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## Effects of Performance Feedback on High School Teachers' Use of Opportunities to Respond and Positive Feedback: Considering Efficiency in High Need Schools

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### Abstract

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### Keywords

engagement, feedback, teachers, high school

Running head: PERFORMANCE FEEDBACK

Effects of Performance Feedback on High School Teachers' Use of Opportunities to Respond  
and Positive Feedback: Considering Efficiency in High Need Schools

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## Abstract

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## Effects of Performance Feedback on High School Teachers' Use of Praise

The transition into high school presents new challenges for adolescents. Increased choice, responsibility, new peer groups, and larger school settings are new encounters that can exacerbate problems of at-risk freshmen (Roderick & Camburn, 1996). Twenty-two percent of ninth graders repeat their first year of high school, a figure that jumps to 40% in America's most troubled urban schools (McCallumore & Sparapani, 2010). A study conducted in Montgomery County, Maryland found students who fail two or more semester courses in the ninth grade graduated in four years only 46% of the time (Rethinam, 2010). In contrast, students who manage the minefield of the freshmen year without failing a class have a 96% chance of graduating from high school in four years (Rethinam, 2010). As McIntosh and White (2006) have observed, "If a student does not have a good experience that freshman year, the decision to drop out of high school is either consciously or subconsciously made at that time" (p. 40). Yet, despite the obvious need for high-level instruction, ninth grade teachers are statistically less qualified, have less experience, and receive less attention from administrators than do their colleagues (Neild & Farley-Ripple, 2008). In fact, American high schools often place their most vulnerable students (i.e., freshmen) with their least effective teachers (Neild & Balfanz, 2006).

Because studies identify teachers as the most important determining factor in a child's educational success (Nye et al., 2004; Stronge, 2007), focus on teacher performance has great promise for raising student achievement. In fact, it is well established that effective school structures and classroom instructional practices can reverse negative social and academic trends (Brophy & Good, 1986; McCallumore & Sparapani, 2010). Empirical research over the last 25 years has identified increased student engagement during instruction as a strong predictor of student success (Finn, 1993; Voelkl, 1995). Students engaged in school tend to have higher

achievement results (Roderick & Engel, 2001) and lower dropout rates (Croninger & Lee, 2001). In contrast, students with low levels of engagement are at risk for a variety of long-term adverse consequences, including disruptive behavior in class, absenteeism, and dropping out of school (Connell et al., 1994). Teachers can greatly enhance student engagement by structuring lessons to both include multiple opportunities for students to respond and providing frequent and consistent feedback (Brophy & Good, 1986; Hattie, 2009). Alarming, despite evidence of effective practices in promoting student success, these practices typically are not implemented within classrooms (Scott et al., 2011; Scott et al., 2017). Described herein is a study of the effects of performance feedback as a means of enhancing teacher's engagement of students through the provision of opportunities for student response and positive acknowledgement of student performance (social and academic) in ninth grade classrooms.

### Changing Teacher Behavior to Affect Student Behavior

Key to the promotion of student success is awareness of the fact that what teachers do during instructional contexts has an immediate and lasting effect on student success (Brophy & Good, 1986; Stronge, 2007). As such, the teacher with a specific objective for instruction of a particular group of students must be concerned with the specific strategies that create the highest probability of student success. While teacher proximity, movement, and the development of consistent routines provide a means of managing the classroom during instruction (Gage et al., 2018; Simonsen et al., 2008), management serves mainly as a vehicle for enhancing the teacher's ability to engage the students with interesting and stimulating instruction (see Brophy, 2006).

### **Enhancing Student Engagement**

Engagement is perhaps the most important predictor of student success with mastery of lesson content (Brophy, 1988). Engagement is defined as the student's active participation with

the content of the lesson. Active participation may involve speaking, showing, building, writing, or otherwise working within the scope of the lesson content.

**Opportunities to respond.** Teacher provision of student opportunities to respond during instruction (OTR) is an instructional strategy in which the teacher engages students by prompting them to think about and respond to the instructional content. An OTR sets the occasion for active student participation and moves the student from a passive observer to an engaged learner. An effective OTR is more than a simple teacher question, it is a pre-planned teacher behavior, a teacher prompt or command that requires students to consider the curriculum and then make a specific response that can be verbal, shown visually (e.g., drawing, writing), or by gesture. The use of OTR has been repeatedly linked to decreases in disruptive behavior and increases in correct responses (Scott et al., 2017; Sticher, et al., 2009; Sutherland et al., 2003) that further enhance a student's desire to be engaged. In addition, because the OTR promotes student responding it also provides the teacher with increased opportunities to provide feedback, thereby furthering the engagement.

OTR offers the teacher multiple formats to engage students in learning. In the traditional setting, OTR might begin with the teacher asking a question and students raising their hands to volunteer to answer (Haydon et al., 2009). However, at-risk students generally do not respond to these passive group requests, preferring instead to allow someone else to answer. In fact, students with a history of failure often avoid answering even direct questions by providing the simple dismissal, "I don't know." Teachers can enhance instruction by expanding the manner and delivery of OTR in creative ways, promoting active responses and engagement for all students during class. Research supports a variety of teacher use of OTR including verbal choral responses in which all students must respond orally in chorus (Haydon et al., 2009; Whitney et

al., 2022), increased rates of prompts (Sutherland et al., 2003) and directions such as “show me yours” or “tell me if this is right” which demand a student response. Response cards can also be used and offer flexibility in the delivery of OTR because of the variety of types of questions teachers can ask and the range of differentiated student responses (Narayan, 1990; Whitney et al., 2022). Using response cards, the teacher may prompt the entire group by directing “everyone raise a red card if you agree or a green card if you disagree with this answer.” However, research on OTR has primarily focused on students with emotional behavioral disorders (Rismiller, 2004) and has been limited mostly to elementary school (Haydon et al., 2010).

### **Teacher Provided Positive Feedback to Students**

Positive feedback refers to any acknowledgement of a student’s appropriate academic or social behavior. This can be done with gestures, facial expressions, or most effectively, with specific verbal praise. As an intervention, feedback is among the most effective in terms of being associated with student success (Gable et al., 2009; Hattie, 2009; Scott & Landrum, 2020). A benefit of implementing positive feedback is that it is a natural teacher behavior that can easily be implemented in any classroom setting (Sutherland et al., 2000). Increasing the rate of teacher praise can decrease the frequency of disruptive behavior and increase appropriate behaviors of students (Stormont et al., 2007). Further, increasing the number of positive acknowledgements immediately and consistently for positive student contributions can increase student output in the classroom (Scott et al., 2017; Sutherland et al., 2000), improve on-task behavior (Bradshaw et al., 2018; Sutherland et al., 2000), and increase academic accuracy (Hattie, 2009; Sutherland & Wehby, 2001). Effective praise also promotes what the teacher deems as acceptable and sets boundaries for expectations in the classroom (Emmer, & Evertson, 1981).



Despite its benefits praise as an instructional strategy is under-utilized in most classrooms (Beaman & Wheldall, 2002; Scott et al., 2017). In the scope of typical instruction, Scott et al. (2017) found teachers' provision of praise typically at rates averaging about once every 3-5 minutes and, in a study on aggressive students, Gorman-Smith (2003) found reprimands were about 20 times as likely as praise. Further, students perceived as having behavior challenges and Black males typically receive less positive feedback and more negative feedback, regardless of their behavior (Hirn & Scott, 2014; Scott et al., Scott et al., 2019). The difficulty many teachers report is that the students who most need the positive feedback are often the least likely to engage in the behaviors that warrant it (Burnett, 2002). However, the use of OTR has been shown to be an effective means of creating opportunities to provide more positive feedback (Sutherland et al., 2002; Whitney et al., 2022). That is, teacher provision of OTR provides an opportunity for the teacher to facilitate a student success and deliver a positive feedback statement.

### **Performance Feedback for Teachers**

Because instructional practices that enhance student engagement are often not frequently used by teachers at any level, simply replacing teachers is unlikely to solve the complexity of ninth grade student struggles According to Walsh and Tracy (2004) advanced degrees (Harnisch, 1987), state certification (Jepsen & Rivkin, 2002), and experience past the initial few years (Rowan et al., 2002) have minimal to no significant influence on student achievement. What's left is the quality of instruction inside the walls of the classroom, and this must be the focus of efforts to improve the outcomes of students. Unfortunately, professional development typically is too brief, devoid of real practice opportunities, and not linked to classroom practice (Protheroe, 2002). A more useful model involves direct observation of teachers as they teach in the

classroom with regular debriefing sessions to consider performance. According to Pianta and Hamre (2009), the information derived from classroom observations not only provides accountability-driven measures of teacher quality, but also lends itself to formative professional development. Thus, a teacher's reflection on his or her own teaching data is used as a means of delivering ongoing professional development with performance feedback.

In their review of performance feedback, Barton and colleagues (2011) found systematic performance feedback in the classroom presented an opportunity for personalized, specific information, reflecting current practice that is generally absent in other professional development iterations. Feedback can be defined as information provided regarding aspects of performance and can include information that is descriptive, corrective, clarifying, or encouraging. To be instructional, "feedback must provide information specifically related to the task or process of learning that fills a gap between what is understood and what is aimed to be understood" (Hattie & Timperley, 2007, p. 82). Further, feedback is more effective when it contains (a) accurate, (b) concrete, (c) specific, and (d) behavior-focused rather than person-focused data (Sutherland et al., 2000).

Research has demonstrated the positive effects of performance feedback for teacher practice through the use of simple descriptive behavior counts (Duchaine et al., 2011; Jeffrey et al., 2009; LaBlanc et al., 2005; Casey & McWilliam, 2008) and with the added components of corrective and reinforcing feedback, intensive training (Auld et al., 2008), goal setting (Colvin et al., 2009), and performance contingencies (DiGennaro et al., 2007). Further, the effects have been demonstrated with teachers at grade levels and a range of targeted instructional behaviors including treatment integrity, attention to child behavior, specific praise, attention to child responses, opportunities to respond, prompts, incidental teaching, and classroom management

strategies. In each case, feedback proved effective in increasing the use of effective classroom instructional strategies. However, relatively few examples have been demonstrated with teachers at the high school level and most examples have used extensive training, coaching, and/or goal setting rather than the simpler delivery of descriptive data which is much more time efficient (see Solomon et al., 2012 for a review of single case research on performance feedback for teachers).

**Efficiency and video feedback.** Because time is generally an issue in schools, efficiency becomes an important consideration. Video as a feedback process has been used for decades as a means of providing specific performance feedback (Williams & Gallinat, 2011). A recent meta-analysis of 33 studies ranging over 40 years (Funkkink et al., 2011) reported that video feedback is generally effective in improving verbal and non-verbal interaction. Video feedback offers a unique opportunity to watch oneself teach, gives space for personal reflection and a more realistic picture of their performance in the classroom (Fuller & Manning, 1973; Hosford, 1980). Technological improvements over time have increased the use of a variety of techniques that provide more individualized feedback opportunities but without requiring large amounts of dedicated coaching time.

Performance feedback provides promising opportunities to increase teachers' use of effective classroom instructional practices like OTR and positive feedback. Because both resources and teacher time are increasingly scarce, this study examined the effects of descriptive performance feedback on ninth grade teachers' use of OTR and positive feedback during instruction. Further, the plan was to use formative performance data to determine whether teachers would require more directive approaches that would include components of prompting and coaching.

## Methods

## **Setting and Participants**

This study was conducted in six classrooms split across two high schools in a large urban district serving 100,000 students in the southeastern United States. The school enrollment in School A was approximately 900 students characterized demographically as 47.3% white, 45.8% African American, 6.9% other ethnicity, and 74.4 % receiving free or reduced lunch. School B was approximately 1400 students characterized demographically as 52% white, 40% African American, 8% other ethnicity, and 57.5 % receiving free or reduced lunch. The state had identified both schools as persistently low-achieving, based on percentages of students scoring proficient or distinguished according to NCLB regulations.

Four teachers in each school were asked to participate based on the following selection criteria: (a) teaches ninth grade students, (b) teaches a core subject area, and (c) teaches students with diverse academic needs and diverse backgrounds. All teachers initially accepted the request to participate although one in each school dropped out midway through the study due to extended absences and health issues. The results report outcomes from two English teachers and one Social Studies teacher in each school and each teacher provided his or her schedule to allow the researcher to identify classroom periods with the most diverse group of students.

## **Dependent Variables**

Dependent variables included two teacher behavior variables: the frequency of group opportunities to respond and frequency of positive feedback (group and individual).

**Opportunity To Respond.** Provision of an opportunity to respond (OTR) was defined as any teacher question or direction that requested or required a student response. Student responses could be verbal, written, or gestural (raising hand, displaying numbers with fingers).

For measurement purposes, an OTR was recorded simply for presenting the opportunity and regardless of whether the student or group responded.

**Positive Feedback.** Provision of positive feedback was defined as any teacher affirmation of student academic or social behaviors, indicating correctness. The feedback could be delivered to the entire class, smaller groups, or individual students. Positive feedback could be verbal or gestural and multiple forms of feedback to a single behavior were recorded as a single occurrence.

### **Measurement**

Coders used Multiple Option Observation System for Experimental Studies (MOOSES) software for recording duration and frequency behaviors in 15-minute classroom observations. The program allows coders to capture data on complex interactions between teachers and students (Tapp, Wehby, & Ellis, 1995). Coders used frequency recording methods to monitor instances of OTR and positive feedback as they occurred. These data were calculated as a rate per minute for each and the results were uploaded to a main database and converted to line graphs on a daily basis. Graduate students in Special Education were trained to use MOOSES first through video scenarios, and then in live classroom settings with a trainer until they met the requirements of 90% reliability. Those persons who coded with a trainer at 90% reliability over a two-week period were then allowed to collect data for the study.

**Reliability and interobserver agreement.** Project trainers concurrently coded during 15% of observations as an index of interobserver reliability. Reliability measure data were coded separately and compared by MOOSES software to produce reliability calculations using a 5 second window for agreement by code. The reliability coefficients for OTR and positive feedback respectively were .93 and .88.

## **Independent Variable and Research Design**

Two doctoral candidates in Educational Leadership served as the researchers for the two schools and provided all performance feedback to the teachers. In School A, data was presented via in-person meetings after school each day and in School B, all data and interaction was conducted via a private internet chat site in which the researcher posted videos of that day's observation for the teacher to watch. A video camera was placed in each of the classrooms and recorded instruction during one class period each day. Performance feedback methods were presented to subjects in two distinct multiple baseline across subjects designs. In this design the independent variable is introduced to subjects in a staggered manner across time to allow the identification of functional relationships.

**Baseline.** During baseline collection, teachers in each of the two studies were observed for 15 minutes during a consistent daily time that did not include the first or last ten minutes of class. Coders recorded the frequency of OTRs and positive feedback. Baseline continued for a minimum of three observations and ended for the first subject when the trend of the data was determined to be stable. In School B, a video camera was placed in the room but was not used to tape the classroom.

**Graphic performance feedback.** After a baseline recording phase, all teachers received a simple descriptive line graph showing both OTR and positive feedback rates per minute. With all subjects, the researcher simply reiterated the operational definitions of OTRs and positive feedback and presented the graph with no discussion of any kind. In School A this phase was done in face-to-face meetings after school and in School B it was done via a private computer chat.

**Enhanced feedback.** In this phase participants received the same graphic feedback but also were presented with verbal or written feedback. The researcher presented and reviewed a handout presenting (a) rationale for group OTRs and positive feedback, (b) operational definitions of OTR and positive feedback, (c) the same style line graph that had been provided in the previous phase, and (d) a verbal description (School A) or written description (School B) of the data that highlighted the trend of the data with some information about level. For example, the researcher might have said or written, “You are still providing about 1 OTR about every 5 minutes – same as you did yesterday.” However, the researchers did not specifically coach or prompt the teachers to do anything different. Each feedback session lasted approximately ten minutes, taking place during teacher planning periods in School A and after school via a private computer chat in School B. Because of multiple absences by the first teacher in School B, this second intervention phase was staggered in reverse fashion to allow Teacher 4 to re-establish a trend.

**Coaching and prompting.** The coaching phase was implemented with teachers in School B only due to logistical issues and time constraints associated with the semester end in School A. In this final phase, the researcher in School B presented the same enhanced feedback components as the previous phase but added specific written prompts about how OTRs might be used as an opportunity to provide more positive reinforcement. For example, the researcher wrote, “You are giving several OTRs, you should think about how to say something positive to a student as soon as he or she answers or complies.”

### **Social Validity**

As a measure of the intervention’s social acceptability, each subject completed a 13-item modified form of the Treatment Acceptability Rating – Revised (TARF-R), which is presented in

Figure 1. The form was revised to eliminate items related to treatments involving single students and parents.

Figure 1. Teacher Social Validity Responses to Likert-Scale Questions

1. How clear is your understanding of the intervention?  

1	2	3	4	5	6	7
Not Clear			Neutral		Very Clear	
2. How willing are you to carry out the intervention?  

1	2	3	4	5	6	7
Not at All			Neutral		Very Willing	
3. To what extent do you think there might be disadvantages in following the intervention?  

1	2	3	4	5	6	7
None likely			Neutral		Many likely	
4. How much time will be needed each day for you to carry out the intervention?  

1	2	3	4	5	6	7
Little time			Neutral		Much time	
5. How confident are you that the intervention will be effective?  

1	2	3	4	5	6	7
Not at all			Neutral		Very Confident	
6. How disruptive will it be to the classroom (in general) to carry out the intervention?  

1	2	3	4	5	6	7
Not at all			Neutral		Very Disruptive	
7. How much do you like the procedures used in the intervention?  

1	2	3	4	5	6	7
Not at all			Neutral		Very Much	
8. To what extents are undesirable effects likely to result from the intervention?  

1	2	3	4	5	6	7
Not at all			Neutral		Very Likely	
9. How willing would you be to change your routine to carry out the intervention?  

1	2	3	4	5	6	7
Not Clear			Neutral		Very Willing	
10. How well will carrying out the intervention fit into your routine?  

1	2	3	4	5	6	7
Not at all			Neutral		Very Well	
11. How important do you feel the opportunities to respond and positive feedback are as instructional strategies?  

1	2	3	4	5	6	7
Not Important			Neutral		Very Important	
12. How difficult do you feel it is to change opportunities to respond and positive feedback during instruction?  

1	2	3	4	5	6	7
Not Difficult			Neutral		Very Difficult	
13. How accurate do you feel the data was in terms of capturing what you do as a teacher?  

1	2	3	4	5	6	7
Not at all			Neutral		Very Well	



## Results

Results are described separately for School A and School B and are presented graphically in Figures 2 and 3.

### School A

**Teacher 1.** During baseline the mean frequency of OTR was .28 per minute (range = 0-.67) and no positive feedback was observed. With the introduction of graphic performance feedback data, the mean rate of group OTR increased slightly to .36 (range = 0 – 1.46) due to a single outlier but with no apparent change in trend or level and an almost total overlapping data points. Rates of positive feedback were unchanged – remaining near zero at .01 per minute (range = 0 - .07). With the introduction of enhanced feedback, provision of group OTR decreased slightly .12 per minute (range 0 = .4) while no change was noted in positive feedback (mean = 0 per minute).

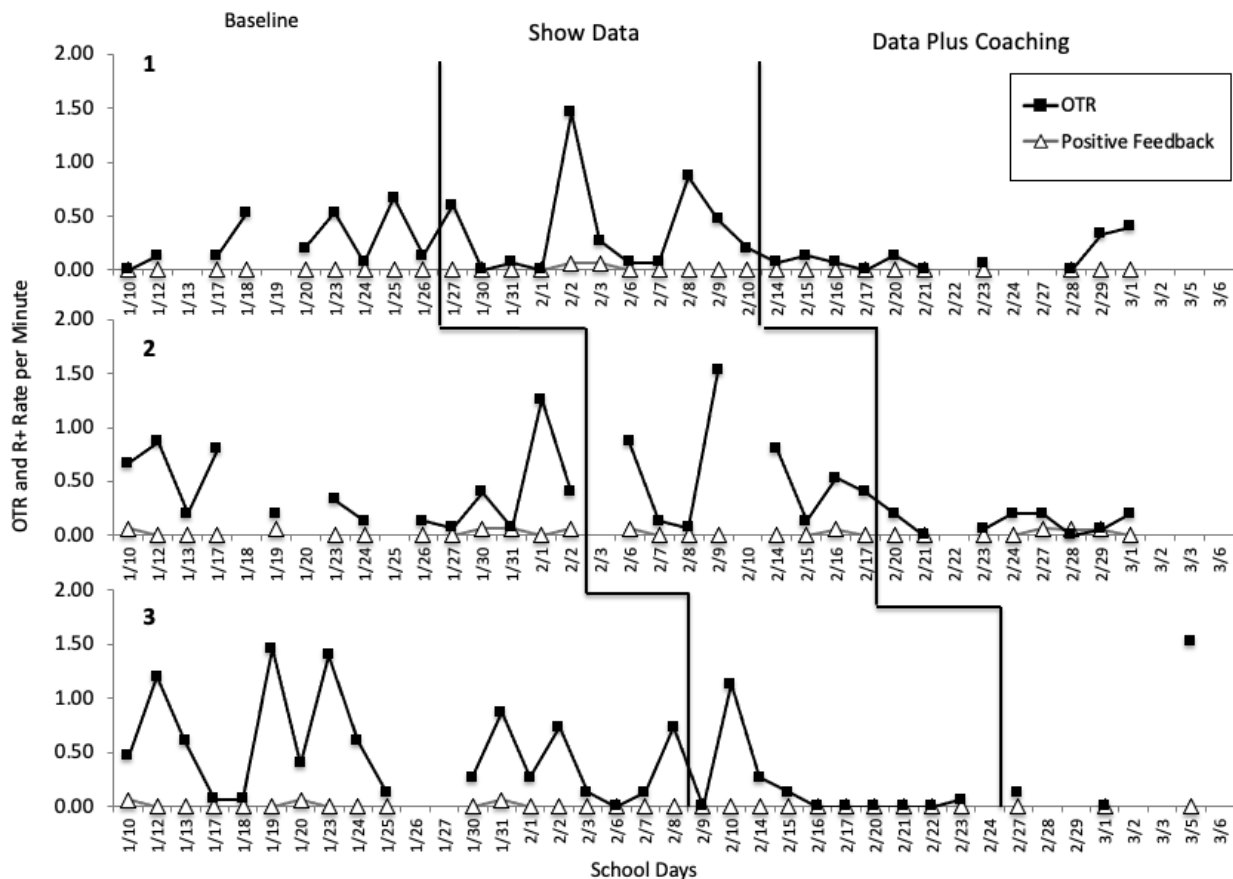
**Teacher 2.** During baseline the mean frequency of OTR was .43 per minute (range = .07 – 1.26 per minute), and positive feedback was observed at .02 per minute (range = 0 - .07). With the introduction of graphic feedback OTR increased slightly to .56 per minute (range = .07 – 1.53) but maintained high variability with no change in trend or level and largely overlapping baseline data. Instances of positive feedback remained relatively unchanged from baseline levels at .02 per minute (range = 0 - .07). With the introduction of enhanced feedback, OTR decreased to below baseline levels at .12 per minute (range = 0 - .20) and the positive feedback remained consistent with both previous phases at .02 per minute (range = 0 - .07).

**Teacher 3.** During baseline the mean frequency of OTR was .52 per minute (range = 0 – 1.46) and positive feedback was observed at .01 per minute (range = 0 - .07). With the introduction of graphic feedback, the OTR rate had one small increase followed by rates near

zero and a mean of .21 per minute (range = 0 – 1.13), while positive feedback remained relatively unchanged with none observed. With the addition of enhanced feedback, three data points for OTR show highly variable data surrounding numerous teacher absences at a mean of .55 per minute (range = 0 – 1.53) and again no positive feedback was observed.

Figure 2.

*OTR and Positive feedback rates per minutes across subjects in School A.*



**School B**

**Teacher 4.** During baseline the mean frequency of OTR was .21 per minute (range = 0 - .47) and positive feedback was observed at .013 per minute (range = 0 - 0.66). With the introduction of graphic feedback via a computer chat, the mean frequency of OTR was at .33 per minute (range = 0 - 1) with a moderate increasing trend while positive feedback remained low

and flat at .02 per minute (range = 0 - .066). With the introduction of enhanced feedback via computer chat, Teacher 4 had several absences and the overall level of OTR dropped slightly to .24 per minute (range = 0 - .4) while positive feedback again remained low and unchanged at .018 per minute (range = 0 - .066). In the final phase that included enhanced feedback plus coaching and prompting via a computer chat, rates of OTR held constant at .338 per minute (range = 0 - .86) with data that largely overlapped the previous phase. Rates of positive feedback again remained low and relatively unchanged at .021 per minute (range = 0 - .133).

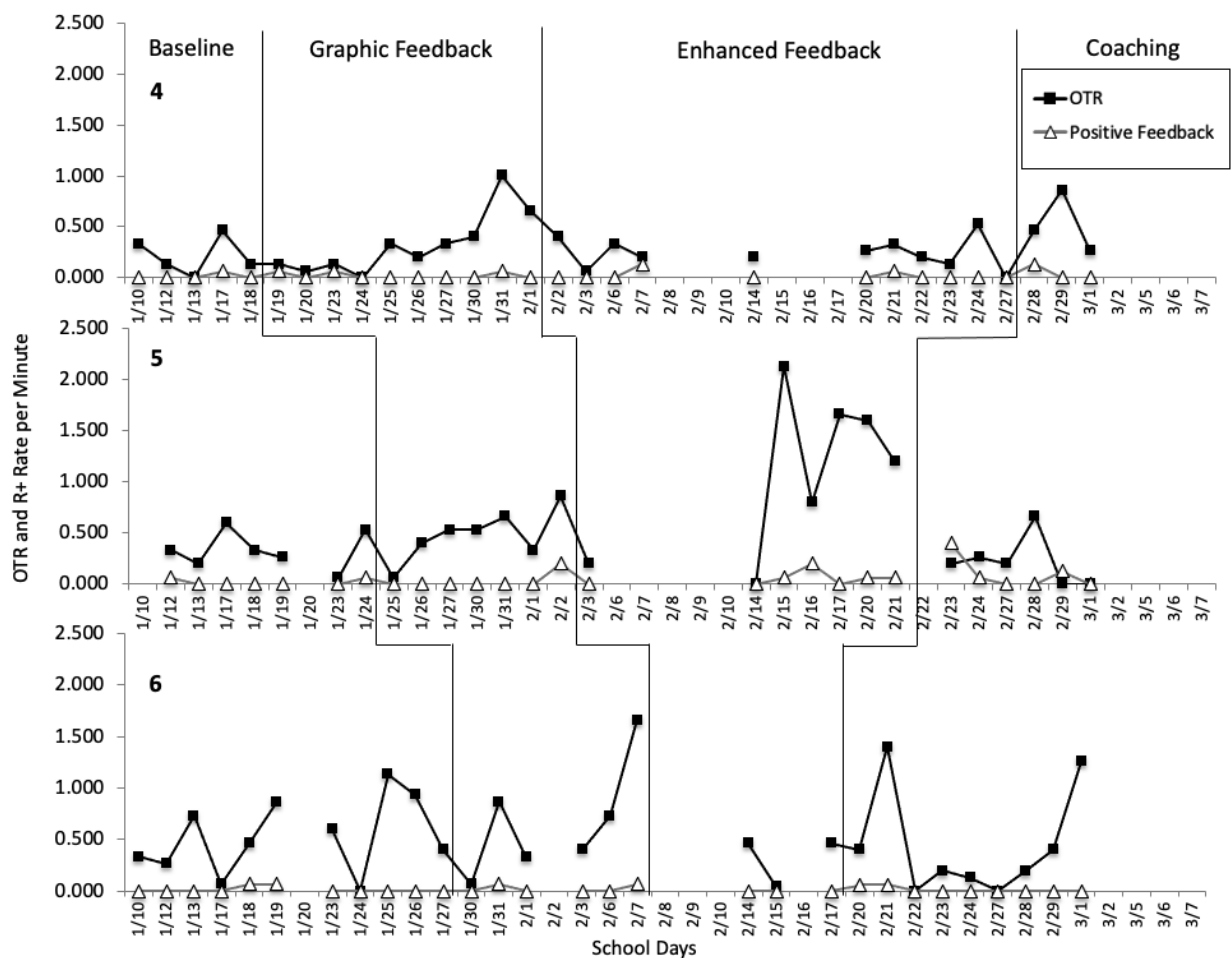
**Teacher 5.** The mean frequency of OTRs was .33 per minute (range = .06-.53) and group positive feedback at .018 per minute (range = 0-.066) during baseline. With the introduction of graphic feedback via a computer chat, the mean frequency of OTR was .42 per minute (range = .06-.66) with a moderate increasing trend and there were no examples of positive feedback. With the introduction of enhanced feedback via a computer chat, the mean frequency of OTR was 1.06 per minute (range = 0-2.13) a significant increasing trend while positive feedback was observed at .073 per minute (range = 0-.2) and remained low and flat. This showed a significant increase of 250% over graphic feedback alone in the use of OTR, albeit with high rates of variability. In the final phase that included enhanced feedback plus coaching and prompting via a computer chat, positive feedback increased very slightly to .098 per minute (range = 0-.4) while OTR decreased significantly in the final phase, returning to below baseline levels at .22 per minute.

**Teacher 6.** During baseline, the mean frequency of OTRs was .52 per minute (range = 0-1.13) and group positive feedback was only seen three times in 12 coding sessions at .012 per minute (range = 0-.066). With the introduction of graphic feedback via a computer chat, the mean frequency of OTR was .67 per minute (range = .33-1.66) with a moderate increasing trend and positive feedback was observed at .022 per minute (range = 0-.066) remaining low and flat.

With the introduction of enhanced feedback via a computer chat, the mean frequency of OTR was .324 per minute (range = .04-.466) with a moderate decreasing trend and there were no examples of positive feedback. During this phase, Teacher 6 actually decreased use of OTR and positive feedback. In the final phase that included enhanced feedback plus coaching and prompting via a computer chat, positive feedback increased very slightly to .017 per minute (range = 0-.06) remaining low and flat and positive feedback was observed in only two of nine coding sessions.

Figure 3.

*OTR and Positive feedback rates per minutes across subjects in School B.*



### **Social Validity**

TARF-R's Likert model scales from 1-7 with 1 corresponding to the lowest set of anchors (i.e. "Not Likely," "Little Time") and 7 corresponding to the highest set of anchors (i.e. "Very Confident," "Much Time"). Teachers strongly agreed with the following statements: (a) clarity of intervention ( $M=6.67$ ); (b) willingness to carry out intervention ( $M=6.33$ ); (c) confidence in the effectiveness of the intervention ( $M=6$ ); (d) acceptability of the procedures ( $M=6$ ); willingness to change teaching routine ( $M=6$ ); (e) how well the intervention fits in routine ( $M=5.67$ ). The teachers disagreed with the following statements: (a) disadvantages in following the intervention ( $M=1.33$ ); (b) intervention will take much time ( $M=2.33$ ); (c) intervention is very disruptive ( $M=1.67$ ); (d) undesirable effects are likely ( $M=1.33$ ); (e) intervention will need much time ( $M=1.33$ ).

### **Discussion**

Overall, the results do not support the findings of previous research indicating that provision of graphic and verbal feedback are associated with increased rates of teacher behavior (Sanetti et al., 2007). However, findings do support previous research on the difficulty of changing teaching behavior (Duffy & Roehler, 1986; Fullan, 1991; Richardson, 1994). There are several possible explanations for the lack of an effect, some of which are related to specific limitations of the studies.

### **Limitations**

Single case studies are difficult to generalize because the small number of participants, increasing risk of a Type II error. Further, the research designs did not include a counterbalancing of intervention sequencing. Thus, it is not clear whether enhanced feedback and coaching might have had a greater impact if introduced earlier in process and then followed by

simple graphic feedback. A further design issue concerns the length of the intervention phases. Because of unexpected teacher absences phases were drawn out for long periods despite little or no effect. It is possible that these lengthy phases caused teachers to lose interest in the study. As noted, two individuals did drop out and others expressed their pleasure when the study ended.

A second potential limitation is that no data was collected on student outcomes as a part of the observations. Thus, it is uncertain how often teachers had legitimate opportunities to provide positive feedback to students. It is possible (albeit unlikely) that the vast majority of teacher presented OTRs resulted in either failure to comply or incorrect responding. Collecting data on student behavior would provide information to better understand the number of legitimate opportunities teachers had to provide positive acknowledgement to students. Third, the length of the observation was only 15 minutes and occurred at the same time during the class each day. It is possible that teachers did increase their use of OTRs and positive feedback but that those changes were not captured during the observation time. Finally, because the study unexpectedly demonstrated no functional relationship between performance feedback and teacher behavior, an expanded qualitative analysis (i.e. structured-interview) might have shed further light on what obstructions subjects perceived as inhibiting their performance.

### **Hypotheses and Implications**

The initial hypothesis was that the interventions would prove effective with all subjects during the graphic feedback phase alone – but certainly after receiving the more enhanced version of feedback. In addition to the relative success of performance feedback in the literature, this hypothesis was based on the fact that the studies described herein were aligned with recommendations for successful teacher change including willing participants in a reform school (Sindelar et al., 2006), an easy to implement teacher variable (Huberman & Miles, 1984), and the

use of specific feedback (Fukkink et al., 2011). Further, the final coaching phase in School B moved beyond simple feedback and moved more into strategies of personal persuasion – but with no effect.

As was noted in the limitations section, these schools were both very busy with additional mandates as a result of being an identified low performing school. Although OTR and positive feedback were not a part of those efforts, it is likely that these teachers were overwhelmed with other demands. In addition, teachers were identified by the school's administrator and, although they were told that their participation was entirely optional, may have felt an obligation to participate with little desire to actually be involved. Social validity data indicate that teachers report the intervention to be both important and simple. As it was, the teachers did exactly what they were asked to do in that they looked at data with the designated coach each day. There was no request that teachers use the data to improve their performance (until the final phase with School B) as they were repeatedly told only of the definition of each variable and that evidence supported its use to increase student engagement. But no contingencies for performance were ever introduced and the researchers did not express any value judgments as part of any of the intervention phases. Further, no goals were set for teachers and no expectations expressed by their coaches. Thus, there were no incentives either to access a positive criterion or to avoid a negative judgment.

While the intent of this research was to study efficiency of teacher change using performance feedback in a high need school, similar studies typically have involved at least some basic level of goal setting or contingency (e.g., Colvin et al., 2008; DiGennario et al., 2007; Duchaine et al., 2011; Meyers et al., 2011; Reinke et al., 2007). Perhaps goal setting or some semblance of a contingency for performance is a necessary component of the teacher change

process when dealing with teachers who either exhibit extremely low rates of a target behavior, are being asked to change a behavior for which they have little incentive, or when the requested change represents a burden. These are questions ripe for further study in an attempt to discern how performance feedback might best be used to change teacher behavior in the schools.

The subject involved in these studies also received no training, instruction, or demonstrations of the effective use of OTR or positive feedback. While they were provided with information as to the association between these practices and student engagement, this was simply a rationale for monitoring and was not used as an avenue to train. Several similar studies involved formal and sometimes complex training sessions, sometimes involving role playing (Auld et al., 2010) and testing for competence (Mortenson & Witt, 1998). Clearly, individuals who have received intensive training are more likely to engage in behaviors than those who have not. As Guskey (2002) has noted, teachers normally abandon an instructional strategy after they find no effect on students. But in this case, teachers never implemented positive feedback at levels greater than once every 13.69 minutes (.073 per minute by Teacher 5 in the enhanced feedback phase) so there is little reason to believe that behavior is related to lack of effect. It is reasonable to assume that training sessions involving discussions, models, role playing, and testing to criterion levels prior to expected implementation would result in higher rates of OTR and positive feedback. Being that the focus herein was on efficiency, training was not included as a component but evidence certainly suggests that training may be a necessary component of teacher change, especially when baseline rates of a target behavior are extremely low. This question also is ripe for further research.

In sum, the current studies suggests that performance feedback alone is not effective as a means of changing teacher behavior with ninth grade teachers exhibiting extremely low rates of



target behavior in low performing schools. While previous research has shown that even rather simple exposure to graphic feedback has successfully changed teacher behavior, the current studies indicate that contextual factors associated with demographics and existing professional development demands may moderate those effects. For example, students from the lowest socioeconomic classes persistently lag behind in achievement, and over the past 25 years, the achievement gap between high- and low-income children has grown 30-40% to where it now is twice as large as the black-white achievement gap (Reardon, 2011). Schools with this achievement gap are more likely to be identified as persistently low performing and face significant mandates for increased professional development and assessment (Perlman & Redding, 2011). Evidence suggests that efficiency of teacher change may not be possible under such conditions. Future research must strive to better prescribe the conditions under which performance feedback is most effectively used and what additional components (e.g., intensive coaching) are necessary to enhance the positive changes that are necessary to increase the probability of student success.

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