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Efficacy and Pedagogical Interaction in Cooperating and Student Teacher Dyads

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ABSTRACT

Cooperating teachers are believed to have a tremendous influence on new teachers' beliefs and practices, but few researchers have systematically studied the mechanism through which cooperating teachers exercise their influence. This study is concerned with pedagogical interaction that occurs between intact pairs of cooperating and student teachers. Specifically, we examined predictors of cooperating teachers' self-reported pedagogical interaction with their student teachers. Results indicate that the efficacy beliefs of cooperating teachers, and the extent to which they believed student teachers imitated their instruction, predicted how much guidance cooperating teachers reported providing. Implications for further research and for student teaching are discussed.

INTRODUCTION

Grossman (2005) described the pedagogy of teacher education as those aspects of teacher preparation that are concerned with *how* student teachers learn to teach. Pedagogy of teacher education may include classroom instruction and interaction among teachers and students, as well as the tasks or assignments completed by student teachers. Researchers of teacher education pedagogy typically focus on the effects of course content and instructional strategies on the professional practice and attitudes of new teachers. The pedagogical influence of interactions between cooperating teachers and student teachers, however, is typically not examined.

Cooperating and mentor teachers are believed to influence new teachers' work socialization, feelings of career satisfaction, perceptions of the professional role, philosophies of teaching, instructional practices, and perhaps even their decision to continue working in the teaching field (Achinstein & Barrett, 2004; Britzman, 2003; Brouwer & Korthagen, 2005; Goodfellow, 2000; Kelchtermans & Ballet, 2001; Seperson, & Joyce, 1973). Documenting the influence of cooperating teachers has been the subject of many studies, however, few have specifically focused on the types and qualities of interaction between these teacher groups as a mechanism for that influence, or on how efficacy beliefs about teaching may influence cooperating teachers' decisions to interact with their student teachers.

In addition, self-efficacy of practicing and preservice teachers has often associated with important educational outcomes including valuing of educational intervention (Cousins & Walker, 2000) and classroom management skills (Woolfolk, Rosoff, & Hoy, 1990). Given the positive findings from research on teacher efficacy, we felt it was important to examine the relations among cooperating and student teachers efficacy beliefs with respect to the types of interaction cooperating teachers believed they are engaging with their student teachers. Examining the manner in which these teacher pairs interact may uncover the means by which cooperating teachers effectively communicate and convince student teachers about important aspects of working in schools and classrooms.

Influence of Cooperating Teachers on Student Teachers

Research examining the influence cooperating teachers have on student teachers has already provided important insights into the process of learning to teach. For example, Hollingsworth (1989) suggest that cooperating teachers may exert their influence on student teachers through actions that express their desire to maintain established procedures and practices that are consistent with their understanding of how learning occurs and how instruction should be structured. Student teachers in that study most often found their own beliefs to be congruent with those of the cooperators' who provided a setting for easy replication of instructional practice, and resulted in little need for negotiation or change in

student teachers' pedagogical knowledge. Guyton and McIntyre (1990) summarized earlier research specifically related to interactions between cooperating and student teachers that occurred during one-to-one conferences. Similar to Hollingsworth's (1989) findings, they concluded that the content of these conferences was not likely to be helpful for assisting new teachers in learning to teach.

More recently, Borko and Mayfield (1995) identified two distinct types of interaction patterns that that occurred during 1-to-1 conferences. The type of pattern that was most likely to occur was based, in part, on the cooperating teachers' perception of their role in helping the student teacher learn to teach. One group of cooperating teachers believed they should be actively involved in their student teachers' learning. Teachers in this group held more regularly scheduled conferences and these conferences tended to be longer in duration. Student teachers' perceptions of the influence of these cooperating teachers was positive and extended to a wide range of teaching activities, including planning and teaching in their specific content area. In contrast, the second group of cooperating teachers seemed to believe they should not be actively involved in their student teachers' learning but should let them learn on their own. Teachers in this group held fewer conferences, and conferences tended to last for shorter periods of time. Student teachers were much less positive about how these cooperating teachers contributed to their learning to teach. These findings suggest that the beliefs and perspectives of cooperating teachers, as well as their beliefs about what they might contribute to the knowledge of student teachers, may influence the usefulness of conferences.

In addition to work focusing on the content of interaction, a few researchers have also examined how cooperating teachers may influence the interpersonal outcomes of student teachers. For example, Kremer-Hayon and Wubbels (1993) examined the influence of the interpersonal behaviors of cooperating teachers on student teachers' satisfaction during practicum experiences. Student teacher satisfaction was positively related with perceptions of cooperating teachers' interpersonal behaviors characterized as demonstrating leadership, being helpful and friendly, and being understanding. Satisfaction was negatively related with perceptions of cooperating teacher behaviors characterized as exhibiting uncertainty and being dissatisfied with the student teacher. The effects of the student-teacher experience, including the interaction between cooperating and student teachers, has also been found to have important implications for the motivation of student teachers (Britzman, 2003; Hamman et al., 2006).

Teacher Efficacy

Teacher self-efficacy seems to be one of the most widely used approaches for analyzing the motivation of teachers (e.g., Coladarci, 1992; Goddard, Hoy, & Woolfolk-Hoy, 2000). Teacher efficacy refers to a judgment that individual teachers make about their own capabilities to successfully perform specific teaching tasks, including engaging students, using specific instructional strategies, and the ability to manage students in a classroom setting (Tschannen-Moran, & Woolfolk-Hoy, 2001). This judgment about capabilities has been associated with a number of important educational outcomes including student achievement in reading and mathematics, as well as teachers' classroom behaviors, planning and organizational skills, preference for classroom management strategies, perceptions of stress, success of program implementations, and sustainability of new program initiatives over time (Tschannen-Moran, Woolfolk-Hoy, & Hoy, 1998).

Teachers' efficacy judgments are also sensitive to specific contexts often found in classroom and school settings. For example, efficacy may be influenced by whether teachers are teaching academic versus non-academic-track students, the overall climate of the school and sense of community perceived by teachers, behavior of the principal, and pressure to comply with curriculum, colleagues, or performance standards (Pelletier, Seguin-Levesque & Legault, 2002; Tschannen-Moran, Woolfolk-Hoy, & Hoy, 1998). If efficacy beliefs of teachers are affected by school contexts, and are predictive of the types and quality of teaching behaviors they are likely to exhibit, then it also seems likely that teacher efficacy may also influence the manner in which cooperating teachers interact with their student teachers during the teaching practicum. That is, the ways in which cooperating teachers choose to interact with student teachers, as reported by Borko and Mayfield (1995) for example, may be affected by the efficacy held by the cooperating teacher.

Theoretical Framework for Examining Interaction

Interaction between members of dyads has been studied extensively in relation to cognitive development. Many of these studies used a research design requiring dyads to collaborate on some form of problem-solving activity. There are several obvious differences between the dyads in developmental studies with children and the dyads composed of a cooperating teacher and a student teacher (e.g., context for working together, duration, objectives), but the results from these studies seem to have a number of provocative implications for interaction between cooperating and student teachers.

Interaction as a causal factor in cognitive development. Overall, it appears that interaction between peers enhances problem-solving capabilities (e.g., Doise, Mugny, & Perret-Clermont, 1975). Interaction may be especially effective at improving performance of novices when the task at hand is ill-defined such as resolving a moral dilemma (Phelps & Damon, 1989), and when members of dyads possess differing levels of expertise (Duvan & Gauvain, 1983). The present study extends these findings by examining the interactions among experienced and novice teachers working at the ill-defined and complex task of teaching.

A model for classifying interaction. One model that may be useful for integrating these findings and examining interaction between cooperating and student teachers is the dyadic interaction model described by Grannot (1993). Grannot articulated a framework for classifying and analyzing interactions of dyads based on the cognitive change theories of both Piaget and Vygotsky. This framework consisted of two continua along which interactions may be classified. The first continuum is concerned with the relative expertise of the two actors. These interactions can be considered symmetrical when participants have equivalent expertise (i.e., experienced-experienced or novice-novice) or asymmetric when experience levels vary (i.e., experience-novice). In the present study, we assumed that interactions regarding instruction between cooperating and student teachers would most accurately be categorized as an asymmetric (expert-novice) condition with respect to the first continuum.

The second continuum is concerned with the degree of collaboration within the dyad. Within the asymmetric condition, Grannot (1993) described interaction that involved only the actions of the novice who attempts to copy an expert. In this type of interaction, the expert does not collaborate with the novice except to exhibit specific behaviors of interest to the novice. A classification of interaction that connotes greater collaboration is guidance. In this type of interaction, the expert more actively collaborates with the novice by directing the behavior of the novice toward a particular goal.

We applied these types of collaboration to the exchanges concerning instruction that might occur between a cooperating and student teacher. We identified two main interaction types: imitation and guidance (Hamman et al., 2006-2007). A case where there is a low level of collaboration about instruction between the cooperating and student teacher may be described as *imitation*. During interactions characterized by imitation, the cooperating teacher functions in a manner that does not directly acknowledge the needs of the student teacher, but rather continues on with "business as usual" leaving the student teacher to figure things out on her or his own. The expectation may be that through observation, the student teacher will eventually imitate the instructional actions of the cooperating teacher.

A higher level of interaction concerning instruction involves the direction or *guidance* of the student teacher by the cooperating teacher. The student teacher is treated more like an apprentice. In such a situation, the cooperating teacher actively directing the student teacher's learning about instruction. Cooperating teachers who engage in guidance-types of interaction are taking an active role in the student teacher's learning.

Focus of the Current Research

The present study addresses two questions related to how efficacy beliefs are related to pedagogical interaction. First, how do the efficacy beliefs of cooperating teachers influence the types and frequency of pedagogical interaction with which they engage the student teacher? Second, how do the efficacy beliefs of the student teacher relate to the interaction behaviors of the cooperating teacher?

METHODS

Paricipants

Participants were existing pairs (n = 38 pairs) of cooperating and student teachers that were arranged for the purposes of the teaching practicum. All student teachers were from a large state university in the Southwest, and were completing their semester-long teaching practicum in local districts as part the state requirement for elementary-level certification.

Student-teacher participants. Thirty-six of the student teachers identify themselves as White (95%), and two participants identify themselves as Hispanic (5%). Thirty-five of the participants are female (92%), and three participants are male (8%). The average age of student teachers at the time of initial data collection was 24.8 years (minimum = 21 yrs; maximum = 50 yrs).

Cooperating-teacher participants. Cooperating teachers were those working in local districts nearby the university and who had volunteered to host a student teacher during the fall semester. Thirty-three cooperating teachers identify themselves as White (90%), and three identify themselves as Hispanic (5%). Thirty-six of the cooperating teachers are female (94%), and two are male (6%). Cooperating teachers reported having, on average, 9.3 years teaching experience. Cooperating teachers were not asked to report their age.

Measures

Teacher Sense of Efficacy Scale (TSES). The TSES (formerly the Ohio State Teacher Efficacy Scale) is a 24-item Likert-type scale that measures teacher efficacy for using instructional strategies, managing a classroom, and engaging students in school-related activities (Tschannen-Moran & Woolfolk-Hoy, 2001). Tschannen-Moran and Woolfolk-Hoy (2001) reported means, standard deviations, and reliabilities for responses to the complete scale (M = 7.10, SD = .94, α = .94). In their initial work, Tschannen-Moran and Woolfolk-Hoy found that practicing teachers' responses to this scale commonly differentiated into three factors (i.e., engagement, instruction, classroom management), but this factor structure was not stable for less experienced teachers. Recent work using parallel factor analysis procedures indicates that a single-factor solution is probably more appropriate for preservice teacher groups (e.g., Buehl, Manning, Cox, & Fives, 2005). Therefore we elected to use a single factor or total efficacy score for parts of our data analysis.

Learning to Teach Questionnaire (LTQ). The LTQ is intended to examine patterns of interaction concerning instructional matters that might occur between cooperating and student teachers (Hamman, Olivarez & Stevens, 2006-2007) (see Appendix). This 10-item, 6-point Likert-type questionnaire required respondents to rate the frequency with which an interaction behavior occurred, where 1 indicated that the interaction behavior "never" occurred, and 6 indicated that the interaction "always" occurred. Items in this questionnaire reflect the framework of collaborative interactions proposed by Grannot (1993).

Initial work on the factor structure of this measure revealed two subscales of interaction consistent with Grannot's (1993) framework. The first factor represented the occurrence of guidance behaviors exhibited by the cooperating teachers (α = .95; e.g., My cooperating teacher offers suggestions to improve my instruction; My cooperating teacher gives me feedback that promotes self-reflection about my instruction). The second factor represents the occurrence of imitative behaviors exhibited by the student teacher (α = .89; e.g., I watch what my cooperating teacher does during instruction and then try it myself; When I teach, I replicate my cooperating teacher's instruction).

Procedures

Cooperating teachers were recruited at their orientation meeting held at a local elementary-school campus, and student teachers were recruited at their initial student-teaching orientation meeting held at the university. Volunteers from each group agreed to participate independent of the other, but only those pairs (i.e., cooperating and student-

TABLE 1

Correlation Coefficients and Descriptive Statistics for Cooperating and Student Teacher Variables

		Student teacher					Cooperating teacher				
	Variables	1	2	3	4	5	6	7	8	9	10
Student teacher											
1	Engagement TE	1.00	.90**	.85**	.28	-.22	.37*	.41*	.16	.15	-.41*
2	Instruction TE		1.00	.82**	.31	-.22	.35	.37*	.16	.16	-.38*
3	Classroom Management TE			1.00	.38*	-.05	.31	.28	.18	.23	-.31
4	Perceived guidance				1.00	.52*	.38*	.39*	.38*	.47**	-.11
5	Perceived imitation					1.00	.16	.19	.23	.26	.14
Cooperating teacher											
6	Engagement TE						1.00	.90**	.64**	.39*	-.14
7	Instruction TE							1.00	.59**	.31	-.10
8	Classroom Management TE								1.00	.25	-.01
9	Perceived guidance									1.00	.25
10	Perceived imitation										1.00
	Mean	6.57	6.39	6.40	4.75	4.54	7.62	7.89	8.16	4.81	4.50
	SD	1.08	1.11	1.43	1.09	.78	.76	.70	.62	.71	.66

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

teacher pairs), who both agreed to participate, comprised the current sample of participants. That is, some student teachers agreed to participate, but their cooperator did not (or visa versa), so these volunteers were dropped from the study sample. Participant pairs were then contacted separately via e-mail within four weeks of the beginning of the teaching practicum and provided a link and password to the secure questionnaire site. Participants completed the survey with reference to the behaviors of one another, but did so independently and with assurances of the confidentiality of their responses. All responses were gathered by the sixth week of the 12-week practicum. Participants completed the two measures in less than 15 minutes.

RESULTS

Relation Between Efficacy and Interaction

Table 1 displays correlation coefficients and descriptive statistics for cooperating and student teacher variables. These results indicate an interesting relation between the perceptions of interaction from cooperating and student teachers, as well as the impact of interaction on efficacy. First, the level of guidance reported by the cooperating teacher is significantly related to the level of guidance reported by the student teacher ($r = .47$, $p < .01$). This suggests that both participants are making reference to similar events when making judgments about pedagogical interaction. Second, in terms of efficacy and interaction, cooperating teachers who perceive their student teacher to imitate them more had student teachers with lower levels of engagement ($r = -.41$, $p < .05$), instructional efficacy ($r = -.38$, $p < .05$), and efficacy for classroom management followed a similar pattern. These relations suggest that cooperating teachers perceive imitation negatively, and occurring more frequently among low-efficacy student teachers. This relationship did not exist for student teachers, however, whose efficacy judgments were not significantly related to interaction. Third, efficacy beliefs of student teachers were significantly correlated with engagement ($r = .37$, $p < .05$) and instructional efficacy ($r = .37$, $p < .05$) of cooperating teachers. Finally, the level of guidance interaction reported by the cooperating teachers was significantly correlated with their efficacy for engagement only ($r = .39$, $p < .05$) and not by any other efficacy belief or rating of imitation frequency.

The fact that most of these coefficients are statistically significant, but moderate, suggests that confidence about engaging, instructing and managing students in a classroom (i.e., teacher efficacy) has a common underlying construct with confidence about interaction within a dyad during the teaching practicum, whereas the relation between cooperators' actions and student teachers' efficacy judgments may suggest that the actions of the cooperator influence or are influence by the efficacy judgments of student teachers. That is, cooperating teachers' interaction may affect student teachers' confidence, or student teachers' confidence may influence the types of interaction cooperators engage in during the practicum.

Influences on Cooperating Teachers' Guidance

Table 2 displays the correlations among the variables in the regression analysis, including the unstandardized regression coefficients (*B*) and intercept, the standardized regression coefficient (β), the semipartial correlations (sr^2), and *R*, R^2, and adjusted R^2 after entry of all the indepen-

TABLE 2

Sequential Regression of Efficacy and Imitation on Cooperating Teachers' Guidance Interaction

	Guidance						sr^2
Variables	(DV)	1	2	3	B	β	(incremental)
1 ST efficacy	.19				.12	.21	.037
2 CT engagement	.39	.36			.35	.37	.120
3 CT imitation	.25	-.38	-.14		.41	.38	.124
				Intercept = -.49			
M	4.81	6.45	7.62	4.50			
SD	.71	1.14	.76	.66	R^2	.28	
					Adj-R^2	.22	
					R	.53	

dent variables. *R* was significantly different from zero after step 3. After step 3, with all IVs in the equation, $R = .53$, $F(3, 37) = 4.43$, $p = .01$.

After step 1, with student teachers' total efficacy score entered in the equation, $R^2 = .03$, $F_{inc}(1, 37) = 1.38$, $p = .24$. After step 2, with cooperating teachers' engagement efficacy entered in the equation, $R^2 = .16$, $F_{inc}(1, 37) = 4.96$, $p = .03$. Addition of cooperating teachers' engagement efficacy results in a significant increment in R^2. Finally, after step 3, with cooperating teachers' perceptions of imitation entered in the equation, $R^2 = .28$, $F_{inc}(1, 37) = 5.88$, $p = .02$. Addition of imitation results in a significant increment in $R^2 = .28$ (adjusted R2 = .22).

These results suggest that cooperating teachers' efficacy and the frequency with which they perceive student teachers to be imitating their instructional behavior are related to the frequency with which they engage in guidance interaction. That is, it seems that cooperating teachers appear to provide guidance more when they feel efficacious about teaching, and perceive the student teachers to be copying their instructional behaviors.

DISCUSSION

Experienced teachers can play an important role in the development of new teachers. The findings from this study suggest that the occurrences of pedagogical interaction may be influenced, in part, by the efficacy beliefs of the cooperating teachers, and their perceptions of the instructional imitation of the student teacher.

Relation Between Interaction and Efficacy

There appears to be a fairly consistent relationship between teacher efficacy beliefs and manifestations of interaction behavior. Student teachers' and cooperating teachers' perception of the frequency with which guidance occurred was moderately correlated with some aspect of teaching efficacy. There seemed, however, to be very little relation between the efficacy beliefs of cooperating and student teachers. In terms of pedagogical interaction, efficacy for engagement appears to be the best predictor for the extent to which cooperating teachers engaged in guidance interaction with their student teachers, but their perceptions of how frequently the student teacher imitates instructional behaviors seems to also influence their behaviors.

The relation between ratings of imitation and student teachers' efficacy raises some interesting issues about how perceptions are mediated in a dyad through the actions of the other. In particular, this finding is interesting because it suggests that cooperating teachers may interpret the behaviors of student teachers' in one of two ways. In the case of imitation interactions, cooperating teachers may view imitation as a form of interest or engagement, on the part of student teachers, in what the cooperator is able to offer the new teacher. The guidance interaction, in this case, would be more of a response to reinforcement given by student teachers that might enhance engagement efficacy of cooperating teachers. On the other hand, cooperating teachers may view student teachers' imitation as an indication that the student teacher is in greater need of assistance. The guidance interaction, in that case, would be more of a response to the perceived needs of student teachers. The results from the current study, and the status of the field at present make it impossible to know definitively the direction of influence.

For student teachers, however, the relation between their efficacy and perceptions of interaction seems clearer. Results from previous research (Hamman et al., 2006) and the current findings suggest that the extent to which student teachers perceive guidance from their cooperating teachers is positively related to teaching efficacy. This result is consistent with developmental studies showing the importance of trans-active statements in dyadic interaction for developing problem-solving capabilities (Berkowitz & Gibbs, 1993), and with the findings of Borko and Mayfield (1995) showing positive outcomes for student teachers whose cooperators took a more active role in the teaching practicum.

Limitations and Further Questions about Interaction

There are limitations of the present study that should be noted. First, the sample size is relatively small given some of the statistical analyses used, and this may have implications for the weight given to the current results. A larger sample is obviously desirable for future work in this area. Second, the ratings of the frequency of interaction were all self-report, and although there appears to be a moderate level of agreement among pairs of cooperating and student teachers about the frequency with which guidance interaction occurs, there is clearly less agreement about how frequently imitation occurs. Identification of explicit guidance or imitative behavior will be useful in future research. Third, the analyses and conclusions reported here were derived from data collected within the first half of the student teaching semester. It is unclear whether perceptions of interaction remain constant over the course of the practicum semester, or whether perceptions might change as the semester proceeds. Finally, all the participants in this study were elementary-certification candidates. It seems possible that differences might be found in interaction behaviors of cooperating teachers based on the school level.

In the future, researchers could focus on the changes

to interaction behaviors and efficacy beliefs for student and cooperating teachers over time and across levels of teaching. Likewise, it seems fruitful to examine the basis from which student teachers and cooperating teachers make decisions about pedagogical interaction. The results from this study suggest that the decision of cooperating teachers to provide guidance to student teachers is influenced partially by the efficacy beliefs of cooperating teachers, and informed partially from their observation of their student teachers.

The sequence of interaction between the members of the dyad, and the judgments that precedes cooperating teachers' decisions to provide guidance seems to be of greatest importance for teacher education in that guidance may be the means through which information about the role of teacher is communicated.

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APPENDIX

Learning to Teach Questionnaire (LTQ) Items by Subscale

(Hamman, Olivarez, Jr., & Stevens, 2006-2007)

Imitation Interactions (α = .89)

I teach in a way that is similar to my cooperating teacher.

I watch what my cooperating teacher does during instruction and then I try it myself.

When I teach, I use similar materials as my cooperating teacher.

When I teach, I replicate my cooperating teacher's instructional methods.

When I'm using new materials, I stay pretty close to what my cooperating teacher does.

Guidance Interaction (α = .95)

My cooperating teacher offers suggestions to improve my instruction.

My cooperating teacher gives me feedback after watching me teach.

My cooperating teacher offers me guidance to improve my teaching.

My cooperating teacher gives me feedback that promotes self-reflection about my instruction.

My cooperating teacher and I have worked together to improve my instruction this semester.