Preserving Autonomy and Interest Mediates Adolescents’ Academic Performance

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Academic performance is influenced by both contextual and personal factors. We asked whether students in early (14-15 years), middle (16-18 years), and late (19-21 years) adolescence used their awareness of both influences when forming academic intentions. Participants (N = 800) evaluated teaching practices, their own readiness to work hard, and their academic performance. For each age group, beliefs about teaching practices and personal effort, in combination, predicted students’ academic performance. Yet a mediation model offered a better explanation of individual differences in intentions. Readiness to take control and sustain interest explained more variance in students’ academic performance than other facets of their intentions. Detectable gender and age-group differences further suggest the importance of considering students’ perspectives when designing educational practices.

INTRODUCTION
Adolescents’ achievement motivation is influenced by contextual factors such as teaching practices and by personal factors such as effort and responsibility (Rubie-Davis, Peterson, Irving, Widdowson, & Dixon, 2010). Knowing how adolescents understand these facts can explain how they use motivational concepts to succeed academically. On the one hand, adolescents might believe that teaching practices that offer personal control, create communities of learners, and offer fair procedures for attaining learning goals are instrumental in their success (Roseth, Saltarelli, & Glass, 2011; Thorkildsen, Golant, & Cambray-Engstrom, 2008). On the other hand, adolescents might see their own effort as the crucial driver of academic success (Graham, 2004; Zimmerman, 1989). We sought to learn more about how adolescents in different cohorts balance concerns with contextual and personal factors when reporting their intentions.

Intentions involve a combination of beliefs, desires, and actions, which together represent motivation (Dennett, 1989). Figure 1 offers a working model of how we defined intentions in this project and used that model to predict adolescents’ academic performance. By capturing adolescents’ intentions, we gained greater insight into how they understand teachers’ perspectives and their own intentions in school. Knowledge of adolescents’ understanding of these intentions can offer deeper insight into how students articulate their involvement in educational activities.

An Intentional Model of Motivation:
Psychological needs are as important to the mind as biological needs are to the body. There is a long tradition of research showing that individuals’ need for autonomy, belongingness, and competence are part of an intentional force that drives academic success (Krapp, 2005; Ryzin, Gravely, & Roseth, 2009). Psychological needs work holistically, so much so that it may be difficult to clearly differentiate between them (Skinner & Belmont, 1993). Factors inside and outside of a person promote autonomy, belongingness, and competence, but ultimately individuals control how they direct their attention to these opportunities. A deeper comparison of how adolescents understand their psychological needs and interests as qualities of their motivation can improve educators’ ability to set expectations for students at different points in the lifecycle. Such understanding is particularly important for students in urban settings who often struggle with stereotypes regarding their motivational orientations (Yeager et al., 2014).

Teaching practices as well as personal effort can be directed toward meeting individuals’ needs for autonomy, belongingness, and competence. Across adolescence, individuals become more aware of how these needs drive intentions, an ability that gains strength in adolescence (Skinner, Furrer, Marchand, & Kindermann, 2008). With such insights, optimal psychological functioning can stimulate growth, integrity, and well-being (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000). Regardless of the degree of self-awareness available to adolescents, their intentions emerge from at least four possible directions.

One direction concerns adolescents’ need for autonomy or self-determination. Autonomy is defined as an individual’s experience of choice and a sense of freedom over the instigation, regulation, and continuation of their behavior (Luyckx, Vansteenkiste, Goossens, & Duriez, 2009). Adolescents experience autonomy when they feel in control of a situation. For example, individuals experience a form of psychological sovereignty when they determine what task to complete or how to accomplish their goals. This freedom to pursue personal curiosities and ideals often leads to greater persistence, even in the face of failure (Luyckx et al., 2009). When autonomy needs remain unmet, a passive adherence to laws established outside of oneself can restrict an individual’s sense of authority over their actions.

In educational settings, autonomy can be promoted via both teaching practices and personal responsibility. Autonomy-supportive teachers expect students to decide how to study, complete an assignment, invent ideas, and have a say in class rules. Likewise, students can accept complete responsibility for...
their willingness to work hard and control their own success and behavior. Students embracing autonomy follow their own interests and make independent decisions about what work to do and when to apply effort.

A second need for belongingness, or relatedness, informs an individual’s intentions from another, more social direction. Belongingness is the feeling of being connected to and accepted by important others. Adolescents need to feel as though they can relate to and experience mutual respect with people who are in their social circle (Faye & Sharpe, 2008; Roese, Eccles, & Sameroff, 1998). Adolescents who have regular and amiable interactions with others in a stable, supportive environment feel a sense of security that allows them to direct their attention to academic outcomes rather than the qualities of their relationships. When belongingness needs remain unmet, if interactions remain consistently unsatisfactory, the resulting emotional emptiness undermines effort (Baumeister & Leary, 1995).

In classrooms, students may feel like they belong as a result of their teachers’ influence or their own internal ability to meet this need. For example, a teacher may help students feel like they are part of a community, meet others with the same interests, or reinforce their opinions (Gillen-O’Neel & Fuligni, 2013; Staples, 2007; Wenger, 1998). Students may also reach out to others and form relationships on their own (Ryan & Grolnick, 1986). When students feel like they belong, they create more supportive relationships with their peers and their teachers.

Competence, a third intentional direction, is the ability to function in environments well enough to master tasks. Individuals who feel competent usually have confidence in their ability to attain an anticipated outcome. They experience a readiness to engage in many different tasks and complete them in an effective manner (Faye & Sharpe, 2008; Luyckx et al., 2009). Individuals who feel incompetent lack the efficacy needed to successfully complete tasks and may even cease trying to learn or using their skills.

A feeling of competence can be facilitated by teaching practices and students’ own sense of personal responsibility. Teachers may direct students’ attention to the conditions needed to ensure success and mastery. They can also organize competitions to help students learn more about the limits of their abilities (Fredricks & Eccles, 2002; Nicholls, 1989). Adolescents can also actively evaluate their own abilities and identify realistic possibilities based on the feedback they receive in educational contexts (Chouinard & Normand, 2008; Durik, Vida, & Eccles, 2006). When feeling competent, these students are able to confidently answer a question with a sense of mastery and satisfaction.

In contrast to the idea that intentions are directed by psychological needs, some theorists focus on dispositional and situational interest as drivers of behavior (Schiefele, 1991). Dispositional interest is a strong, long-term preference for certain ideas, subjects, or activities. Situational interest is the collection of environmental qualities that focus attention and direct reactions. Regardless of the source, interest stimulates reactions that have short- and long-term consequences for students’ academic success and psychological well-being. Adolescents who are interested in a task or subject matter are likely to choose more challenging tasks, persist even in the face of failure, and feel a heightened sense of enjoyment, satisfaction, and drive. Students who are unable to sustain interest are likely to give up

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Figure 1: An intentional model explaining the relations between adolescents’ beliefs about ideal teaching practices, readiness to work hard, and academic performance.
easily, take fewer risks, and be less willing to take responsibility for their own and others’ learning.

Within educational settings, interest is often viewed as an intrinsic concept, yet its conceptualization subsists in the relation between the person and the environment (Hidi, Renninger, & Krapp, 2004). However, direct relationships between teacher-stimulated interest and learning are difficult to establish. Teachers can manipulate curriculum, instructional practices, texts, and learning environments, but they cannot directly manipulate interest (Harackiewicz, Tauer, Barron, & Elliot 2002; Hidi et al., 2004; Mitchell, 1993). For this reason, in the current study, interest is measured as part of adolescents’ action readiness, but not as a quality of teachers’ actions. Interest, in this view, is a directive force within the intentional model that explains students’ choice of school-related tasks.

**Connecting Theory to Evidence:**

Regardless of whether adolescents focus on teachers’ expectations or their own needs or interests, their beliefs, desires, and actions foster academic achievement (Dennett, 1989; Nicholls, 1989). The intentional perspective that guided our study led us to ask whether adolescents were aware of the ubiquitous nature of the psychological needs for autonomy, belongingness, and competence as well as how their personal interests are embedded in teaching practices and their readiness to work hard.

If participants emphasize the contextual factors that are salient in their intentions, they should show a strong preference for ideal teaching practices that meet students’ psychological needs. If participants emphasize personal factors, they should report a readiness to address each of their psychological needs and interest through hard work. Participants with an unbalanced awareness of their intentions would endorse either contextual or personal means of addressing their needs. Participants with a complete awareness would find a balance between contextual and personal factors, but this balance would be informed by any psychological needs that occupy their attention. The effects of these possibilities on behavior were further validated by comparing adolescents’ reports of the contextual and personal aspects of their intentions with indicators of their academic performance.

To test for three possibilities, that beliefs about contextual support, the readiness to work hard, or the combination of these beliefs and desires would guide academic functioning, we conducted a sequential analysis of adolescents’ beliefs about an ideal school and their readiness to work hard as possible predictors of academic performance. We expected that the students in our study would provide complex representations of their intentions well enough to find support for an additive model.

Global representations of adolescents’ intentions can help educators determine how to better organize instruction, but knowledge of individual differences attributable to age and gender yields a more nuanced explanation of adolescents’ motivation to succeed. Individual differences in how students perceive their classroom environment and the motivational strategies used by teachers are easily detected and addressed (Maehr & Braskamp, 1986; Ryan & Grolnick, 1986; Thorkildsen, 1993). Such variability is also evident in how students define their responsibilities as learners (Graham, 2004; Nicholls, 1989).

**METHODS**

**Participants:**

Adolescents (N = 800) aged 14 to 21 years reported on their academic performance and completed measures related to contextual and personal factors that influence their academic performance. All participants were enrolled in either a high school or a four-year university around the greater Chicago area. To control for age and gender, we randomly selected an equal number of male and female participants from a larger data set, creating three age cohorts of early (14-15 years, n = 200), middle (16-18 years, n = 300), and late (19-21 years, n = 300) adolescents. Diverse races and ethnicities were represented. Participants were of Latino (n = 243), White/Caucasian (n = 220), Black/African-American (n = 102), Asian/Asian-American (n = 95), Alaskan Native/Native American (n = 87), and dual ethnic or other (n = 53) origins.

**Procedures:**

High school and university students completed a collection of surveys in their respective academic settings in conjunction with other teaching and learning activities. Some individuals completed the measures online, whereas others were given face-to-face instructions and completed a paper-and-pencil version of the measures. Analyses did not control for the method of administration because there were no significant differences across the samples that were attributable to these decisions.

Assessments of students’ beliefs about teaching practices, readiness to work hard, and academic performance were conducted in conjunction with a broader group of surveys that focused on schooling and goals. After being informed of their rights, most students proceeded to complete the surveys on their own. A small sample of students had learning disabilities that required administrators to read individual items as students wrote their answers on the survey. Only fully completed surveys were used in this project.
Instruments:
Instruments used for this study have been previously used in related research (Thorkildsen, Golant, & Richesin, 2007; Thorkildsen et al., 2008). This validity study helps to confirm that the strong internal consistencies in previously published measures were not attributable to the length of the surveys.

Participants reported their beliefs on how teachers should address students’ needs for autonomy (α = .84, 11 items, e.g., “In an ideal school, most students will stay involved if they have a say in how to study”), belongingness (α = .83, 14 items, e.g., “Most students will stay involved if they feel like part of a community”), and competence (α = .84, 16 items e.g., “Most students will stay involved if teachers make sure they have teachers who set goals with them”). The scale ranged from always (5) to never (1).

Participants reported the conditions in which they were ready to work hard by considering their commitment to autonomy (α = .81, six items, e.g., “I usually work hardest when I am free to work on my own goals”), belongingness (α = .72, seven items, e.g., “I usually work hardest when my teachers care about me”), and competence (α = .81, nine items, e.g., “I usually work hardest when I feel smart”) as well as interest in learning (α = .81, five items, e.g., “I usually work hardest when the ideas are exciting to think about”). The scale ranged from strongly agree (5) to strongly disagree (1).

Participants reported five indicators of their academic performance by rating their ability (e.g., “I think my ability in school is…”), class rank (e.g. “Compared to most students my ability in schoolwork is…”), typical grades (e.g., “What is the most common grade you get in your classes?”), grade aspirations (e.g., “In most courses, I am usually satisfied if my grade is…”), and effort on homework (α = .83, five items, e.g., “How much homework do you usually finish?”). Each 5-point scale reflected high (5) to low (1) ratings.

RESULTS
After completing exploratory factor analysis and building internally consistent measures, we compared correlations between each set of scores and found support for our decision to explore individual differences in adolescents’ intentions. Individual differences in adolescents’ evaluations of teaching practices were more salient when the three basic needs for autonomy, belongingness, and competence were distinguished in participants’ perceptions of teaching practices. Similarly, when basic needs were distinguished along with interest in measures of participants’ readiness to work hard, we could make more nuanced comparisons of the qualities of participants’ intentions.

Weak correlations were apparent between the three assessments of students’ beliefs about how teaching practices should be used to encourage motivation, suggesting that these measures might fairly be combined into a single index (Table 1). Yet correlations between the four readiness-to-work-hard measures ranged from moderate to strong. Together, these measures showed high (5) to low (1) ratings.

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<td>6. Ready to learn</td>
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<td>7. Ready for interest</td>
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<td>8. Performance</td>
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Table 1: Correlations, Means, and Standard Deviations for Teaching Practices, Readiness to Work Hard, and Academic Performance (n = 800). Note: Correlations between the Ideal Teaching Practices subscales are sufficiently high that they can be averaged. Correlations between the Readiness-to-Work-Hard subscales show a greater range, indicating the value of exploring the variance in greater detail.

Findings suggest the value of exploring individuals’ understanding of motivation by distinguishing three basic human needs and evaluating which needs best help to explain the variation in students’ academic performance.

Moving to the primary research question, we evaluated whether participants’ preoccupations with the practices of teachers or their own readiness to work hard best explained differences in their academic performance using sequential regression analyses. Participants’ beliefs about teaching practices were included in the first block, and their readiness to work hard beliefs were included in the second block. Both sets of beliefs explained differences in students’ academic performance (Table 2, R² = .08). The direct effects of beliefs about teaching practices explained a significant amount of variance in the initial model, F(3, 796) = 11.29, p = .000, adjusted R² = .04. However, the addition of individuals’ readiness to work hard added a stronger explanation of the variance in academic performance, F(4, 792) = 8.83, p = .000, adjusted $R^2 = .07$. Change
statistics suggested that both blocks contributed about equally to this explanation in that the $\Delta R^2 = .04$ in each case. Change statistics suggested that both blocks contributed about equally to this explanation in that the $\Delta R^2 = .04$ in each case.

Despite this broad finding, indirect effects were apparent when we conducted a more nuanced investigation into the relations between the needs-based subscales and academic performance. In step 1, students’ belief about whether teachers should support autonomy played an especially important role in explaining differences in their academic performance. This effect disappeared in step 2 when students’ readiness to work hard was combined with their beliefs about teaching practices in the second model. Participants’ readiness to take control over their learning ($\beta = .13$) worked together with their readiness to become interested in the material ($\beta = .14$) to mediate the effects of their beliefs about teaching practices in explaining performance differences. This partial mediation effect suggests that students’ action readiness may play a stronger role in explaining performance than their beliefs about how teachers should support their motivation.

Within-subjects analysis of variance suggests that age and gender are significant exogenous variables in this sample, but effect sizes are small (Table 3). Mauchly’s Test of Sphericity indicated that the assumption of sphericity had been violated for the beliefs scale, $\chi^2(2) = 46.41, p = .000$ and for the readiness scale $\chi^2(5) = 149.41, p = .000$. Therefore, a Greenhouse-Geisser correction and univariate tests were used to compare students’ reasoning across age cohorts and gender. Findings were identical with and without this correction.

There were significant age cohort, $F(3,79, 1502.59) = 9.23, p < .000, \eta^2 = .02$, and gender, $F(1,89, 1502.59) = 9.23, p = .000, \eta^2 = .02$, differences in students’ beliefs about the practices teachers should use to support students’ motivation. Older adolescents noted more than younger adolescents that teachers should use supportive practices, and males placed less emphasis on supportive teaching practices than females did. The gender-by-age cohort interaction was not significant. In all cases, the effect sizes for these findings were small, suggesting that the overall fit of the model would not be significantly improved by controlling for this variance.

There were no gender differences in the conditions under which adolescents were ready to work hard, but age cohort differences were once again apparent, $F(5,30, 2104.45) = 34.32, p < .000, \eta^2 = .08$. Table 3 conveys that older adolescents were more ready to work hard when the situation addressed their need for autonomy, competence, and interest than participants in early and middle adolescence. Cohort differences were not apparent in adolescents’ readiness to address their belongingness needs. Once again, the effect sizes for these findings were small, suggesting that the overall fit of the model would not be significantly improved by controlling for this variance.

College students were recruited for the oldest age group, whereas high school students were recruited for the early and middle adolescence cohorts. It should not be surprising, therefore, to find significant differences in academic performance for the oldest cohort of students. Indeed, this was apparent when volunteers evaluated their ability and effort, $F(2, 794) = 21.28, p = .000, \eta^2 = .05$. Once again, the effect size for this difference was small, but participants in middle adolescence reported the lowest levels of academic performance ($M = 3.31, SD = .05$), participants in early adolescence reported significantly higher levels of academic performance ($M = 3.47, SD = .06$), and participants in late adolescence reported the highest levels of academic performance ($M = 3.74, SD = .05$). These findings suggest that it would be premature to assume that differences in performance were somehow aligned with participants’ age.

Consolidating findings on adolescents’ awareness of their intentions made it clear that their beliefs about teaching practices and readiness to work hard contributed equally to predictions of their academic performance. Adolescents’ quest for autonomy and interesting work partially mediated the relation between their beliefs about ideal teaching practices and their academic performance. As anticipated, the significant differences attributable to age cohort and gender contributed very little to this overall pattern of findings.

CONCLUSION

Students’ psychological needs within academic settings can be met by contextual factors such as teaching practic-

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<th>Late adolescence</th>
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<tr>
<td></td>
<td>Male</td>
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<td>Performance</td>
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Table 3: Means (and Standard Deviations) for Students’ Perceptions by Age Cohort and Gender. Note: Findings from post hoc tests are reported in the text.
es that foster control, belonging, and competence while learning. These needs can also be addressed by personal factors such as the students’ own effort and sense of responsibility for their success. Media outlets often blame teachers for individual differences in students’ achievement, but the responses of adolescents in our study did not corroborate this view. Instead they asserted that teaching practices along with their own willingness to work hard each significantly contributed to their achievement motivation. Contrary to the popular notions, these students reported a tendency to balance their explanations of contextual and personal factors that influence their performance.

Adolescents’ responses in our study also provided a meaningful explanation for the relationship between their perceptions of supportive teaching practices, effort, and academic performance. Adolescents’ willingness to work hard partially mediated the relationship between perceptions of teaching practices and achievement. Specifically, their willingness to take control of their learning and immerse themselves in work that is interesting overpowered their beliefs about what teachers should do to support students’ feelings of autonomy. This explanation lends further support to studies that depict adolescents as eager to learn and take responsibility for their learning (Benner & Graham, 2009; Thorkildsen et al., 2008). Our finding reinforces the well-established idea that adolescents’ perceptions of having their need for autonomy met can be a powerful motivating force that guides their actions in school (Ryzin et al., 2009) and suggests that adding the construct of interest in future research could strengthen the power of such models in predicting academic engagement.

Our secondary findings regarding individual differences attributable to age and gender also contradict earlier reports of marked declines in adolescents’ achievement motivation across time (Roeser et al., 1998). Older students in our study evaluated all motivational influences more favorably than younger students. They also reported higher beliefs about their ability and effort in representing their academic performance. Individuals in the middle adolescent cohort reported the lowest scores for academic performance. This trajectory of individual differences lends support to the idea that motivational trajectories are non-linear across adolescence (Frenzel, Dicke, Pekrun, & Goetz, 2012). Consistent with previous evidence, females in our study reported more complex thinking about how teachers can help students sustain motivation than males. Yet males and females were equally ready to work hard. These small yet significant effects of age and gender further confirm the idea that motivation is best promoted by focusing on personal responsibility.

Although we did not track students’ academic performance over time, the cross-sectional design of our study made it possible to compare adolescents in high school and college. Perhaps high school students dealing with the pressures of transitioning to life beyond school and university students learning how to navigate college life would benefit from being mindful of the attributions they make for their learning outcomes. The very basic trends that make up our findings can be used as a starting place for more elaborate conversations about adolescents’ understandings of how and why their intentions are important factors in their academic success.

Our findings also suggest that practitioners who design age-appropriate curricular interventions and learning opportunities should take time to converse with students about what they think about particular activities, intended to stimulate interest and a feeling of autonomy. Perhaps the mere act of asking students to voice their opinions during the curricular design process could foster greater self-control and interest. This small step could be vitally important for many adolescents, especially in urban settings like the ones in which this study was conducted (Thorkildsen, 2007). Adolescents in such settings struggle daily with negative stereotypes about their willingness to take responsibility for their own educational outcomes, and their ability to remain academically and personally engaged in school. Conveying faith in adolescents’ ability to make meaningful contributions to local communities as well as to society at large could have a much stronger impact on their motivation than an externally generated intervention intended to maximize academic engagement.

REFERENCES


Danya Ata is a junior in the Honors College and the College of Liberal Arts and Sciences. She is pursuing a Bachelor of Arts in the Teaching of English at the secondary level. Danya has been a tutor at UIC’s Writing Center for two years and has used this experience to better herself as a writer. Her commitment to teaching has led her to learn more about the field in order to prepare herself as a future educator. Danya hopes to pursue a career in Educational Psychology in the future.

Huong Nguyen is a senior studying the concentration of Applied Psychology at the College of Liberal Arts and Sciences. Her research interests consist of early childhood development and emotional and behavioral disorders. Through her research and professors’ help, Huong gained valuable skills needed for her future career. After she obtains her Bachelors and Masters, Huong aspires to be a licensed counseling social worker.

Persis Driver is a doctoral student in Educational Psychology in the College of Education at UIC. Her research interests lie in understanding how to improve classroom based, collaborative learning conditions for students. She has been a teaching assistant and instructor on record in the College of Education for the past three years and has received UIC’s 2014 Excellence in Undergraduate Mentoring for Graduate Students award.

Terri Thorkildsen is Professor of Education and Psychology in the College of Education at the University of Illinois at Chicago. Her research focuses on students understanding of fairness, epistemology, and motivation as each pertains to critical issues within school settings. She is a Fellow of the American Educational Research Association and of the American Psychological Association and a recipient of UIC’s Silver Circle Award and Teaching Recognition Award.