in the other), and off-Task was decreased (18% in both classrooms). Levels of disruption remained relatively unchanged from their fairly low baseline levels.

While increasing PN ratios may have a positive effect on student behaviors, a great deal of research is needed to determine the extent of this relationship. If a causal relationship can be established, more research is called for as a means to identify the most effective staff training models.
REFERENCES


Lewis, T. (2010, March). *Are we there yet? Mapping the SW-PBS course for the long haul.* Invited presentation at the 7th Annual Association for Positive Behavior Support Conference, St. Louis, MO.


APPENDICES
Appendix A

Instructor Observation Sheet
# Instructor Observation Sheet

<table>
<thead>
<tr>
<th>Minute</th>
<th>Positive</th>
<th>Negative</th>
<th>Minute</th>
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<td></td>
<td></td>
<td>Min 11</td>
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</tr>
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<td>Min 2</td>
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<td>Min 7</td>
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<td></td>
<td>Min 12</td>
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<td>Min 3</td>
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<td>Min 5</td>
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<td>Min 10</td>
<td></td>
<td></td>
<td>Min 15</td>
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<td></td>
</tr>
</tbody>
</table>

Instructions: Before beginning complete the top sections of the data collection sheet. Then tally the number of positive and negative interactions observed within each minute. DO NOT complete the bottom portion of the sheet.

- **Positive interactions** will include:
  - (a) Specific praise statement, which incorporates praise word or phrase (e.g., "I like," "I appreciate"). And refers to a specific person or behavior
  - (b) General praise statement, that contains a praise word but does not specify a specific person or behavior (e.g., "Nice job," "Well done," "Excellent work")
  - (c) Use of the word "yes" or its derivatives only in response to a student behavior or answer, but not in the context of teaching. Ex. Student asks "is this a square" and teacher answers "yes" do not include. Ex. If student answers a question correctly and the teacher smiles and says "yes" then do include.

- **Negative interactions** will include:
  - Any error correction or reprimand
  - Any statement beginning with "no," "stop," or "don't"
  - Use of the students name in a negative tone
  - Reminders to be quiet or cues to stay on task (e.g., "Shhhhh," or "Class class.")
Appendix B

Student Observation Sheet
## Student Behavior Data Collection Sheet

**Instructor ID:** [Blank]  
**Observer Name:** [Blank]  
**Start:** [Blank]  
**End:** [Blank]  
**Activity:** [Blank]  
**IOA:** YES NO  
**Date:** [Blank]

<table>
<thead>
<tr>
<th>Student 1</th>
<th>Student 2</th>
<th>Student 3</th>
<th>Student 4</th>
<th>Student 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>10s ENG OFF DIS</td>
<td>10s ENG OFF DIS</td>
<td>10s ENG OFF DIS</td>
<td>10s ENG OFF DIS</td>
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<td>60s ENG OFF DIS</td>
<td>60s ENG OFF DIS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1st Minute</th>
<th>2nd Minute</th>
<th>3rd Minute</th>
<th>4th Minute</th>
<th>5th Minute</th>
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<td>9th Minute</td>
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<td>16th Minute</td>
<td>17th Minute</td>
<td>18th Minute</td>
<td>19th Minute</td>
<td>20th Minute</td>
</tr>
</tbody>
</table>

**Questions and Notes:** [Blank]
Appendix C

Training Checklist
Training Checklist

** Please initial in each box as the information is presented during the training. After training sign the bottom line and return to Rikki.**

- Introduction to PN Ratio
- Presentation of Research
- Rationale
- Strategies

_________________________________________  ______________
Signature                                      Date
Appendix D

Letter of Information
LETTER OF INFORMATION

The Effectiveness of an Intervention Designed to Increase the Positive to Negative Ratio of Instructor Interactions During After School Programming

**Introduction/ Purpose** Dr. Richard P West and student, Rikki K. Wheatley are conducting a research study designed to produce an effective training for increasing the overall ratio of positive to negative interactions between After School Club staff and students. You have been asked to take part because of your affiliation with the After School Club program through Logan City Parks and Recreation.

**Procedures** As part of your project participation, you will participate in up to two training sessions with the researchers, lasting a total of 75 minutes. In some experimental conditions this may include short, weekly meetings where you will be provided with feedback on your performance. Additionally, you are agreeing to allow observers to record your interactions with students and report these data anonymously. If you agree to be in this research study, you are agreeing to allow observers to conduct classroom observations during homework time and anonymously report your data as part of the research findings.

**Risks** Risks of participation in this study are no greater than what you might experience in everyday activities working with children and participating in professional development.

**Benefits** Your contribution could help to influence training packages delivered to future After School Club staff members as well as teachers and para-professionals who work in an educational setting.

**Explanation & offer to answer questions** The student researcher Rikki Wheatley has explained this research study to you and answered your questions. If you have other questions or research-related problems, you may reach (PI) Dr. Richard West at (435) 770-1502.

**Voluntary nature of participation and right to withdraw without consequence** Participation in the training sessions to increase the PN ratio while working with students has been designated as part of expected After School Club staff training; however, allowing the use of your individual information and observation results in this research is entirely voluntary. All information used as data in the research study will be anonymized before analysis: i.e., your name would not appear on any items, and your confidentiality would be protected. You may refuse to allow the use of your information or withdraw from the study at any time. If at any time the research staff feels you are a hazard to yourself, or anyone else participating in the study, you may be withdrawn from this study without your consent.

**Confidentiality** Research records will be kept confidential, consistent with federal and state regulations. Only the research team (Dr. Richard P. West and Rikki Wheatley) will have access to the observation data, which will be kept in a password-protected private electronic space. To protect your privacy, personal, identifiable information will be removed from study documents and replaced with a study identifier. Identifying information will be stored separately from data and will not be associated with individual results.
LETTER OF INFORMATION

The Effectiveness of an Intervention Designed to Increase the Positive to Negative Ratio of Instructor Interactions During After School Programming

IRB Approval Statement The Institutional Review Board for the protection of human participants at Utah State University has approved this research study. If you have any questions or concerns about your rights or a research-related injury and would like to contact someone other than the research team, you may contact the IRB Administrator at (435) 797-0567 or email irb@usu.edu to obtain information or to offer input.

Investigator Statement “I certify that the research study has been explained to the individual, by me or my research staff, and that the individual understands the nature and purpose, the possible risks and benefits associated with taking part in this research study. Any questions that have been raised have been answered.”

Signature of Researcher(s)

______________________________  ______________________________
Dr. Richard P. West                    Rikki K. Wheatley
(435) 770-1502                          (435) 797-8020
rich.west@usu.edu                     rikki.wheatley@usu.edu
LETTER OF INFORMATION

The Effectiveness of an Intervention Designed to Increase the Positive to Negative Ratio of Instructor Interactions During After School Programming

Decline Participation

☐ I do not wish for my observation data to be anonymized and used as data for the research described in this document.

____________________________________  __________________________________
Signature                                   Date

Name (PLEASE PRINT)