

# *Middle Grades Research Journal*

Volume 8 - No. 1, Spring 2013

**SPECIAL ISSUE: MOTIVATION**

*James A. Middleton*  
Special Issue Editor

*Frances R. Spielhagen*  
Editor-in-Chief

*Robert Capraro*  
*Mary Margaret Capraro*  
*Gerald A. Goldin*  
Associate Editors

# ***THE RELATIONSHIPS AMONG MIDDLE SCHOOL STUDENTS' MOTIVATIONAL ORIENTATIONS, LEARNING STRATEGIES, AND ACADEMIC ACHIEVEMENT***

**Megan S. McClintic-Gilbert and Jennifer Henderlong Corpus**

*Reed College*

**Stephanie V. Wormington**

*Duke University*

**Kyla Haimovitz**

*Stanford University*

The present study examined the extent to which middle school students' ( $N = 90$ ) learning strategies mediated the relationship between their motivational orientations and academic achievement. Survey data revealed that higher degrees of intrinsic motivation predicted the use of both deep and surface learning strategies, whereas higher degrees of extrinsic motivation predicted the use of superficial strategies. Students' semester grade point averages indicated that academic achievement was negatively related to both extrinsic motivation and the use of superficial learning strategies, but surprisingly unrelated to intrinsic motivation and the use of deep learning strategies. As predicted, the negative relationship between extrinsic motivation and achievement was fully mediated by the use of superficial learning strategies.

Motivation to learn is an essential component of academic success, particularly at the middle school level, which is marked by declines in school grades, competence beliefs, the quality of teacher-student relationships, and the perceived value of school (Barber & Oleson, 2004; Eccles & Midgley, 1989; Eccles et al., 1993; Guttman & Midgley, 2000; Harter, Whitesell, & Kowalski, 1992; Wigfield et al.,

1997). However, the form that motivation takes is just as important as the amount of motivation students have (Deci & Ryan, 2000; Vansteenkiste, Lens, & Deci, 2006; Vansteenkiste, Sierens, Soenens, Luyckx, & Lens, 2009). Researchers have long distinguished between *intrinsic* and *extrinsic* forms of motivation, arguing that they have distinct consequences for learning (e.g., Deci, Koestner, &

---

• **Jennifer Henderlong Corpus**, Department of Psychology, Reed College, 3203 SE Woodstock Blvd., Portland OR 97202.  
E-mail: [henderlj@reed.edu](mailto:henderlj@reed.edu)

Ryan, 1999; Harter, 1978; Sansone & Harackiewicz, 2000). Indeed, intrinsic motivation (i.e., learning for the sake of learning) predicts regular homework completion (Otis, Groutzet, & Pelletier, 2005), cognitive engagement (Walker, Greene, & Mansell, 2006), high classroom grades (Boiché, Sarrazin, Grouzet, Pelletier, & Chanal, 2008; Gottfried, 1985, 1990; Lepper, Corpus, & Iyengar, 2005), and strong standardized test scores (Gottfried, 1985; Lepper et al., 2005). Extrinsic motivation (i.e., learning as a means to an end), by contrast, tends to serve as a negative predictor of these same achievement outcomes (Lepper et al., 2005; Vansteenkiste et al., 2009).

What is the mechanism by which these forms of motivation predict achievement? One possibility is that students are more attentive to and engaged with material that they find to be intrinsically interesting (Harackiewicz, Barron, Tauer, Carter, & Elliot, 2000; Stipek, 2002). Theoretically, this leads to richer conceptual understanding and better performance. This perspective is supported by work within the literature on interest development (Hidi & Renninger, 2006; Schiefele, 1991, 2009). On the other hand, students pursuing schoolwork as a means to an extrinsic end may adopt more superficial strategies that involve minimal effort and focus on simple task completion. In short, motivation orientation may shape students' tendency to act as self-regulated learners who employ cognitive and metacognitive strategies that affect learning and performance (see Pintrich & DeGroot, 1990; Schunk, 2008; Zimmerman, 2008; Zimmerman & Schunk, 2001). Understanding the specific ways in which intrinsic and extrinsic motivations translate into strategic action and thus achievement may be crucial for designing interventions to improve learning outcomes.

Although the relationships between strategy use and more general patterns of motivation have been examined (e.g., Bouffard, Vezeau, & Bordeleau, 1998; Järvelä, Järvenoja, & Malmberg, 2012; Pintrich & DeGroot, 1990; Shih, 2005; Wolters, 2004; Wolters & Taylor, 2012), little work has explored the connection

between such strategies and the specific forms of intrinsic and extrinsic motivation. This particular connection may be critical for understanding the link to academic achievement given the important role of intrinsic and extrinsic motivations in both pedagogical philosophy and classroom settings (e.g., Greenberg, 1992; Lillard, 2005; Mitchell & Gerwin, 2008). To this end, we consider the extent to which a set of strategic approaches to schoolwork may be systematically related to intrinsic and extrinsic forms of motivation.

### Deep Strategies

Deep learning strategies represent active cognitive engagement on the part of the learner and tend to involve techniques that help students assimilate and connect new material with prior knowledge. Such strategies include distinguishing essential versus nonessential information, integrating new information with what is already known, and monitoring comprehension of learning (Entwistle & Ramsden, 1983; Nolen, 1988). More specifically, deep learning strategies include elaboration, summarization, critical thinking, organization of information, and metacognitive regulation (Entwistle & Ramsden, 1983; Weinstein & Mayer, 1986).

Previous research has shown a connection between deep learning strategies and achievement indicators such as exam performance (Cano, 2005; Elliot, McGregor, & Gable, 1999; Fenollar, Román, & Cuestas, 2007; Garcia & Pintrich, 1994; Simons, Dewitte, & Lens, 2004) and perceived competence (Diseth, 2011; Meece, Blumenfeld, & Hoyle, 1988). These indicators have also been linked to intrinsic motivation and with goals that emphasize learning and mastery (Diseth & Kobbeltvedt, 2010; Elliot et al., 1999; Meece et al., 1988; Nolen, 1988; Somuncuoglu & Yildirim, 1999; Stipek & Gralinski, 1996; Vansteenkiste, Simons, Lens, Soenens, & Matos, 2005). Because students who are driven by curiosity to seek challenges and master new material would presumably be drawn to the use of deep learning strategies,

we expected such strategies to be positively related to intrinsic motivation. In addition, we expected that students who desire easy work—a symptom of extrinsic motivation—would not employ deep learning strategies because the effort required would be too great. Such strategies, moreover, would likely be unnecessary for easy work.

### Surface Strategies

Surface learning strategies require some effort but less cognitive engagement than deep processing strategies. Such strategies include the use of rehearsal and rote memorization. Students who use surface strategies might be seen reading material over and over, memorizing facts or words, and copying notes until the material can be recalled for an exam (Entwistle & Ramsden, 1983; Nolen, 1988; Weinstein & Mayer, 1986). While these tactics can be useful, they are time consuming and tend not to enhance conceptual understanding (Weinstein & Mayer, 1986).

Previous research has shown that surface strategies are rarely related to GPA and exam performance (Elliot et al., 1999; Watkins, 2001), but are consistently, positively, related to a desire to outperform others (Elliot et al., 1999; Harackiewicz, Barron, Carter, Letho, & Elliot, 1997; Nolen, 1988; Pintrich, Smith, Garcia, & McKeachie, 1993), to avoid being outperformed by others (Middleton & Midgley, 1997), and to avoid work (Nolen, 1988; Somuncuoglu & Yildirim, 1999). We therefore expected surface learning strategies to relate positively to students' desire to please others—a key dimension of extrinsic motivation (see Román, Cuestas, & Fenollar, 2008). At the same time, some previous research has shown such strategies to be moderately positively related to an emphasis on learning and mastery (Liem, Lau, & Nie, 2008). One can imagine, for example, a student who pursues a task out of genuine enjoyment while still believing that a strategy like rote memorization is an effective way to learn the material. We thus anticipated a positive relationship

between surface strategies and intrinsic motivation.

### Superficial Strategies

Superficial strategies describe techniques students employ when they want to complete their work, but are not necessarily invested in learning or even achieving at a certain level. Students who use these strategies generally wish to expend minimal effort (Meece et al., 1988). More specifically, these strategies encompass behaviors such as guessing, copying, completing only the easy parts of assignments, and turning in work without checking answers or proofreading.

Previous research has shown these strategies to be negatively related to achievement test scores (Garcia & Pintrich, 1994; Stipek & Gralinski, 1996) and perceived competence (Meece et al., 1988). Superficial strategy use has also been associated with an emphasis on external orientations, such as doing better than others (Meece et al., 1988; Stipek & Gralinski, 1996) and avoiding work (Meece et al., 1988). We therefore expected that superficial learning strategies would be positively related to extrinsic motivation and negatively related to intrinsic motivation in that students who embrace challenging work seem unlikely to engage in tactics such as guessing and copying.

### Research Questions and Hypotheses

The present study was designed to address three primary research questions regarding the relationships among motivational orientations, learning strategies, and academic achievement at the middle school level.

*First, how do middle school students' intrinsic and extrinsic motivational orientations relate to their use of learning strategies?* As outlined above, we predicted that intrinsic motivation would be positively related to deep learning strategies and—to a lesser extent—surface strategies, and negatively related to superficial strategies. In addition, we predicted that at least some forms of extrinsic motivation

would be negatively related to deep learning strategies and positively related to surface and superficial strategies.

*Second, how do motivational orientations and learning strategies relate to concurrent levels of achievement?* We predicted that intrinsic motivation would be positively related to achievement while extrinsic motivation would be negatively related to achievement. We also predicted that the use of deep learning strategies would be positively related to achievement while the use of superficial learning strategies would be negatively related to achievement.

*Third, is the relationship between middle school students' motivational orientations and achievement mediated by learning strategies?* We expected that the predicted positive relationship between intrinsic motivation and academic achievement would be mediated by deep strategy use, and that the predicted negative relationship between extrinsic motivation and academic achievement would be mediated by superficial strategy use. Importantly, such a pattern of mediation would provide an explanatory framework for the relationship between students' motivational orientations and their academic achievement.

## METHOD

### Participants

Participants were 90 students from a public middle school in the Pacific Northwest (51% female; 46% sixth grade, 27% seventh grade, 27% eighth grade)<sup>1</sup>. The school served a largely working class population with 63% of students eligible for free or reduced-priced lunches. The majority of the sample identified as Caucasian (60%), with smaller percentages of Hispanic (23%), Asian or Pacific Islander (21%), African American (8%), or some other ethnicity (7%). A sizable minority of participants (33%) spoke a language other than English at home. Students were recruited via announcements made during lunchtime and letters sent home to their parents.

### Measures

Students were provided with a 5-point response scale (1 = *not like me at all*, 5 = *exactly like me*) for use with the self-report measures described below.

**Intrinsic and Extrinsic Motivational Orientations.** Students' intrinsic and extrinsic motivational orientations were assessed with reliable and valid scales from Corpus, McClintic-Gilbert, and Hayenga (2009), which were based on Lepper et al. (2005) and Harter (1981). The intrinsic motivation scale was composed of 17 items assessing students' preference for challenge (e.g., "I like hard work because it's a challenge"), desire for independent mastery of academic material (e.g., "I like to try to figure out how to do school assignments on my own"), and perceived role of curiosity or interest as the driving force of their behaviors (e.g., "I ask questions in class because I want to learn new things"). Because previous research (Lepper et al., 2005) has conceptualized intrinsic motivation as a single higher-order factor, all 17 items were averaged together to form an internally consistent index of intrinsic motivation ( $\alpha = .87$ ). Because previous research has conceptualized extrinsic motivation as a multifaceted construct (Lepper et al., 2005; Ryan & Deci, 2000), two separate dimensions of students' extrinsic motivation were assessed: A preference for easy work (5 items; e.g., "I don't like difficult schoolwork because I have to work too hard";  $\alpha = .84$ ) and a desire to please others (6 items; e.g., "I read things because the teacher wants me to";  $\alpha = .79$ ). The 11 items were also averaged together to form an internally consistent composite index of extrinsic motivation ( $\alpha = .85$ ).

**Learning Strategies.** Based on the characteristics of deep versus surface learning strategies outlined in previous research (Entwistle & Ramsden, 1983; Nolen, 1988; Weinstein & Mayer, 1986), items from Pintrich and DeGroot's (1990) scales of cognitive and metacognitive learning strategies were categorized accordingly. Deep learning strategies (6

items,  $\alpha = .73$ ) included elaboration (e.g., "When I study, I put important ideas into my own words"), critical thinking (e.g., "When reading I try to connect the things I am reading about with what I already know"), organization, and metacognitive self-regulation (e.g., "I ask myself questions to make sure I know the material I have been studying"). Surface learning strategies (5 items,  $\alpha = .75$ ) included rehearsal and rote memorization (e.g., "When I study for a test I practice saying the important facts over and over to myself"). Finally, superficial learning strategies were assessed with Stipek and Gralinski's (1996) 5-item scale, with the exception that some items were reworded to mirror the form of the deep and surface strategy items discussed above. The specific superficial strategies included exerting minimal effort (e.g., "When I'm reading or doing homework, I usually skip the hard parts"), guessing (e.g., "When I do work, I usually guess a lot so that I can finish quickly"), and copying (e.g., "When doing work, I sometimes just copy down someone else's answers"). One item ("I usually do my work without thinking too hard") was dropped from the scale due to low reliability, and the four remaining items averaged together ( $\alpha = .65$ ). This reliability is moderate, not above the .70 standard for examining trends among individuals. Nevertheless, as this study is exploratory, the scale demonstrates enough reliability to provide guidance regarding the relationship between preference for superficial learning strategies and motivational orientation. Future research may need to develop a more reliable measure to make claims about individual differences.

**Academic Achievement.** To assess current academic achievement, fall quarter grades were collected from school records from participants with parent permission (87% of sample). An overall GPA was calculated using grades from all classes, using a scale that ignored pluses and minuses (e.g., A+, A, A- = 4.0; B+, B, B- = 3.0, etc.). To assess past academic achievement, cumulative school grades from the preceding year were collected from

school records (available for 73% of the sample). For eighth-grade students, this GPA included all courses; for others, this GPA included only academic courses (mathematics, science, social science, and language arts). This slight difference was based on the information made available by the school.

### Procedure

The survey was administered to participants in groups of approximately 20 students during homeroom period midway through the fall semester. Before beginning the survey, the 5-point response scale was explained and the privacy of responses was emphasized. A trained survey administrator read each item aloud while research assistants circled the room to answer questions from individual students. The procedure took approximately 20 minutes and students were given a college-themed pencil as a token of appreciation.

## RESULTS

### How Do Motivational Orientations Relate to Learning Strategies?

**Correlational Analyses.** Bivariate correlations were computed to examine the relationships among learning strategies and motivational orientations, as reported in Table 1.

**Intrinsic motivation and learning strategies.** As predicted, intrinsic motivation was positively related to both deep ( $r = .62, p < .01$ ) and surface ( $r = .48, p < .01$ ) learning strategies. The difference between these two correlations was statistically significant ( $t = 1.99, p < .05$ ) indicating that intrinsic motivation was more strongly associated with deep than with surface learning strategies. The predicted negative relationship between superficial learning strategies and intrinsic motivation did not emerge ( $r = -.03, ns$ ).

**Extrinsic motivation and learning strategies.** The extrinsic motivation composite vari-

TABLE 1  
Means, Standard Deviations, and Pearson Correlations Among the Motivational,  
Learning Strategy, and Achievement Variables

Variable	2	3	4	5	6	7	8	9	M	SD
<b>Motivational Orientations</b>										
1. Intrinsic motivation	-.26*	-.48**	.03	.62**	.48**	-.03	.05	.04	3.39	0.65
2. Extrinsic motivation composite	—	.85**	.87**	-.04	.18 <sup>†</sup>	.59**	-.23*	-.17	3.21	0.80
3. Preference for easy work	—	—	.49**	-.18 <sup>†</sup>	-.01	.50**	-.21 <sup>†</sup>	-.25**	2.83	1.05
4. Desire to please others	—	—	—	.11	.31**	.51**	-.18	-.05	3.52	0.87
<b>Learning Strategies</b>										
5. Deep strategies	—	—	—	—	.65**	.00	.03	.11	3.25	0.72
6. Surface strategies	—	—	—	—	—	.30**	-.10	-.15	3.08	0.82
7. Superficial strategies	—	—	—	—	—	—	-.49**	-.55**	1.96	0.82
<b>Achievement</b>										
8. Current GPA	—	—	—	—	—	—	—	.67**	3.13	0.83
9. Past GPA	—	—	—	—	—	—	—	—	2.94	0.96

*N* = 90 for Variables 1-7; *N* = 78 for Variable 8; *N* = 66 for Variable 9.

<sup>†</sup> *p* ≤ .10, \* *p* < .05, \*\* *p* < .01 (two-tailed).

able was positively related to superficial learning strategies ( $r = .59, p < .01$ ), but unrelated to either deep or surface learning strategies. Examining the separate dimensions of extrinsic motivation revealed the predicted positive relationship between a preference for easy work and superficial learning strategies ( $r = .50, p < .01$ ), and a nonsignificant relationship for the predicted negative relationship between a preference for easy work and deep learning strategies ( $r = -.18, p < .10$ ). Moreover, the desire to please others was positively related to both surface ( $r = .31, p < .01$ ) and superficial ( $r = .51, p < .01$ ) learning strategies.

**Regression Analyses.** As shown in Table 2, hierarchical linear regression was conducted to test the unique contributions of intrinsic and extrinsic motivational orientations for predicting each learning strategy. For each regression, learning strategies were considered criterion variables and motivational orientations were considered predictor variables. Grade level and past achievement were entered at Step 1. Although past achievement data were available for only 73% of the sample, we included it in the model because of its potential role as a

third variable accounting for the relationship between learning strategies and motivation.<sup>2</sup> Initially, gender was also entered in Step 1 but it was deleted from final regressions because beta weights were negligible. Motivational orientations (intrinsic motivation, preference for easy work, desire to please others) were entered in Step 2.

**Deep learning strategies.** Motivational orientations accounted for a significant amount of variance ( $\Delta R^2 = .41$ ) in reported use of deep learning strategies,  $F(5, 60) = 9.48, p < .001$ . Of the separate motivational variables in the model, only intrinsic motivation ( $\beta = .72, p < .001$ ) was a significant predictor, suggesting that the correlational relationship observed between intrinsic motivation and deep learning strategies was rather strong. Contrary to predictions, however, a preference for easy work did not serve as a negative predictor of deep learning strategies.

**Surface learning strategies.** Motivational orientations accounted for a significant amount of variance ( $\Delta R^2 = .23$ ) in reported use of surface learning strategies,  $F(5, 60) = 4.41, p < .01$ . Of the separate motivational variables in

TABLE 2  
Hierarchical Regression Analyses Predicting Students' Learning Strategies,  
Controlling for Levels of Past Achievement

Variable	Deep Strategies <sup>a</sup>			Surface Strategies <sup>b</sup>			Superficial Strategies <sup>c</sup>		
	B	SE B	b	B	SE B	b	B	SE B	b
<b>Step 1</b>									
Grade	-.11	.10	-.14	-.09	.10	-.11	-.09	.11	-.09
Past achievement	.09	.09	.13	-.10	.09	-.14	-.48	.09	-.54**
<b>Step 2</b>									
Grade	.06	.08	.07	.03	.10	.03	-.09	.10	-.09
Past achievement	.08	.07	.11	-.11	.08	-.15	-.41	.08	-.46**
Intrinsic Motivation	.75	.13	.72**	.50	.15	.47**	.08	.15	.06
Extrinsic: preference for easy work	.08	.09	.12	.05	.11	.07	.23	.11	.27*
Extrinsic: desire to please others	.04	.09	.05	.17	.10	.22	.28	.10	.29**

Note: *N* = 66. <sup>a</sup> $R^2 = .03, ns$ , for Step 1;  $\Delta R^2 = .41, p < .001$ , for Step 2. <sup>b</sup> $R^2 = .19, ns$ , for Step 1;  $\Delta R^2 = .23, p < .001$ , for Step 2. <sup>c</sup> $R^2 = .56, p < .001$  for Step 1;  $\Delta R^2 = .22, p < .001$ , for Step 2. \* *p* < .05, \*\* *p* < .01.

the model, only intrinsic motivation ( $\beta = .47, p < .01$ ) was a significant predictor; a desire to please others did not significantly predict the use of surface learning strategies.

**Superficial Learning Strategies.** Motivational orientations accounted for a significant amount of variance ( $\Delta R^2 = .22$ ) in reported use of superficial learning strategies  $F(5, 60) = 13.20, p < .001$ . Of the separate motivational variables in the model, both a preference for easy work ( $\beta = .27, p < .05$ ) and a desire to please others ( $\beta = .29, p < .01$ ) were significant positive predictors. Contrary to expectations, intrinsic motivation did not predict a lack of superficial strategy use.

How Do Motivational Orientations and Learning Strategies Relate to Concurrent Achievement?

**Motivational Orientations and Achievement.** Despite the positive relationship between intrinsic motivation and achievement shown in past research, intrinsic motivation and GPA were unrelated in the present study ( $r = .056, ns$ ; see Table 1). However, both the extrinsic motivation composite ( $r = -.23, p < .05$ ) and the dimension of a preference for easy work ( $r = -.21, p < .10$ ) showed the predicted

negative relationship with academic achievement. The relationship between the desire to please others and achievement was non-significant ( $r = -.18, p = .11$ ).

**Learning Strategies and Achievement.** As shown in Table 1, the reported use of deep learning strategies was surprisingly unrelated to GPA ( $r = .03, ns$ ). Consistent with predictions, however, the reported use of superficial learning strategies was negatively related to GPA ( $r = -.49, p < .01$ ), indicating that students who emphasize minimal effort exertion tend to perform poorly in school.

### Do Learning Strategies Mediate the Relationship Between Motivational Orientation and Achievement?

We next tested whether the relationships observed among motivational orientations and achievement were mediated by the learning strategies students report using. Although intrinsic motivation and deep learning strategies were positively related to one another, neither was related to achievement, indicating that there was no relationship to be mediated in the present sample. However, there were sig-

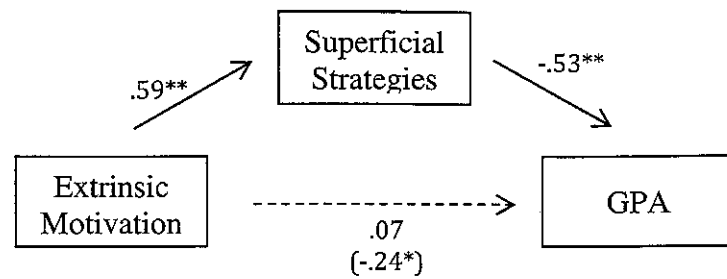


FIGURE 1  
The Mediated Relationship Between  
Extrinsic Motivation and Achievement.

nificant relationships among both dimensions of extrinsic motivation, superficial learning strategies, and achievement. We therefore proceeded with a simple mediational analysis using the extrinsic motivation composite variable. Consistent with the requirements of full mediation (Baron & Kenny, 1986), the extrinsic motivation composite predicted both superficial learning strategies ( $\beta = .59, p < .001$ ) and GPA ( $\beta = -.24, p < .05$ ). When GPA was regressed on both extrinsic motivation and superficial learning strategies simultaneously, superficial strategies remained a significant predictor ( $\beta = -.53, p < .001$ ) while the direct effect of extrinsic motivation was no longer significant ( $\beta = .07, ns$ ), indicating a fully mediated model (see Figure 1). Sobel's (1982) test confirmed that this reduction was significant,  $Z = 3.66, p < .01$ .

## DISCUSSION

Within this sample of middle school students, those who were intrinsically motivated tended to engage in conceptually rich learning strategies (i.e., deep learning strategies) and, to a lesser extent, rehearsal techniques (i.e., surface learning strategies). Those who were extrinsically motivated, by contrast, tended to adopt superficial strategies for task completion, such as guessing or copying. By controlling for prior achievement in our analyses, we showed that these relationships were not simple

byproducts of students' achievement status. Most importantly, the present study provided evidence for a mechanism underlying the relationship between extrinsic motivation and poor achievement: it appears that students who are motivated by easy work and the opportunity to please others tend to engage in superficial strategies for completing their academic work, which, in turn, predicts poor classroom grades.

On the one hand, an extrinsic focus arguably distracts students from embracing the material itself, and strategies such as guessing and copying likely produce poor results. On the other hand, it is also possible that doing poorly in school may bring about an extrinsic focus given the tendency of authority figures to restrict autonomy in the face of poor performance (Ginsburg & Bronstein, 1993; Pomerantz & Eaton, 2001). Moreover, a poor report card may also deplete students' sense of competence and elicit a tendency toward superficial engagement with schoolwork (Deci & Ryan, 2000). That report cards were released to both students and researchers several weeks after survey data were collected speaks in favor of the first explanation: students who are extrinsically motivated appear to suffer poor performance, at least in part, because they adopt superficial strategies for managing their schoolwork. Of course a bidirectional model (i.e., a potential vicious cycle) is entirely compatible with this view, and future research using experimental approaches or causal mod-

eling must be conducted to address the issue of causality.

Although many of the present findings were consistent with hypotheses, neither intrinsic motivation nor deep learning strategies showed the predicted positive relationship with achievement. This is somewhat surprising given the prevalence of such positive associations in the extant literature (e.g., Church, Elliott, & Gable, 2001; Gottfried, 1985, 1990; Lepper et al., 2005; Pintrich & DeGroot, 1990). The most plausible explanation is a lack of power due to sample size given that related research projects with larger samples from the same population as the present study have found the relationship between intrinsic motivation and achievement to be positive and significant (Corpus et al., 2009; Hayenga & Corpus, 2010). It is unclear whether a larger sample would reveal a positive relationship between deep learning strategies and achievement. It is also likely that deep—as well as surface—learning strategies are more or less adaptive depending on the particular learning setting and form of evaluation. Future research along these lines would be beneficial.

Several limitations of the present study should be considered. First is the issue of causality addressed above. Establishing directionality of effects in future research is essential for guiding teachers and policymakers in the development of programs that lead to adaptive motivation and meaningful achievement gains. Second is the reliance on self-report methods, which require self-awareness and are subject to social-desirability biases. Although student reports of strategy use and motivation do correspond well with actual strategy use (Nolen, 1988) and teacher ratings of observed motivation (Lepper et al., 2005), behavioral measures would be a useful step for future research. Third is the relatively small sample size, which may have limited power to detect significant effects.

Despite these limitations, the present findings may have important implications for classroom practice. Teachers may wish to deemphasize—or at least avoid promoting—

extrinsic motivation in their classrooms to encourage deeper learning strategies and academic success. Perhaps even more promising is the possibility that learning strategies may be taught to students even when their motivational orientations are difficult to manipulate. For example, educators might indicate to extrinsically oriented students that the best way to please the teacher or even to make their work easier is to make connections between what they already know and what they are learning—by expending effort towards deep processing strategies. By understanding the mechanisms through which motivational orientations drive achievement, we may be able to teach children effective strategies to increase effective learning.

## NOTES

1. The sample was a subset of a larger longitudinal project on developmental change in students' motivational orientations (see Corpus et al., 2009; Haimovitz, Wormington, & Corpus, 2011; Hayenga & Corpus, 2010). Data on learning strategies have not been previously reported.
2. A second set of hierarchical regressions omitting past achievement from the model did not alter the pattern of data or significance levels reported below with one exception: the desire to please others was a significant positive predictor of surface learning strategies when past achievement was omitted from the model, but only approached significance when past achievement was included.

## REFERENCES

- Barber, B. K., & Olsen, J. A. (2004). Assessing the transition to middle and high school. *Journal of Adolescent Research, 19*, 3-30.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173-1182.
- Boiché, J. C. S., Sarrazin, P. G., Grouzet, F. M. E., Pelletier, L. G., & Chanal, J. P. (2008). Students'

- motivational profiles and academic outcomes in physical education: A self-determination perspective. *Journal of Educational Psychology*, 100, 688-701.
- Bouffard, T., Vezeau, C., & Bordeleau, L. (1998). A developmental study of the relation between combined learning and performance goals and students' self-regulated learning. *British Journal of Educational Psychology*, 68, 309-319.
- Cano, F. (2005). Epistemological beliefs and approaches to learning: Their change through secondary school and their influence on academic performance. *British Journal of Educational Psychology*, 75, 203-221.
- Church, M. A., Elliot, A. J., & Gable, S. L. (2001). Perceptions of classroom environment, achievement goals, and achievement outcomes. *Journal of Educational Psychology*, 9, 43-54.
- Corpus, J. H., McClintic-Gilbert, M. S., & Hayenga, A. (2009). Within-year changes in children's intrinsic and extrinsic motivational orientations: Contextual predictors and academic outcomes. *Contemporary Educational Psychology*, 34, 154-166.
- Deci, E. L., Koestner, R., & Ryan, R. M. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin*, 125, 627-668.
- Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11, 227-268.
- Diseth, A. (2011). Self-efficacy, goal orientations and learning strategies as mediators between preceding and subsequent academic achievement. *Learning and Individual Differences*, 21, 191-195.
- Diseth, A., & Kobbeltvedt, T. (2010). A mediation analysis of achievement motives, goals, learning strategies, and academic achievement. *British Journal of Educational Psychology*, 80, 671-687.
- Eccles, J. S., & Midgley, C. (1989). Stage-environment fit: Developmentally appropriate classrooms for young adolescents. In C. Ames & R. Ames (Eds.), *Research on motivation in education: Vol 3. Goals and cognition* (pp. 139-186). Orlando, FL: Academic Press.
- Eccles, J. S., Wigfield, A., Midgley, C., Reuman, D., MacIver, D., & Feldlaufer, H. (1993). Negative effects of traditional middle schools on students' motivation. *The Elementary School Journal*, 93, 553-574.
- Elliot, A. J., McGregor, H. A., & Gable, S. (1999). Achievement goals, study strategies, and exam performance: A mediational analysis. *Journal of Educational Psychology*, 91, 549-563.
- Entwistle, N. J., & Ramsden, P. (1983). *Understanding student learning*. New York, NY: Nichols.
- Fenollar, P., Román, S., & Cuestas, P. J. (2007). University students' academic performance: An integrative conceptual framework and empirical analysis. *British Journal of Educational Psychology*, 77, 873-891.
- Garcia, T., & Pintrich, P. R. (1994). Regulating motivation and cognition in the classroom: The role of self-schemas and self-regulatory strategies. In D. H. Schunk & B. J. Zimmerman (Eds.), *Self-regulation of learning and performance: Issues and educational applications* (pp. 127-153). Hillsdale, NJ: Erlbaum.
- Ginsburg, G. S., & Bronstein, P. (1993). Family factors related to children's intrinsic/extrinsic motivational orientation and academic performance. *Child Development*, 64, 1461-1474.
- Gottfried, A. E. (1985). Academic intrinsic motivation in elementary and junior high school students. *Journal of Educational Psychology*, 77, 631-645.
- Gottfried, A. E. (1990). Academic intrinsic motivation in young elementary school children. *Journal of Educational Psychology*, 82, 525-538.
- Greenberg, D. (1992). *Education in America: A view from Sudbury Valley*. Framingham, MA: The Sudbury Valley School Press.
- Gutman, L. M., & Midgley, C. (2000). The role of protective factors in supporting the academic achievement of poor African American students during the middle school transition. *Journal of Youth and Adolescence*, 29, 223-248.
- Haimovitz, K., Wormington, S. V., & Corpus, J. H. (2011). Dangerous mindsets: How beliefs about intelligence predict motivational change. *Learning and Individual Differences*, 21, 747-752.
- Harackiewicz, J. M., Barron, K. E., Tauer, J. M., Carter, S. M., & Elliot, A. J. (2000). Short-term and long-term consequences of achievement goals: Predicting interest and performance over time. *Journal of Educational Psychology*, 92, 316-330.
- Harackiewicz, J. M., Barron, K. E., Carter, S. M., Letho, A. T., & Elliot, A. J. (1997). Predictors and consequences of achievement goals in the college classroom; Maintaining interest and

- making the grade. *Journal of Personality and Social Psychology*, 73, 1284-1295.
- Harter, S. (1978). Effectance motivation reconsidered: Toward a developmental model. *Human Development*, 21, 34-64.
- Harter, S. (1981). A new self-report scale of intrinsic versus extrinsic orientation in the classroom: Motivational and informational components. *Developmental Psychology*, 17, 300-312.
- Harter, S., Whitesell, N. R., & Kowalski, P. (1992). Individual differences in the effects of educational transitions on young adolescent's perceptions of competence and motivational orientation. *American Educational Research Journal*, 29, 777-807.
- Hayenga, A. O., & Corpus, J. H. (2010). Profiles of intrinsic and extrinsic motivation: A person-centered approach to motivation and achievement in middle school. *Motivation and Emotion*, 34, 371-383.
- Hidi, S., & Renninger, K. A. (2006). The four-phase model of interest development. *Educational Psychologist*, 41, 111-127.
- Järvelä, S., Järvenoja, H., & Malmberg, J. (2012). How elementary school students' motivation is connected to self-regulation. *Educational Research and Evaluation*, 18, 65-84.
- Lepper, M. R., Corpus, J. H., & Iyengar, S. S. (2005). Intrinsic and extrinsic motivational orientations in the classroom: Age differences and academic correlates. *Journal of Educational Psychology*, 97, 184-196.
- Liem, A. D., Lau, S., & Nie, Y. (2008). The role of self-efficacy, task value, and achievement goals in predicting learning strategies, task disengagement, peer relationship, and achievement outcome. *Contemporary Educational Psychology*, 33, 486-512.
- Lillard, A. S. (2005). *Montessori: The science behind the genius*. New York, NY: Oxford University Press.
- Meece, J. L., Blumenfeld, P. C., & Hoyle, R. H. (1988). Students' goal orientations and cognitive engagement in classroom activities. *Journal of Educational Psychology*, 80, 514-523.
- Middleton, M. J., & Midgley, C. (1997). Avoiding the demonstration of lack of ability: An underexplored aspect of goal theory. *Journal of Educational Psychology*, 89, 710-718.
- Mitchell, D., & Gerwin, D. (2008). *Survey of Waldorf Graduates: Phase III*. Wilton, NH: Research Institute for Waldorf Education.
- Nolen, S. B. (1988). Reasons for studying: Motivational orientations and study strategies. *Cognition and Instruction*, 5, 269-287.
- Otis, N., Grouzet, F. M. E., & Pelletier, L. G. (2005). Latent motivational change in an academic setting: A 3-year longitudinal study. *Journal of Educational Psychology*, 97, 170-183.
- Pintrich, P. R., & DeGroot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology*, 82, 33-40.
- Pintrich, P. R., Smith, D. A., Garcia, T., & McKeachie, W. (1993). Reliability and predictive validity of the Motivated Strategies for Learning Questionnaire (MSLQ). *Journal of Educational Psychology and Measurement*, 53, 801-813.
- Pomerantz, E. M., & Eaton, M. M. (2001). Maternal intrusive support in the academic context: Transactional socialization processes. *Developmental Psychology*, 37, 174-186.
- Román, S., Cuestas, P. J., & Fenollar, P. (2008). An examination of the interrelationships between self-esteem, others' expectations, family support, learning approaches, and achievement. *Studies in Higher Education*, 33, 127-138.
- Sansone, C., & Harackiewicz, J. M. (Eds.). (2000). *Intrinsic and extrinsic motivation: The search for optimal motivation and performance*. San Diego, CA: Academic Press.
- Schiefele, U. (1991). Interest, learning, and motivation. *Educational Psychologist*, 26, 299-323.
- Schiefele, U. (2009). Situational and individual interest. In K. R. Wentzel (Ed.), *Handbook of motivation at school* (pp. 197-220). New York, NY: Taylor & Francis.
- Schunk, D. H. (2008). Metacognition, self-regulation, and self-regulated learning: Research recommendations. *Educational Psychology Review*, 20, 463-467.
- Shih, S. S. (2005). Taiwanese sixth graders' achievement goals and their motivation, strategy use, and grades: An examination of the multiple goal perspective. *The Elementary School Journal*, 106, 39-58.
- Simons, J., Dewitte, S., & Lens, W. (2004). The role of different types of instrumentality in motivation, study strategies, and performance: Know why you learn, so you'll know what you learn! *British Journal of Educational Psychology*, 74, 343-360.
- Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation

- models. In S. Leinhardt (Ed.), *Sociological methodology 1982* (pp. 290-312). San Francisco, CA: Jossey-Bass.
- Somuncuoglu Y., & Yildirim, A. (1999). Relationship between achievement goal orientations and use of learning strategies. *Journal of Educational Research, 92*, 267-277.
- Stipek, D. (2002). *Motivation to learn: Integrating theory and practice* (4th Ed.). Boston, MA: Allyn & Bacon.
- Stipek, D., & Gralinski, J. H. (1996). Children's beliefs about intelligence and school performance. *Journal of Educational Psychology, 88*, 397-407.
- Vansteenkiste, M., Lens, W., & Deci, E. L. (2006). Intrinsic vs. extrinsic goal contexts in self-determination theory: Another look at the quality of academic motivation. *Educational Psychologist, 41*, 19-31.
- Vansteenkiste, M., Sierens, E., Soenens, B., Luyckx, K., & Lens, W. (2009). Motivational profiles from a self-determination perspective: The quality of motivation matters. *Journal of Educational Psychology, 101*, 671-688.
- Vansteenkiste, M., Simons, J., Lens, W., Soenens, B., & Matos, L. (2005). Examining the motivational impact of intrinsic versus extrinsic goal framing and autonomy-supportive versus internally controlling communication style on early adolescents' academic achievement. *Child Development, 76*, 483-501.
- Walker, C. O., Greene, B. A., & Mansell, R. A. (2006). Identification with academics, intrinsic/extrinsic motivation, and self-efficacy as predictors of cognitive engagement. *Learning and Individual Differences, 16*, 1-12.
- Watkins, D. (2001). Correlates of approaches to learning: A cross-cultural meta-analysis. In R. Sternberg & L. Zhang (Eds.), *Perspectives on thinking, learning, and cognitive styles* (pp. 315-327). Mahwah, NJ: Erlbaum.
- Weinstein, C. E., & Mayer, R. E. (1986). The teaching of learning strategies. In M. C. Wittrock (Ed.), *Handbook of research on teaching* (pp. 315-329). New York, NY: MacMillan.
- Wigfield, A., Eccles, J. S., Yoon, K. S., Harold, R. D., Arbretton, A. J. A., Freedman-Doan, C., & Blumenfeld, P. C. (1997). Change in children's competence beliefs and subjective task values across the elementary school years: A 3-year study. *Journal of Educational Psychology, 89*, 451-469.
- Wolters, C. A. (2004). Advancing achievement goal theory: Using goal structures and goal orientations to predict students' motivation, cognition, and achievement. *Journal of Educational Psychology, 96*, 236-250.
- Wolters, C. A., & Taylor, D. J. (2012). A self-regulated learning perspective on student engagement. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 635-651). New York, NY: Springer.
- Zimmerman, B. J. (2008). Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *American Educational Research Journal, 45*, 166-183.
- Zimmerman, B. J., & Schunk, D. H. (2001). *Self-regulated learning and academic achievement*. Mahwah, NJ: Erlbaum.