



The Importance of Interest: The Role of Achievement Goals and Task Values in Promoting the Development of Interest

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Abstract

We review studies that document the role of interest in promoting academic achievement, course choices, and career decisions, and discuss the process of interest development. In particular, we focus on the role of achievement goals in promoting the perception of task values and subsequent interest, and review randomized field trials in which we tested an experimental utility value intervention designed to promote interest in educational contexts. We discuss the implications for educational policy and theory development.

Why would Sandy, a high school basketball player, spend countless hours shooting baskets in her driveway, until her arms were so tired that she could hardly move? Why would Jean, a high school student, spend his weekends attending science competitions, often traveling many hours in a car each way? Some researchers who study motivation would say that these two individuals were exhibiting well-developed interests in basketball and science, respectively. In this study, we consider how interest in activities and topics develops, and why interest is so important to our daily lives.

Definitions of Interest

Colloquially, being interested in something can mean that we care about it, that it is important to us, and that we have (mostly) positive feelings towards it. We often say things like, “I’m interested in the well-being of my child,” “I’m interested in playing football this fall,” and “I have a research interest in social psychology.” However, interest can also be more fleeting, such as when we see an interesting TV program, or an unexpected noise arouses our curiosity. John Dewey once described interest as “being engaged, engrossed, or entirely taken up with” an activity, object, or topic (Dewey, 1913, p. 17). More contemporary interest theorists have divided interest into two components: individual interest and situational interest (Hidi & Baird, 1988; Renninger, 2000). Individual interest is more enduring, and trait-like, and endures over time. It can be considered a disposition that individuals take with them from one context to the next. In the opening example, Sandy’s interest in basketball and Jean’s interest in science have developed such that they take these interests with them from place to place. In contrast, situational interest is more momentary and situationally bound; in other words, it can be a specific reaction to something in a situation such as a funny video clip, humorous conversation, or colorful objects.

How Does Interest Develop?

A primary question in interest research is how situational interest, such as that prompted by watching a movie about the Civil War, can develop into an enduring interest in a topic or activity, such as American history. Hidi & Renninger (2006) have recently outlined a model of interest development detailing the conditions under which situational interest can be transformed over time into individual interest. Their approach contains an element of classic Lewinian social psychology in that interest develops as a function of both the person and the situation. In their model, it is the interaction between the person and the object that determines the extent of interest development. Thus, personal characteristics and social contexts both contribute to the experience of interest when engaging in an activity.

According to Hidi and Renninger, three factors contribute to the development of interest: knowledge, positive emotion, and personal value. As individuals learn more about a topic, they become more skilled and knowledgeable. An increase in knowledge can bring about positive affect as individuals feel more competent and skilled through task engagement. In addition, as they spend more time with the activity, they may find personal meaning and relevance in the activity, such as when a high school student discovers that an understanding of biology can help her pursue her dream of becoming doctor. An individual's goals can also contribute to the development of interest by leading him/her to become more engaged in his/her learning, develop competence, and to further explore the topic. For example, Sandy's goals for basketball include becoming a starter on her high school team and playing in college. These goals encourage her to practice on her own, seek out coaches to help her improve her game, and try her best during practices and games. As she develops her competence, her knowledge increases and the positive affect she gets from playing volleyball also increases.

The Importance of Interest (What Does It Do?)

Interest is often thought of as a process that contributes to learning and achievement. That is, being interested in a topic is a mental resource that enhances learning, which then leads to better performance and achievement (Hidi, 1990). Indeed, research has demonstrated that both situational and individual interest promote attention, recall, task persistence, and effort (Ainley, Hidi, & Berndorff, 2002; Hidi, 1990; Hidi & Renninger, 2006). In their meta-analysis of over 150 studies that examined the relationship between interest and performance, Schiefele, Krapp, & Winteler (1992) found that individual interest was correlated with both academic and laboratory performance ($r_s = 0.31$ and 0.27 , respectively). From this perspective, then, interest appears to play a very important role in learning and academic achievement.

As important as interest is for performance and achievement, however, we believe that interest is critically important in its own right. Indeed, one of the primary goals of college education is to help students discover their true interests and chart a life course based on interests developed and nurtured in college. Thus interest may be viewed as essential with respect to adjustment and happiness in life. Relegating interest to the role of a mediator (i.e. a motivational process that is important only because it influences performance) misses the central importance of interest in our lives. Researchers in positive and health psychology have demonstrated that happiness and life satisfaction are important components of well-being (Lucas, 2007; Sheldon & Lyubomirsky, 2007). Pursuing activities and topics that we find interesting play an important part in determining how fulfilled we are

with our lives, and not doing so leaves us with a feeling of unease and discontent (Sheldon & Elliot, 1999). We therefore endorse the perspective that interest is an important outcome, and we believe that it is a crucial component of success in academics, sports, or other areas of our lives (Harackiewicz, Durik, & Barron, 2005; Hidi & Harackiewicz, 2000; Maehr, 1989; Nicholls, 1979).

In our research, for example, we have found that both situational and individual interest can play a powerful role in predicting future choices and career paths. In two longitudinal studies, we followed college students from their first semester of their freshman year through graduation (Harackiewicz, Durik, Barron, Linnenbrink, & Tauer, 2008; Harackiewicz, Barron, Tauer, & Elliot, 2002). We measured students' interest during an introductory psychology course taken during the first semester of their freshman year. After 7 years, we measured the subsequent interest in psychology in two ways. We analyzed students' academic transcripts and counted the number of additional psychology courses that they took, and coded whether or not students chose to major in psychology. We found that the interest that students reported at the end of their first semester of introductory psychology predicted the number of additional psychology courses taken over the course of their academic career, as well as whether or not they decided to major in psychology. Other researchers have found similar results with middle- and high-school students (Meece, Wigfield, & Eccles, 1990; Updegraff, Eccles, Barber, & O'Brien, 1996; Wigfield, 1994; Xiang, Chen, & Bruene, 2005). For example, Xiang et al. (2005) found that fourth-graders who were more interested in a school-based running program (i.e. "Road Runners") were more likely to spend their free-time engaged in running. Thus, interest in a topic or activity can have a powerful influence on people's lives, by impacting how they choose to spend their free time, and by influencing college course selections and major, as well as the trajectory of students' careers after college.

Theoretical Integration

In our own efforts to understand the development of interest, we have integrated interest theory with two other motivational frameworks: achievement goal and expectancy–value theories. When students enter into a classroom setting, they often adopt goals that are specific to that situation. They may want to get a good grade, impress their friends, meet new people, or learn something interesting. Achievement goal researchers have focused on two types of competence-related goals that individuals often adopt: mastery and performance goals (Ames, 1984; Dweck, 1986; Nicholls, 1984; for reviews, see Ames & Archer, 1988; Elliot, 2005). Mastery goals focus on developing and improving ones skills or knowledge, whereas performance goals focus on doing better than others in the situation. These achievement goals have been further subdivided in terms of how individuals pursue mastery and normative excellence. Researchers (Elliot & McGregor, 2001; Pintrich, 2000) have found that individuals can pursue these two types of goals in one of two ways: by trying to attain the desired outcome, such as learning as much as possible (mastery-approach) and doing better than others (performance-approach), or trying to avoid negative outcomes such as not learning the material (mastery-avoidance) or doing worse than others (performance-avoidance). As mentioned earlier, the goals that individuals choose to pursue in achievement settings provide purposes, or reasons, for task engagement, and serve to orient their attention and effort while engaged in the activity. Of particular relevance to interest development, a focus on task mastery and skill development may encourage the individual to explore all aspects of the task, master it and develop skills, and experience positive affect (Flum & Kaplan, 2006; Renninger, 2000).

These are some of the components of interest development as outlined in the Hidi and Renninger model. Our longitudinal research with college students and high-school athletes demonstrates that mastery goals, measured at an earlier time point, are associated with interest at a later time point (Harackiewicz, Barron, Carter, Lento, & Elliot, 1997; Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002; Harackiewicz, Barron, Tauer, Carter, & Elliot, 2000; Harackiewicz et al. 2008; Hulleman, Durik, Schweigert, & Harackiewicz, 2008). Our most recent longitudinal research indicates that the relationship between mastery-approach goals and interest is upheld even when controlling for the initial levels of interest that students have when they enter the situation (Harackiewicz et al., 2002; Hulleman et al., 2008).

We have also incorporated expectancy-value models of motivation into our research on interest (Harackiewicz, Durik, & Barron, 2005). Expectancy-value models of motivation posit that an individual will be motivated to engage in a task to the extent that they feel they can be successful at it (expectancy) and they perceive the task as being important to them in some way (value). Although there have been numerous expectancy-value models proposed over the years (for reviews, see Eccles & Wigfield, 2002; Wigfield & Eccles, 1992), we focus on the Eccles et al. (1983) version of expectancy-value that differentiates task value into several components. In their model, tasks are important because they are fun and enjoyable (intrinsic value), are useful and relevant to other tasks or aspects of life (utility value), are important to the person's sense of self (attainment value), and they require certain amounts of time, energy, and resources (cost value). In this paper, we will focus on intrinsic and utility value as they are the most closely aligned with situational interest (Hulleman, Durik, et al., 2008). Indeed, intrinsic value seems to correspond directly to situational interest as defined by Hidi and Renninger.

Research utilizing the Eccles et al.'s (1983) perspective indicates that task values (intrinsic and utility) are associated with achievement choices, such as course enrolment decisions, free-time activities, and intentions, whereas expectancies for success are associated with performance (e.g. Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002). In addition, our recent research has revealed that task values play an important role in the development of interest (Durik & Harackiewicz, 2007; Hulleman, Durik, et al., 2008). In our longitudinal survey research, we have found that perceptions of task value are associated with subsequent interest. In two studies, Hulleman, Durik et al. (2008) assessed perceived intrinsic and utility value in two contexts – an introductory psychology course for undergraduates and a summer football camp for high-school athletes. Task values were assessed at the mid-point of a 15-week semester and a 4-day summer football camp. Interest in psychology was assessed at the end of the semester, and interest in football was assessed at the end of camp. The results indicated that student's and athlete's perceptions of intrinsic and utility value for their course topic and sport, respectively, were associated with their interest at the end of the semester and the summer camp (Hulleman, Durik et al., 2008).

The integration of achievement goals and interest theory, and expectancy-value and interest theory, has revealed that the goals that individuals adopt in achievement situations, as well as the value they perceive in activities, promote the development of subsequent interest in topics and activities. We have begun work to integrate these three perspectives in a chain of interest development. We believe that the goals and interests that individuals have when they enter a situation help determine the type of task value they perceive when pursuing the task, and that these task values will then be predictive of subsequent interest. As reviewed earlier, we found that the goals students and athletes

adopted were predictive of their subsequent interest in psychology and football, respectively (Hulleman, Durik et al., 2008). In both the college classroom and high-school football camp, we found that task values measured at the mid-point of the semester and the summer football camp were associated with interest at the end of the semester or camp. Importantly, the effects of mastery goals on interest were no longer significant when we included task values in the model. This means that the effects of mastery-approach goals on interest were due to their facilitative effects on value perceptions. In other words, mastery goals promoted the perception of task values, which in turn promoted subsequent interest. Thus, this correlational study is our first indication that achievement goals and task values can work together in the development of subsequent interest.

These correlational findings led us to wonder if we might be able to intervene in the process of interest development with experimental manipulations. Our earlier research had explored experimental goal interventions, which proved to influence interest (see Harackiewicz, Barron, & Elliot, 1998 for review), but our more recent research has focused on the value process. In particular, we have tested whether we can help students discover value, and whether increasing value will promote interest. In a laboratory experiment, Durik & Harackiewicz (2007) manipulated the presence of task value while teaching participants a novel mental math technique, and examined the effects of this intervention on subsequent task interest. The experiment was divided into two sections. In the learning session, participants were taught how to use the new technique, and given an opportunity to use it on a practice set of multiplication problems. During this learning session, participants in the utility value condition were told how the new math technique could be useful in everyday life, such as calculating tips at restaurants and when shopping. Participants in the control condition did not receive this information. In the performance session, participants solved as many multiplication problems as they could in 5 min. After they completed the problems, they were asked to indicate how interested they were in the new technique. The results indicated that participants who received the utility value manipulation reported higher levels of interest in math than those in the control condition. These results suggest that we can help students develop interest by highlighting the utility value of topics.

Up to this point, we have focused on the role of task values in the development of interest. However, expectancy-value models of motivation encourage us to also consider the role of expectancies in motivation and interest development. As reported previously, expectancy-value research tends to reveal that success expectancies are related to performance, whereas task values are related to interest and task choices (Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002). In a laboratory experiment (C. Hulleman, et al., unpublished data, Study 1), we examined the effects of a utility value intervention for participants who had low- versus high-success expectancies in math. The basic procedures were similar to the study of Durik & Harackiewicz (2007) in which participants learned a new mental math technique and then performed a set of multiplication problems. The difference was in the manipulation of utility value. In the C. Hulleman, Godes, Hendricks, & Harackiewicz's (unpublished data) study, we asked participants to write about how they could apply the mental math technique to their own lives after they had learned the technique, but before they answered the multiplication problems. In other words, students were encouraged to think about and actively process the utility value of the math technique by writing about it in their own words. The control group wrote an essay that was unrelated to the mental math technique. The results indicated that the utility value intervention increased interest in the math technique compared to the

control group, regardless of how competent participants thought they were at math. However, further analyses indicated that the intervention was especially beneficial for participants who did not expect to do well in math. In fact, participants with low-success expectancies were as interested in the technique as the participants with high-success expectancies in either the control group or the utility value group. The participants who reported the least amount of interest in the math technique were control group participants with low-success expectancies. The results from this study support the original tenets of expectancy-value theory that both expectancies for success and perceived value of the task determine the motivation and interest in an activity, and suggest that our intervention was most successful for students who lacked confidence in their math ability. Our intervention helped participants discover the utility value of the technique, and this intervention was particularly effective for students who lacked confidence in their math skills.

Randomized Field Experiments: Real-World Applications

Up to this point, we have discussed longitudinal survey and laboratory experiments that test and support our integrated model of interest development. Individually, these approaches have their strengths and weaknesses. The longitudinal survey approach allows us to observe relationships between variables as they exist in real-world contexts. Although these observations can produce hypotheses about what variables might be most effectively manipulated to produce increases in an outcome of interest, it is more difficult to determine causal relationships in an observational setting (Maxwell & Cole, 2007). In contrast, when properly designed and conducted, laboratory experiments allow us to manipulate variables and infer causality based on differences between groups. The laboratory setting also allows us to refine our experimental interventions so that they can be as effective as possible. A limitation of this approach is that the laboratory environment can be artificial, making generalizations to real-world contexts difficult (Harackiewicz & Barron, 2004). In our most recent research, we add a third approach, randomized field experiments, as a means of bringing theoretical findings to the real world and providing a more difficult test – that of application to the real-world setting. The randomized experiment combines the ability to make causal inference based on the experimental method with the application to real-world contexts from observational studies. The power of this approach is that it can generate information that furthers theoretical understanding and also provide practical information for practitioners who work in the real world (Cook, 2002).

In a series of two randomized trials (C. Hulleman, et al., unpublished data, Study 2; Hulleman, An, Hendricks, & Harackiewicz, 2008; Hulleman & Harackiewicz, 2009), we manipulated utility value and assessed its effects on classroom interest. In both randomized field experiments, we employed the utility intervention that we developed in our earlier laboratory research (C. Hulleman, et al., unpublished data, Study 1) in two college classrooms. After the mid-semester exam, introductory psychology ($n = 237$) and statistics students ($n = 44$) received an essay assignment to complete within the next 3 weeks (Hulleman, An, Hendricks, & Harackiewicz, unpublished data; Hulleman & Harackiewicz, 2008). All of the students selected a topic that they had studied previously. The students in the utility condition then wrote about how this topic applied to their lives in some way, whereas students in the control condition wrote a summary of what they had learned about the topic. At the end of the semester, their interest in psychology (or inclination to take more statistics courses) was assessed on an in-class survey. Success

expectancies were based on participants' mid-semester exam grades. The results replicated our laboratory findings (C. Hulleman, et al., unpublished data, Study 1). Students with low exam scores reported higher levels of interest in psychology (or greater inclination to take more statistics courses) in the utility condition than the control condition. Students with high exam scores reported equally high amounts of interest at the end of the semester regardless of experimental condition. Thus, we were able to promote interest development in college classes with a simple utility value intervention.

The results from these randomized trials corroborate the laboratory findings and confirm the predictive power of the expectancy-value model in the promotion of interest.

The motivational intervention tested in our laboratory and randomized field studies was shown to increase student motivation, and this intervention was particularly beneficial for students who had low-success expectancies and/or low performance in the course. In other words, this intervention was most effective for students who mostly need help – those who lack confidence in their skills. In addition to their theoretical significance, our findings have implications for educational practice and policy.

Implications for Practice and Policy

From a practical perspective, the research presented in this study, particularly the randomized classroom experiments, provide a blueprint for how teachers can enhance student motivation in the classroom. The intervention worked because it enabled students to make a connection between their course material and their lives. In other words, they were able to discover meaning and value in their education. Our intervention was most effective in enhancing perceptions of utility value and interest for low-performing students – a group that is often in need of effective intervention. In addition, the intervention is easy to implement, low cost, requires minimal effort on the part of the instructor, and works in both large lecture and smaller, laboratory-based science and statistics courses.

Our research also has implications for educational policy by highlighting the importance of interest and student motivation. What is the current state of student motivation in school? The longitudinal research on motivation of K-12 students has evidenced an alarming trend – student interest in school tends to decrease over time, with low achievers evidencing lower interest overall than high achievers (Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002; Lepper, Corpus, & Iyengar, 2005). Interest in school tends to bottom out during the early high-school years, with some students showing slight increases in some subject areas near graduation (Eccles & Wigfield, 2002). Unfortunately, interest is at its lowest at a crucial time in development – when students are deciding whether to pursue more education or not. Thus, declining interest could also mean declining achievement, commitment to school, and persistence in terms of graduation and entrance into post-secondary education.

Given the role that interest plays in determining the quality of the educational experience, along with the evidence demonstrating declining interest over time, student interest should be a major issue in national, state, and local educational policy. However, this does not seem to be the case. For example, the No Child Left Behind Act (NCLB) – with its focus on increasing student achievement in American education, particularly for disadvantaged and other low-achieving students – makes no explicit provisions or recommendations for enhancing student motivation, interest, and engagement in the classroom (No Child Left Behind, 2006). Instead, the focus is on student performance on standardized tests and increasing these test scores over time. Many of

the educational practices precipitated by NCLB – such as narrowing the curriculum in order to “teach to the test”, and stressing the importance of performing well on “high stakes” tests – only serve to squeeze out portions of the educational experience that are meaningful and relevant to students’ lives (Meier & Wood, 2004; Ryan & Brown, 2005). It is ironic that public policies intended to create a higher achieving, and more equal, educational system are potentially undermining success and access to education beyond high school. Not only is there a well-documented problem of declining interest over time, but we are now faced with public policies that might further undermine student interest.

One way to enhance student interest is by creating an engaging, meaningful environment where students are able to discover the value in what they are learning (Brophy, 1999; Stipek, 2002; Wigfield & Eccles, 2002). Curricular interventions at both the high-school and college level aimed at enhancing student interest are likely to impact student success and access to higher education. This is particularly true for low-achieving students who already suffer from lowered interest in school. As many theorists have suggested (Erikson, 1950; Roeser & Galloway, 2002), the educational trajectories that students develop in high school serve as the foundation for educational quality beyond high school (Lumina Foundation, 2006). Without a sufficient level of achievement in high school, students will not have access to further education. Without sufficient interest in school, they may not choose to go. As we have tried to demonstrate in this study, theoretical work in motivation provides a framework within which we can test and implement interventions to address the issue of educational quality, access, and success at both the high-school and college levels.

The Cycle Continues: Implications for Theory

Our model of interest development needs further validation in the form of longitudinal analyses as well as experiment research. This will continue the interwoven methodological and theoretical cycles. Observational studies set up hypotheses to test in laboratory experiments, which then lead to randomized intervention studies with practical applications. These findings in turn impact theory, as well as generate new questions. Our research process does not end when the findings are understood, and practices and policies are changed. Instead, the results will have implications for theorizing and future research. For example, although our research demonstrated the effectiveness of our utility value intervention in helping students discover value and find interest in the material, we did not document how this process occurred. Did the process of making connections help students identify with the material and see themselves using statistics in their future careers? Did making a connection help students pay more attention in class, put forth more effort, and generally become more involved in the learning process? The answers to these questions will not only help us to understand why the intervention worked, but also help practitioners know what to look in a successful intervention in their own classrooms. And so the cycle of theory testing and refinement work in a complementary fashion in creating a firm foundation of theory-guided practice.

Short Biographies

Judith Harackiewicz received her PHD in Psychology from Harvard University, and is Professor of Psychology at the University of Wisconsin-Madison. She has been studying

intrinsic motivation and interest for 30 years, conducting experimental and longitudinal studies in academic and athletic contexts. She just completed a term as Editor of *Personality and Social Psychology Bulletin*.

Chris Hulleman received his PhD in social and personality psychology from the University of Wisconsin–Madison, and went on to do a postdoctoral fellowship in the Learning Sciences Institute in Vanderbilt University's Peabody College. He currently has a joint appointment as assistant professor of Graduate Psychology and assistant assessment specialist in the center for Assessment and Research Studies at James Madison University. Dr. Hulleman's primary research interests involve understanding the contextual and personality factors that influence motivation and performance. His methodological interests include developing guidelines for translating laboratory research into the field, and developing indices of implementation fidelity.

Endnote

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References

- Ainley, M., Hidi, S., & Berndorff, D. (2002). Interest, learning, and the psychological processes that mediate their relationship. *Journal of Educational Psychology*, **94**, 545–561.
- Ames, C. (1984). Achievement attributions and self-instructions under competitive and individualistic goal structures. *Journal of Educational Psychology*, **76**, 478–487.
- Ames, C., & Archer, J. (1988). Achievement goals in the classroom: Students' learning strategies and motivation processes. *Journal of Educational Psychology*, **80**, 260–267.
- Brophy, J. (1999). Toward a model of the value aspects of motivation in education: Developing appreciation for particular learning domains and activities. *Educational Psychologist*, **34**, 75–85.
- Cook, T. D. (2002). Randomized experiments in educational policy research: A critical examination of the educational evaluation community has offered for not doing them. *Educational Evaluation and Policy Analysis*, **24**, 175–199.
- Dewey, J. (1913). *Interest and Effort in Education*. Cambridge, MA: Riverside Press.
- Durik, A. M., & Harackiewicz, J. M. (2007). Different strokes for different folks: How personal interest moderates the effects of situational factors on task interest. *Journal of Educational Psychology*, **99**, 597–610.
- Dweck, C. S. (1986). Motivational processes affecting learning. *American Psychologist*, **41**, 1040–1048.
- Eccles, J., Adler, T. F., Futterman, R., Goff, S. B., Kaczala, C. M., Meece, J. L., et al. (1983). Expectancies, values, and academic behaviors. In J. T. Spence (Ed.), *Achievement and Achievement Motives: Psychological and Sociological Approaches* (pp. 75–146). San Francisco, CA: W. H. Freeman.
- Eccles, J., & Wigfield, A. (2002). Motivational beliefs, values, and goals. *Annual Review of Psychology*, **53**, 109–132.
- Elliot, A. J. (2005). A conceptual history of the achievement goal construct. In A. J. Elliot & C. S. Dweck (Eds.), *Handbook of Competence and Motivation* (pp. 52–72). New York, NY: Guilford Publications, Inc.
- Elliot, A. J., & McGregor, H. (2001). A 2 × 2 achievement goal framework. *Journal of Personality and Social Psychology*, **80**, 501–519.
- Erikson, E. H. (1950). *Childhood Society*. New York: Norton.
- Flum, H., & Kaplan, A. (2006). Exploratory orientation as an educational goal. *Educational Psychologist*, **41**, 99–110.
- Harackiewicz, J. M., & Barron, K. E. (2004). Conducting social psychological research in educational settings: "Lessons we learned in school". In A. T. Panter, C. Sansone & C. C. Morf (Eds.), *The Sage Handbook of Methods in Social Psychology* (pp. 471–484). Thousand Oaks, CA, USA: Sage Publications.
- Harackiewicz, J. M., Barron, K. E., Carter, S. M., Letho, A. T., & Elliot, A. J. (1997). Determinants and consequences of achievement goals in the college classroom: Maintaining interest and making the grade. *Journal of Personality and Social Psychology*, **73**, 1284–1295.
- Harackiewicz, J. M., Barron, K. E., & Elliot, A. J. (1998). Rethinking achievement goals: When are they adaptive for college students and why? *Educational Psychologist*, **33**, 1–21.
- Harackiewicz, J. M., Barron, K. E., Pintrich, P. R., Elliot, A. J., & Thrash, T. (2002). Revision of achievement goal theory: Necessary and illuminating. *Journal of Educational Psychology*, **94**, 638–645.
- 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., Tauer, J. M., & Elliot, A. J. (2002). Predicting success in college: A longitudinal study of achievement goals and ability measures as predictors of interest and performance from freshman year through graduation. *Journal of Educational Psychology*, **94**, 562–575.
- Harackiewicz, J. M., Durik, A. M., & Barron, K. E. (2005). Multiple goals, optimal motivation, and the development of interest. In S. M. Laham, J. P. Forgas & K. D. Williams (Eds.), *Social Motivation: Conscious and Unconscious Processes* (pp. 21–39). New York, NY, USA: Cambridge University Press.
- Hidi, S. (1990). Interest and its contribution as a mental resource for learning. *Review of Educational Research*, **60**, 549–571.
- Hidi, S., & Baird, W. (1988). Strategies for increasing text-based interest and students' recall of expository texts. *Reading Research Quarterly*, **23**, 465–483.
- Hidi, S., & Harackiewicz, J. M. (2000). Motivating the academically unmotivated: A critical issue for the 21st century. *Review of Educational Research*, **70**, 151–179.
- Hidi, S., & Renninger, K. A. (2006). The four-phase model of interest development. *Educational Psychologist*, **41**, 111–127.
- Hulleman, C. S., An, B., Hendricks, B., & Harackiewicz, J. M. (2007, June). *Interest Development, Achievement, and Continuing Motivation: The Pivotal Role of Utility Value*. Poster presented at the Institute for Education Sciences 2007 Research Conference, Washington, DC.
- Hulleman, C. S., An, B., Hendricks, B., & Harackiewicz, J. M. (2008). Interest development, achievement, and continuing motivation: The pivotal role of utility value. Unpublished manuscript.
- Hulleman, C. S., Durik, A. M., Schweigert, S., & Harackiewicz, J. M. (2008). Task values, achievement goals, and interest: An Integrative analysis. *Journal of Educational Psychology*, **100**, 398–416.
- Hulleman, C. S., Godes, O., Hendricks, B., & Harackiewicz, J. M. (2008). Putting the “X” back in expectancy-value models of motivation: A process analysis of utility value. Manuscript under editorial review.
- Hulleman, C. S., & Harackiewicz, J. M. (2009). Making education relevant: Increasing interest and performance in high school science classes. Unpublished manuscript.
- Jacobs, J. E., Lanza, S., Osgood, D. W., Eccles, J. S., & Wigfield, A. (2002). Changes in children's self-competence and values: Gender and domain differences across grades one through twelve. *Child Development*, **73**, 509–527.
- 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.
- Lucas, R. E. (2007). Personality and the pursuit of happiness. *Social and Personality Psychology Compass*, **1**, 168–182.
- Lumina Foundation. (2006). *What we know about access and success in postsecondary education: Informing Lumina Foundations strategic direction*. Accessed on May 9, 2006 from <http://www.luminafoundation.org/research/what-we-know/index/.html>.
- Maehr, M. (1989). Thoughts about motivation. In C. Ames & R. Ames (Eds.), *Research on Motivation in Education: Goals and Cognitions* (Vol. 3, pp. 299–315). New York: Academic Press.
- Maxwell, S. E., & Cole, D. A. (2007). Bias in cross-sectional analysis of longitudinal meditation. *Psychological Methods*, **12**, 23–44.
- Meece, J. L., Wigfield, A., & Eccles, J. S. (1990). Predictors of math anxiety and its influence on young adolescents' course enrollment intentions and performance in mathematics. *Journal of Educational Psychology*, **82**, 60–70.
- Meier, D., & Wood, G. (2004). *Many children left behind: How the No Child Left Behind Act is damaging our children our schools*.
- Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review*, **91**, 328–346.
- No Child Left Behind. (2006). *Official US government website of the No Child Left Behind Act*. Accessed on May 9, 2006 from <http://www.ed.gov/nclb>.
- Pintrich, P. R. (2000). Multiple goals, multiple pathways. *The role of goal orientation in learning and achievement*. *Journal of Educational Psychology*, **92**, 544–555.
- Pintrich, P. (2003). A motivational science perspective on the role of student motivation in learning and teaching contexts. *Journal of Educational Psychology*, **95**, 667–686.
- Renninger, K. A. (2000). Individual interest and its implications for understanding intrinsic motivation. In C. Sansone & J. M. Harackiewicz (Eds.), *Intrinsic and Extrinsic Motivation: The Search for Optimal Motivation and Performance* (pp. 373–404). San Diego, CA: Academic Press, Inc.
- Roeser, R., & Galloway, R. (2002). Studying motivation to learn during early adolescence: A holistic perspective. In F. Pajares & T. Urdan (Eds.), *Academic Motivation of Adolescents*, (331–372). USA: Information Age Publishing, Inc.
- Ryan, R. M., & Brown, K. (2005). Legistating competence: High-stakes testing policies and their relations with psychological theories and research. In A. J. Elliot & C. S. Dweck (Eds.), *Handbook of Competence and Motivation* (pp. 354–372). New York, NY: Guilford Publications.
- Schiefele, U., Krapp, A., & Winteler, A. (1992). Interest as a predictor of academic achievement: A meta-analysis of research. In K. A. Renninger, S. Hidi & A. Krapp (Eds.), *The Role of Interest in Learning and Development* (pp. 183–211). Hillsdale, NJ: Erlbaum.

- Sheldon, K., & Elliot, A. (1999). Goal striving, need satisfaction, and longitudinal well-being: The self-concordance model. *Journal of Personality and Social Psychology*, **76**, 482–497.
- Sheldon, K. M., & Lyubomirsky, S. (2007). Is it possible to become happier? *Social and Personality Compass*, **1**, 129–145.
- Stipek, D. (2002). *Motivation to Learn: Integrating Theory and Practice* (4th edn). Boston: Allyn & Bacon.
- Updegraff, K. A., Eccles, J. S., Barber, B. L., & O'Brien, K. M. (1996). Course enrollment as self-regulatory behavior: Who takes optional high school math courses? *Learning and Individual Differences*, **8**, 239–259.
- Wigfield, A. (1994). Expectancy-value theory of achievement motivation: A developmental perspective. *Educational Psychology Review*, **6**, 49–78.
- Wigfield, A., & Eccles, J. (1992). The development of achievement task values: A theoretical analysis. *Developmental Review*, **12**, 265–310.
- Wigfield, A., & Eccles, J. (2002). The development of competence beliefs, expectancies for success, and achievement values from childhood through adolescence. In A. Wigfield & J. Eccles (Eds.), *Development of Achievement Motivation* (pp. 91–120). San Diego, CA: Academic Press.
- Xiang, P., Chen, A., & Bruene, A. (2005). Interactive impact of intrinsic motivators and extrinsic rewards on behavior and motivation outcomes. *Journal of Teaching in Physical Educational*, **24**, 179–197.