



University of Kentucky
College of Education

Investigating the Relationship Between Teacher Feedback and Student Self-Efficacy

Megan K. Thomas, MS, Ellen Usher, PhD, & Natasha Mamaril, MS



Introduction

- Teacher feedback has a powerful influence on student learning, motivation, and achievement (Hattie & Timperley, 2007).
- Social cognitive theory provides a framework for considering the influence of teacher feedback on student motivation and success.
- Bandura (1997) named social persuasions as one of the four key sources of self-efficacy, or the belief in one's capabilities to carry out particular tasks. Students with higher *self-efficacy* tend to have higher academic achievement and persistence (Pajares & Urdan, 2006).
- Positive feedback generally raises self-efficacy and criticism undermines it.
- In the area of mathematics, researchers have shown that certain types of teacher feedback, including positive, ability-focused, and effort-focused feedback, are related to higher student mathematics self-efficacy and competence (Schunk, 1983, 1984; Schweinle, Meyer, & Turner, 2006).
- Researchers have also demonstrated that boys and girls tend to receive similar amounts of positive feedback from teachers in the area of mathematics (Foote, 2002). Boys often receive higher amounts of negative feedback than girls (Burnett, 2002).
- In this study, we look at social persuasions by focusing on how students perceive the messages their teachers send them in mathematics.

Purpose of the Study

The purpose of this study was:

- To investigate students' perceptions of the frequency of four types of teacher feedback (positive, negative, effort-focused, and ability-focused) in the domain of mathematics
- To determine whether gender differences exist in patterns of perceived feedback
- To examine the relationship between perceived feedback and students' mathematics self-efficacy

Method

Participants

Participants in the study were 200 sixth-grade students (94 girls; 106 boys) from a suburban middle school in the southeastern United States. Participants were from a variety of ethnic backgrounds (81% White, 8% Black, 4% Asian/Asian American, 3% Hispanic).



Sixth grade students from a suburban middle school taking the survey



Researcher reading the survey to students

Measures

Participants completed a survey of mathematics attitudes, which included measures of Teacher Feedback and General Mathematics Self-Efficacy.

Teacher Feedback

- This scale assessed students' perceptions of the frequency of their mathematics teacher's positive, negative, ability-focused, and effort-focused feedback and was measured using 22 items developed by Burnett (2002).
- Each item presented students with an example of a statement that their mathematics teacher might say (e.g., "Keep up the good work"). Students rated *how often* their teacher provides similar feedback to them during mathematics instruction (Likert-type scale, 1 = *Never*; 6 = *Almost always*).

General Mathematics Self-Efficacy

- Four-item scale adapted from Bandura (2006) (e.g., "In general, how confident are you in your abilities in math?"). Students rated their self-efficacy on a Likert-type scale (1 = *Not at all confident*; 6 = *Completely confident*).

Analyses

- One-way ANOVAs and post-hoc paired-samples *t* tests were used to examine mean differences in student perceptions of each type of teacher feedback. Correlations were calculated among each of the variables of interest.
- Independent-samples *t* tests were used to examine gender differences in perceptions of frequency for each type of feedback.
- Multiple regression analysis was used to investigate which types of teacher feedback predicted mathematics self-efficacy.

Results

Table 1. Means, Standard Deviations, Cronbach's Alphas, Zero-Order Correlations, and Paired-Samples *t* Tests

	M	SD	α	1	2	3	4	5
1. Math Self-Efficacy	5.2	1.0	.90	—				
2. Positive Teacher Feedback	4.5	1.2	.92	.42	—	17.42 ^a	11.05 ^b	10.43 ^c
3. Negative Teacher Feedback	2.4	1.1	.89	-.35	-.09	—	-9.63 ^d	-11.62 ^e
4. Ability-focused Teacher Feedback	3.8	1.5	.91	.44	.78	-.15	—	-1.85 ^f
5. Effort-focused Teacher Feedback	3.9	1.4	.89	.36	.80	-.03	.84	—

Note. Zero-order correlations are found below the diagonal. Paired-samples *t* tests are found above the diagonal. Paired-samples *t* tests were not calculated between Math Self-Efficacy and the types of teacher feedback.
^aCohen's *d* = 1.85. ^bCohen's *d* = 0.55. ^cCohen's *d* = 0.49. ^dCohen's *d* = -1.03. ^eCohen's *d* = -1.18. ^fCohen's *d* = -0.07.
 Yellow shaded boxes indicate a significant finding ($p < .01$).

Table 2. Means and Standard Deviations for Teacher Feedback Variables by Gender

	Girls (n = 93)		Boys (n = 103)		<i>t</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Positive Teacher Feedback	4.7	1.2	4.4	1.2	1.39	.25
Negative Teacher Feedback	2.1	1.0	2.7	1.2	-3.62	-.54
Ability-focused Teacher Feedback	3.9	1.6	3.7	1.5	.74	.13
Effort-focused Teacher Feedback	4.0	1.4	3.8	1.4	1.31	.14

Note. Yellow shaded boxes indicate a significant finding ($p < .01$).

Table 3. Multiple Regression Results for the Prediction of General Mathematics Self-Efficacy

Variable	<i>B</i>
Positive Teacher Feedback	.201
Negative Teacher Feedback	-.284**
Ability-focused Teacher Feedback	.297*
Effort-focused Teacher Feedback	-.061
<i>R</i> ²	.29**
<i>F</i>	19.77**

* $p < .05$. ** $p < .01$.

Key Findings

- Students who perceived higher amounts of positive, ability-focused, and effort-focused teacher feedback reported higher levels of self-efficacy.
- Students who perceived higher levels of negative teacher feedback reported lower levels of self-efficacy.
- Boys reported receiving significantly higher levels of negative teacher feedback in mathematics than did girls.
- No significant gender differences were found for positive, ability-focused, and effort-focused feedback.
- Student perceptions of the frequency of negative teacher feedback and ability-focused teacher feedback significantly predicted mathematics self-efficacy.

Conclusion

- Students perceive significantly more positive feedback than they do effort, ability, or negative feedback. This is consistent with previous research (Brophy, 1981; Hattie & Timperley, 2007). This finding could indicate a positive perceptual bias on the part of students or could reflect the actual feedback patterns at work in middle school classrooms. We suggest testing this latter possibility with observational approaches.
- Only negative feedback and ability-related feedback predicted self-efficacy. Teachers should be attentive to their use of negative and ability-focused feedback when attempting to enhance student self-efficacy.
- Unlike many feedback studies that rely on experimental approaches, this naturalistic design that surveyed students in their mathematics classrooms offers a clearer picture of feedback processes that occur in the classroom.
- Future research should examine whether correspondence and specificity between feedback and self-efficacy measures alter these findings (Bandura, 1997).

References

- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Bandura, A. (2006). Guide for constructing self-efficacy scales. In F. Pajares & T. Urdan (Eds.), *Self-efficacy beliefs of adolescents* (pp. 339-367). Greenwich, CT: Information Age Publishing.
- Brophy, J. (1981). Teacher praise: A functional analysis. *Review of Educational Research*, 51, 5-32.
- Burnett, P. C. (2002). Teacher praise and feedback and students' perceptions of the classroom environment. *Educational Psychology*, 22, 5-16. doi: 10.1080/01443410120101215
- Foote, C. (2002). Gender differences in attribution feedback in the elementary classroom. *Research in the Schools*, 9, 1-8.
- Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, 77, 81-112. doi: 10.3102/003465430298487
- Pajares, F., & Urdan, T. (Eds.). (2006). *Adolescence and education, Vol. 5: Self-efficacy beliefs of adolescents*. Greenwich, CT: Information Age Publishing.
- Schunk, D. H. (1983). Ability versus effort attributional feedback: Differential effects on self-efficacy and achievement. *Journal of Educational Psychology*, 75, 848-856.
- Schunk, D. H. (1984). Sequential attributional feedback and children's achievement behaviors. *Journal of Educational Psychology*, 76, 1159-1169.
- Schweinle, A., Meyer, D., & Turner, J. (2006). Striking the right balance: Students' motivation and affect in elementary mathematics. *Journal of Educational Research*, 99(5), 271-293.

For more information, please contact Megan Thomas: megan.kk.thomas@uky.edu