Am I as You See Me or Do You See Me as I Am? Self-Fulfilling Prophecies and Self-Verification

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This research investigated the extent to which self-fulfilling prophecies and self-verification occurred among 108 teachers and 1,692 students in 108 sixth-grade public school math classrooms. Results demonstrated three main findings. Self-fulfilling prophecies and self-verification occurred simultaneously in a context where perceivers and targets had highly valid information on which to base their initial perceptions. The availability of highly valid information led perceivers and targets to develop initially similar perceptions before mutual influence took place. High similarity between perceivers' and targets' initial perceptions had no effect on the power of self-verification but weakened the effect of self-fulfilling prophecies for some targets. These findings are discussed in terms of their implications for extended and close relationships and how the nature of people's perceptions may influence the power of self-fulfilling prophecies and self-verification.

In areas as diverse as public school classrooms and military camps in Israel, people's (i.e., perceiver's) false beliefs create self-fulfilling prophecies by shaping how others (i.e., targets) behave and view themselves (e.g., Eden & Shani, 1982; Jussim, Eccles, & Madon, 1996). However, targets are rarely so malleable that they simply become what others expect them to be. Targets also self-verify during social interactions by convincing perceivers to adopt expectations that match their own self-concepts (Swann, 1987). Several studies have demonstrated that these processes can occur simultaneously (Major, Cozzarelli, Testa, & McFarlin, 1988; McNulty & Swann, 1994; Swann & Ely, 1984). However, those studies focused on social relationships in which perceivers had little or invalid information about targets. Mutual influence may operate differently when perceivers have a wealth of valid information on which to base their perceptions. The current research addressed this issue by examining self-fulfilling prophecies and self-verification within sixth-grade public school math classrooms where

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teachers and students both had access to highly valid information about students.

Self-Fulfilling Prophecies

Merton (1948) introduced the term self-fulfilling prophecy to refer to false beliefs that lead to their own fulfillment. He argued that self-fulfilling prophecies were responsible for a host of social problems ranging from bank failures to discrimination against ethnic minorities. However, it was not until Rosenthal and Jacobson (1968) demonstrated that teacher expectations could shape student achievement that self-fulfilling prophecies became a major topic in social psychology. Since Rosenthal and Jacobson's classic research, there have been literally hundreds of studies devoted to examining the self-fulfilling nature of expectations. This research has demonstrated the widespread existence of self-fulfilling prophecies across a variety of settings (Harris & Rosenthal, 1985; Rosenthal & Rubin, 1978). Of particular interest to educational and social psychologists have been the self-fulfilling effects of teacher expectations on students' self-concepts. By changing how students view themselves, teachers may influence students' educational and occupational opportunities.

The shaping of student self-concepts through self-fulfilling prophecies is well documented. Feedback regarding ability influences student self-perceptions of ability under experimental conditions (e.g., Jussim, Soffin, Brown, Ley, & Kohlhepp, 1992). Moreover, naturalistic studies show that teacher expectations predict student self-concepts (Parsons, Kaczala, & Meece, 1982; Vallerand, Fortier, & Gray, 1997; see Eccles & Wigfield, 1985, for a review) and students' own performance expectations (Brattesani, Weinstein, & Marshall, 1984), even after controlling for previous student achievement. Thus, there is considerable evidence that targets often come to view themselves as others see them.

Self-Verification

However, targets do not always change their self-concepts in response to perceiver expectations. In fact, at about the same time that Merton (1948) discussed the power of beliefs to shape reality, Lecky (1945) discussed targets' desire for information that validates their preexisting self-concepts. Researchers have recently taken Lecky's ideas regarding self-consistency motives one step further by arguing that targets actively engage in self-verification (e.g., Swann & Ely, 1984; Swann & Hill, 1982; Swann, Pelham, & Krull, 1989; Swann & Read, 1981). According to self-verification theory (Swann, 1987), targets not only desire information that is consistent with their self-concepts but also take active steps to increase the likelihood that self-consistent information will be forthcoming.

For example, targets have better recall for information that matches their self-concepts, retain such information more accurately, view it as more credible, and believe that it reflects their own abilities better than information that is inconsistent with their self-concepts (see Jones, 1973; Shrauger, 1975; Swann, 1987, for reviews). Targets also select interaction partners who provide feedback that is congruent with their self-concepts more often than they select interaction partners who provide feedback that is incongruent with their self-concepts (Swann et al., 1989; Swann & Predmore, 1985; Swann, Stein-Seroussi, & Giesler, 1992). These findings indicate that targets often maintain their preexisting self-concepts by distorting and/or changing perceiver expectations.

Mutual Influence: Self-Fulfilling Prophecies and Self-Verification

Although self-fulfilling prophecies and self-verification may occur simultaneously, research addressing these processes has remained largely independent, focusing on either self-fulfilling prophecies or self-verification. We are aware of only three exceptions. Major et al. (1988) and Swann and Ely (1984) provided perceivers with information about targets' personalities and then had perceivers and targets interact. Both studies found evidence of mutual influence. Major et al. found that perceivers changed how sociably targets perceived themselves, whereas targets also convinced perceivers to view them more in line with their own perceptions of sociability. Swann and Ely found that perceivers sometimes led targets to confirm their initial expectations about the targets' introversion or extroversion. Targets also changed perceiver expectations to more closely match their own self-concepts of introversion or extroversion. McNulty and Swann (1994) found similar findings under naturalistic conditions. College students modified their self-concepts to more closely match their roommates beliefs about them (e.g., athletic and academic ability) while also changing their roommates' beliefs to more closely match their own self-concepts.

These findings indicate that self-fulfilling prophecies and self-verification can occur simultaneously. However, these studies were restricted to contexts in which perceivers initially had invalid or very little information about targets. Major et al. (1988) and Swann and Ely (1984) manipulated perceiver expectations so that they conflicted with target self-concepts. McNulty and Swann (1994) focused on new roommates who had not lived together previously. New roommates have much less valid information about each other than do perceivers in many naturally occurring social relationships (e.g., wives and husbands, parents and children). Mutual influence

may operate differently when perceivers and targets have access to valid information.

Research Objectives

It was precisely this kind of situation that interested us. We wondered whether self-fulfilling prophecies and self-verification also occur simultaneously in situations in which perceivers and targets have valid information on which to base their perceptions. We addressed this issue by examining self-fulfilling prophecies and self-verification in public school math classrooms where teachers and students both had access to students' previous grades and standardized test scores. We also explored whether the availability of valid information led perceivers and targets to develop initially similar perceptions before mutual influence occurred and whether this similarity, in turn, influenced the power of mutual influence. We focused on two possible effects of similarity.

We explored whether high similarity increases the power of self-fulfilling prophecies and self-verification. People have better memory for information that is similar to their own perceptions and view such information as more accurate and believable than information that is vastly discrepant from their own perceptions (see Jones, 1973; Shrauger, 1975; Swann, 1987, for reviews). If perceivers and targets forget or ignore perceptions that differ from their own but remember and attend to perceptions that are similar to their own, then self-fulfilling prophecies and self-verification may be greater among perceivers and targets who hold initially similar perceptions.

Alternatively, high similarity may reduce the power of self-fulfilling prophecies and self-verification. Perceivers and targets may sometimes interpret each other's perceptions as matching their own (Swann, 1987), a process that may be especially likely when the discrepancy between their perceptions is small. Targets also may discount or ignore small discrepancies because they do not seriously challenge the validity of their own perceptions or the belief that they can control and predict their social environments (Swann & Read, 1981). If perceivers and targets can tolerate small discrepancies through these mechanisms, then their attempts at mutual influence may be reduced.

Conceptual Model

We examined the process of mutual influence in the context of a conceptual model presented in Figure 1. The model assumes that perceivers and targets may influence each other. Paths A, B, C, and D represent the extent to which perceivers and targets base their beliefs about targets on targets' background information (e.g., targets' past behavior, social group membership, achievement or personality test scores, rumors, etc.). Paths A and B represent the influence of targets' background information on perceivers' beliefs at Time 1 and Time 2, respectively. Paths C and D represent the influence of targets' background information on targets' beliefs at Time 1 and Time 2, respectively. Correlation E represents the similarity between perceivers' and targets' beliefs at Time 1. Higher correlations indicate greater similarity. The level of similarity between perceivers' and targets' beliefs at Time 1 is higher to the extent that both base their perceptions on the same background information.

Path F represents self-fulfilling prophecies in which perceivers shape how targets view themselves. Path G represents self-verification in which targets change how perceivers view them. The potential strength of these paths may depend on the level of similarity between perceivers' and targets' beliefs at Time 1. Higher similarity may weaken the power of mutual influence, in which case paths F and G will become smaller as perceivers' and targets' beliefs at Time 1 become more similar (i.e., when correlation E becomes higher). Alternatively, similarity may strengthen the power of mutual influence, in which case Paths F and G will become larger as perceivers' and targets' beliefs at Time 1 become more similar (i.e., when correlation E becomes higher). Path H represents the stability of perceivers' beliefs from Time 1 to Time 2. Path I represents the stability of targets' beliefs from Time 1 to Time 2.[1]

METHOD

Participants

This research is based on longitudinal data from public school math classrooms in Southeastern Michigan for the Michigan Study of Adolescent Life Transitions (Eccles, 1988). The first year of data collection was 1983. Analyses for the current study used data from 108 teachers and 1,692 students (i.e., 878 female students, 814 male students). There were 1,519 White students, 79 African American students, 46 students of other ethnicities, and 48 students missing ethnicity information. Demographic information about the teachers is not available. There were between 4 and 33 students in each of 108 classrooms. The median classroom size was 16. Each student had the same math teacher for the entire school year. Each teacher taught only one math class.

Questionnaires

Teacher perceptions were assessed in early October of sixth grade (Time 1) and again in March of sixth grade (Time 2). Student perceptions were assessed in late September or early October of sixth grade (Time 1) and again in March of sixth grade (Time 2). This study

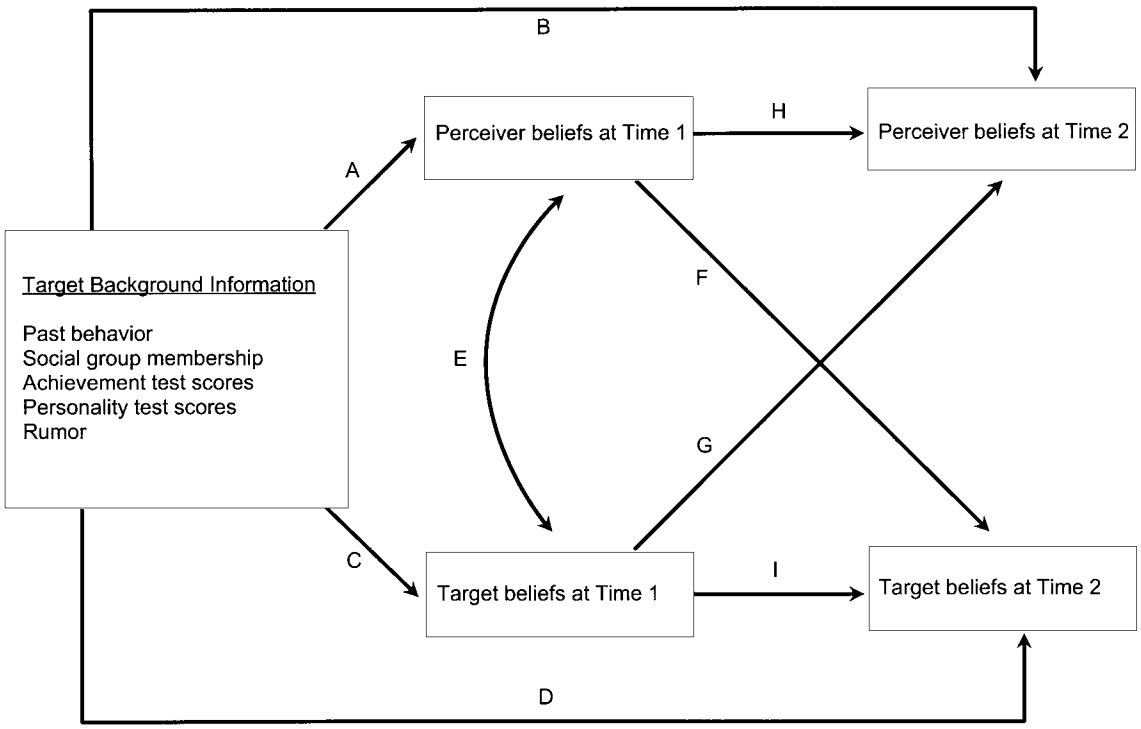

Figure 1 Conceptual model.
NOTE: *N* = 108 teachers and 1,692 students in 108 classrooms. Paths A, B, C, and D reflect the degree to which perceiver and target beliefs are based on targets' background information. Path E represents the correlation between perceiver and target beliefs at Time 1. Path F reflects self-fulfilling prophecy. Path G reflects self-verification. Paths H and I reflect the stability of perceiver and target beliefs from Time 1 to Time 2.

focuses on questionnaire items that assessed teacher and student perceptions of students' ability and motivation. All items are reliable and valid (see Eccles et al., 1989; Eccles-Parsons et al., 1983; Parsons et al., 1982).

Teacher perceptions. Teachers rated individual student's ability and motivation in math by responding to the following three questions: (a) "How much natural math talent does this student have?" with endpoints 1 (*very little math talent*) and 7 (*a lot of math talent*); (b) "How hard does this student try in math?" with endpoints 1 (*does not try at all*) and 7 (*tries very hard*); and (c) "Compared to other students in this class, how well is this student performing in math?" with endpoints 1 (*near the bottom of the class*) and 5 (*one of the best in the class*). Teachers made these ratings twice, once at the beginning of the sixth grade (Time 1) and then again at the end of the sixth grade (Time 2). We combined the individual teacher perception variables regarding students' math talent, performance, and effort to create a teacher perception scale for each student at each time point. For each scale, we standardized each component variable (talent, performance, and effort) and then summed them. Cronbach's alpha equaled .87 for the teacher perception scale at Time 1 and .85 for the teacher perception scale at Time 2. We subsequently refer to these scales as teacher perceptions at Time 1 and Time 2, respectively.

Self-concept of math ability. Students rated their own ability in math by responding to two questions: (a) "How good at math are you?" with endpoints 1 (*not at all good*) and 7 (*very good*) and (b) "If you were to rank all of the students in your math class from the worst to the best in math, where would you put yourself?" with endpoints 1 (*the worst*) and 7 (*the best*). Students made these ratings twice, once at the beginning of the sixth grade (Time 1) and then again at the end of the sixth grade (Time 2). We summed the two measures of student perceptions to create a self-concept scale for each student at each time point. Cronbach's alpha for the student self-concept scales equaled .79 at Time 1 and .84 at Time 2. We subsequently refer to these scales as student self-concepts at Time 1 and Time 2, respectively.

Student motivation. Students also indicated their interest in math and their perceptions about the utility of math. These motivational constructs were assessed at the beginning (Time 1) and end (Time 2) of the school year. However, because this study used student motivation as a control variable, only students' Time 1 ratings were included in the analyses. Two items assessed students' interest in math. First, students used a response scale with endpoints 1 (*very boring*) and 7 (*very interesting*) to respond to the following statement: "In general, I find math assignments . . . ." Second, students were asked the

following: "How much do you like math?" with endpoints 1 (*a little*) and 7 (*a lot*). We summed the two measures to create a single variable reflecting students' interest in math. Cronbach's alpha for this scale equaled .84.

Three questions assessed students' perceptions about the utility of math: (a) "In general, how useful is what you learn in math?" (b) How useful do you think the math you are learning will be for what you want to do after you graduate and go to work?" and (c) "How useful do you think high school math will be for what you want to do after you graduate and go to work?" Each question used a response scale with endpoints 1 (*not at all useful*) and 7 (*very useful*). Cronbach's alpha for this scale equaled .72.

Measures of Students' Achievement

Final marks in fifth-grade math and percentile ranks on a standardized math test taken during fifth grade or the beginning of sixth grade served as measures of previous achievement.

TABLE 1: Descriptive Statistics

Variable	*Minimum-Maximum Value*	*Mean*	*Standard Deviation*
Teacher perceptions at Time 1	–8.02 to 4.32	0.00	2.70
Teacher perceptions at Time 2	–7.65 to 4.21	0.00	2.66
Student self-concepts at Time 1	2 to 14	10.20	2.47
Student self-concepts at Time 2	2 to 14	10.19	2.41
Final marks in fifth-grade math	3 to 16	11.47	2.51
Standardized math test scores	1 to 99	62.87	25.60
Interest value in math	2 to 14	9.38	3.47
Utility value of math	3 to 21	18.26	3.21

NOTE: N = 108 teachers and 1,692 students in 108 classrooms. Higher values reflect more favorable teacher perceptions and student self-concepts, better grades and standardized test scores, greater interest in math, and perceived utility of math. All variables except teacher perceptions and standardized math test scores are in raw score units. The teacher perception variables were created by standardizing teacher perceptions of performance, talent, and effort and then summing the standardized components. This procedure was performed once for teacher perceptions at Time 1 and a second time for teacher perceptions at Time 2. Standardized math test scores are in percentile ranks.

RESULTS

Preliminary Analyses

Table 1 presents descriptive statistics for the measures of previous student achievement and student motivation (i.e., final marks in fifth-grade math, standardized math test scores, interest in math, and utility of math) as well as teacher perceptions and student self-concepts at Time 1 and Time 2. Table 2 presents the correlations among these variables and the intraclass correlations.

Overview of the Main Analyses

Structural equation modeling (SEM) analyses tested the model shown in Figure 1. One problem presented by these data in conducting such an analysis concerns the nested or clustered nature of the data. Traditional SEM procedures assume that the data have been derived from an independent sample of 1,692 observations. Given that these data were derived from students in 108 classrooms, it is likely that students in the same classroom are more similar to one another than would be expected from a sample of independent observations. Furthermore, some of the measures (i.e., teacher perceptions) were based on ratings of the students by teachers in those classrooms. These measures may not be independent because each teacher rated multiple students.

The impact of such clustering in a sample has been termed the "design effect" (Cochran, 1977). Muthén (1997, p. 456) gives the following formula for the design effect:

$$V_C/V_{SRS} = 1 + (c - 1)\ \rho,$$

where V_C equals the variance of the parameter being estimated (e.g., mean, correlation, regression coefficient) under cluster sampling and V_{SRS} equals the variance assuming simple random sampling. In this formula, c reflects the size of the cluster (or, in this case, classroom; the average size of the classrooms was 15.67 students) and ρ reflects the intraclass correlation or the extent to which the classrooms differ from one another on the variable. This formula makes clear that if one has a cluster sample and assumes that the data have been derived from a simple random sample, then the variance estimates for various parameters are underestimated. As a consequence, significance tests for these parameters are positively biased (e.g., they are larger than they should be), making it more likely that one will find statistically significant differences between groups or statistically significant relationships among the variables.

This formula also makes clear that this bias is only present if the intraclass correlations for the measures being used in the analyses are greater than zero. Table 2 presents the intraclass correlations for the measures that were used in the present analyses. On the basis of the values reported in Table 2 and the formula above, the variances of these measures based on assuming a simple random sample are from 31% (for the two self-concept measures) to 76% (standardized math test scores) too small relative to the values under cluster sampling. Clearly, we need to adjust for this bias in the variance estimates in testing the structural equation model shown in Figure 1.

The Mplus program (Muthén & Muthén, 1998) permits the testing of structural equation models while tak-

TABLE 2: Correlations

	Correlation								
Variable	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*ICC*
1. Teacher perceptions at Time 1		.77	.49	.46	.60	.65	.29	.24	.11
2. Teacher perceptions at Time 2			.47	.53	.65	.67	.28	.21	.09
3. Student self-concepts at Time 1				.64	.41	.43	.46	.24	.03
4. Student self-concepts at Time 2					.41	.42	.37	.20	.03
5. Final marks in fifth-grade math						.59	.24	.17	.19
6. Standardized math test scores							.24	.19	.22
7. Interest value in math								.33	.07
8. Utility value of math									.05

NOTE: $N = 108$ teachers and 1,692 students in 108 classrooms. Correlations were based on the pooled within-class variances and covariances among the variables. As a consequence, the influence of clustering on the data has been removed. These correlations are significant at $p < .001$. ICC refers to intraclass correlations. These correlations reflect the amount of variance in each variable that is explained by mean differences between the 108 classrooms.

ing into account the clustered or nested nature of the data (see discussion by Muthén, 1997; Muthén & Satorra, 1995) on the basis of a maximum likelihood fitting function using robust standard errors and a mean-adjusted chi-square statistic. As shown in Figure 1, the model to be tested involves relationships among variables at the individual or student level. That is, characteristics of the classrooms are not included as predictors in the model. The Mplus procedure will be used to derive corrections to the standard errors associated with the parameter estimates. This procedure also corrects for the impact of clustering on the overall evaluation of model fit (see discussion by Muthén & Satorra, 1995).

SEM Results

Table 3 presents the SEM results involving the paths from the exogenous variables (i.e., final marks in fifth-grade math, standardized math test scores, interest in math, and utility of math) to the endogenous variables (i.e., teacher perceptions and student self-concepts at Times 1 and 2). Teacher perceptions at Time 1 were significantly related to all four of these variables; in combination, these predictors accounted for 47% of the variance in teacher perceptions at Time 1. Similarly, student self-concepts at Time 1 were significantly related to all four of these variables; in combination, these variables accounted for 34% of the variance in student self-concepts at Time 1. At Time 2, teacher perceptions were significantly related to final marks in fifth-grade math, standardized math test scores, and interest in math, whereas student self-concepts at Time 2 were related to their final marks in fifth-grade math and to interest in math.

Figure 2 presents the results for the relationships between teacher perceptions and student self-concepts. According to the self-fulfilling prophecy hypothesis, teacher perceptions at Time 1 should predict changes in student self-concepts at Time 2. Results were consistent with this prediction. Higher teacher perceptions at the beginning of sixth grade predicted higher student self-concepts at the end of sixth grade, even when controlling for initial student self-concepts, previous student achievement, and student motivation ($b = .12$, $p < .05$). In combination, these predictors accounted for 44% of the variation in student self-concepts at Time 2.

According to the self-verification hypothesis, student self-concepts at Time 1 should predict changes in teacher perceptions at Time 2. Results also were consistent with this prediction. Higher student self-concepts at the beginning of sixth grade predicted higher teacher perceptions at the end of sixth grade, even when controlling for initial teacher perceptions, previous student achievement, and student motivation ($b = .04$, $p < .05$). In combination, these predictors accounted for 65% of the variation in teacher perceptions at Time 2.

Because this structural equation model included all possible relationships among the variables in the model (e.g., it represented a fully recursive model), the model fit the variances and covariances of the variables perfectly. A "trimmed" version of the model was also tested, which eliminated the paths between the exogenous and endogenous variables that were nonsignificant (i.e., from standardized math test scores to student self-concepts at Time 2; from interest in math and utility of math to teacher perceptions at Time 2; see Table 3). This modified model also fit the data after setting these three paths to zero, $\chi^2(3, N = 1{,}692) = .07$.

The results shown in Figure 2 suggest that teacher perceptions may have had a greater impact on student self-concepts than student self-concepts had on teacher perceptions. To directly test the difference in the magnitude of these relationships, a second modification of the model was tested, wherein the path from teacher perceptions at Time 1 to student self-concept at Time 2 was constrained to be equal to the path from student self-concepts at Time 1 to teacher perceptions at Time 2. This latter model also fit the data, $\chi^2(4, N = 1{,}692) = .96$, indi-

TABLE 3: Paths From the Exogenous Variables to the Endogenous Variables

	Exogenous Variable			
Endogenous Variable	*Final Mark in Fifth-Grade Math*	*Standardized Math Test Score*	*Interest in Math*	*Utility of Math*
Teacher perceptions at Time 1	.29*	.41*	.10*	.07*
Teacher perceptions at Time 2	.18*	.15*	.04	.00
Student self-concepts at Time 1	.16*	.24*	.36*	.06*
Student self-concepts at Time 2	.06*	.02	.08*	.01

NOTE: N = 108 teachers and 1,692 students in 108 classrooms. Values are the standardized path coefficients derived from the results of the Mplus modeling analyses.
*$p < .05$.

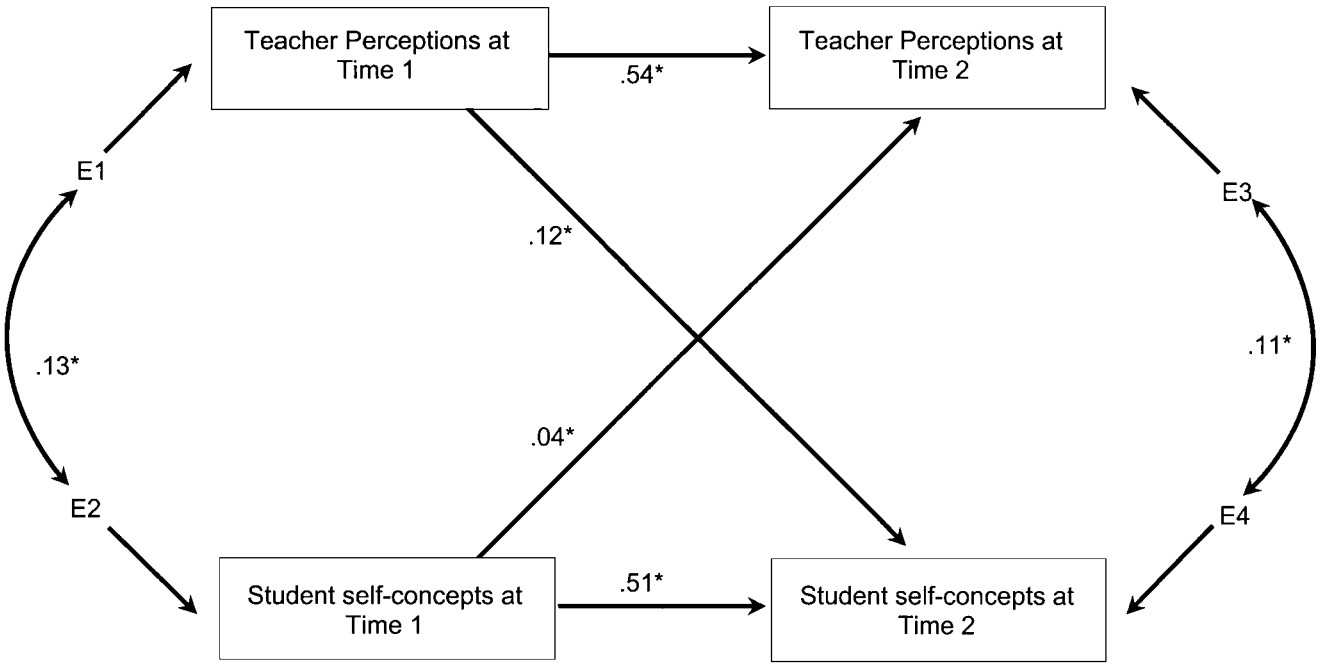

Figure 2 Results.
NOTE: N = 108 teachers and 1,692 students in 108 classrooms. This figure shows the relationships between teacher perceptions and student self-concepts. Values are the standardized path coefficients derived from the results of the Mplus modeling analyses.
*$p < .05$.

cating that the difference in the magnitude of these two path coefficients was not statistically significant.[2]

Highly Valid Background Information and Similarity Between Perceptions

The results presented thus far demonstrated that self-fulfilling prophecies and self-verification occurred simultaneously in a context where perceivers and targets had valid background information on which to base their initial perceptions. The next analysis examined the extent to which valid background information led perceivers and targets to develop similar perceptions before mutual influence occurred; that is, this analysis identified how much of the similarity (i.e., correlation) between teachers' and students' Time 1 perceptions was due to previous student achievement.

Values were calculated by summing the products of the direct paths shown in Table 3 between previous student achievement and teacher perceptions at Time 1 and student self-concepts at Time 1 (see Loehlin, 1992). We assessed this correlation with the following equation in which each letter represents a correlation or coefficient in Tables 2 and 3:

$$r_{\text{teacher perceptions Time 1 and student self-concepts Time 1}} = (v * w * x) + (v * y) + (z * x) + (z * w * y),$$

where v represents the relationship between standardized test scores and teacher perceptions at Time 1, w rep-

resents the correlation between final marks in fifth-grade math and standardized test scores, x represents the relationship between final marks in fifth-grade math and student self-concepts at Time 1, y represents the relationship between standardized test scores and student self-concepts at Time 1, and z represents the relationship between final marks in fifth-grade math and teacher perceptions at Time 1.

Substituting the corresponding values from Tables 2 and 3, the equation becomes as follows:

$$r_{\text{teacher perceptions Time 1 and student self-concepts Time 1}} = (.41 * .59 * .16) + (.41 * .24) + (.29 * .16) + (.29 * .59 * .24).$$

This equation yields a correlation of .22, which indicates that previous student achievement explains almost half of the total relationship between teacher perceptions and student self-concepts (i.e., .22/.49 = .45). Thus, one reason that teachers and students held similar perceptions at the beginning of the school year (before self-fulfilling prophecies and self-verification took place) was because both based their perceptions on valid background information.

Similarity of Perceptions and the Power of Mutual Influence

The final set of analyses tested whether similarity between perceiver and target perceptions at Time 1 moderated the power of mutual influence by testing for an interaction between teacher perceptions at Time 1 and student self-concepts at Time 1. We created this interaction term by standardizing both variables and then multiplying the standardized variables together. We then added this interaction term to the structural equation model tested earlier, with this interaction term predicting both teacher perceptions and student self-concepts at Time 2.[3] The interaction term did not significantly predict teacher perceptions at Time 2, $b = -.01$, $t = -.91$, but did significantly predict student self-concepts at Time 2, $b = .06$, $t = 2.81$, $p < .05$.

To evaluate the nature of this interaction, the relationship between teacher perceptions at Time 1 and student self-concepts at Time 2 was evaluated at high (i.e., 2 standard deviations above the mean), average (i.e., mean), and low (i.e., 2 standard deviations below the mean) levels of student self-concepts at Time 1. Results indicated that teacher perceptions at Time 1 predicted student self-concepts at Time 2 more strongly for students with very high self-concepts at Time 1 ($b = .24$) than for students with average ($b = .13$) or very low self-concepts ($b = .01$) at Time 1. Specifically, for high and average self-concept students, teacher perceptions at Time 1 predicted smaller changes in student self-concepts the greater the similarity between teachers' and students' Time 1 perceptions. In contrast, for low self-concept students, teacher perceptions at Time 1 predicted equivalent changes in student self-concepts across different levels of similarity between teachers' and students' Time 1 perceptions.

DISCUSSION

This study demonstrated three main findings regarding the process of mutual influence. Self-fulfilling prophecies and self-verification occurred simultaneously in a context where perceivers and targets had highly valid information on which to base their initial perceptions. The availability of highly valid information led perceivers and targets to develop initially similar perceptions before mutual influence took place. High similarity between perceivers' and targets' initial perceptions had no effect on the power of self-verification but weakened the effect of self-fulfilling prophecies for some targets.

Self-Fulfilling Prophecies and Self-Verification

This research demonstrated that self-fulfilling prophecies and self-verification simultaneously occurred between teachers and students over the course of a school year. Teacher perceptions at the beginning of the school year predicted changes in student self-concepts of math ability at the end of the school year. Student self-concepts of math ability at the beginning of the school year predicted changes in teacher perceptions at the end of the school year. In addition, because teachers and students both had access to students' previous grades and standardized test scores, these findings provide evidence that mutual influence occurs between people who have valid information on which to base their perceptions. This point is important because it means that mutual influence is not restricted to brief encounters and newly formed relationships, such as those shared by acquaintances and new friends, but also may characterize extended encounters and close relationships, such as those shared by lifelong friends, family members, and coworkers.

Valid Information and Similar Perceptions

Understanding how mutual influence operates in the context of valid information is also important because of its potential to lead perceivers and targets to develop initially similar perceptions before self-fulfilling prophecies and self-verification occur. Perceivers and targets may partly base their initial perceptions on available background information. To the extent that this information is valid, perceivers and targets will develop accu-

rate, and therefore similar, perceptions before self-fulfilling prophecies and self-verification occur (Jussim, 1991). Consistent with this, our results showed that almost half of the similarity between teachers' and students' initial perceptions was due to a reliance on students' previous achievement. Thus, unlike some relationships in which people may develop initially dissimilar perceptions because they lack valid information, there are other relationships in which people may develop initially similar perceptions because they have access to valid information.

Similarity and the Power of Mutual Influence

Several lines of research suggest that the extent to which people's perceptions are similar has implications for the power of mutual influence (Jones, 1973; Shrauger, 1975; Swann, 1987; Swann & Read, 1981). The current study explored this possibility and found that similarity did not moderate self-verification but did moderate self-fulfilling prophecies for some students. We next discuss possible explanations that may account for these findings.

Similarity and self-verification. The failure of similarity to moderate self-verification may reflect the value that students placed on their math ability and the nature of the perceptions that teachers and students held. People's motivation to self-verify is strongest when important aspects of the self are called into question (Swann, 1987). The students in our research may have viewed their math ability as particularly important within the context of their math class and may have been highly motivated to self-verify—even when the similarity between their self-concepts and their teachers' perceptions was high. In other words, the value that students' placed on their math ability may have been a more important determinant of their attempts to self-verify than was the magnitude of the similarity between their self-concepts and teachers' perceptions.

It is also possible that students did try to self-verify more strongly when the similarity between their self-concepts and teachers' perceptions was low than when it was high, but teachers did not respond differentially to these attempts. Teachers based their perceptions predominantly on students' previous achievement (Table 3) and, consequently, may have received confirmatory feedback for their perceptions throughout the school year via students' performance on classroom tests and homework assignments. This confirmatory feedback may have convinced teachers about the validity of their perceptions and decreased their willingness to change, even when confronted with students whose attempts to self-verify were high.

Similarity and self-fulfilling prophecies. Similarity did moderate the power of self-fulfilling prophecies, but only for high and average self-concept students. Self-fulfilling prophecies were weakest when these students' initial self-concepts matched teachers' initial perceptions of them. The valence of students' self-concepts may explain this pattern. People with higher self-concepts are less susceptible to self-fulfilling prophecies because they tend to hold more confident self-concepts (Campbell & Lavallee, 1993; Pelham, 1991; Swann & Ely, 1984).

However, within our data, higher self-concepts only protected students against self-fulfilling prophecies when teachers' and students' initial perceptions were similar. We suspect that high and average self-concept students could not maintain confident self-concepts when their perceptions differed substantially from their teachers' perceptions. Teachers have greater status, experience, and power than do students—factors that may have caused teachers' perceptions to appear particularly credible. A large discrepancy between students' self-concepts and teachers' perceptions may have led high and average self-concept students to question the validity of their own perceptions, thereby increasing their susceptibility to self-fulfilling prophecies. In fact, high self-concept students were as susceptible to self-fulfilling prophecies as were low self-concept students when the similarity between their self-concepts and their teachers' perceptions was very low.

Mutual Influence: A Converging Process

Mutual influence is usually conceptualized as a convergent process whereby perceivers and targets negotiate a middle ground over the course of their interactions (Swann, 1987). According to this conceptualization, perceivers' and targets' final perceptions are less extreme than were their initial perceptions. One might wonder, however, whether mutual influence also can lead perceivers and targets to switch perceptions over the course of their relationship. This would mean that perceivers' final perceptions of targets would be more similar to targets' initial self-perceptions than are targets' final self-perceptions, and that targets' final self-perceptions would be more similar to perceivers' initial perceptions than are perceivers' final perceptions. Although we do not deny that such an outcome may sometimes occur, there is reason to believe that it is not typical. In both laboratory and naturalistic contexts, empirical investigations consistently show that perceivers and targets develop increasingly similar perceptions over the course of their relationships (Major et al., 1988; McNulty & Swann, 1994; Swann & Ely, 1984) (see Table 2). Moreover, people typically enter social interactions with goals that are most easily achieved through

mutually agreed-on identities (Swann, 1987). For these reasons, we believe that a convergence of perceptions is the most likely outcome of mutual influence.

Limitations

There are several limitations to our research that qualify the insights that it provides. Most important, with naturalistic studies, there is always the possibility that a relevant predictor was omitted from the analyses. The possibility of omitting a relevant predictor characterizes all nonexperimental studies. No matter how many control variables are included in a naturalistic study, it is always possible that a relevant one was omitted (e.g., Judd & McClelland, 1989; Pedhazur, 1982). However, we reduced the likelihood that a relevant predictor was omitted from our analyses by including extensive controls (i.e., standardized test scores, grades, interest value in math and utility value of math). These controls surpass those used in most studies examining teacher-student relations (see Jussim & Eccles, 1995) and reduce the likelihood that the significant relations between teacher perceptions and student self-concepts reflect a spurious relation to an omitted third variable.

Second, our research was based on only 1 year of teacher-student interactions. We do not know, therefore, whether self-fulfilling prophecies and self-verification were more powerful in previous years or whether their effects would dissipate had teachers and students interacted for longer periods of time, although recent research suggests that they would (Smith, Jussim, & Eccles, 1999). We also do not know if our pattern of findings would differ with students of different ages and whether our findings generalize to settings other than the classroom.

Third, our research focused on perceptions of ability and motivation. These perceptions may be more stable and less open to change than other types of perceptions, such as those regarding personality traits. Finally, because this study is the first to address the role that similarity plays in the process of mutual influence, it is possible that our results reflected unique aspects of the classroom. More studies are needed before general conclusions can be drawn regarding the magnitude of mutual influence under conditions of low and high similarity between perceivers' and targets' initial perceptions.

CONCLUSION

The results of this study were consistent with the conclusion that perceivers changed how targets viewed themselves at the same time that targets changed how perceivers viewed them. However, unlike previous studies on mutual influence (Major et al., 1988; McNulty & Swann, 1994; Swann & Ely, 1984), the process of negotiation between perceivers and targets in this study occurred within a context of highly valid information. The availability of this information turned out to be more important for self-fulfilling prophecies than for self-verification. Results suggested that the extent to which targets were successful at changing perceivers' perceptions did not depend on the similarity between perceivers' and targets' initial perceptions. In contrast, perceivers were less successful at changing how some targets viewed themselves the more similar their perceptions were to targets' self-concepts. These findings suggest that as perceivers acquire more valid information about targets, their ability to change targets' perceptions may decline, especially among targets who hold positive views of themselves. Targets, in contrast, may continue to influence perceivers over the entire course of their relationship, thus ultimately having greater influence in the long run.

NOTES

1. In practice, each path in the model may represent several paths. There may be many types of background information; perceivers may develop beliefs regarding multiple aspects of targets, targets may hold multiple self-views, various target behaviors/perceiver beliefs may be influenced, and so forth. The model assumes a time lag between the variables such that awareness of background information precedes the development of perceivers' and targets' beliefs at Time 1.

2. An issue that arises in testing cross-lagged panel models such as the one shown in Figure 1 concerns the impact of differential stability of the variables being analyzed. So, for example, one might find that teacher perceptions are more predictive of student self-concepts than the reverse because the latter variable is less stable over time (i.e., the Time 1–Time 2 correlation is lower), resulting in a situation where there is more residual variance in student self-concepts at Time 2. As can be seen in Figure 2, this did not appear to be a serious problem with the present data, because the measures of teacher perceptions and student self-concepts showed very similar stability over time. Indeed, a model that constrained the stability of these two measures to be the same over time also was found to fit the data, $\chi^2(5, N = 1{,}692) = 1.15$, indicating that the results were not affected by the differential stability of these two measures.

3. Paths also were included in this model from the exogenous variables (i.e., final marks in fifth-grade math, standardized math test scores, interest in math, and utility of math) to the interaction term.

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