

CLASSROOM ACTIVITIES THAT MOTIVATE GIFTED HIGH SCHOOL STUDENTS: AN
INVESTIGATION OF STUDENT AND TEACHER PERCEPTIONS

A Thesis by

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The following faculty members have examined the final copy of this thesis for form and content, and recommend that it be accepted in partial fulfillment of requirement for the degree of Master in Education, with a major in Special Education.

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ABSTRACT

This quantitative study was designed to investigate whether gifted achievers and gifted underachievers differ in their perceptions of the intrinsic motivation of specific classroom activities and if their motivation as measured by the IMI correlates to academic performance as measured by class grades. The study also investigated which activities are frequently used by teachers of gifted students as well as how motivating they believe each activity is to students.

The sample included 21 gifted students in a large urban high school and 10 teachers. The students completed a pre-inventory checklist of activities they believe to be valuable and then completed a Likert-scale inventory. The inventory is an adaptation of the *Intrinsic Motivation Scale* from the University of Rochester and includes subscales which rate students' enjoyment, competence, perceived choice, and pressure/tension related to a variety of commonly used classroom activities. Teachers completed a two-part Likert-scale inventory of classroom activities: first to investigate the frequency of use of a number of common classroom activities and then to collect data on the teachers' assessment of the motivating value of each activity. This study may provide insights between research into motivation theories and research in effective classroom activities and may help teachers provide better classroom conditions for all students, but particularly underachieving gifted students.

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CHAPTER 1

INTRODUCTION

Despite their high potential, there are academically gifted students who underperform, drop out, or otherwise fail to achieve academic success in the traditional high school. It could be suggested that these underachieving, unmotivated gifted students are an untapped, underutilized resource in our country. Anecdotally, educators relate similar stories of two cadres of gifted students. There are stories of those students who are highly motivated and achieve great success, win large scholarships, and continue on to college and careers. Conversely, at many urban high schools there are nearly as many stories of gifted students who underperform and never reach their potential and end up working low-wage jobs with low satisfaction.

How to best engage and motivate this type of unmotivated, underachieving gifted high school student has been the subject of a wide variety of research (Kanevsky & Keighley, 2003; McCoach & Seigle, 2003; Neihart, 2006; Renzulli & Park, 2000). For the purposes of this study, underachieving students are those who “exhibit a severe discrepancy between expected achievement (as measured by standardized achievement test scores or cognitive or intellectual ability assessments) and actual achievement (as measured by class grades and teacher evaluations)” (McCoach & Seigle, 2003). During 15 years in the classroom, I have observed educators trying every new teaching trend and high-interest activity in attempts to engage and re-energize underachieving students with mixed results. Some highly innovative and engaging strategies have been explored, such as the computer-based, interdisciplinary problem solving games reported by C. P. Lim to increase both intrinsic and extrinsic motivation among students (2008). Yet this type of activity requires a vast dedication of classroom time and reallocation of

teaching resources that are not always available in the typical high school. Other approaches, such as the Global Learning model (Gibson, Rimmington & Landwehr-Brown, 2008), simulation games (Auman, 2011), or even Renzulli's (1977) Schoolwide Enrichment Model are effective in providing gifted students with more choices and the real-world applicability that drives intrinsic motivation. However, some of these can be difficult for an individual teacher to incorporate and may be better suited to a wider adoption by a department or school.

Meanwhile, researchers in education continue to explore the areas of goal setting, intrinsic motivation, and classroom conditions to understand and potentially unlock the puzzle of what keeps students motivated and engaged in the classroom. A one-size-fits-all answer is elusive, and, yet, in the current educational context, driven by No Child Left Behind and teacher accountability, finding better classroom activities and strategies to motivate students is important to the mission of educators and the success of students.

The problem of underachieving students has been studied by many, and yet “despite the widespread interest, researchers possess only a rudimentary understanding of this phenomenon” (McCoach & Seigle, 2003, p. 144). Additionally, it would seem that many students, particularly those labeled gifted and talented, may select to underperform—performing well in Calculus while failing Physics or History, for example. One question that continues to emerge is why do some teachers have success with a student when other equally educated and well-intentioned teachers do not?

Complicating the issues for classroom teachers is that many of the factors that differentiate underachieving from high-achieving gifted students, such as anxiety, attention-deficit/hyperactivity disorder, and emotional problems (McCoach & Seigle, 2003) are largely beyond the reach of the individual teacher in a classroom. These factors point to a need for more

research into specific classroom strategies and teacher qualities that may help gifted students overcome those underlying causes of low performance. There is also an opportunity to further evaluate the effect of building-wide interventions, such as the Responsive Classroom approach (Rimm-Kaufman & Chiu, 2007) or Renzulli's Schoolwide Enrichment Model (1977), or more specifically for gifted students, the Global Learning model (Gibson, Rimmington, & Landwehr-Brown, 2008). All of these impact student learning and motivation in areas where extrinsic and intrinsic factors overlap. Studying how teachers can better understand and then apply classroom practices that enhance individual gifted students' intrinsic and extrinsic motivation may lead to better outcomes for all students.

This study focuses on classroom activities and how students and teachers perceive the motivational capacity of each activity. The teacher inventories, conducted first, helped me to understand which activities are most commonly used and identify teacher perceptions of the motivational potential of each activity. The student inventory was designed to investigate whether gifted achievers and gifted underachievers differ in their perceptions of the intrinsic motivation of specific classroom activities. It also allowed me to see if students' reports of intrinsic motivation correlate with their academic performance as measured by grade point average.

In this study, the questions to be answered are: Are particular strategies more motivational than others for high school gifted students, especially underachieving gifted students, and is their intrinsic motivation as measured by their interest/enjoyment of an activity related to their grades? Also, which activities are most frequently used by teachers and do teachers believe these activities are motivating to students?

CHAPTER 2

LITERATURE REVIEW

What Motivates Students?

High-achieving students often appear to be motivated by something within them. As Ryan and Deci (2000) state, “the most basic distinction is between *intrinsic motivation*, which refers to doing something because it is inherently interesting or enjoyable, and *extrinsic motivation*, which refers to doing something because it leads to a separable outcome.” It makes sense that students may have individual interests and act upon them without outside prompting or rewards. And it likewise follows that many students will find school work important for reasons that are more externally motivating, such as getting into college or avoiding trouble with their parents.

Adolescent students report that they enjoy “...working in groups and with friends to increase understanding or interest in particular lesson or subjects...” in Schmakel’s (2008) research on student viewpoints on motivation and achievement. Yet, her research also noted one student reporting that too much group work just led to socializing (2008). Contradictory student reporting like this indicates the need for more data to connect activities to both outcomes and motivating potential. It may also indicate a wider range of individual preferences and reflect each individual’s intelligences as supported by Gardner’s multiple intelligences theory (1983).

For gifted students, choice is frequently connected to motivation in school. As Gentry, Gable and Springer (2000) note: “Providing students with choices is probably the simplest modification that teachers can make to increase motivation and learning...” (p. 87). In addition to choice, students mention that they want fun activities, but also more challenging work

(Schmakel, 2008). Such research findings suggest that there is room for rigor within motivating activities that may appear more “fun” on the surface. Complex computer-based activities (Lim, 2008) or research-based, role-playing games or simulations (Auman, 2011) are examples of this.

Looking into the individual personality traits that correlate to better intrinsic academic motivation, Barnett, Hoekman, & McCormick (2005), found indications that optimism is a significant factor in gifted students’ academic motivation and success. Their study measured students’ anxiety and coping mechanisms for academic stress and the impact on extrinsic and intrinsic motivation. In addition, they found that an individual might be the recipient of optimism from others in a classroom setting, which, although their research did not cover teachers, could suggest that classroom conditions that foster optimism could benefit gifted students, also. The intrinsic motivation inventory used in my research has aspects that explore students’ sense of competence and the pressure each activity may engender.

Although students often report that games and competition are motivating (Schmakel 2008), over time, the extrinsic momentum is lost without any translation into intrinsic motivation. Deci, Koestner, and Ryan’s (2001) review of extrinsic and intrinsic research points out that not all extrinsic motivating factors are equal, for example, verbal rewards, tangible rewards, and engagement rewards all impact intrinsic motivation in different, not always positive, ways.

Further complicating the intrinsic versus extrinsic discussion is the “tendency of children with close relationships to their parents or teachers to be more intrinsically motivated by school tasks” (Kover & Worell, 2010, p. 470). It appears that students who exhibit greater intrinsic motivation are more likely to be academically successful, yet determining which extrinsic

motivators individual teachers can successfully employ in their classrooms to encourage the development of intrinsic motivation is less clear.

Teachers, Students, and Promoting Motivation

Teachers interact with students by providing them with tools and the information needed to learn new things. Understanding which tools or activities best access students' intrinsic motivation to learn could have a positive impact on academic outcomes.

Finding the balance between what students say and what they actually do is also of concern for classroom teachers. In their study of gifted and non-gifted middle school students' attitudes toward school, Gentry, Gable, and Springer (2000) indicate that student self-reports are often at odds with teacher observations and predictions, providing further justification for the need for more data on student attitudes.

Within the realm of the classroom and what teachers can do to engage and motivate students, the concepts of choice, challenge, enjoyment, and interest frequently surface. Some research, including Renzulli's Schoolwide Enrichment Model (1977) and Bandura's Self-Efficacy Theory (1977), touch on these factors as being particularly important to gifted students. Following largely on Renzulli's line of reasoning, Gentry et al. (2000) linked student choice and interest to positive influences on academic motivation among 7th grade students. Overall, their research indicated that students found academic classes offering few choices largely uninteresting (Gentry et al. 2000).

Relating to the idea of challenge, Bembenuity (2009) discusses the idea that "academic delay of gratification is a key factor that influences an individual's motivation to excel in academic tasks." This study explains how students who can focus on the longer-term goal seem to be more motivated to apply themselves to the short-term tasks. Bembenuity continues to

connect this attitude to how students perform and to how they evaluate the teacher and course in a college setting.

Engagement and Motivation

While educational research has looked at the reasons for underachievement and lack of academic motivation from a variety of perspectives, behaviorist research builds on the premise that the habits associated with gifted students' poor academic performance can be learned and unlearned and can be tied to active engagement in appropriate activity. Fredrick's 1977 study of the use of classroom time concluded that students' on-task behavior is clearly linked to improved academic achievement. Still others (Auman, 2011) have connected students' motivation to engagement, "where the students played an active role in their own learning processes" (Lim, 2008, p. 1085). Downer, Rimm-Kaufman, and Pianta (2007) studied classroom conditions and found that not only did children prove to be more engaged in smaller groups, but they were also more engaged by challenging schoolwork. Additionally, they found that "[c]hildren at risk for school problems particularly benefit from higher classroom quality within more demanding instructional contexts" (2007, p. 413). This research supports the idea that underperforming gifted students can be positively motivated by high-quality instruction and that more specific information that applies to the high school setting is an area for further study.

School engagement is a more loosely defined concept, yet Fredricks, Blumenfeld and Paris (2004) compiled various theories of engagement including behavioral, emotional and cognitive engagement, and they reviewed definitions to provide a platform from which additional research into academic engagement could begin. They concluded with a call for research that would provide "richer characterizations of how students behave, feel, and think—

research that could aid in the development of finely tuned interventions” (2004, p. 87).

Inventorying students on their personal intrinsic motivations should add to this area of research.

Classroom Conditions

Peter Thomas (2011) calls for providing gifted students with more open-ended assessments to allow for sophisticated and varied responses that are more motivating and appropriate for gifted students. This idea dovetails with Renzulli’s Schoolwide Enrichment Model (1977) that revolves around keeping high-achieving students motivated by providing such activities as open-ended assignments, tiered assignments, independent projects, and opportunities for collaboration.

Another school-wide intervention, the Responsive Classroom approach “prioritizes a caring classroom environment and integrates social and academic learning” (Rimm-Kaufman & Chiu, 2007, p. 399). This approach is relevant to this study of motivation and classroom activities as it clarifies both teacher and student roles in the learning process. The approach is structured to help students, particularly those at-risk of school problems, to navigate both social and academic tasks within a positive environment (Rimm-Kaufman & Chiu, 2007) and, therefore, could provide insights into how teachers can adapt not only the activities they use, but also the manner in which they are presented within the classroom.

In a study of the connection between classroom conditions, students at risk, and behavioral engagement, Downer, Rimm-Kaufman and Pianta (2007), found small group instruction was more effective than large group instruction at increasing student engagement and reducing behavior problems. The study also found better engagement during lessons involving analysis and inference rather than lessons relating to basic skills (2007). While the study did not

directly discuss specific activities, it does make connections between student motivation and broad categories of activities.

How to Measure Student Motivation for School Activities

Following on earlier studies and experiments, researchers in the Psychology Department at The University of Rochester developed, and validated over several adaptations, the Intrinsic Motivation Inventory (IMI). The IMI is “a multidimensional measurement device intended to assess participants’ subjective experience related to a target activity in laboratory experiments” (p. 52). As stated on the website, the scale is a tool that can be downloaded for free and modified to fit specific activities.

In my study, the IMI was used to collect data on student responses to the intrinsic motivation of specific classroom activities. The literature suggests that students make claims about what motivates them that later may prove to be overstated or inaccurate (Schmakel, 2008). While there is a great deal known about engaging students in the classroom, there is still no clear answer to what can increase motivation in underperforming gifted students.

Through my investigation, I hope to find a correlation between specific classroom activities, student motivation, and student achievement. The questions to be answered are: do gifted achievers and gifted underachievers differ in their perceptions of the intrinsic motivation of specific classroom activities? Does their motivation as measured by the IMI correlate to the academic performance as measured by class grades? And, which activities are frequently used by teachers of gifted students and how motivating do they believe each activity is to students?

CHAPTER 3

METHODOLOGY

Because underperforming, unmotivated gifted students represent an unrealized potential resource, there is a need for more information on how to reach these students in the high school classroom. This study investigated whether gifted achievers and gifted underachievers differ in their perceptions of the intrinsic motivation of specific classroom activities. The study also investigated which activities are frequently used by teachers of gifted students as well as how motivating they believe each activity is to students.

Inventory Instruments

There were separate inventories for the students (Appendix A & B) and teachers (Appendix C). The student inventory is based on an adaptation of the Intrinsic Motivation Inventory (IMI) developed at the University of Rochester (Appendix D). According to the University of Rochester website, the IMI in various forms has been used in a variety of studies related to intrinsic motivation and self-regulation and continues to be used in research with students of all ages (Geier & Bogner, 2011). The inventory used for this study asked students to rate commonly used classroom strategies in their high school, on scales of enjoyment, choice, stress, and perceived competence.

The teacher inventory (Appendix C) has 40 items broken into two categories—classroom activity frequency and perceived motivation of activity. The Likert-scale questions ask teachers to rate how frequently common classroom strategies are used and how motivating, in their opinion, the same set of activities is for students. The inventory also asks for some open-ended responses from teachers to add to the depth and richness of the inventory information.

To correlate the inventory results, student grades were compared to the student inventory responses to see if what students perceive as intrinsically motivating is related to their academic performance as measured by grade point average. In addition, the relative scores on the interest/enjoyment scale of the high-achieving students were compared to those of the low-achieving students. Because anecdotal student reports of intrinsic motivation do not always match performance, this research sought to determine if any relationship exists between students' perceptions of the activities and students' overall grades.

Participants

The student participants ($N = 21$) were a convenience sample, selected because they were enrolled as gifted students in a large, urban high school. There were 12 females and 9 males. Three were freshmen, 10 were sophomores, 4 were juniors, and 4 were seniors. Twelve were Caucasian, 2 African American, 4 Hispanic, and 3 were mixed race. Of the students completing the inventory, 15 had a grade point average above 3.0 on a 4.0 scale and 6 had a grade point average 2.9 or below.

All of the participating teachers had contact with the gifted students as self-contained, class-within-a-class, or general education teachers. There were 10 teachers from both special education/gifted and core academic subjects, including mathematics, social studies, science, and English/language arts.

Procedures

An application was submitted to the Office of Research Administration at Wichita State University, which was approved. Teacher consent forms and inventories were distributed first. The inventory was provided to 10 teachers of gifted students from a variety of academic subjects.

After inventorying teachers, the student inventories were prepared, using the five most frequently used classroom activities as reported by the teachers.

The parent and student consent process consisted of letters to parents, classroom explanation to the students, and student assent forms distributed and collected over the period of several weeks. Follow-up calls to non-responders achieved only a 25% return and consent rate.

Initial inventories (see Appendices A, B, & C) were administered after the consent and assent forms were collected. Students were inventoried during the self-contained gifted enrichment class in which all of the target students at the school are enrolled.

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Data Analysis

The data analysis involved two steps. The first step examined the average student scores for each of the five classroom activities. The second step was to calculate the correlation between students' interest in and enjoyment of classroom activities and their overall grade point average. Because the students represented freshmen with only one full semester of course grades through to seniors with seven full semesters completed, it was important to consider the potential effect of maturation on the grade point average data.

Using descriptive statistics, the data from the student and teacher inventories was analyzed. After tabulating the initial checklist for students, selected activities were inventoried with the IMI based on the teachers' responses. The inventory data was tabulated and scored using the item scoring guidelines provided in the IMI. This yielded several scores for each of the five activities inventoried. Scores for each activity were also compared and discussed. Percentages were determined and described. Evidence of a positive correlation was investigated between the various classroom activities, student motivation scores, and student grade point average using an analysis of variance (ANOVA).

CHAPTER 4

RESULTS

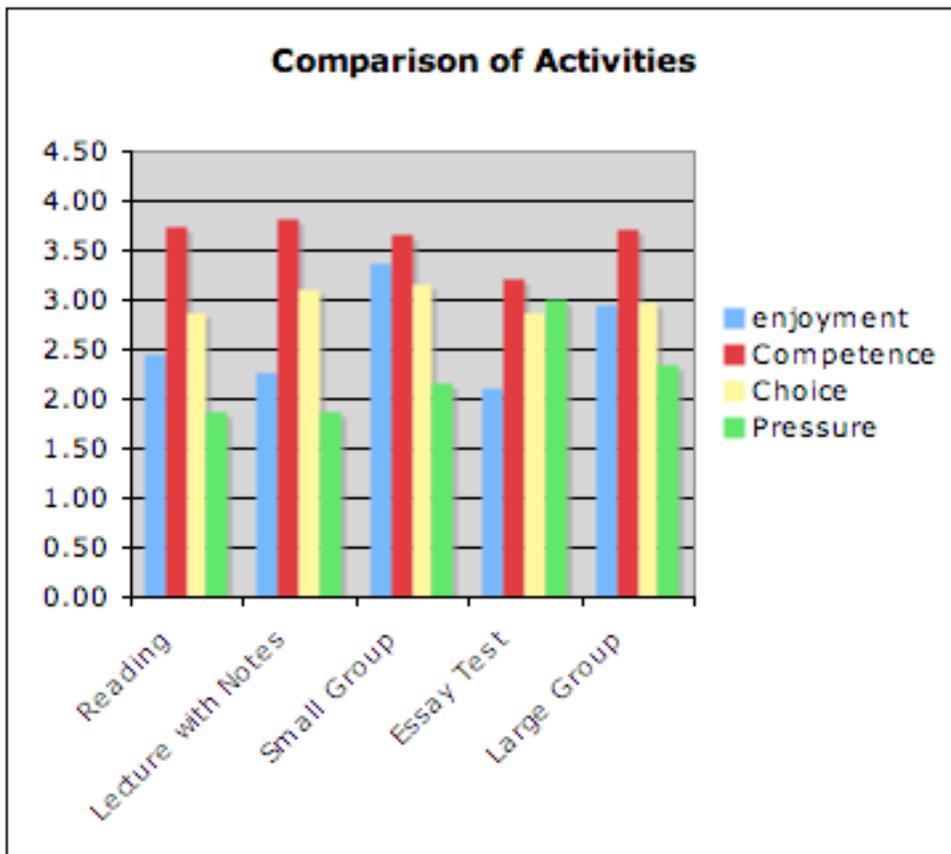
In this study, the questions to be answered are: Do gifted achievers and gifted underachievers differ in their perceptions of the intrinsic motivation of specific classroom activities? Does their motivation as measured by the IMI correlate to the academic performance as measured by class grades? And, which activities are frequently used by teachers of gifted students and how motivating do they believe each activity is to students?

To begin to answer these questions, students ranked a list of classroom strategies. Similarly, teachers provided information on which strategies they use most frequently in class. The students' stated preferences showed little overlap with the list of most commonly used strategies. The most frequently used classroom strategies as reported by the teachers were A) reading assignments, B) teacher lecture with student notes, C) small-group activity, D) written/essay test, E) large-group teacher-led activity. Students, however, preferred different classroom strategies than the teachers with the exception of small-group work. Students listed labs and experiments as the most beneficial with multiple-choice tests, small-group activities, group projects, and debates filling out the top five.

Students were then inventoried on the most commonly used activities, as these are the most likely to impact their grade point averages. The IMI inventory provides a score for four separate motivation related indicators: 1) interest/enjoyment, 2) choice, 3) competence, and 4) pressure/tension. The inventory provides a numerical score for each of the indicators for each strategy.

While there is student variation in how each strategy is scored, students' responses followed a similar pattern. All students rated their competence as high compared to the pressure/tension of the strategies, for example. From Table 1 it can be seen that, students show generally higher perceptions of their competence: 3.62 out of 5 on all activities compared to the other subscales. The next highest score was their perceived choice at 2.99, followed by 2.63 for their perceived enjoyment, and showing the lowest score for perceived pressure/tension of the five classroom activities. To arrive at these scores, the scores of all students were averaged for each indicator. Additionally, a table showing the breakdown by individual students was created and is included (Appendix D).

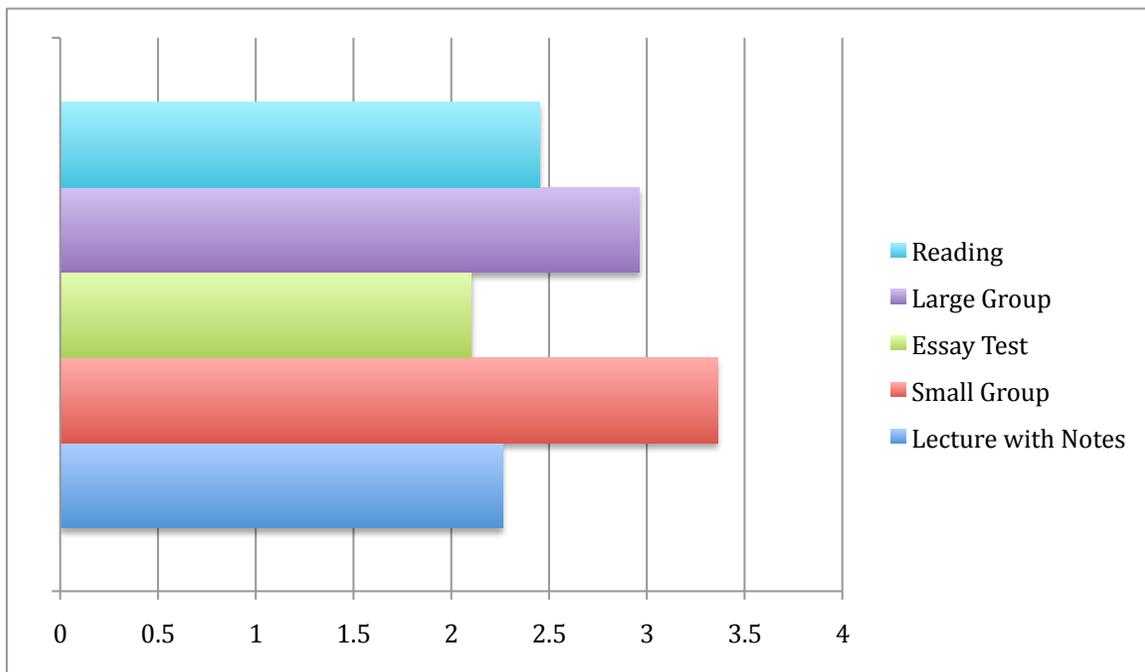
TABLE 1
COMPARISON OF ALL INVENTORIED ACTIVITIES



Interest and Enjoyment Subscale

This category is thought to be most related to intrinsic motivation. With an average score of 2.63, (Table 2) the five most commonly used activities in gifted classrooms do not rate as particularly enjoyable for students. Of the five activities, small-group work rated as the most enjoyable (3.23) with in-class tests ranking the lowest (2.26). Note taking and reading from text both ranked as low interest/enjoyment by students.

TABLE 2
OVERALL INTEREST/ENJOYMENT



ANOVA

The one-way ANOVA examining relationship between overall interest/enjoyment and cumulative grade point average indicated there is a very low positive relationship, $p=0.017$. This result is so small as to be virtually irrelevant.

TABLE 3
ONE-WAY ANOVA

SUMMARY					
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>	
Column 1	21	68.8	3.276190476	0.708844762	
Column 2	21	56.2353333	2.677873016	0.520063805	

ANOVA					
<i>Source of variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>
Between Groups	3.758829725	1	3.758829725	6.117346441	0.017731067
Within Groups	24.57817134	40	0.614454284		
Total	28.33700107	41			

Two-way ANOVA

To further investigate the data, a two-factor ANOVA was used to check for relationship between low-academic achievement and interest/enjoyment compared to high-academic achievement and interest/enjoyment. Breaking the students into low- and high-achievement groups, did show slightly higher P-values, with a slightly stronger relationship to high-achievement and interest/enjoyment.

TABLE 4
TWO-WAY ANOVA

<i>SUMMARY</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>	
Row 1	2	4.85	2.425	0.052272222	
Row 2	2	6.39	3.195	0.47045	
Column 1	2	5.943333333	2.971666667	1.003472222	
Column 2	2	5.296666667	2.648333333	0.007605556	
ANOVA					
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>
Rows	0.5929	1	0.5929	1.417818047	0.444716019
Columns	0.104544444	1	0.104544444	0.25	0.704832765
Error	0.418177778	1	0.418177778		
Total	1.115622222	3			

Student Preferences

When given the initial inventory of class activities, students indicated a strong preference for more active hands-on activities such as labs/experiments, whereas teachers indicated that those types activities are used only rarely. The only activity that overlapped on both the top five activities enjoyed and valued by students and frequently used by teachers was small-group work. Students were generally most averse to reading from texts and taking notes, which are widely used and considered important activities by the teachers.

CHAPTER 5

DISCUSSION & CONCLUSIONS

In this study, it was challenging to accurately determine whether gifted achievers and gifted underachievers differ in their perceptions of the intrinsic motivation of specific classroom activities. Their motivation as measured by the IMI showed very minimal correlation to their academic performance as measured by class grades, yet the IMI appears to be a generally valid tool. Ultimately, there appears to be a disconnect between which activities are frequently used by teachers of gifted students and how motivating the teachers believe each activity is to students.

Motivation and Grades

Breaking the total sample into two sections, those with high grade point averages and those with low grade point averages, did show a small correlation between higher interest and enjoyment ratings and high grade point averages. While most gifted students are academically motivated in a variety of ways, and as suggested by Mills (2003), teachers who have exceptional content knowledge can also potentially increase the motivation of the small portion of seriously underperforming and undermotivated gifted students. Additionally, the inventory and survey data imply that teachers could positively impact underachieving students by including more frequent use of high-interest activities in the classroom. The majority who are already motivated and performing at high levels could also be positively affected.

Results of IMI

Students expressed a range of responses on which of the most commonly used classroom activities they found interesting/enjoyable. Reflecting the individual variances seen in the gifted population, some students prefer individual tasks, even test-taking, over interpersonal activities

such as small-group work, but the majority of students tend to prefer social interaction and hands-on activities. Interestingly, students, regardless of high or low academic achievement, viewed their competence as high on all activities, regardless of the pressure or enjoyment of the activity. This finding that gifted students are aware of and secure in their abilities falls in line with Schmake'l's (2008) assertion that students want to be challenged, even if they are not using their talents to be successful in terms of grades, which aligns with Deci's et al. (2001) findings that not all motivators have equal impact.

Based on the teacher surveys, advanced-level courses, where gifted students are most likely to be enrolled, rarely include high-interest activities preferred by the students. The potential for higher motivation through adopting more frequent use of high-interest activities could result in better academic performance for some underachieving students. The data collected from teachers and students indicates that there is a disconnect between the most frequently used classroom activities and those that students indicate are of high value to them. The inventory results showing that students have high feelings of competence while low interest/enjoyment, and relatively low responses to choice, may indicate that teachers could have a positive impact on student motivation by providing greater variety and choices to students. Previous research has indicated that choice can have positive academic benefits (Gentry et al., 2000) and is relatively simple for teachers to implement in the high-school classroom.

Students' generally low interest in reading stood out in this study as an area of concern. It is hard to envision how students can acquire necessary information and knowledge without reading extensively. Teachers may be able to choose high-interest texts, provide more options for student reading, and share their enthusiasm about what they are reading to potentially positively impact student reading habits.

Incidental Data

An earlier, failed, attempt at administering the inventory resulted in a small group of student inventory responses on classroom activities that were highly ranked by students rather than those most commonly used by their teachers. The scores on these did rate the interest/enjoyment more highly. This could indicate reliability of the instrument as well as imply that the student rankings in the initial assessment match the inventory results. There is still a need for research connecting student preferences for high-interest activities to overall academic performance and intrinsic motivation.

Limitations

The Intrinsic Motivation Inventory appears to be reliable as used in this study, but may be a less effective tool with high school students than with college-aged students, or it may need to be modified to shorten the time required. High schools students may lack the maturity needed to complete the lengthy inventory with the care and thoughtfulness required. While tabulating data, there was a concern that a few inventories might have been marked incorrectly as they seemed to present inherent contradictions on occasional items—students marking both the positive and the reverse scored items with the same score, perhaps due to misreading or inattention.

Another potential factor that may reduce the meaningfulness of the data collected is the small sample size. While 25% of the gifted students I have access to at my school did participate, fewer lower-achieving students returned their permission forms, so the sample was skewed to high-performers. Because low-performers do reflect a smaller number of the total gifted population, this may not be a major factor.

Using grade point average data was convenient and relevant, but it may not be as accurate a predictor for younger students who have only one semester of grade data available. Also, the

relevance of the inventory responses for certain low-achieving students—specifically a student who enjoys learning and school, but routinely fails to do homework and therefore has low academic success may yield questionable data. This student is an outlier for this study because he is intrinsically motivated to learn but has difficulty complying with the traditional tasks that school requires. Perhaps this inventory would be better correlated with students and graduation and/or drop-out rates.

As the research in the areas of student intrinsic motivation has indicated, there is a wide variety of reasons why gifted students may underperform, most of which relate to factors outside the influence of the classroom teacher. Family stability, parental support, and the students' ability to envision a positive future for themselves each impact the students' attitudes and actions in the classroom (McCoach & Seigle 2003). Adapting classroom activities and providing positive classroom environments may help some students, but it is unclear from the results of this study whether or not it has a significant impact overall.

Implications

While this study affirmed that students have confidence in their own intelligence and abilities, it did not go far enough in determining which activities have the most motivational impact on students.

Many studies have supported the assertion that teachers are important to creating engagement and motivating all students, both the high-achieving and underachieving, and this study focused on the intrinsic motivation of specific activities. As Mills states, formal training in gifted education may not be enough to motivate and teach gifted students; teachers must also possess deep expertise in their content to have the most impact on gifted students.

The reasons for gifted students to underachieve vary widely and each student has to be assessed individually, yet there is still room for research that combines and builds on studies that investigate teacher effectiveness as well as those that investigate academic motivation. This study does support the idea that students, in general, need a wide range of classroom activities to remain the most engaged.

Future research on classroom strategies and how they impact underachieving gifted students may come from case studies focused on intrinsic motivation for this subgroup of students.

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APPENDICES

APPENDIX A

INVENTORY OF STUDENTS: INITIAL ACTIVITY ASSESSMENT

From the following list, please place a check mark next to the seven (7) activities you feel are the most valuable to your academic achievement:

- teacher lecture/student notes
- small-group activity
- large-group teacher-led activity
- independent practice (seat work)
- test review game
- student created game
- independent project
- group project
- lab/experiment
- research in library
- outside speaker
- video with notes or handout
- video with activity
- student presentation
- gallery walk activity
- debate-type activity
- multiple choice test
- written/essay test (timed, in-class)
- out of class essay
- reading assignment (textbook or other)

APPENDIX B

INVENTORY OF STUDENTS: ACTIVITY EVALUATION

For each of the following activities, please indicate how true each statement is for you relating to that classroom activity, using the following scale:

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

A. Lab or experiment

1. While I work on the activity I enjoy it.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

2. I do not feel nervous doing the activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

3. I feel that it is my choice to do the activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

4. I think I am good at this type of activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

5. I find this type of activity very interesting.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

6. I feel tense while doing the activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

7. I think I do well at this activity compared to other students.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

8. Doing this activity is fun.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

9. I feel relaxed while doing this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

10. I enjoy this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

11. I do not really have a choice about doing this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

12. I am satisfied with my performance on this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

13. I am anxious while doing this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

14. I think the activity is boring.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

15. I feel I have the skills I need to do this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

16. I think this activity is interesting.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

17. I feel pressured while doing this task.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

18. I feel that I have to do this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

19. I do the activity because I had no choice.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

20. After working on this activity, I feel competent.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

B. Teacher lecture and student notes

21. While I work on the activity I enjoy it.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

22. I do not feel nervous doing the activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

23. I feel that it is my choice to do the activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

24. I think I am good at this type of activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

25. I find this type of activity very interesting.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

26. I feel tense while doing the activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

27. I think I do well at this activity compared to other students.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

28. Doing this activity is fun.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

29. I feel relaxed while doing this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

30. I enjoy this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

31. I do not really have a choice about doing this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

32. I am satisfied with my performance on this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

33. I am anxious while doing this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

34. I think the activity is boring.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

35. I feel I have the skills I need to do this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

36. I think this activity is interesting.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

37. I feel pressured while doing this task.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

38. I feel that I have to do this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

39. I do the activity because I had no choice.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

40. After working on this activity, I feel competent.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

C. Multiple choice test

41. While I work on the activity I enjoy it.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

42. I do not feel nervous doing the activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

43. I feel that it is my choice to do the activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

44. I think I am good at this type of activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

45. I find this type of activity very interesting.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

46. I feel tense while doing the activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

47. I think I do well at this activity compared to other students.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

48. Doing this activity is fun.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

49. I feel relaxed while doing this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

50. I enjoy this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

51. I do not really have a choice about doing this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

52. I am satisfied with my performance on this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

53. I am anxious while doing this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

54. I think the activity is boring.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

55. I feel I have the skills I need to do this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

56. I think this activity is interesting.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

57. I feel pressured while doing this task.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

58. I feel that I have to do this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

59. I do the activity because I had no choice.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

60. After working on this activity, I feel competent.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

D. Small group project

61. While I work on the activity I enjoy it.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

62. I do not feel nervous doing the activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

63. I feel that it is my choice to do the activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

64. I think I am good at this type of activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

65. I find this type of activity very interesting.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

66. I feel tense while doing the activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

67. I think I do well at this activity compared to other students.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

68. Doing this activity is fun.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

69. I feel relaxed while doing this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

70. I enjoy this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

71. I do not really have a choice about doing this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

72. I am satisfied with my performance on this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

73. I am anxious while doing this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

74. I think the activity is boring.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

75. I feel I have the skills I need to do this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

76. I think this activity is interesting.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

77. I feel pressured while doing this task.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

78. I feel that I have to do this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

79. I do the activity because I had no choice.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

80. After working on this activity, I feel competent.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

E. Test review game

81. While I work on the activity I enjoy it.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

82. I do not feel nervous doing the activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

83. I feel that it is my choice to do the activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

84. I think I am good at this type of activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

85. I find this type of activity very interesting.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

86. I feel tense while doing the activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

87. I think I do well at this activity compared to other students.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

88. Doing this activity is fun.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

89. I feel relaxed while doing this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

90. I enjoy this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

91. I do not really have a choice about doing this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

92. I am satisfied with my performance on this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

93. I am anxious while doing this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

94. I think the activity is boring.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

95. I feel I have the skills I need to do this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

96. I think this activity is interesting.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

97. I feel pressured while doing this task.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

98. I feel that I have to do this activity.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

99. I do the activity because I had no choice.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

100. After working on this activity, I feel competent.

1	2	3	4	5
not at all true	slightly true	moderately true	mostly true	very true

APPENDIX C

INVENTORY OF TEACHERS USE AND BELIEF OF MOTIVATION FOR SPECIFIC TEACHING ACTIVITIES

For each of the following activities, please indicate how frequently you use the activity in your classroom.

1. teacher lecture and student notes

1	2	3	4	5
never	infrequently	occasionally	frequently	daily

2. small-group activity

1	2	3	4	5
never	infrequently	occasionally	frequently	daily

3. large-group teacher-led activity

1	2	3	4	5
never	infrequently	occasionally	frequently	daily

4. independent practice (seat work)

1	2	3	4	5
never	infrequently	occasionally	frequently	daily

5. test review game

1	2	3	4	5
never	infrequently	occasionally	frequently	daily

6. student created game

1	2	3	4	5
never	infrequently	occasionally	frequently	daily

7. independent project

1	2	3	4	5
never	infrequently	occasionally	frequently	daily

8. group project

1	2	3	4	5
never	infrequently	occasionally	frequently	daily

9. lab/experiment

1	2	3	4	5
never	infrequently	occasionally	frequently	daily

10. research in library

1	2	3	4	5
never	infrequently	occasionally	frequently	daily

11. outside speaker

1	2	3	4	5
never	infrequently	occasionally	frequently	daily

12. video with notes or handout

1	2	3	4	5
never	infrequently	occasionally	frequently	daily

13. video with activity

1	2	3	4	5
never	infrequently	occasionally	frequently	daily

14. student presentation

1	2	3	4	5
never	infrequently	occasionally	frequently	daily

15. gallery walk activity

1	2	3	4	5
never	infrequently	occasionally	frequently	daily

16. debate-type activity

1	2	3	4	5
never	infrequently	occasionally	frequently	daily

17. multiple-choice test

1	2	3	4	5
never	infrequently	occasionally	frequently	daily

18. written/essay test (timed, in-class)

1	2	3	4	5
never	infrequently	occasionally	frequently	daily

19. out of class essay

1	2	3	4	5
never	infrequently	occasionally	frequently	daily

20. reading assignment (textbook or other)

1	2	3	4	5
never	infrequently	occasionally	frequently	daily

For the same list, please indicate the degree to which you believe students are motivated by the activity.

21. teacher lecture and student notes

1	2	3	4	5
not at all	somewhat	neutral	moderately	highly

22. small-group activity

1	2	3	4	5
not at all	somewhat	neutral	moderately	highly

23. large-group teacher-led activity

1	2	3	4	5
not at all	somewhat	neutral	moderately	highly

24. independent practice (seat work)

1	2	3	4	5
not at all	somewhat	neutral	moderately	highly

25. test review game

1	2	3	4	5
not at all	somewhat	neutral	moderately	highly

26. student created game

1	2	3	4	5
not at all	somewhat	neutral	moderately	highly

27. independent project

1	2	3	4	5
not at all	somewhat	neutral	moderately	highly

28. group project

1	2	3	4	5
not at all	somewhat	neutral	moderately	highly

29. lab/experiment

1	2	3	4	5
not at all	somewhat	neutral	moderately	highly

30. research in library

1	2	3	4	5
not at all	somewhat	neutral	moderately	highly

31. outside speaker

1	2	3	4	5
not at all	somewhat	neutral	moderately	highly

32. video with notes or handout

1	2	3	4	5
not at all	somewhat	neutral	moderately	highly

33. video with activity

1	2	3	4	5
not at all	somewhat	neutral	moderately	highly

34. student presentation

1	2	3	4	5
not at all	somewhat	neutral	moderately	highly

35. gallery walk activity

1	2	3	4	5
not at all	somewhat	neutral	moderately	highly

36. debate-type activity

1	2	3	4	5
not at all	somewhat	neutral	moderately	highly

37. multiple-choice test

1	2	3	4	5
not at all	somewhat	neutral	moderately	highly

38. written/essay test (timed, in-class)

1	2	3	4	5
not at all	somewhat	neutral	moderately	highly

39. out of class essay

1	2	3	4	5
not at all	somewhat	neutral	moderately	highly

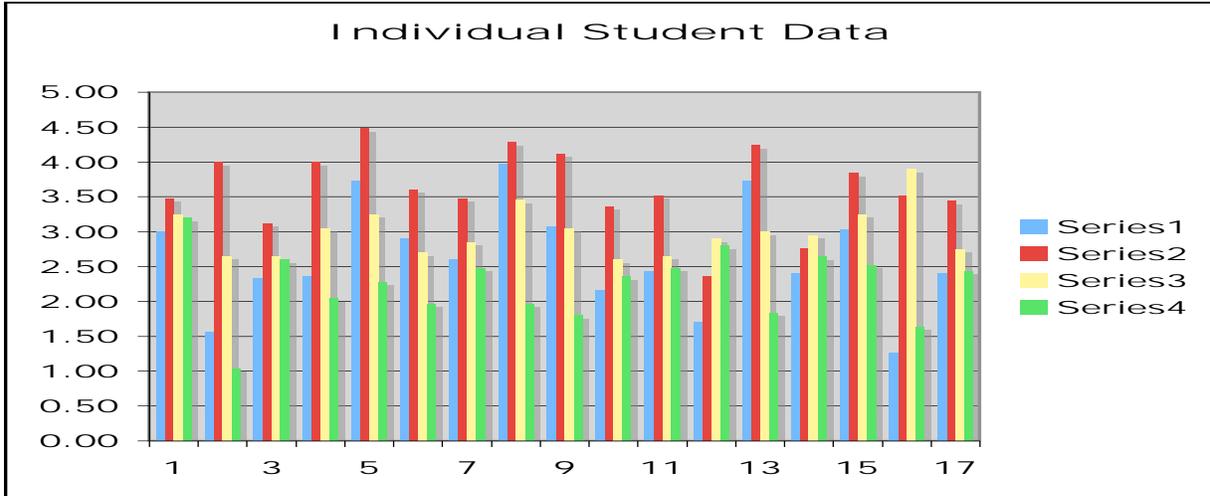
40. reading assignment (textbook or other)

1	2	3	4	5
not at all	somewhat	neutral	moderately	highly

Please list 3 or 4 activities that you have used with this class that you believe motivated the students to learn most effectively and achieve the best academic gains.

APPENDIX D

INDIVIDUAL STUDENT RESPONSES TO IMI



APPENDIX E

INTRINSIC MOTIVATION INVENTORY (IMI) SCALE DESCRIPTION

The Intrinsic Motivation Inventory (IMI) is a multidimensional measurement device intended to assess participants' subjective experience related to a target activity in laboratory experiments. It has been used in several experiments related to intrinsic motivation and self-regulation (e.g., Ryan, 1982; Ryan, Mims & Koestner, 1983; Plant & Ryan, 1985; Ryan, Connell, & Plant, 1990; Ryan, Koestner & Deci, 1991; Deci, Eghrari, Patrick, & Leone, 1994). The instrument assesses participants' interest/enjoyment, perceived competence, effort, value/usefulness, felt pressure and tension, and perceived choice while performing a given activity, thus yielding six subscale scores. Recently, a seventh subscale has been added to tap the experiences of relatedness, although the validity of this subscale has yet to be established. **The interest/enjoyment subscale is considered the self-report measure of intrinsic motivation;** thus, although the overall questionnaire is called the Intrinsic Motivation Inventory, it is only the one subscale that assesses intrinsic motivation, per se. As a result, the interest/enjoyment subscale often has more items on it than do the other subscales. The perceived choice and perceived competence concepts are theorized to be positive predictors of both self-report and behavioral measures of intrinsic motivation, and pressure/tension is theorized to be a negative predictor of intrinsic motivation. Effort is a separate variable that is relevant to some motivation questions, so is used if it is relevant. The value/usefulness subscale is used in internalization studies (e.g., Deci et al, 1994), the idea being that people internalize and become self-regulating with respect to activities that they experience as useful or valuable for themselves. Finally, the relatedness subscale is used in studies having to do with interpersonal interactions, friendship formation, and so on.

The IMI consists of varied numbers of items from these subscales, all of which have been shown to be factor analytically coherent and stable across a variety of tasks, conditions, and settings. The general criteria for inclusion of items on subscales have been a factor loading of at least 0.6 on the appropriate subscale, and no cross loadings above 0.4. Typically, loadings substantially exceed these criteria. Nonetheless, we recommend that investigators perform their own factor analyses on new data sets. Past research suggests that order effects of item presentation appear to be negligible, and the inclusion or exclusion of specific subscales appears to have no impact on the others. Thus, it is rare that all items have been used in a particular experiment. Instead, experimenters have chosen the subscales that are relevant to the issues they are exploring.

The IMI items have often been modified slightly to fit specific activities. Thus, for example, an item such as "I tried very hard to do well at this activity" can be changed to "I tried very hard to do well on these puzzles" or "...in learning this material" without effecting its reliability or validity. As one can readily tell, there is nothing subtle about these items; they are quite face-valid. However, in part, because of their straightforward nature, caution is needed in interpretation. We have found, for example, that correlations between self-reports of effort or interest and behavioral indices of these dimensions are quite modest--often around 0.4. Like other self-report measures, there is always the need to appropriately interpret how and why

participants report as they do. Ego-involvements, self-presentation styles, reactance, and other psychological dynamics must be considered. For example, in a study by Ryan, Koestner, and Deci (1991), we found that when participants were ego involved, the engaged in pressured persistence during a free choice period and this behavior did not correlate with the self-reports of interest/enjoyment. In fact, we concluded that to be confident in one's assessment of intrinsic motivation, one needs to find that the free-choice behavior and the self-reports of interest/enjoyment are significantly correlated.

Another issue is that of redundancy. Items within the subscales overlap considerably, although randomizing their presentation makes this less salient to most participants. Nonetheless, shorter versions have been used and been found to be quite reliable. The incremental R for every item above 4 for any given factor is quite small. Still, it is very important to recognize that multiple item subscales consistently outperform single items for obvious reasons, and they have better external validity.

On The Scale page, there are five sections. First, the full 45 items that make up the 7 subscales are shown, along with information on constructing your own IMI and scoring it. Then, there are four specific versions of the IMI that have been used in past studies. This should give you a sense of the different ways it has been used. These have different numbers of items and different numbers of subscales, and they concern different activities. First, there is a standard, 22-item version that has been used in several studies, with four subscales: interest/enjoyment, perceived competence, perceived choice, and pressure/tension. Second, there is a short 9-item version concerned with the activity of reading some text material; it has three subscales: interest/enjoyment, perceived competence, and pressure/tension. Then, there is the 25-item version that was used in the internalization study, including the three subscales of value/usefulness, interest/enjoyment, and perceived choice. Finally, there is a 29-item version of the interpersonal relatedness questionnaire that has five subscales: relatedness, interest/enjoyment, perceived choice, pressure/tension, and effort.

Finally, McAuley, Duncan, and Tammen (1987) did a study to examine the validity of the IMI and found strong support for its validity.

References

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The Scales

THE POST-EXPERIMENTAL INTRINSIC MOTIVATION INVENTORY (Below are listed all 45 items that can be used depending on which are needed.)

For each of the following statements, please indicate how true it is for you, using the following scale:

1	2	3	4	5	6	7
not at all			somewhat			very
true			true			true

Interest/Enjoyment

I enjoyed doing this activity very much

This activity was fun to do.

I thought this was a boring activity. (R)

This activity did not hold my attention at all. (R)

I would describe this activity as very interesting.

I thought this activity was quite enjoyable.

While I was doing this activity, I was thinking about how much I enjoyed it.

Perceived Competence

I think I am pretty good at this activity.

I think I did pretty well at this activity, compared to other students.

After working at this activity for awhile, I felt pretty competent.

I am satisfied with my performance at this task.

I was pretty skilled at this activity.

This was an activity that I couldn't do very well. (R)

Effort/Importance

I put a lot of effort into this.

I didn't try very hard to do well at this activity. (R)

I tried very hard on this activity.

It was important to me to do well at this task.

I didn't put much energy into this. (R)

Pressure/Tension

I did not feel nervous at all while doing this. (R)

I felt very tense while doing this activity.

I was very relaxed in doing these. (R)
I was anxious while working on this task.
I felt pressured while doing these.

Perceived Choice

I believe I had some choice about doing this activity.
I felt like it was not my own choice to do this task. (R)
I didn't really have a choice about doing this task. (R)
I felt like I had to do this. (R)
I did this activity because I had no choice. (R)
I did this activity because I wanted to.
I did this activity because I had to. (R)

Value/Usefulness

I believe this activity could be of some value to me.
I think that doing this activity is useful for _____
I think this is important to do because it can _____
I would be willing to do this again because it has some value to me.
I think doing this activity could help me to _____
I believe doing this activity could be beneficial to me.
I think this is an important activity.

Relatedness

I felt really distant to this person. (R)
I really doubt that this person and I would ever be friends. (R)
I felt like I could really trust this person.
I'd like a chance to interact with this person more often.
I'd really prefer not to interact with this person in the future. (R)
I don't feel like I could really trust this person. (R)
It is likely that this person and I could become friends if we interacted a lot.
I feel close to this person.

Constructing the IMI for your study. First, decide which of the variables (factors) you want to use, based on what theoretical questions you are addressing. Then, use the items from those factors, randomly ordered. If you use the value/usefulness items, you will need to complete the three items as appropriate. In other words, if you were studying whether the person believes an activity is useful for improving concentration, or becoming a better basketball player, or whatever, then fill in the blanks with that information. If you do not want to refer to a particular outcome, then just truncate the items with its being useful, helpful, or important.

Scoring information for the IMI. To score this instrument, you must first reverse score the items for which an (R) is shown after them. To do that, subtract the item response from 8, and use the resulting number as the item score. Then, calculate subscale scores by averaging across

all of the items on that subscale. The subscale scores are then used in the analyses of relevant questions.

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The following is a 22 item version of the scale that has been used in some lab studies on intrinsic motivation. It has four subscales: interest/enjoyment, perceived choice, perceived competence, and pressure/tension. The interest/enjoyment subscale is considered the self-report measure of intrinsic motivation; perceived choice and perceived competence are theorized to be positive predictors of both self-report and behavioral measures of intrinsic motivation. Pressure tension is theorized to be a negative predictor of intrinsic motivation. Scoring information is presented after the questionnaire itself.

TASK EVALUATION QUESTIONNAIRE

For each of the following statements, please indicate how true it is for you, using the following scale:

1	2	3	4	5	6	7
not at all			somewhat			very
true			true			true

1. While I was working on the task I was thinking about how much I enjoyed it.
2. I did not feel at all nervous about doing the task.
3. I felt that it was my choice to do the task.
4. I think I am pretty good at this task.
5. I found the task very interesting.
6. I felt tense while doing the task.
7. I think I did pretty well at this activity, compared to other students.
8. Doing the task was fun.

9. I felt relaxed while doing the task.
10. I enjoyed doing the task very much.
11. I didn't really have a choice about doing the task.
12. I am satisfied with my performance at this task.
13. I was anxious while doing the task.
14. I thought the task was very boring.
15. I felt like I was doing what I wanted to do while I was working on the task.
16. I felt pretty skilled at this task.
17. I thought the task was very interesting.
18. I felt pressured while doing the task.
19. I felt like I had to do the task.
20. I would describe the task as very enjoyable.
21. I did the task because I had no choice.
22. After working at this task for awhile, I felt pretty competent.

Scoring information. Begin by reverse scoring items # 2, 9, 11, 14, 19, 21. In other words, subtract the item response from 8, and use the result as the item score for that item. This way, a higher score will indicate more of the concept described in the subscale name. Thus, a higher score on pressure/tension means the person felt more pressured and tense; a higher score on perceived competence means the person felt more competent; and so on. Then calculate subscale scores by averaging the items scores for the items on each subscale. They are as follows. The (R) after an item number is just a reminder that the item score is the reverse of the participant's response on that item.

Interest/enjoyment: 1, 5, 8, 10, 14(R), 17, 20
 Perceived competence: 4, 7, 12, 16, 22
 Perceived choice: 3, 11(R), 15, 19(R), 21(R)
 Pressure/tension: 2(R), 6, 9(R), 13, 18

The subscale scores can then be used as dependent variables, predictors, or mediators, depending on the research questions being addressed.

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TEXT MATERIAL QUESTIONNAIRE I

For each of the following statements, please indicate how true it is for your, using the following scale as a guide:

1	2	3	4	5	6	7
not at all			somewhat			very
true			true			true

1. While I was reading this material, I was thinking about how much I enjoyed it.
2. I did not feel at all nervous while reading.
3. This material did not hold my attention at all.
4. I think I understood this material pretty well.
5. I would describe this material as very interesting.
6. I think I understood this material very well, compared to other students.
7. I enjoyed reading this material very much.
8. I felt very tense while reading this material.
9. This material was fun to read.

Scoring information. Begin by reverse scoring items # 2 and 3. In other words, subtract the item response from 8, and use the result as the item score for that item. This way, a higher score will indicate more of the concept described in the subscale name. Then calculate subscale scores by averaging the items scores for the items on each subscale. They are shown below. The (R) after an item number is just a reminder that the item score is the reverse of the participant's response on that item.

Interest/enjoyment: 1, 3(R), 5, 7, 9
Perceived competence: 4, 6,
Pressure/tension: 2(R), 8

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The next version of the questionnaire was used for a study of internalization with an uninteresting computer task (Deci et al., 1994).

ACTIVITY PERCEPTION QUESTIONNAIRE

The following items concern your experience with the task. Please answer all items. For each item, please indicate how true the statement is for you, using the following scale as a guide:

1	2	3	4	5	6	7
not at all			somewhat			very
true			true			true

1. I believe that doing this activity could be of some value for me.
2. I believe I had some choice about doing this activity.
3. While I was doing this activity, I was thinking about how much I enjoyed it.
4. I believe that doing this activity is useful for improved concentration.
5. This activity was fun to do.
6. I think this activity is important for my improvement.

7. I enjoyed doing this activity very much.
8. I really did not have a choice about doing this activity.
9. I did this activity because I wanted to.
10. I think this is an important activity.
11. I felt like I was enjoying the activity while I was doing it.
12. I thought this was a very boring activity.
13. It is possible that this activity could improve my studying habits.
14. I felt like I had no choice but to do this activity.
15. I thought this was a very interesting activity.
16. I am willing to do this activity again because I think it is somewhat useful.
17. I would describe this activity as very enjoyable.
18. I felt like I had to do this activity.
19. I believe doing this activity could be somewhat beneficial for me.
20. I did this activity because I had to.
21. I believe doing this activity could help me do better in school.
22. While doing this activity I felt like I had a choice.
23. I would describe this activity as very fun.
24. I felt like it was not my own choice to do this activity.
25. I would be willing to do this activity again because it has some value for me.

Scoring information. Begin by reverse scoring items # 8, 12, 14, 18, 20, and 24 by subtracting the item response from 8 and using the result as the item score for that item. Then calculate subscale scores by averaging the items scores for the items on each subscale. They are shown below. The (R) after an item number is just a reminder that the item score is the reverse of the participant's response on that item.

Interest/enjoyment: 3, 5, 7, 11, 12(R), 15, 17, 23
 Value/usefulness: 1, 4, 6, 10, 13, 16, 19, 21, 25
 Perceived choice: 2, 8(R), 9, 14(R), 18(R), 20(R), 22, 24(R)

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SUBJECT IMPRESSIONS QUESTIONNAIRE

The following sentences describe thoughts and feelings you may have had regarding the other person who participated in the experiment with you. For each of the following statement please indicate how true it is for you, using the following scale as a guide:

1	2	3	4	5	6	7
not at all			somewhat			very
true			true			true

1. While I was interacting with this person, I was thinking about how much I enjoyed it.
2. I felt really distant to this person.
3. I did not feel at all nervous about interacting with this person.
4. I felt like I had choice about interacting with this person.
5. I would describe interacting with this person as very enjoyable.
6. I really doubt that this person and I would ever become friends.
7. I found this person very interesting.
8. I enjoyed interacting with this person very much.
9. I felt tense while interacting with this person.
10. I really feel like I could trust this person.

11. Interacting with this person was fun.
12. I felt relaxed while interacting with this person.
13. I'd like a chance to interact more with this person.
14. I didn't really have a choice about interacting with this person.
15. I tried hard to have a good interaction with this person.
16. I'd really prefer not to interact with this person in the future.
17. I was anxious while interacting with this person.
18. I thought this person was very boring.
19. I felt like I was doing what I wanted to do while I was interacting with this person.
20. I tried very hard while interacting with this person.
21. I don't feel like I could really trust this person.
22. I thought interacting with this person was very interesting.
23. I felt pressured while interacting with this person.
24. I think it's likely that this person and I could become friends.
25. I felt like I had to interact with this person.
26. I feel really close to this person.
27. I didn't put much energy into interacting with this person.
28. I interacted with this person because I had no choice.
29. I put some effort into interacting with this person.

Scoring information. Begin by reverse scoring items # 2, 3, 6, 12, 14, 16, 18, 21, 25, 27, and 28 by subtracting the item response from 8 and using the result as the item score for that item. Then calculate subscale scores by averaging the items scores for the items on each subscale. They are shown below. The (R) after an item number is just a reminder that the item score is the reverse of the participant's response on that item.

Relatedness: 2(R), 6(R), 10, 13, 16(R), 21(R), 24, 26
Interest/enjoyment: 1, 5, 7, 8, 11, 18(R), 22
Perceived choice: 4, 14(R), 19, 25(R), 28(R)
Pressure/tension: 3(R), 9, 12(R), 17, 23,
Effort: 15, 20, 27(R), 29