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ABSTRACT

Classroom decision-making was conceptualized within the framework of person-environment fit. A longitudinal sample of 2239 sixth graders in 117 mathematics classrooms were surveyed. The findings include: (1) students typically report fewer decision-making opportunities than they think they should have in their mathematics classrooms; (2) students within a classroom tend to agree among themselves concerning decision-making prerogatives that actually do exist, but there is less consensus concerning prerogatives that should exist; (3) congruence on these "can decide" and "should decide" dimensions is associated with positive values and affect concerning mathematics as well as high effort and expectancies for success in mathematics; (4) congruence in mathematics classrooms is not related in the same way to similar outcomes in social and athletic activity domains; (5) congruence is inversely related to student misbehavior at school; and (6) these effects of decision-making congruence persist even after controlling for the level of actual decision-making opportunities in the classroom. Since past research has demonstrated that children's values and expectancies predict significant educational outcomes, the findings of this study imply that educators should work toward increasing their students' decision-making congruence in mathematics. Thirty-two references, four tables, and the study instrument are appended. (Author/HNS)

Students' Decision-Making Congruence in Mathematics Classrooms:

A Person-Environment Fit Analysis

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Abstract

Conceptualizing classroom decision-making within the framework of person-environment fit, several hypotheses are examined for a longitudinal sample of 2239 6th graders in 117 math classrooms. The findings include: (a) students typically report fewer decision-making opportunities than they think they should have in their math classrooms; (b) students within a classroom tend to agree among themselves concerning the decision-making prerogatives that actually do exist, but there is less consensus concerning the decision-making prerogatives that should exist; (c) congruence on these "can decide" and "should decide" dimensions is associated with positive values and affect concerning mathematics as well as high effort and expectancies for success in math; (d) decision-making congruence in mathematics classrooms is not related in the same way to similar outcomes in social and athletic activity domains; (e) congruence is inversely related to student misbehavior at school, as assessed both by student self-report and teacher ratings; and (f) these effects of decision-making congruence persist even after controlling for the level of actual decision-making opportunities in the classroom. Since past research has demonstrated that children's values and expectancies predict significant educational outcomes, the findings of this study imply that educators should work toward increasing their students' decision-making congruence in mathematics.

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In the late 1930's, Murray (1938) and Lewin (1935) proposed that an individual's behavior is jointly determined by characteristics of the person and properties of the immediate environment. This idea has given rise to person-environment fit theory, which predicts that when the needs or goals of an individual are congruent with opportunities afforded by the environment, favorable affective, cognitive, and behavioral outcomes should result for that individual. Conversely, when a discrepancy exists between the needs of the individual and opportunities available in that individual's environment, unfavorable outcomes should result. Examinations of the effects of person-environment fit in work settings (French, Rogers, & Cobb, 1974; Veroff & Feld, 1970) and in school settings (Feather, 1975; Fraser, 1981; Fraser & Fisher, 1983; Getzels, 1969; Kulka, Mann, & Klingel, 1980) have yielded findings supportive of this theory.

There is frequently an important person-environment discrepancy for students concerning the decision-making opportunities afforded them in the classroom: Many students want more decision-making opportunities than they receive (Lee, Statuto, & Kedar-Voivodas, 1983; Moos, 1979; Reuman, Mac Iver, Klingel, Midgley, Feldlaufer, & Hermalin, 1984). In their study of second, fourth, and sixth grade students, Lee and his colleagues (Lee, 1979; Lee et al., 1983) found that there is a grade-related increase in this discrepancy. As children mature, they increasingly want to have a say in classroom decisions. Although children report increasing opportunities for decision-making as grade level increases, the increasing opportunities fail to keep pace with children's increasing desire for such opportunities (see also Midgley & Feldlaufer, 1986).

Person-environment fit theory would predict that this discrepancy in decision-making should produce unfavorable student outcomes. Unfortunately, most studies of the relationship between decision-making opportunities in the classroom and students' affective, cognitive, and behavioral outcomes have not been explicitly conceptualized in terms of person-environment fit (e.g., deCharms, 1968, 1976; Epstein, 1981; Epstein & McPartland, 1977; Richter & Tjosvold, 1980; Wang & Stiles, 1976). Thus, although these studies have tended to assume that students would prefer more decision-making opportunities, person-environment congruence was not directly measured. In general, these studies have found that increased opportunity for decision-making is associated with more positive academic-related behaviors and more positive attitudes toward the self, teachers, and classrooms. Conversely, studies of student dissatisfaction with decision-making opportunities (e.g., McPartland & McDill, 1974, 1977) and research on student feelings of powerlessness (e.g., Thomas, Kreps, & Cage, 1977) have shown that these feelings are predictive of student disruption, truancy, and vandalism.

In an earlier study examining the effects of decision-making congruence on student outcomes, we collected data from 206 students in ten seventh grade math classrooms (Reuman et al., 1984). Student perceptions of actual and ideal decision-making opportunities were measured on four yoked pairs of items adapted from Lee (1979). Other questionnaire items assessed a broad range of student values, beliefs, and behaviors. Based on past findings and person-environment fit theory, we predicted that students would report fewer decision-making opportunities than they thought they should have, and that congruence on these "can decide" and "should decide" dimensions would be positively related to math value and enjoyment, and inversely related to school misbehavior. Consistent support for the hypotheses was found. Overall, students perceived high levels of actual constraint with respect to decision-making in their math classrooms, and much lower levels of ideal constraint. Often, however, there was substantial disagreement among the students within a classroom concerning the decision-making constraints that should exist. A series of simple regression models showed consistent positive effects of decision-making congruence on math enjoyment and math value. Congruent students were more likely to view math as interesting and useful, and the effort required to do well in math worthwhile. Further, congruent students more often cited interest in school subjects as an important reason for coming to school, and less often cited social relations at school or mandatory attendance as reasons for coming to school. To the extent that students reported congruence between actual and ideal decision-making prerogatives, they consistently were less likely to misbehave at school. These relations were evident from both student self-report data and from teacher assessments of student misbehavior. Finally, decision-making congruence in these seventh grade math classrooms was consistently related to a higher self-concept of ability in math and to a lower sense of frustration with math.

The present study builds on this work. Unlike our first study, which was cross-sectional, this study is a two-wave panel study. By relating within-school-year change in decision-making congruence to within-school-year change in student outcomes, we will be able to make stronger tests of our hypotheses and to obtain better estimates of the magnitude of congruence effects than was possible before. Whereas the first study was limited to 206 students in ten classrooms, the present study examines 2239 students in 117 classrooms. By considering a much larger range of students and classroom environments, the generalizability of the earlier findings can be tested.

A brief statement of our major hypotheses follows:

(1) Students will typically report fewer decision-making opportunities than they think they should have in their math classrooms;

(2) Students within a classroom will tend to agree among themselves concerning the decision-making prerogatives that actually do exist, but there will be less consensus concerning the decision-making prerogatives that should exist in that classroom;

(3) Congruence on these "can decide" and "should decide" dimensions will be positively related to values, affect, self-concept of ability, expectancies for success, effort, and performance level in mathematics;

(4) Decision-making congruence in mathematics classrooms will not be related in the same way to similar outcomes in social and athletic activity domains;

(5) Congruence will be inversely related to student misbehavior at school;

(6) These effects of decision-making congruence will persist even after controlling for the number of actual decision-making opportunities students receive.

Method

Sample

The data presented in this paper were collected as part of a larger investigation (the Transitions in Early Adolescence Project) concerned with the impact of change in the classroom and family environments of early adolescents on their achievement-related beliefs, motives, values, and behaviors. Analyses reported in this paper are restricted to data collected at the first two waves of this four-wave panel study. The data are from the fall and spring of the 1983-84 school year.

Twelve school districts with varying educational practices were recruited for the Transitions project. The school districts are located near a major metropolitan area in the midwest and serve low- and middle-income communities. All teachers in these districts who taught fifth or sixth graders scheduled to make the transition to middle/junior high school the following year were invited to participate. In this way, 143 classrooms were recruited: 14 fifth grade classrooms, 107 sixth grade classrooms, and 22 classrooms containing students of more than one grade level. Students participated on a voluntary basis; 79 percent (3248/4110) of all enrolled students participated.

Case selection. Only a subset of the student sample from the Transitions project is used in the analyses reported here. In order to hold grade level constant, only sixth graders are included. Students who changed classrooms or teachers during the school year are excluded, as are any students who failed to answer all questionnaire items measuring students' actual and ideal decision-making prerogatives. The total number of cases included by these criteria is 2239.

Measures

Survey questionnaires were administered to students in their math classrooms. Students' decision-making prerogatives in math were measured using five pairs of items adapted from Lee et al. (1983). Each yoked pair of items assessed student perceptions of actual and ideal decision-making opportunities in their math classrooms. For example:

Do you help to decide how much math homework you get?

Do you think you should help to decide how much math homework you get?

These items asked students about decision-making opportunities with respect to where they sit in math class, how much math homework they receive, what math they work on during class, what they work on in class after finishing their math assignments, and what the rules are in their class. Each item measuring actual decision-making prerogatives was coded "1" for students who said that they did not have the decision-making prerogative and "2" for students indicating that they did have the prerogative. Similarly, responses concerning ideal or preferred decision-making prerogatives were coded "1" for students who thought they should not have the prerogative and "2" for students who thought they should have the prerogative. For each yoked pair of items measuring actual and ideal prerogatives, students could be coded as discrepant (1) or congruent (2). Students were coded as discrepant if they said they do not but should have a decision-making prerogative, or if they said they actually do but should not have the prerogative. Similarly, students were coded as congruent if they said they actually do and should have a decision-making prerogative, or if they said they do not and should not have that prerogative.

In addition to the decision-making items, the student questionnaire included items assessing a broad range of students' values, beliefs, and behaviors. In the domain of affect and values, there were items measuring math utility value, math intrinsic value, liking for teacher, liking of school, reasons for coming to school, and values concerning social relationships and sports. Another set of questions probed the frequency of school misbehaviors. Still other sets focused on self-concept of ability, expectancies for success, perceived task difficulty, anxieties and worries, and student effort and performance in math.

Key outcomes were measured using a multiple indicator approach (Alwin, 1974; Campbell & Fiske, 1959; Sullivan & Feldman, 1979). Multiple measures of each outcome were obtained, and confirmatory factor analyses were used to verify that items intended to measure the same outcome were unidimensional, and items intended to measure distinct outcomes showed discriminant validity (Reuman, 1986). For each outcome, a composite variable was created by summing students' responses to the multiple indicators of the outcome. Appendix A lists the items defining the composites used here, and gives internal consistency reliability estimates for each composite. Some of the other outcomes considered in this study were measured using single items. These single-item measures are listed in Appendix B.

Finally, as a check on potential self-presentation biases in certain student self-report items (particularly effort and misbehavior at school), teachers filled out an assessment of each participating student with respect to these behaviors.

Results

Actual and Ideal Decision-Making Prerogatives

Table 1 summarizes student perceptions of the decision-making opportunities that actually exist in their classrooms, the opportunities they say ideally should exist, and the congruence between these actual and ideal opportunities. Inspection of the means in Table 1 reveals that most students perceive that they have no say in where they sit, how much math homework they receive, what math classwork they perform, or what the rules are in their classroom. Many students, however, think they *should* have a say in these decisions. Pairwise t-tests at both waves indicate that the actual level of decision-making opportunity given to students in these four areas is significantly lower than the level of decision-making opportunity they feel they *should* have. Averaging across these four areas of decision-making at Wave 1, only 23.4 percent of the students reported having a decision-making prerogative whereas 56.3 percent of the students thought they should have that prerogative. Similarly, at Wave 2, an average of only 21.2 percent of the students reported having a decision-making prerogative whereas 58 percent of the students thought they should have that prerogative.

In contrast to the first four areas of decision-making considered above, 70 percent of all students reported at Wave 1 that they could decide what to do in math class after finishing their math work whereas only 58 percent of all students thought they should have this prerogative. The analogous percentages at Wave 2 are 72 percent and 65 percent, respectively. At both waves, pairwise t-tests indicate that the actual level of being able to decide what to do next is significantly higher than the level of opportunity students feel they should have (see Table 1).

Each yoked pair of items measuring actual and ideal decision-making opportunities could be crossed to define categories of students who say (a) they do not but should have a particular decision-making prerogative; (b) they do but should not have the prerogative; (c) they do not and should not have the prerogative; or (d) they do and should have the prerogative. Averaging across all five yoked pairs of items measuring decision-making opportunities at Wave 1, we find 32.6 percent, 8.8 percent, 34.6 percent, and 24.0 percent of our sample falling in categories (a) through (d), respectively. The comparable percentages at Wave 2 are 35.6, 7.5, 33.0, and 23.9. This pattern means that most of the students we have classified as "discrepant" do not have decision-making opportunities they feel entitled to, whereas relatively equal proportions of "congruent" students say they have the prerogatives they prefer or do not have prerogatives they would not prefer.

Pairwise *t*-tests indicate that there are some significant mean changes across waves in the variables displayed in Table 1. Students' perceived level of actual decision-making opportunity decreased between the fall and spring in three areas: decisions concerning seating, homework, and classroom rules. Students' perceptions of the ideal level of decision-making opportunity increased for decisions concerning seating, classwork, and what to do next after finishing their math work. Finally, the congruence between actual and ideal prerogatives decreased significantly for decisions concerning seating but did not change significantly in the other decision-making areas. Although these mean changes within the school year are significant, it should be noted that their magnitude is not large.

Differential consensus on actual versus ideal prerogatives

Whereas students within a classroom reach fairly high agreement concerning the decision-making prerogatives that actually do exist in that classroom, there is less agreement among students concerning the decision-making prerogatives that should exist (see Table 2). Pairwise t-tests indicate that there is significantly lower within-classroom consensus on ideal than actual prerogatives in four of the five decision-making areas at both waves. For decisions involving class rules, there is a non-significant trend in the same direction. There is a tendency for within-classroom consensus to increase between the fall and the spring, but this trend is significant for only three of the 10 items (see Table 2).

Finding higher within-classroom consensus on measures of actual prerogatives than on measures of ideal prerogatives suggests an important difference in the nature of these measures. We interpret students' reports of actual prerogatives as "veridical" reports of a publicly-shared environment, whereas it is likely that the measures of ideal prerogatives reflect individual differences among students that originate in the personal history of decision-making opportunities that students have experienced at home and in their previous classrooms. Additional support for this distinction between the measures of actual and ideal prerogatives comes from consideration of the internal consistency reliabilities of each set of indicators. The internal consistency (Kuder-Richardson-20 estimate) of the five actual prerogatives is .24 and .27 at Waves 1 and 2, respectively. The internal consistency of the five ideal prerogatives is .63 and .64 for the two waves. The low internal consistency of actual prerogatives suggests that teachers who grant one kind of decision-making prerogative will not necessarily grant the other kinds of prerogatives considered here. The higher internal consistency of students' ideal prerogatives suggests a more coherent personal organization of valued decision-making opportunities.

Effects of Congruence Between Actual and Ideal Classroom Prerogatives

Creation of composite measuring decision-making congruence. In order to assess the effects of decision-making congruence on various student outcomes, a composite variable is needed that summarizes the degree of congruence between each student's actual and ideal prerogatives. To this end, we computed the sum of children's congruence scores concerning decisions about seating, math homework, math classwork, and classroom rules. In creating this composite, students' congruence on decisions about what to do next when they are finished with their math work was excluded. As seen earlier, students' responses to this area of decision-making differed from their responses in other areas in that students tended to report that they were given a greater role in decision-making in this area than they felt they should have. Furthermore, at both waves, the composite that excluded this decision-making area had higher internal consistency reliability (KR-20 equal to .49 at Wave 1 and .55 at Wave 2) than did a composite that included this area (KR-20 equal to .43 at Wave 1 and .53 at Wave 2).

Overview of analysis strategy. Whenever possible, the method of first differences (Liker, Augustyniak, & Duncan, 1985; Wonnacott & Wonnacott, 1970) was used to assess the impact of decision-making congruence on the dependent variables considered in this investigation. The method of first differences uses two-wave panel data to obtain parameter estimates that are better than those usually obtained in simple cross-sectional models and in conventional two-wave models (Liker, Augustyniak, & Duncan, 1985). Parameter estimates obtained using most procedures are biased if there are any unmeasured, unchanging factors (i.e., background or personality factors) that influence the dependent variable and are associated with independent variables in the model. The method of first differences eliminates bias due to these unmeasured, unchanging factors. The method of first differences also eliminates bias due to systematic measurement error in independent variables if that measurement error persists across waves (e.g., error arising when respondents persistently over- or understate their true position or persistently misinterpret items). Consistent estimates are obtained even in the presence of perfect autocorrelation between the measurement errors of an independent variable.

The method of first differences involves taking the difference between two equations that represent a process at two points in time. For example, the simple model that underlies most of our analyses is that a student's score on any one of our outcome variables is affected by the congruence between that student's actual and ideal decision-making prerogatives. At Wave 1, this model can be expressed by the following structural equation:

$$Y_{i1} = \beta_0 + \beta_1 X_{i1} + \beta_2 Z_{i1} + \epsilon_{i1}$$

where Y_{i1} is the value of the dependent variable for the ith individual at Wave 1, X_{i1} is this individual's level of decision-making congruence, and Z_{i1} is the individual's score on unmeasured personality and background factors. Similarly, the model at Wave 2 could be expressed as:

$$Y_{i2} = \beta_0 + \beta_1 X_{i2} + \beta_2 Z_{i2} + \epsilon_{i2}.$$

Taking first differences yields the following equation that leads to a better estimate of the crucial parameter, β_1, than would be obtained from the cross-sectional equation at either wave:

$$\Delta Y = \Delta\beta_0 + \beta_1 \Delta X_i + \Delta\epsilon_i.$$

The ΔZ term drops out of the differenced equation because change in this variable is, by definition, zero. In other words, a simple regression of ΔY on ΔX yields an estimate of β_1 after eliminating bias caused by unchanging "Z" variables or by autocorrelated measurement errors. This differenced regression equation was estimated for every dependent variable that was available at both waves.

Although in our conceptualization decision-making congruence is seen as a crucial determinant of student outcomes at school, other conceptualizations have often ignored congruence and focused solely on the actual number of decision-making opportunities given to students. In order to assess the relative importance of actual decision-making versus decision-making congruence, the method of first differences was also used to estimate the simple effects of actual decision-making prerogatives, and the simultaneous effects of actual decision-making prerogatives and decision-making congruence. Both unstandardized (b) and standardized (β) regression coefficients were obtained for every model estimated.

Model 1: Simple effects of decision-making congruence. Table 3 lists the regression coefficients and their associated significance levels obtained in our first difference analyses. Students who are given decision-making opportunities that are congruent with the opportunities they consider ideal believe math to have greater utility and intrinsic value, like their teacher more, and like school this year more than do students who experience decision-making opportunities that are discrepant from those they consider ideal. Students who experience decision-making congruence are less likely than others to say that they come to school only because they have to or because they like to participate in sports. Although decision-making congruence is positively related to students' expectancies for success in math, it is not related to students' self-concept of math ability nor to their perceptions concerning the difficulty of math. Similarly, congruence is unrelated to math worry, math test anxiety, or somatic signs of evaluation anxiety. Finally, although congruence is positively related to both self-report and teacher-report measures of student effort, it is not related to students' time spent on math outside of the classroom nor students' performance or grade in math.

It was not possible to use the first difference method in analyzing student misbehavior; teacher report items concerning misbehavior at Wave 1 were different than those asked at Wave 2, and student self-reports were available only at Wave 2. Therefore, cross-sectional regression models were used in all analyses involving misbehavior. As can be seen in Table 3, to the extent that students report congruence between the actual and ideal decision-making prerogatives in their math classrooms, they are less likely to misbehave at school. This relationship is evident both from self-report and from teacher reports.

<u>Models 2 and 3: Simple effects of actual decision-making opportunities and simultaneous effects of congruence and actual</u>

decision-making opportunities. In our sample, the within-year change in number of actual decision-making prerogatives students report is positively related to the within-year change in decision-making congruence they exhibit ($r = .26$, $N = 2239$, $p < .0001$). However, in contrast to the simple effects of decision-making congruence, the simple effects of actual decision-making opportunities occur only about as often as would be expected by chance given the number of dependent variables examined in Table 3. Furthermore, these effects of actual opportunities disappear when one simultaneously controls for the effects of decision-making congruence. On the other hand, none of the effects of decision-making congruence disappear when one simultaneously controls for the effects of actual decision-making opportunities; parameter estimates of congruence effects are similar in Models 1 and 3.

Across-domain comparisons. In order to test the hypothesis that effects of decision-making congruence in the context of mathematics instruction would not generalize to other domains of student activity, we examined effects of decision-making congruence on outcome variables in social and athletic activity domains. The Transitions project assessed students' self-concept, perceived utility value, and perceived intrinsic value of being popular and of participating in sports, using items analogous to those in the math domain (see Appendix C). Because the Transitions project used fewer indicators of constructs in the social and athletic domains than in the math domain, only a subset of the math domain indicators of self-concept, utility value, and intrinsic value are used in these across-domain comparisons. Table 4 displays effects of within-school-year change in decision-making congruence and actual prerogatives (measured in mathematics contexts) on change in analogous mathematics, popularity, and athletic outcomes.

The effects of decision-making congruence clearly do not generalize across domains. When self-concept is the outcome, for instance, actual prerogatives and decision-making congruence have no effect in the mathematics and athletic domains, but congruence does show a significant negative effect on popularity self-concept. When utility value is the outcome, decision-making congruence has a positive effect, a negative effect, and no effect in relation to mathematics, popularity, and athletics, respectively. When intrinsic value is the outcome of interest, congruence only has an effect in the mathematics domain, and actual prerogatives only has an effect in the social domain. The inverse relationship between congruence and the perceived utility of being popular may mean that students who feel "out of synch" (discrepant) with decision-making conditions in their mathematics class divert their personal investments toward social relations with their classmates. It is less clear why congruence is inversely related to popularity self-concept, and why actual prerogatives are inversely related to the perceived intrinsic value of popularity.

Discussion

All of our hypotheses received at least partial support. Consistent with Hypothesis 1 and with others' findings (Lee et al., 1983; Midgley & Feldlaufer, 1986; Moos, 1979; Reuman et al., 1984), students in our sample typically report having fewer decision-making opportunities than they think they should have in their math classrooms. These sixth grade math classrooms are failing to fit many of their students in an important way. The only decision-making area where this pattern is not found concerned decisions regarding what students do in math class after completing their math work. This area of decision-making may be distinctive in that the choices early finishers make in this regard can negatively affect students who are still trying to finish their math assignments. That is, if the early finishers in a given classroom tend to choose activities that are distracting to those still working, those students who are not consistently among the earlier finishers may desire greater teacher control in this area.

Consistent with person-environment fit theory, and with Hypotheses 3 and 5, decision-making congruence is positively associated with students' favorable math-related and school-related affects, values, and behaviors and is negatively related to unfavorable outcome (e.g., misbehavior or feeling that one comes to school only because one is forced to attend). Increases in decision-making congruence are consistently predictive of increases in students' liking their math teacher, school, and math itself, and their perceptions of the importance of math. Of course, this does not mean that decision-making congruence in math is related to all math-related affective variables. For example, change in decision-making congruence is not related to change in students' math-related worry and test anxiety, and somatic signs of anxiety at school. Furthermore, consistent with Hypothesis 4, decision-making congruence shows differential effects on affects and values across math, social, and athletic activity domains. For instance, decision-making congruence in math classrooms is inversely related to the importance children place on popularity, whereas it is positively related to the importance they place on being good at math.

It is interesting that decision-making congruence is positively related to children's expectancies for success in math but is unrelated to their perceptions of how good they are at math or how difficult math is perceived to be. Does providing children with the degree of decision-making they want in their math classrooms give them confidence that they can shape the environment to ensure success even if they don't think they are particularly good at math and think that math is a fairly difficult subject? This question requires further research, especially because our earlier study (Reuman et al., 1984) found a positive relationship between self-concept of math ability and decision-making congruence in math.

The portion of Hypothesis 3 concerning effort and performance level in mathematics is only partially supported. Consistent with the hypothesis, increases in decision-making congruence are associated with increases in student effort in math. This relationship is evident both from student self-reports of effort and from teacher assessments of student effort. However, there is no similar effect of congruence on the amount of time children report spending on math homework or on math-related activities outside of math class. Thus, ones' positive behavioral responses to decision-making congruence within the classroom may not generalize, at least not immediately, to ones' behavioral responses outside the classroom. Similarly, although congruent students try harder in math than discrepant students, their performance levels and grades in math are not immediately affected. We look forward to examining possible lagged effects of decision-making congruence on the math performance and continuing motivation of these students as we follow them for two additional waves in our panel study.

In the present study, as in our earlier study (Reuman et al., 1984), decision-making congruence predicts student outcomes much better than does the level of actual decision-making opportunities. These findings suggest that past research has perhaps placed too much emphasis on the number of decision-making opportunities given to students without devoting enough explicit attention to the opportunities that students prefer or consider ideal. Future research should try to delineate the conditions under which the level of actual decision-making opportunities provided to students will have a direct effect on student attitudes and behaviors even after one controls for the level of students' decision-making congruence.

Not only are the immediate impacts of decision-making discrepancy disturbing, the possible long term consequences are very sobering. Because past research has demonstrated that children's achievement values, affective reactions, and expectancies predict persistence, performance, task choice, and enrollment decisions (Battle, 1966; Crandall, Katkovsky, & Preston, 1962; Eccles, Adler, Futterman, Goff, Kaczala, Meece, & Midgley, 1983), we are troubled by the finding that person-environment discrepancy in decision-making is resulting in lowered values and expectancies, and in negative affective reactions for many children.

What are the implications of our findings for educators? Educators should work toward increasing the fit between actual opportunities and the opportunities which students feel are justified. However, this poses a dilemma. Although students within a classroom tend to agree among themselves concerning the actual opportunities present in their classroom, they display considerable disagreement concerning which opportunities they feel are justified. Because students differ in what decision-making opportunities they believe they should have, a uniform decision-making policy within a classroom will result in some students' congruence and others' discrepancy. For example, allowing students to help decide how much math homework they will get may have a positive effect on students who believe they should have a say in this, but may have a negative effect on those who believe that the teacher should make this decision. For some types of decisions it might be possible to individualize the role given to students in order to bring them all into congruence. For other types of decisions, establishing a classroom-wide decision-making policy may be the only practical or equitable course of action.

When a classroom-wide decision-making policy is necessary, teachers could learn through class discussions what decisions a majority of their students believe they should have a say in. Prerogatives could then be established in specific domains of classroom activity. Teachers and students could monitor the success with which students handle these prerogatives, establish sanctions for misuse, and decide when a prerogative should be revoked. Even though some students' preferences will not be met, being involved in the process of establishing, monitoring, and evaluating opportunities for classroom decision-making should heighten students' feelings of congruence with their classroom environment. Had more teachers in our sample requested input from students about their ideal prerogatives, they might have been able to avert the condition where so many of their students felt they did not have decision-making opportunities they ought to have.

One effect of involving students in the process of classroom decision-making may be to redefine their ideal prerogatives. Students who were part of a minority that voted to institute a prerogative would be aware of the reasoning of the majority. This might facilitate the re-examination of their position. That is, hearing their classmates' or their teacher's arguments against a particular prerogative may help these students understand the reasons for the prerogative's absence. If this helps them feel less strongly that they should have the prerogative, these students may suffer fewer of the negative consequences of lack of fit with the classroom environment. For students who continue to believe that they should have the prerogative, the experience of participating in a democratic process may reduce alienation from school.

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TABLE 1

MEAN ACTUAL AND IDEAL PREROGATIVES AND DECISION-MAKING CONGRUENCE OF STUDENTS IN SIXTH GRADE MATHEMATICS CLASSROOMS

Item Content	Wave		Contrast of
	One	Two	*Wave 1 v. Wave 2*
Decide where sit			
Actual	1.35	1.32	*2.70***
Ideal	1.68	1.72	*-3.25***
Congruence	1.52	1.49	*2.07**
Actual v. ideal	*-25.33****	*-31.44****	
Decide how much homework			
Actual	1.13	1.10	*3.11***
Ideal	1.47	1.48	*-0.82*
Congruence	1.59	1.58	*1.48*
Actual v. ideal	*-29.99****	*-33.50****	
Decide what classwork			
Actual	1.12	1.12	*-0.10*
Ideal	1.40	1.42	*-2.00**
Congruence	1.64	1.63	*1.03*
Actual v. ideal	*-24.99****	*-27.11****	
Decide class rules			
Actual	1.34	1.31	*3.00***
Ideal	1.70	1.70	*0.12*
Congruence	1.56	1.53	*1.72*
Actual v. ideal	*-30.80****	*-33.41****	
Decide what to do next			
Actual	1.70	1.72	*-1.45*
Ideal	1.58	1.65	*-6.44****
Congruence	1.62	1.62	*0.11*
Actual v. ideal	*9.82****	*5.00****	

Note. N = 2239 students in each cell. Pairwise *t*-tests are shown in italics; *, **, and *** indicate *p*-values less than or equal to .05, .01, and .001, respectively.

TABLE 2

MEAN PERCENT AGREEMENT (WITHIN-CLASSROOM)

ACROSS FIVE DECISION-MAKING PREROGATIVES

Item Content	Wave		Contrast of
	One	Two	*Wave 1 v. Wave 2*
Decide where sit			
Actual	75.00	80.01	-4.08***
Ideal	71.16	73.76	-2.15*
Actual v. ideal	1.96*	3.13**	
Decide how much homework			
Actual	88.42	89.76	-1.49
Ideal	62.18	62.04	0.14
Actual v. ideal	19.01***	21.28***	
Decide what classwork			
Actual	88.48	87.62	0.84
Ideal	64.16	64.64	-0.44
Actual v. ideal	18.54***	16.64***	
Decide class rules			
Actual	73.50	74.31	-0.68
Ideal	72.55	72.35	0.16
Actual v. ideal	0.52	1.10	
Decide what to do next			
Actual	73.73	74.63	-0.77
Ideal	64.18	68.13	-3.58***
Actual v. ideal	6.54***	4.67***	

Note. N = 117 classrooms in each cell. Pairwise t-tests are shown in italics; *, **, and *** indicate p-values less than or equal to .05, .01, and .001, respectively.

TABLE 3

EFFECTS OF WITHIN-SCHOOLYEAR CHANGE IN DECISION-MAKING CONGRUENCE AND ACTUAL PREROGATIVES ON

CHANGE IN 6TH GRADERS' BELIEFS, VALUES, AND BEHAVIORS

Dependent Variable	*N*	Model 1: Δ Congruence		Model 2: Δ Actual		Model 3: Δ Congruence		+ Δ Actual	
		b	β	b	β	b	β	b	β
Δ Math utility value	2186	.421***	*.110****	.064	*.012*	.440***	*.115****	-.100	*-.019*
Δ Math intrinsic value	2186	.415***	*.136****	.179*	*.042**	.410***	*.134****	.024	*.006*
Δ Like teacher	2223	.252***	*.188****	.133***	*.071****	.244***	*.182****	.043	*.023*
Δ Like school	2061	.189***	*.146****	.049	*.027*	.194***	*.150****	-.025	*-.014*
Δ Reason come: Friends	2049	-.060	*-.035*	-.043	*-.018*	-.055	*-.032*	-.022	*-.009*
Δ Reason come: Band, art, etc	2045	-.072	*-.040*	.018	*.007*	-.082*	*-.046**	.049	*.020*
Δ Reason come: Sports	2049	-.083*	*-.048**	.025	*.010*	-.095*	*-.056**	.062	*.026*
Δ Reason come: Have to	2051	-.124**	*-.066***	-.097	*-.037*	-.113**	*-.060***	-.053	*-.020*
Δ Math self-concept	2213	.016	*.007*	.033	*.010*	.010	*.005*	.029	*.009*
Δ Math expectancies	2230	.122***	*.075****	.031	*.014*	.125***	*.076****	-.015	*-.006*
Δ Math task difficulty	2186	-.067	*-.026*	-.030	*-.008*	-.066	*-.026*	-.005	*-.001*
Δ Free time on math	2216	.007	*.003*	.042	*.012*	-.001	*.000*	.042	*.012*
Δ Time on math homework	2218	.019	*.027*	.020	*.021*	.016	*.024*	.014	*.014*
Δ Effort: self report	2219	.050*	*.042**	-.009	*-.006*	.056*	*.047**	-.030	*-.018*
Δ Effort: teacher report	2222	.042*	*.046**	.025	*.020*	.040*	*.044**	.011	*.008*
Δ Performance: teacher report	2220	.008	*.013*	.003	*.004*	.008	*.013*	.000	*.000*
Δ Math grade	1103	.026	*.020*	-.033	*-.018*	.035	*.028*	-.048	*-.026*

TABLE 3 (continued)

Dependent Variable	N	Model 1: Δ Congruence		Model 2: Δ Actual		Model 3: Δ Congruence		+ Δ Actual	
		b	β	b	β	b	β	b	β
Δ Math worry	2178	.049	*.018*	-.067	*-.018*	.066	*.025*	-.092	*-.025*
Δ Math test anxiety	2162	-.043	*-.011*	-.014	*-.002*	-.044	*-.011*	.002	*.000*
Δ Somatic signs	2176	.019	*.005*	.089	*.018*	.002	*.001*	.088	*.017*
		Model 1: Congruence		**Model 2: Actual**		**Model 3: Congruence**		**+ Actual**	
		b	β	b	β	b	β	b	β
Misbehavior[a]									
Self-report (Wave 2)	2155	-2.142***	*-.197****	-.053	*-.003*	-2.334***	*-.215****	.932**	*.060***
Teacher report:									
Student fights (Wave 1)	2230	-.036***	*-.076****	-.002	*-.004*	-.038***	*-.081****	.012	*.019*
Disciplinary action (Wave 2)	2219	-.076***	*-.124****	.007	*.008*	-.084***	*-.137****	.040*	*.046**
Parents called in (Wave 2)	2220	-.034***	*-.122****	-.013	*-.033*	-.034***	*-.122****	.000	*.001*
Student suspended (Wave 2)	2217	-.009***	*-.079****	-.001	*-.004*	-.009***	*-.085****	.003	*.020*

Note. *, **, and *** indicate that the effect is significant at or below .05, .01, and .001, respectively. N's are lower than 2239 because of missing data on dependent variables.

[a] Self-report measures and teacher ratings of student misbehavior were collected either at Wave 1 or at Wave 2, so cross-sectional analyses are performed for these dependent variables.

TABLE 4

EFFECTS OF WITHIN-SCHOOLYEAR CHANGE IN DECISION-MAKING CONGRUENCE AND ACTUAL PREROGATIVES ON CHANGE IN 6TH GRADERS' BELIEFS AND VALUES ACROSS THREE ACTIVITY DOMAINS

Dependent Variable	*N*	Model 1: Δ Congruence		Model 2: Δ Actual		Model 3: Δ Congruence + Δ Actual			
		b	β	b	β	b	β	b	β
Δ Math self concept	2218	.011	*.007*	.038	*.018*	.004	*.003*	.036	*.017*
Δ Popularity self concept	2151	-.113**	*-.060***	.005	*.002*	-.122**	*-.065***	.050	*.019*
Δ Sports self concept	2176	-.043	*-.026*	-.028	*-.012*	-.041	*-.024*	-.012	*-.005*
Δ Math utility value	2223	.068**	*.065***	-.002	*-.001*	.073**	*.070***	-.029	*-.020*
Δ Popularity utility value	2167	-.071*	*-.046**	.013	*.006*	-.078*	*-.051**	.042	*.020*
Δ Sports utility value	2155	.051	*.037*	-.013	*-.007*	.058	*.042*	-.035	*-.019*
Δ Math intrinsic value	2225	.145***	*.111****	.026	*.014*	.151***	*.116****	-.030	*-.016*
Δ Popularity intrinsic value	2166	-.019	*-.019*	-.069*	*-.050**	-.006	*-.007*	-.066*	*-.049**
Δ Sports intrinsic value	2157	.016	*.016*	-.004	*-.003*	.018	*.018*	-.011	*-.008*

Note. *, **, and *** indicate that the effect is significant at or below .05, .01, and .001, respectively. *N*'s are lower than 2239 because of missing data on dependent variables. To maintain across-domain comparability in these analyses, only two math self-concept items, one math utility value item, and one math intrinsic value item were used.

APPENDIX A

STUDENT QUESTIONNAIRE ITEMS MEASURING OUTCOMES RELATED TO MATHEMATICS AND MISBEHAVIOR AT SCHOOL

Math utility value: Girls' alpha = .815; Boys' alpha = .771

In general, how useful is what you learn in math?

not at all useful						very useful
1	2	3	4	5	6	7

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?

not at all useful						very useful
1	2	3	4	5	6	7

Is the amount of effort it will take to do well in math this year worthwhile to you?

not very worthwhile						very worthwhile
1	2	3	4	5	6	7

For me, being good at math is

not at all important						very important
1	2	3	4	5	6	7

How useful do you think high school math will be for what you want to do after you graduate and go to work?

not at all useful						very useful
1	2	3	4	5	6	7

Math intrinsic value: Girls' alpha = .759; Boys' alpha = .745

Do you spend as much time as you do in math
(Check one answer.)

_____ 1) because you have to in order to finish the work.
_____ 2) because you just like doing math.

In general, I find working on math assignments

very boring						very interesting
1	2	3	4	5	6	7

How much do you like doing math?

a little						a lot
1	2	3	4	5	6	7

Would you take more math <u>if you didn't have to</u>? *(Reversed for analyses)*

_____ 1) I very definitely would take more math.
_____ 2) I probably would take more math.
_____ 3) Maybe I would take more math.
_____ 4) I'm not sure.
_____ 5) Maybe, but not that likely.
_____ 6) I probably would not take any more math.
_____ 7) I very definitely would not take any more math.

Math self-concept: Girls' alpha = .810; Boys' alpha = .7[illegible]

How good at math are you?

not at all good						very good
1	2	3	4	5	6	7

If you were to rank all the students in your math class from the worst to the best in math, where would you put yourself?

the worst						the best
1	2	3	4	5	6	7

Compared to most of your other school subjects, how good are you at math?

much worse						much better
1	2	3	4	5	6	7

Math expectancies: Girls' alpha = .765; Boys' alpha = .791

How well do you think you will do in math this year?

not at all well						very well
1	2	3	4	5	6	7

How successful do you think you'd be in a career that required mathematical ability?

not very successful						very successful
1	2	3	4	5	6	7

Math task difficulty: Girls' alpha = .627; Boys' alpha = .627

In general, how hard is math for you?

very easy						very hard
1	2	3	4	5	6	7

Compared to other students your age, how much time do you have to spend working on your math assignments?

much less time						much more time
1	2	3	4	5	6	7

Compared to most other school subjects you have taken or are taking, how hard is math for you?

my easiest course						my hardest course
1	2	3	4	5	6	7

Free time spent on math: Girls' alpha = .581; Boys' alpha = .585

Some kids spend time doing math games or activities. Some of the math games and activities kids have told us about are making models or clothes, reading maps, playing Monopoly, and playing with computers or a Rubik's cube.

Outside of the time you spend at school or doing school work, how often do you do math games or activities just because you want to?

never						very often
1	2	3	4	5	6	7

If you didn't have other things you had to do, how much time would you spend doing math games or activities?

a lot less time than I do now						a lot more time than I do now
1	2	3	4	5	6	7

Math worry: Girls' alpha = .[illegible]28; Boys' alpha = .488

If you are absent from school and you miss a math assignment, how much do you worry that you will be behind the other students when you come back to school?

not at all						very much
1	2	3	4	5	6	7

When the teacher says she is going to ask you some questions to find out how much you know in math, how much do you worry that you will do poorly?

not at all						very much
1	2	3	4	5	6	7

Math test anxiety: Girls' alpha = .894; Boys' alpha = .872

Before you take a test in math, how nervous do you get?

I'm not nervous at all						I'm very nervous
1	2	3	4	5	6	7

While you are taking a test in math, how nervous do you get?

I'm not nervous at all						I'm very nervous
1	2	3	4	5	6	7

Do math tests scare you?

not at all						very much
1	2	3	4	5	6	7

Somatic signs of anxiety: Girls' alpha = .817; Boys' alpha = .791

Does the hand you write with shake when you are taking a test?

not at all						it shakes a lot
1	2	3	4	5	6	7

Does your heart beat faster when you have to do a test?

not at all						a lot faster
1	2	3	4	5	6	7

When the teacher asks you to write on the blackboard, does the hand you write with sometimes shake?

not at all						it shakes a lot
1	2	3	4	5	6	7

Misbehavior: Alpha = .804

Think about the last three weeks you were at school. About how often in those three weeks did you do the things listed below while you were at school? (Circle one number for each question.)

In the last three weeks at school, about how many times did you . . .

punch or push around another student?

0 1 2 3 4 5 6 7 8 9 10 11 12 or more

write or draw anything on school property when you were not supposed to?

0 1 2 3 4 5 6 7 8 9 10 11 12 or more

wise off and disrupt a class?

0 1 2 3 4 5 6 7 8 9 10 11 12 or more

refuse to work in a class?

0 1 2 3 4 5 6 7 8 9 10 11 12 or more

call a student names or make fun of another student?

0 1 2 3 4 5 6 7 8 9 10 11 12 or more

copy someone else's work when you were not supposed to?

0 1 2 3 4 5 6 7 8 9 10 11 12 or more

bring alcohol or drugs to school?

0 1 2 3 4 5 6 7 8 9 10 11 12 or more

Since this past January, how many times have you not come to school when you were supposed to? (Do not include times when you were sick or went on a trip with your parents. Circle one answer.)

0 1 2 3 4 5 6 7 8 9 10 11 12 or more

APPENDIX B

SINGLE-INDICATOR DEPENDENT VARIABLES REGRESSED ON DECISION-MAKING CONGRUENCE AND ACTUAL PREROGATIVES

Student Self-Report Measures

How much do you like your math teacher?

not very much						very much
1	2	3	4	5	6	7

How much do you like school this year?

not at all						very much
1	2	3	4	5	6	7

Different students have different reasons for coming to school. How **important are each of the reasons below for you for coming to school?**

I come to school because I like to see my friends there.

not an important reason						a very important reason
1	2	3	4	5	6	7

I come to school because I like the special activities we do there, like band or art.

not an important reason						a very important reason
1	2	3	4	5	6	7

I come to school because I like the sports we do there.

not an important reason						a very important reason
1	2	3	4	5	6	7

I come to school because I have to.

not an important reason						a very important reason
1	2	3	4	5	6	7

How much time do you spend on math homework?
(Check one answer.)

_____ 1) less than 15 minutes a day
_____ 2) 15 to 30 minutes a day
_____ 3) 30 minutes to an hour a day
_____ 4) an hour or more a day

How hard do you work in math?

a little						a lot
1	2	3	4	5	6	7

Teacher Ratings

How hard does this student try in math?

does not try at all						tries very hard
1	2	3	4	5	6	7

Compared to other students in this class, how well is this student performing in math?

near the bottom of the class	below the middle of the class	in the middle of the class	above the middle of the class	one of the best in the class
1	2	3	4	5

Please check Rarely, Sometimes, or Often to tell how frequently this student does each of the following.

	Rarely 1	Sometimes 2	Often 3
This student fights or quarrels with other students	_____	_____	_____

How often have you had to take any disciplinary action with this student? *(Reversed for analyses).*

_____ 1) Very frequently
_____ 2) Frequently
_____ 3) Occasionally
_____ 4) Rarely

In the current school year, did this student have any behavior or discipline problems at this school which resulted in the student's parents being sent a note or being asked to come in and talk with the teacher or principal? *(Reversed for analyses).*

______1) Yes ______2) No

In the current school year, was this student suspended from school for a day or more? *(Reversed for analyses).*

______1) Yes ______2) No

APPENDIX C

DEPENDENT VARIABLES USED IN ACROSS-DOMAIN COMPARISONS

Self-Concept

Mathematics: Wave 1 alpha = .801; Wave 2 alpha = .832

How good at math are you?

not at all good 1 2 3 4 5 6 7 very good

If you were to rank all the students in your math class from the worst to the best in math, where would you put yourself?

the worst 1 2 3 4 5 6 7 the best

Popularity: Wave 1 alpha = .869; Wave 2 alpha = .871

How popular are you in school?

not at all popular 1 2 3 4 5 6 7 very popular

If you were to rank all the students in your class from the least to the most popular, where would you put yourself?

the least popular 1 2 3 4 5 6 7 the most popular

Athletics: Wave 1 alpha = .873; Wave 2 alpha = .873

How good at sports are you?

not at all good 1 2 3 4 5 6 7 very good

If you were to rank all the students your age from the worst to the best in sports, where would you put yourself?

the worst 1 2 3 4 5 6 7 the best

Utility Value

For me, being good at math is

not at all important						very important
1	2	3	4	5	6	7

For me, being popular is

not at all important						very important
1	2	3	4	5	6	7

For me, being good at sports is

not at all important						very important
1	2	3	4	5	6	7

Intrinsic Value

How much do you like doing math?

a little						a lot
1	2	3	4	5	6	7

How much do you like doing things with your friends?

a little						a lot
1	2	3	4	5	6	7

How much do you like playing sports?

a little						a lot
1	2	3	4	5	6	7

END

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