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Intended Persistence: Comparing Academic and Creative Challenges in High School

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Intended Persistence:

Comparing Academic and Creative Challenges in High School

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Abstract

How do high school students approach academic and creative challenges? This study compares the content of academic and creative challenges for 190 high school students, and examines students' intentions to persist. Students reported experiencing academic and creative challenges in different areas: academic challenges were described primarily in math/science and English, with themes related to time management and striving to improve, while creative challenges were described overwhelmingly in art and music and concerned problem solving difficulties. Students reported more interest and intention to persist in the creative than academic challenges. Interest was the strongest predictor of persistence across both academic and creative challenges. The divergent perceptions of creative and academic challenges suggest that capitalizing on the creative elements of academic assignments could boost student interest and subsequent persistence.

Keywords: academic challenges; creative challenges; persistence; intrinsic motivation; high school

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Introduction

High school students face challenges inside and outside of the classroom and how they respond to these challenges influences their long-term achievement. For example, a student who struggles with pre-calculus may choose not to persevere and take calculus the following year; he or she is then much less likely to become a math or science major in college. Creative projects, whether related to schoolwork or extracurricular endeavors, also present many challenges that require persistence. A student who fails to adapt to the discomfort of the critique process in an art course may actively avoid similar activities for fear of criticism in the future. Because critical thinking and creativity are crucial for success in the 21st century workplace (Dede, 2010), it is important to study student persistence in relation to both academic and creative endeavors.

Persistence is defined as "the quality that allows someone to continue doing something or try to do something even though it is difficult or opposed by other people" (persistence, 2016). Early adolescence is a time of increased awareness about one's abilities relative to his or her peers; it can therefore be a phase during which achievement motivation declines (Eccles, Midgley, and Adler, 1984; Wigfield and Eccles, 1994). Even short dips in motivation and achievement in secondary school can have lasting consequences, as entry into higher-level courses or competitive post-secondary education often require success in previous pre-requisite and increasingly challenging classes. The ability to continue working towards a goal, despite obstacles, doubts, or setbacks, is a valuable skill to develop.

Educational psychologists describe student performance and persistence as shaped by expectancies of success and perceived value (Eccles [Parsons] et al., 1983; Eccles and Wigfield,

1995, 2002). Student choices and persistence are predicted both by perceptions of competency (*Am I able to successfully complete this task?*) and by judgments of task value (*Do I want to do this task?*). Task values include perceptions of personal importance of the task (deriving a sense of personal identity from the task), intrinsic value (enjoying the task for its own sake), and utility value (usefulness of the task for other goals). Expectancies and values predict persistence in course enrollment decisions, such as the number of mathematics and science courses taken in high school (Joyce and Farenga, 2000; Lent, Brown, and Larkin, 1984; Simpkins, Davis-Kean, and Eccles, 2006; Updegraff, Eccles, Barber, and O'Brien, 1996). Moreover, high school student expectancy of success, perceived task value, and persistence have been shown to predict actual math achievement in high school geometry (Pokay and Blumenfled, 1990), and prior academic self-concept has been shown to predict grades and standardized test scores beyond what is explained by prior academic achievement (Marsh, Byrne, and Yeung, 1999).

Creativity research emphasizes the role of intrinsic motivation in fueling creative drive (Amabile, 1996). Individuals persist in creative endeavors on account of enjoyment and passion for an activity (Bonneville-Roussy, Lavigne, and Vallerand, 2011; Csikszentmihalyi, 1990). Intrinsic motivation predicts the extent of student involvement in creative activities, as well as creativity ratings of completed products. For example, in one study trait intrinsic motivation predicted students' current involvement in creative writing, the hours per week they made art, the number of artworks they produced, and instructor ratings of student commitment to art and artistic potential (Amabile, Hill, Hennessey, and Tighe, 1994).

While previous studies examined motivation and persistence within a single domain – either the academic or the creative – this study compares the factors associated with persistence across academic and creative challenges. First, we examine the content of academic and creative

challenges. We then compare motivational predictors of intended persistence for these challenges. Learning how students think about creative and academic challenges and why they choose to persist through these challenges could provide important information for educational psychologists, teachers, and parents who help students to set and achieve long-term goals.

Content of Academic and Creative Challenges

The content of students' challenges – represented by the subject areas, themes, and words they use to describe the challenges – reflects implicit theories of what constitutes academic and creative domains. The beliefs students construct from their observations and interactions at school influence their perceptions of creative and academic challenges. For instance, teachers have even been found to distinguish between "creative" and "good" students, suggesting creativity is not always viewed as desirable in class (Karwowski, 2010; Westby and Dawson, 2010). Teachers' beliefs are implicitly or explicitly transmitted to students, which in turn influences students' own beliefs.

When thinking of creativity, people tend to have an art-bias (Runco, 2008; Runco and Pagnani, 2011; Sawyer, 2012). For instance, Glăveanu (2011) asked his participants to propose a symbol for creativity and to rate their own creativity. Participants not only proposed art-related symbols (e.g., paintbrush and colors, musical notes), but also interpreted their creative ability in terms of experiences in drawing and playing music, or whether they liked to make art and were able to generate original artistic ideas. Similarly, when asked to rate to what extent creativity is required to fulfill the demands of various occupations, people more quickly and highly rated creativity as requisite for artistic professions (e.g., acting, writing, painting), than for any other occupational domain (e.g., engineering, philosophy, cooking; Glăveanu, 2014). It is likely then

that students perceive the creative domain with a similar kind of art-bias, labeling tasks as creative when they relate to the arts.

Another question concerns how students describe their challenges. The words people use are associated with personality processes and social motivations (Pennebaker, Mehl, and Niederhoffer, 2003). In one study, students who felt a sense of ownership over a lab project in an inquiry-based learning course described their experience using more emotion words, personal pronouns, and statements of excitement, than did students enrolled in a standard lab course (Hanauer, Frederick, Fotinakes, and Strobel, 2012). Because creative activities are marked by a greater degree of choice and perceived independence than traditional academic assignments with clearly defined steps and outcomes (Ramsden, 1979; Sternberg and Wagner, 1993), we hypothesize that student descriptions of creative and academic challenges will differ in frequencies of linguistic categories related to agency and choice (e.g., personal pronouns and emotion words; Hanauer, Frederick, Fotinakes and Strobel, 2012). We also hypothesized differences in cognitive mechanism words (*e.g. evaluate, consider, know),* social words *(e.g. companion, listen, people),* leisure words (*e.g. hobby, sing, unwind),* work (*e.g. assignment, busy, productive),* and achievement words (*e.g. goal, improve, succeed).*

Predictors of Academic and Creative Persistence

Whether a student decides to quit or to continue with an activity depends on both motivation and personality. While motivation variables influence achievement and persistence in specific domains (e.g., school vs. extracurricular activities, math vs. English), personality traits predict persistence across domains (Barrick and Mount, 1991; Poropat, 2009).

Research on academic persistence has been based prominently on expectancy-value theories (Eccles and Wigfield, 2002). Expectancies refer to individuals' beliefs about how well

they will do on a task and are influenced by task-specific ideas regarding one's competence and perceptions of success. Students who believe they will do well on a task perform better and are more likely to persevere through challenges (Eccles, 2005b). For instance, students' 6th grade ability beliefs for mathematics and science predicted their 10th grade ability beliefs, as well as the number of high school courses they took in mathematics and physical science, a measure of subject area persistence (Simpkins et al., 2006). Likewise, undergraduate students concentrating in science that reported higher levels of self-efficacy persisted longer in technical and science-related courses than those with lower expectancies for success (Lent et al., 1984).

Expectancies are also important for creative achievement. High creative self-efficacy – the belief that one is able to be successful in tasks requiring creativity – predicts teacher ratings of creativity for elementary school students (Beghetto, Kaufman, and Baxter, 2011), as well as creative performance of professional adults (Tierney and Farmer, 2011). Such beliefs powerfully motivate initial goal setting and aid in the ongoing process of recommitting to one's goals (Bandura and Locke, 2003). For example, individuals displaying greater creative self-efficacy were more effortful in creatively expressing themselves on tasks than those with low creative self-efficacy (Tierney and Farmer, 2002, 2004).

Persistence is also predicted by perceived task values (Eccles, 2005b). Task value is conceptualized as a function of personal importance (a link between the task and one's sense of self), intrinsic value (enjoyment of the activity), and utility value (usefulness of the task toward the completion of a goal; Eccles, 2005b). Task values predict persistence outcomes, such as the number of mathematics and science courses taken by students in high school (Joyce and Farenga, 2000; Simpkins et al., 2006; Updegraff et al., 1996). Early research found that utility values were a key predictor of high school math class enrollment (Updegraff et al., 1996), mediating the

relationship between prior achievement and math aptitude and the number of courses taken. More recent research has found that ability belief is a stronger predictor of the same criterion (Simpkins et al., 2006). Simpkins and her colleagues speculated that the difference between these findings might be due to the increasingly competitive college admissions process, with rising numbers of college-bound students taking more challenging courses in mathematics and science to strengthen their college applications. Many students therefore see value in taking these courses in high school, basing their persistence decisions on their ability beliefs. This research makes it difficult to hypothesize about the relative importance of different task values in predicting intended academic persistence.

Though extrinsic motivators contribute to creative achievement, intrinsic motivation is crucial for creative persistence (Amabile, 1996). Individuals focus more deeply and concentrate for longer periods of time when they are intrinsically motivated– when they engage in an activity because of a genuine interest and a personal sense of enjoyment in the activity, rather than to achieve a goal external to the task itself (Amabile, 1996; Hennessey and Amabile, 1998). Case studies of highly creative, intensely committed individuals show that they are fascinated by a set of problems and challenges that drive their work over a period of years (Albert, 1990; Gruber and Davis, 1988). Moreover, the perseverance and passionate involvement stemming from intrinsic motivation play a significant role in creative discovery (Csikszentmihalyi and Robinson, 1986; Vallerand et al., 2003).

Because high school aims to prepare students for long-term college and career goals, it is likely that perceived utility value will be greater for academic challenges than for creative challenges. We hypothesize that intrinsic value will predict intended persistence for both

academic and creative challenges, but that utility value will be relatively more important in predicting academic than creative persistence.

Whereas motivational factors might show a somewhat divergent relationship to academic and creative persistence, personality traits affect behavior across situations and domains (Bem and Funder, 1978; Matthews, Deary and Whiteman, 2003). The Big Five dimension of Conscientiousness involves specific personality traits associated with persistent behavior, including a high level of self-discipline, willingness to overcome obstacles, and motivation to achieve. Conscientiousness is the chief personality predictor of academic performance and is consistently related to school success across student age and grade levels (Noftle and Robins, 2007; Poropat, 2009). Conscientious students fulfill the demands of school more easily; their organization, attention to detail, striving for achievement, dependability, and self-discipline help them complete assignments on time, persist in their work, and fulfill classroom requirements (McCrae and Costa, 1999).

McCrae (1987) proposed that conscientious individuals were more likely to follow through with a creative undertaking than their less responsible or less goal-driven peers. While Conscientiousness does not predict performance on short creativity tasks (e.g., Ivcevic, Brackett, and Mayer, 2007; McCrae, 1987; Silvia, Nusbaum, Berg, Martin, and O'Connor, 2009), Conscientiousness-related traits predict long-term creativity. For instance, college women described by observers as not giving up under conditions of adversity achieved higher occupational creativity at age 52 (Helson, Roberts, and Agronick, 1995). Robert and Cheung (2010) showed that Conscientiousness supports creative achievement; highly conscientious individuals outperformed those with low Conscientiousness on creative activities that required intense task focus and persistence.

The Present Study

This study is the first to compare academic and creative challenges, as well as students' intended persistence in response to these challenges. First, we examine content differences in students' descriptions of academic and creative challenges, including differences in the subject areas (e.g., math), thematic content (nature of the challenges), and words used to describe the challenges. Second we address differences in motivation and intended persistence for academic and creative challenges. We hypothesize higher persistence and intrinsic value for creative challenges and higher utility value for academic challenges. The third aim is to compare predictors of persistence for academic and creative challenges. We expect intrinsic value and conscientiousness to predict persistence in both academic and creative challenges, and utility value to predict persistence in academic challenges.

Method

Participants and Procedure

Participants were 190 high school students (73 male; mean age = 16) from a private co-educational school in the Northeast. Participants identified as Caucasian (*n* = 121), African American (*n* = 8), Asian or Asian American (*n* = 25), Hispanic (*n* = 4), and biracial (*n* = 3).

Data were collected through the Qualtrics online survey system using a survey comprising two parts. In the first part, students completed a series of questions about a recent creative challenge they had experienced and in the second part, students completed questions about a recent academic challenge (survey was administered over a period of two days).

Measures

Open-ended challenge prompts. Participants were asked to think about a creative (or academic) challenge they were experiencing. The prompt asked students to describe the

challenge in their own words, including how the challenge made them feel and how they planned to address the challenge in the future.

After responding to each open-ended challenge prompt, students noted how long they had been experiencing the challenge (response options: *less than one week, less than one month, 2-3 months, 6 months, a year or more*) and how long they had been pursuing the creative or academic activity (response options: *just started it recently, less than one year, 1-2 years, 3-4 years, 5 or more years*).

Motivation variables.

Achievement and expectations. In the creative domain, level of accomplishment and achievement hopes were assessed on a 7-point scale modeled after the Creative Achievement Questionnaire (Carson, Peterson, and Higgins, 2005), with the following response options: (1) just beginning to learn or explore this creative area, (2) receiving praise for creative potential in this area, (3) receiving praise for achievement in this creative area, (4) having mentors suggest I pursue this creative activity as a possible profession, (5) being involved in a public presentation/display of my creative work (e.g. exhibit, public performance, competition, etc.), (6) winning a local prize or award/achieving local recognition in this creative area, and (7) winning multiple prizes/awards/achieving national recognition in this creative area.

For the academic domain, both current and hoped-for achievement were assessed in terms of school grades. Participants answered what grade they had in the challenging academic subject at the time of the study (current achievement) and what grade they had hoped to receive (achievement hope). Students were asked to respond on a 100-point scale. In cases where they entered a letter grade or a range of scores (e.g., 90-100), a midpoint was used (e.g., A- was scored as 91, midpoint of the 90-92 range).

Values. Two motivational values were assessed: intrinsic value (2 items; e.g., *I like doing this subject/activity very much*; $\alpha_{academic} = .82$; $\alpha_{creative} = .89$) and utility value (3 items: e.g., *This subject/activity is very useful for what I want to do after I graduate*; $\alpha_{academic} = .83$, $\alpha_{creative} = .92$).

Effort and choice. Students were asked questions pertaining to the amount of energy or effort they devoted to a subject or activity (3 items; e.g., *I put a lot of effort into this activity*; $\alpha_{academic} = .77$, $\alpha_{creative} = .77$) and the degree of choice with which they felt they approached the subject or activity (1 item; e.g., *I have no choice in doing this activity*)

Persistence. Intended persistence was assessed with 5 statements reflecting plans to continue working on a challenging task (e.g., *I have decided to stick with this subject despite the challenges*; *I intend to continue learning and working in this area in the future*) or to quit (e.g., *I have been thinking about quitting this activity for the past month*; *I am planning to stop taking this subject as soon as possible*; *As soon as I am allowed, I will give up this kind of activity*). Students responded on a 6-point Likert scale ($\alpha = .82$ and .83 for academic and creative persistence, respectively).

Conscientiousness. Self-reported Conscientiousness was assessed with the scale from the Big Five Inventory (John, Naumann, and Soto, 2008). Students responded to 8 items using a 5-point Likert scale (e.g., *I see myself as someone who does a thorough job*; $\alpha = .76$).

Content of Creative and Academic Challenges

Word usage. Word usage in open-ended descriptions of academic and creative challenges was examined with the Linguistic Inquiry and Word Count (LIWC; Pennebaker, Chung, Ireland, Gonzalez, and Booth, 2007). LIWC is a text analysis software that reports

proportions of words in a sample of text using a set of pre-programmed linguistic and content categories (e.g., emotion words, social words, pronouns).

Content categories examined in this study included: first person singular pronouns (e.g., *I, me, my*), social words (e.g., *friend, share, talk*), cognitive mechanism words (e.g., *decide, imagine, discover*), affect words (positive emotion words: e.g., *love, happy, hopeful*; negative emotion words: e.g., *bored, hate, nervous*), achievement words (e.g., *overcome, practice, solve*), work-related words (e.g., *project, employ, career*), and leisure words (e.g., *TV, play, music*). All linguistic content categories were scored as the percent of the total words in the description.

Subject areas. Challenge subject areas included: math/science, English, humanities, English as a Second Language (ESL), group projects, art/music, other, and multiple (see Table 1). Two individuals coded responses, assigning each challenge to one of the eight subject areas, with 89% agreement for creative challenge and 94% agreement for academic challenge responses. All disagreements were resolved through discussion.

Content themes. Content themes addressed the nature of students' academic and creative challenges, and included: time management, failing/low performance, striving to improve, interpersonal challenges, concentration/interest, problem solving process, and ability/skill level (see Table 2). Two coders assigned each response to one of the seven, with 87% agreement for creative challenges and 90% agreement for academic challenges. All disagreements were resolved through discussion.

Results

The results are presented in three sections, addressing each of the research questions. First, we present descriptive statistics and paired samples t-tests to examine content differences in students' descriptions of academic and creative challenges. We examine differences in the

subject areas, thematic content of challenges, and words used to describe the challenges. Second, we present paired samples t-tests addressing differences in motivation and intended persistence for academic and creative challenges. Finally, we compare predictors of persistence for academic and creative challenges.

Content Differences in Academic and Creative Challenges

Word usage. The total word count for open-ended responses was higher for creative than for academic challenges ($t(110) = -5.82$, $p < .001$, creative: $M = 49.69$, $SD = 35.07$, academic: $M = 34.64$, $SD = 30.17$). As predicted, students used different word categories in their descriptions of academic and creative challenges (see Table 4). While there was not a difference in the overall frequencies of affect words, creative challenge descriptions included more positive emotion words ($t(107) = -2.51$, $p = .01$, creative challenge: $M = 3.64$ $SD = 3.05$, academic challenge: $M = 2.52$, $SD = 3.25$) and academic challenge descriptions included more negative emotion words ($t(109) = 1.98$, $p = .05$, creative: $M = 2.57$, $SD = 2.62$, academic: $M = 3.32$, $SD = 3.33$). Creative challenges were also described using more cognitive mechanism words ($t(109) = -4.50$, $p < .001$, creative: $M = 19.36$, $SD = 7.40$, academic: $M = 14.40$, $SD = 8.74$) and social words ($t(107) = -3.00$, $p = .003$, creative: $M = 4.14$, $SD = 4.55$, academic: $M = 2.50$, $SD = 3.29$).

Furthermore, use of leisure words was higher in descriptions of creative challenges ($t(106) = -4.76$, $p < .001$, creative: $M = 2.09$, $SD = 2.96$, academic: $M = .54$, $SD = 1.58$) and use of work-related words was higher in descriptions of academic challenges ($t(105) = 8.79$, $p < .001$, creative: $M = 3.91$, $SD = 3.71$, academic: $M = 10.95$, $SD = 7.26$). Significant differences were not found in the mean frequencies of achievement words or first person singular pronouns.[1]

[1] Some student responses were very brief, so additional paired samples t-tests were conducted only for responses with more than 6 words to ensure that differences in response length did not skew results (first person singular pronouns, $n = 97$; affect, $n = 97$; positive emotion, $n = 95$; negative emotion, $n = 96$; cognitive mechanisms, $n = 97$; social, $n = 95$; leisure, $n = 95$; work, $n = 94$; achievement, $n = 94$). These

Subject areas. Because comparisons involved repeated measures, McNemar's test was used to examine subject area differences in creative and academic challenges. Only participants who provided consistent descriptions of the challenge subject area were included in the analyses (i.e., open-ended description mentioned history and the follow-up question about the subject area listed history; $n = 120$).

Figure 1 shows the distribution of subject areas for the academic and creative challenges. The academic challenges were described most often in math/science (37%), followed by multiple subject areas (20%), English (20%), and humanities (18%). In contrast, most creative challenges were in the art/music subject area (52%). McNemar tests showed that math/science, humanities, and multiple subject areas were more likely to be mentioned in academic challenges (ps < .001) and that art/music and group projects areas were more commonly mentioned in relation to creative challenges (ps < .001). The frequencies of English and 'other' subject areas were comparable for academic and creative challenges.

Content themes. Figure 2 shows the distribution of content themes in the described challenges. The academic challenges most often described striving to improve (31%) and time management problems (21%). By contrast, creative challenges largely described difficulties in the problem solving process (55%). McNemar's test showed that differences between academic and creative challenges were significant for these three content themes (time management: $p = .006$, striving to improve: $p = .001$, and problem solving process: $p < .001$). Differences were not significant for failing/low performance, interpersonal difficulties, concentration/interest, or ability/skill level.

Differences in Motivation and Persistence Across Academic and Creative Challenges

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analyses differed from those including all participants only in that the difference in the mean frequencies for positive emotion words was not statistically significant, $t(94) = -1.85$, $p = .07$.

Paired samples t-tests were used to compare differences in motivational value variables (intrinsic and utility value), effort, choice, and intended persistence for academic and creative challenges (see Table 3).[2]

Students reported being more interested in creative challenges ($t(124) = -8.44$, $p < .001$, creative: $M = 4.60$, $SD = 1.30$, academic: $M = 3.27$, $SD = 1.28$) and having more choice in creative challenges ($t(123) = -7.14$, $p < .001$, creative: $M = 4.22$, $SD = 1.74$, academic: $M = 2.66$, $SD = 1.46$). Utility value and effort were comparable across academic and creative challenges.

As was hypothesized, the mean self-reported persistence for creative challenges ($M = 4.55$, $SD = 1.21$) was higher than the mean persistence score for academic challenges ($M = 3.95$, $SD = 1.18$, $t(151) = -4.64$, $p < .001$).

Predictors of Academic and Creative Persistence

Table 5 presents correlations of all variables with academic and creative persistence. Both academic and creative persistence were positively correlated with utility value, intrinsic value, and effort. Fisher r-to-z transformations revealed that for intrinsic value, the correlation was significantly larger for creative challenges than for academic challenges (creative: $r(106) = .70$, $p < .001$; academic: $r(112) = .50$, $p < .001$; $z = -2.33$, $p = .02$).

Achievement and expectancy variables showed a similar pattern of correlations, with academic and creative persistence both positively correlating with current achievement and hoped-for achievement. The correlation between current achievement and persistence was again significantly stronger for creative challenges than for academic challenges (creative: $r(106) = .50$, $p < .001$; academic: $r(107) = .22$, $p = .02$, $z = -2.34$, $p = .02$).

[2] Students' current achievement and hoped-for achievement in academic and creative domains were not compared, because the scales used to measure these variables were not comparable.

Higher academic persistence was also associated with less time one struggled with the challenge, while creative persistence was not (creative: $r(110) = .05$, $p = .59$; academic: $r(112) = .50$, $p < .001$; $z = 3.66$, $p < .001$). On the other hand, creative persistence was associated with more time having pursued the activity, while academic persistence was not (creative: $r(110) = .52$, $p < .001$; academic: $r(114) = .08$, $p = .40$, $z = -3.66$, $p < .001$). As expected, correlations with choice also revealed a significant relationship with creative persistence but not with academic persistence (creative: $r(105) = .51$, $p < .001$; academic: $r(114) = .16$, $p = .10$; $z = -2.91$, $p = .004$).

As hypothesized, conscientiousness was associated similarly with academic and creative persistence (creative: $r(105) = .24$, $p < .01$; academic: $r(114) = .18$, $p < .05$; $z = .58$, $p = .56$).

Discussion

The present research examined the nature of academic and creative challenges in high school students and the factors that motivate students to persist through these challenges. Students reported academic and creative challenges in different subject areas (math/science for academic vs. art/music for creative challenges), described different themes (striving to improve for academic challenges versus difficulties with the problem solving process for creative challenges), and used different words to describe academic and creative challenges. Students perceived creative challenges as more interesting and reported more intention to persist through creative challenges. Intrinsic value was the strongest predictor of persistence across domains. Motivational values and achievement were more successful in predicting creative than academic persistence.

The tendency for students to report creative challenges in the areas of art and music offers additional support for an art bias in people's conceptions of creativity – a belief that creativity is first and foremost expressed in the arts (Runco, 2008; Runco and Pagnani, 2011).

For example, people tend to represent creativity with art-related symbols, discuss their own creativity in the context of artistic expression, and score artistic professions highest in terms of creativity (Glăveanu 2011, 2014); when asked to identify a creative individual, people focus on eminent artists with major creative accomplishments, or on artists whose efforts have resulted in a socially recognized product (e.g., paintings, sculptures, musical scores; Runco and Pagnani, 2011). Similarly, more than half of the students in our study described creative challenges related to making or producing art and music – "*I have not really had time to work on my music*," "*I didn't have any good ideas for a painting*," and "*I had to create something in ceramics and I had no idea what to do.*"

Although students largely associated creativity with art-related projects, they described academic challenges that were just as creative in nature. For instance, students wrote about "*making an infomercial project in math*," "*creating a graph about a logo or picture using equations*," and "*writing an English monologue explaining what a character would think in a specific situation.*" Thus, students' responses showed that there was room for creativity across different subject areas in school; however, when asked to describe a creative challenge, implicit notions of what it means for something to be creative determined what students chose to discuss.

Because representations of creativity are bound to the social contexts in which they are exercised (Glăveanu, 2011), it is interesting to consider what about the classroom environment perpetuates conceptions of creativity as separate from academics. Why, for example, did students consider English equally representative of the academic and creative challenge domain? Students discussed English assignments dealing with writing in their creative challenge responses (e.g., "*I find it hard to write and edit my papers for English class*" or "*I have to write letters to a soldier who is currently in war and I can't imagine what the soldier is going through*") and in their

academic challenges (*e.g. "I had a bad grade in English and needed to get my grade up")*. Assignments for English classes not only require verbal skill and ability, commonly associated with the academic domain (Cain, Oakhill, and Bryant, 2004; Duncan et al., 2007), but also are often open-ended in nature and encourage broad thinking.

What is the nature of academic and creative challenges? Students principally described academic challenges related to time management and improving their performance. For example, they talked about juggling "*school deadlines and projects at the same time as final grades and sports*," and having to "*cram [projects] in Sunday night*," along with "*trying to get above a 90 in classes*" and "*asking for extra help and notes*" to prevent failing exams. On the other hand, students described struggling with the problem solving aspects of creative challenges, such as knowing "*where to start building*," "*trying to create choreography*," and "*brainstorming to develop ideas*." Students' responses regarding academic challenges described stress amidst external deadlines and pressures to perform, while they described creative challenges as more internal cognitive struggles around developing original ideas to satisfy their own notions of creativity, or encountering problems bringing ideas from concept to creation. The tendency to describe the problem solving process in creative challenges but not in academic challenges speaks to the nature of the academic assignments in which the steps to success are relatively explicit (i.e., study harder, spend more time on assignments, ask for help, get higher grades), while overcoming creative challenges requires discovering appropriate strategies.

The higher frequency of positive emotion words (e.g., *enjoy, happy*) and leisure words (e.g., *decorate, play)* students used to describe their creative challenges echo research which shows that individuals engage in creative activities because they are pleasurable and satisfying in and of themselves (Amabile, 1996). Moreover, the number of cognitive mechanism words (e.g.,

generate, know) used by students was higher for creative challenges. Research shows that emotion and cognitive processing words indicate both a greater depth of processing, as well as attempts by individuals to actively understand a stress-inducing experience (Francis and Pennebaker, 1992; Pennebaker, Colder, and Sharp, 1990). Thus, students appear to exercise healthier coping skills in response to creative, rather than academic, challenges; this is of interest to the study of persistence, as active coping effort has been linked to persistence in school (Hill, 2009; LeSure-Lester, 2003). Students' use of more work-related words (e.g., *manage, earn*) and negative emotion words (e.g., *bored, nervous*) in descriptions of their academic challenges frames school as a stressful experience (Bethune, 2014).

This study was unique in comparing expectancy and value predictors of academic and creative persistence. Consistent with existing literature on achievement motivation (Eccles, 2005b), measures of current achievement and expectancy (hoped-for achievement), as well as intrinsic value and utility value, predicted both academic and creative persistence. However, intrinsic value and current achievement were significantly stronger predictors of creative persistence than academic persistence. Also, mean differences between academic and creative challenges supported previous findings; creative challenges were described as more intrinsically interesting, reflecting the key role of intrinsic motivation in creativity (Amabile, 1996).

Interestingly, students perceived comparable utility in academic and creative tasks. This finding may reflect the increasingly important role of creativity in workplace achievement and success (Florida, 2002). High school students are likely aware of the growing valuation of creativity and in deciding whether to persist through a creative challenge, they place the utility value of that activity as higher in their hierarchy of subjective task values.

The limitations of this study open new avenues for future research. Assessment of academic and creative persistence relied on self-reports and therefore measured students' intended persistence, rather than their actual behavioral persistence. Research shows there is a difference between an individual's intentions and behavior (Sheeran, 2002). While intentions indicate what one means or anticipates to do and how hard one plans to try to do it, they only partially correspond to actual behavior (Biddle, Goudas, and Page, 1994; Webb and Sheeran, 2006; Zinn and Liu, 2008). Thus, the next step in understanding academic and creative challenges should involve measuring student persistence in a longitudinal manner with an observational component. Furthermore, future work could enhance the generalizability of our findings. The sample in the present study was from a private college preparatory school with a predominantly middle class background. Because implicit theories, subjective task values, and expectancies, are sensitive to social context (Eccles, 2005a; O'Brien, Martinez-Pons, and Kopala, 1999) our research invites further study of different and more socioeconomically diverse groups of students.

A second area for future research is in working towards the cross-cultural generalizability of these findings. This study is the first of its kind and thus we cannot yet make claims about its generalizability to others cultures; however, research on implicit theories of creativity shows that they are largely similar across cultures. For instance, there are findings across cultures that while teachers report favorable views towards creativity, they also associate creativity with undesirable characteristics in their students, such as being impulsive and emotional (Runco and Johnson, 2002), risk-taking (Tan, 2003), and arrogant and rebellious (Chan and Chan, 1999). Given the similarities in implicit theories of creativity across cultures, it is likely that the predictors of creative persistence are also similar.

Similarly, expectancies and self-efficacy generalize across cultures. For example, the Big-fish--little-pond effect, in which students in more selective schools have lower self-efficacy, has been demonstrated in 26 countries including Australia, the United States, Russia, Korea, and European nations (Marsh and Hau, 2003). However, research has not yet established whether expectancies and self-efficacy beliefs, are formed in the same way across cultures, and some research has shown that efficacy beliefs operate differently across cultures (e.g., Earley, Gibson, and Chen, 1999; Klassen, 2004). For example, when comparing individualist and collectivist cultures, non-Western people tend to rate their efficacy as lower than Western participants, regardless of actual level of performance, but with better calibration (see Klassen, 2004, for a review of this literature).

In sum, the present study compared students' perceptions of academic and creative challenges and explored what motivates students to persist in those challenges. Contemporary education practice asks students to persist through challenges that simultaneously encompass the academic and the creative, while the work environment encourages both strategic and creative thinking. However, students' diverging conceptions of academic and creative challenges can affect how they perceive educational activities and whether they choose to engage and persist in those activities. Drawing students' attention to the creative aspects of academic assignments can potentially heighten their task engagement and enjoyment. Finally, capitalizing on students' interests in the development of academic curricula, perhaps allowing for increased choice and self-directed learning, may not only drive student exploration and experimentation, but it could also lead to higher levels of student persistence.

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Table 1

Content domains for academic and creative challenges

Challenge subject	Definition	Examples
Math/science	Math, science, computer science, technology and invention	Math is a big struggle for me; When I had to make a web page for my science class
English	English	Writer's block keeps me from writing; I find it hard to write my papers in English class
Humanities	History, economics, foreign language	AP history continues to be my biggest struggle in school; My French test gave me a hard time
ESL	"English as a second language"; challenges explicitly referencing "ESL Culture," or difficulties with the English language	Homework from ESL Culture has been really annoying; I feel like I did not improve my English skill at all
Group projects	Working in a group or on Project Based Learning (PBL) tasks	Struggling with knowing what to do for my PBL and how our group will do it; A hard project with people I did not want to work with
Art/music	Fine and performing arts categories: art, music, dance, theater, humor, film, digital media, or social media	Trying to create choreography for a dance team; I have trouble in ceramics
Other	Sports activities, other school-related activities, community activities; activities that do not fall into a specific subject area	Every day is my creative challenge; An academic challenge is standardized testing
Multiple subjects	The described challenge spans more than one subject area	Making a creative project for classes I struggle in; I struggle in math and foreign language

Table 2

Content themes for academic and creative challenges

Challenge theme	Definition	Examples
Time management	Juggling multiple tasks, meeting deadlines, making up for lost time, or balancing work and leisure	I cannot manage my time really well since I have so many other different things going on; I have to catch up on a lot of missed tests and homework
Failing/low performance	Feeling dissatisfied with a performance, outcome, or achievement	I was trying to make a video game and I messed up; Not making Magna Cum Laude
Striving to improve	Making an effort to do better, improve future performance, or meet personal aspirations	I am meeting with the teacher of the class to figure it out; I study really hard and never give up
Interpersonal difficulties	Experiencing conflicts with others	No one will give me the chance to showcase my talent; I have trouble working in groups
Concentration/interest	Struggling with the ability to concentrate, sustain focus, or maintain interest in an activity	I had trouble focusing and I did not want to do it; I am bored
Problem solving process	Problems executing an idea, either from a lack of ideas to begin with or from encountering problems while working on a task	Writer's block is super annoying; I was having trouble thinking of what to write for a history essay
Ability/skill level	Lack of skill, doubting one's skill level and abilities, or lacking confidence in the belief that one can perform a task	I did not have much experience with Photoshop; I'm feeling scared and insecure

Table 3

Descriptive statistics: Motivation and persistence

	Academic challenge		Creative challenge			
Variable	*M*	*SD*	*M*	*SD*	*t*	*p*
Time experiencing challenge	2.98	1.56	2.76	1.45	--	--
Time pursuing subject/activity	3.83	1.32	3.22	1.53	--	--
Other setbacks	3.02	.94	2.87	.92	--	--
Achievement/expectations						
Current achievement	86.14	8.13	3.09	1.91	--	--
Hoped-for achievement	91.16	5.07	3.11	1.94	--	--
Motivation values						
Utility value	3.59	1.28	3.51	1.55	.42	.67
Intrinsic value	3.27	1.28	4.60	1.30	-8.44	<.001
Effort	4.35	.98	4.33	1.09	.17	.86
Choice	2.66	1.46	4.22	1.74	-7.14	<.001
Persistence	3.95	1.18	4.55	1.21	-4.64	<.001

Note. Paired samples t-tests were conducted for motivation values, as well as effort, choice, and persistence.

Table 4

Descriptive statistics: Comparison of linguistic variables for academic and creative challenges

	Academic challenge		Creative challenge			
Variable	*M*	*SD*	*M*	*SD*	*t*	*p*
Total word count	34.64	30.17	49.69	35.07	-5.82	<.001
First person singular	10.01	6.18	9.95	4.27	.09	.93
Affect	6.12	4.69	6.47	4.14	-.59	.56
Positive emotions	2.52	3.25	3.64	3.05	-2.51	.01
Negative emotions	3.32	3.33	2.57	2.62	1.98	.05
Cognitive mechanisms	14.40	8.74	19.36	7.40	-4.50	<.001
Social	2.50	3.29	4.14	4.55	-3.00	.003
Leisure	.54	1.58	2.09	2.96	-4.76	<.001
Work	10.95	7.26	3.91	3.71	8.79	<.001
Achievement	3.68	3.98	4.03	3.15	-.74	.46

Note. All variables except Total Word Count refer to percentages of words in that content category.

Table 5.

Correlations: Predictors of academic and creative persistence

Predictors	Academic persistence	Creative persistence	*z*	*p*
Time involved w/ activity	.08	.52***	-3.66	<.001
Duration of challenge	-.50***	.05	3.66	<.001
Motivation values				
Utility value	.29**	.36***	-0.57	.57
Intrinsic value	.50***	.70***	-2.31	.02
Achievement and expectations				
Current achievement	.22*	.50***	-2.34	.02
Hoped-for achievement	.28**	.38***	-0.80	.42
Effort	.31**	.51***	-1.76	.08
Choice	.16	.51***	-2.91	<.001
Conscientiousness	.24**	.18*	0.58	.56

Note. *p< .05, **p< .01, ***p< .001

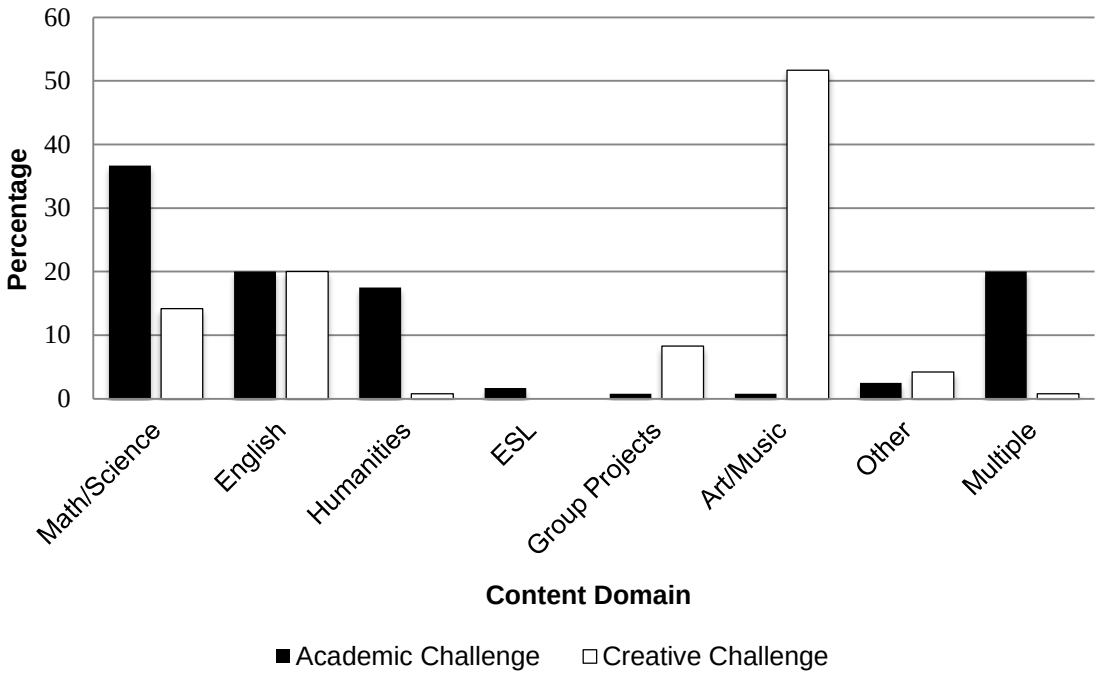

Figure 1. Subject areas for academic and creative challenges

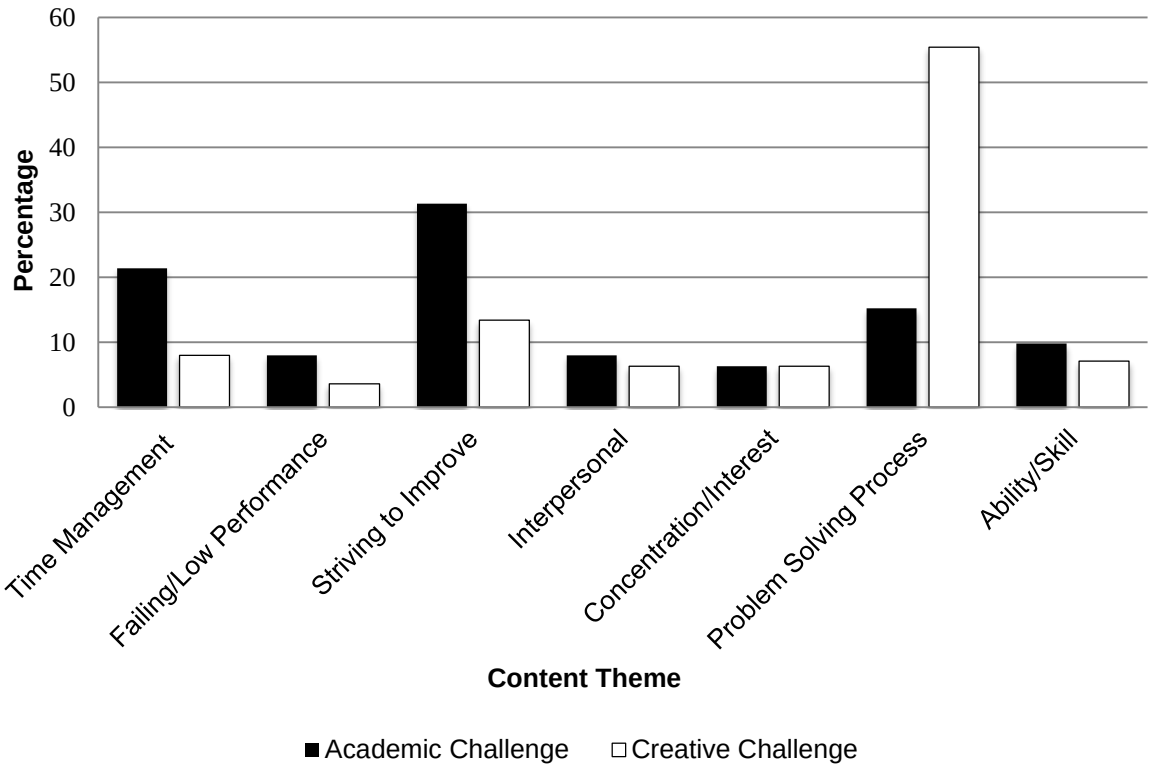

Figure 2. Content themes for academic and creative challenges

Response to Editors

COMMENTS FOR THE AUTHOR(S):

1. Please proof read through the text carefully one more time to catch any typographical or grammatical errors. Also, there remain a few asterisks in some text citations, generally in the new text, that should be replaced with "and".
The manuscript has been proofread and typos corrected. We have removed two remaining asterisks in the text that we found.

2. Please provide brief biographical notes for each author, giving departmental and institutional affiliation, academic position, and research interests. Two to four sentences for each author are usually sufficient. Place these on a separate page near the beginning or end of the manuscript.
Brief biographical notes for each o the five authors have been added on a separate page after the acknowledgements and before the references toward the end of the manuscript body.