

The Connie Belin & Jacqueline N. Blank International Center
for Gifted Education and Talent Development

The University of Iowa College of Education



Nurturing Potential | *Inspiring Excellence*



Proceedings of the Acceleration Poster Session at the 2008 Wallace Research Symposium on Talent Development

Sponsored by the Institute for Research and Policy on Acceleration at
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Preface

In May 2008, the Ninth Wallace Research Symposium on Talent Development was hosted by the Belin-Blank Center for Gifted Education and Talent Development at The University of Iowa. As is typical of the Wallace Symposium, the presentations at the 2008 conference spanned multiple areas of gifted education research and applied psychology. A special poster session was dedicated exclusively to research on academic acceleration, a session that signaled the Belin-Blank Center's efforts to bring acceleration to the attention of researchers, educators, and politicians. The eight articles in this volume are brief reports of the acceleration research presented at that special, acceleration-themed poster session at the 2008 Wallace Symposium.

Academic acceleration is an effective, empirically validated educational intervention for high-ability students (Colangelo, Assouline, & Gross, 2004). Acceleration moves high-ability students through an educational program at a rate faster or at an age younger than typical. The goal of acceleration is to match the level, complexity, and pace of the curriculum with a student's intellectual abilities.

The Institute for Research and Policy on Acceleration (IRPA) was established in 2006 at the Belin-Blank Center (B-BC) with the goal of focusing solely on academic acceleration for high-ability students. One of IRPA's first activities was to encourage research on acceleration by supporting others' projects through competitive grant opportunities in 2007 and 2008. The brief reports in this volume are based on the projects that were funded in 2007 and presented at the acceleration poster session at the 2008 Wallace Symposium. Titles and abstracts for the projects funded through IRPA's 2008 grant competition are in the Appendix. IRPA, and the funding for the 2007 and 2008 grant competitions, were made possible through the support of a grant from the John Templeton Foundation.

About the Institute for Research and Policy on Acceleration

The founding of IRPA at the Belin-Blank Center was a direct outcome of the success of the two-volume report *A Nation Deceived: How Schools Hold Back America's Brightest Students* (2004) by Nicholas Colangelo, director of the Belin-Blank Center, Susan Assouline, associate director of the Belin-Blank Center, and Miraca Gross, a gifted education scholar from the University of New South Wales in Australia. (*A Nation Deceived* can be downloaded at no cost at www.nationdeceived.org.) *A Nation Deceived* synthesizes 50 years of robust and consistent research on academic acceleration that demonstrates the ef-

fectiveness of grade-based (e.g., grade skipping) and content-based (e.g., Advanced Placement® courses) acceleration for high-ability students. Importantly, the research presented in *A Nation Deceived* shows that grade-accelerated students generally perform better academically than their chronologically older classmates and show equal levels of social and emotional adjustment (in other words, acceleration does not result in social or emotional harm to the student).

Despite the long and consistent history of research supporting the educational effectiveness of acceleration, school officials routinely avoid it. This disparity between research and practice exists because of two major issues, one of which is academic, the other social. The academic concern revolves around the educator's anxiety that a student may appear to learn the material but not truly comprehend the complexity of the advanced content or may later reveal gaps in the material learned. Thus, in time the student's academic progress would then be negatively affected.

The second issue, which seems to cause even greater resistance, is concern about the student's social development. This concern is based on the belief that removing students from the traditional trajectory of a specific grade for a specific age jeopardizes their social development. In other words, although they may effectively handle the academic aspect of acceleration, the social aspects may result in undesirable short-term or long-term consequences.

Many schools routinely avoid academic acceleration, as evidenced by the lack of policies that address either the desirability of acceleration or procedures to be followed in making decisions about acceleration for particular students. In the most recent *State of the States in Gifted Education 2008–2009*—a national survey from the National Association for Gifted Children (NAGC) and the Council of State Directors of Programs for the Gifted (CSDPG) based on data collected between June and September 2007—only eight states report having a state policy that allows acceleration; seven states report having a policy that formally relegates the decision about an acceleration policy to local education agencies (LEAs); and 27 states report having no policy, thus leaving any decisions about acceleration to LEAs by default (NAGC & CSDPG, 2009).

The publication of *A Nation Deceived* ignited a national conversation about acceleration and the needs of high-ability students. To encourage the translation of the research results into policy, IRPA partnered with NAGC and the CSDPG to write *Guidelines for Developing an Academic Acceleration Policy*. *Guidelines*, released in November 2009, is a significant new document that provides professional guidance and advocacy for states and school districts in the development of acceleration policies. Through its research, policy, and ad-

vocacy efforts, IRPA will continue to serve as a resource for individuals or groups who have questions about acceleration, including educators and administrators who request guidance on policy issues.

The Belin-Blank Center's efforts at advocating for acceleration expand beyond our geographical borders. Our colleagues across the globe indicate that acceleration can and does work in their countries. *A Nation Deceived*, Volume I, has been translated into Arabic, Chinese, French, German, Japanese, Russian, and Spanish; it soon will be available also in Korean and Hindi. The translations are available for free download at www.accelerationinstitute.org. We encourage our colleagues to analyze acceleration practices in international settings so that we may learn more about how acceleration can work worldwide.

Issues in acceleration

The eight articles in this volume consider new angles and nuances to familiar questions in acceleration research: Are accelerated students successful academically and socially? What can schools do to support the academic and social development of high-ability students? Taken together, the results of these articles continue to support the role of acceleration in helping high-ability students succeed in academic, social, and personal matters.

The first article in the volume, by Karen Rogers, is a best-evidence synthesis of research from 1998–2008 on the many forms of acceleration, and it represents an update of the meta-analysis she reported in *A Nation Deceived* (Rogers, 2004). Across the 234 studies in this best-evidence synthesis, Rogers found that the effect of acceleration on academic outcomes was strong; the effect on social outcomes was small but positive (social effects ranged from moderately negative for residential high schools to strongly positive for the Study of Mathematically Precocious Youth [SMPY] Talent Search); and, the effect on psychological adjustment was also small but positive. A finding by Rogers that might be counterintuitive to those not familiar with acceleration research and who might assume that grade acceleration is harmful to students is that “the most consistently positive effects across academic, psychological, and social outcomes were found for grade skipping.”

Rogers's best-evidence synthesis brings us into the 21st century and provides a valuable overview of the state of acceleration research. From the hundreds of studies included in her synthesis, Rogers detected patterns in the topics researched: studies on middle school and high school students outnumbered those of elementary students; social effects were investigated less frequently than academic and psychological outcomes; some forms of acceleration (e.g., compacting and continuous progress) have been studied less often

than other forms (e.g., Advanced Placement® and content-based acceleration); and, many studies lacked methodological rigor. Future investigators of acceleration may do well to heed Rogers's observations.

Rogers observed that there are fewer studies on the effects of acceleration on younger students than on older students. We are pleased to present the results of one study that has elementary students as participants. Seon-Young Lee, Paula Olszewski-Kubilius, and George Peternel report a qualitative study of the effectiveness of Project EXCITE. Project EXCITE at the Center for Talent Development at Northwestern University provides acceleration in mathematics for minority students who have limited opportunities to develop their math ability. Based on semi-structured interviews, Lee et al. reported that the students felt challenged by the accelerated math class and prepared for more advanced math classes.

Lannie Kanevsky's article presents a survey of acceleration practices in public schools in Canada's provinces and territories. Kanevsky's survey results are remarkably similar to acceleration practices of the public school system in the United States. She found considerable variability in the forms of acceleration that are offered from province to province. Content-based acceleration is more prevalent than grade-based acceleration (with the exception of Quebec). Kanevsky closes her article with the observation that “Canada, like the United States, may also be a ‘nation deceived.’” Additional research that analyzes acceleration practices in international settings can help us learn more about the implementation of acceleration worldwide.

A commonly offered form of acceleration for high school students is the Advanced Placement® (AP) Program, which offers courses that allow students to pursue college-level studies while still in high school. Nationally, in May 2009, more than 1.6 million high school students took more than 2.9 million AP exams (College Board, 2010). Research supports that AP courses and exams are a rigorous and meaningful indicator of academic preparation for college (Geiser & Santelices, 2004; Keng & Dodd, 2008). Because of the strong connection between participation in AP and college success, it is crucial to understand how to foster student success in AP courses and exams. Two articles, one by Ackerman and the other by Hertzberg-Davis, Williams, and Callahan, examined AP.

Phillip Ackerman's article discusses how success in AP classes can be improved based on an understanding of individual differences in personality, interest, and motivation. AP exams are scored on a 1-to-5 scale, with 5 considered top-level work in a corresponding college course. A score of 3 or better is accepted at more than 3,600 colleges and universities for either college credit or advanced placement in college courses. The percent of students who score below a 3 on an AP exam—scores of 1 or 2 are not accepted for college credit or advanced placement—is an indication that procedures for evaluating

and placing students into AP courses might be necessary to increase student success in AP courses. Ackerman reports that a small set of measures administered to high school students prior to their participation in an AP Biology course (and, by extension, the AP Biology exam) predicted AP Exam performance. The significant variables in predicting AP Biology exam performance were GPA, interest in biology, and self-efficacy for performance on the AP Biology exam. As Ackerman discusses, if these results generalize to other AP content areas, it may be possible to predict performance on AP exams and to match students to AP courses in which they are most likely to succeed based on underlying individual characteristics.

Holly Hertberg-Davis, Benjamin Williams, and Carolyn Callahan consider the role of course support structures in the success of African-American students in AP courses while in high school and subsequently in college. Minority participation in AP coursework is historically low. The College Board (*Report to the Nation*, February 2010, p. 2) reports that “increasing numbers of African-American, Latino and American Indian students are participating in AP, but these students remain underserved.” Specifically, “Black or African-American students represent 14.5 percent of the public school graduating class of 2009, and 8.2 percent of the AP examinee population” (*Report to the Nation*, p. 2).

Hertberg-Davis, Williams, and Callahan surveyed African-American college students who had participated in their high school’s formal support structure (e.g., peer study groups, pre-AP courses, help sessions with teachers) while taking AP courses. An important finding for increasing minority participation and success in AP courses is that students who participated in support structures reported higher AP exam scores and a feeling of being better prepared for college-level work than students who did not participate in support structures. Interviews with the students revealed commonalities to their reasons for participating in AP courses. The AP support structures the students participated in were available to all students enrolled in the AP courses; future research can address the extent to which different students benefitted from participating in support structures.

Another form of acceleration for high school-aged students is early entrance to college, which is grade-based acceleration that results in a student entering college at a younger-than-typical age (see Brody, Muratori, & Stanley, 2004). Two early-entrance-to-college programs, the Program for Exceptionally Gifted (PEG) at Mary Baldwin College and the Texas Academy of Mathematics and Science (TAMS) at the University of North Texas, are the focus of two studies in this volume.

Elizabeth Connell, Sally Dobyms, Nancy Heilbronner, and Sally Reis investigated the reasons for the attrition rate at the PEG program, which is higher than the attrition rate of traditional college programs. Connell and her co-authors share responses to open-ended survey questions to capture

the experiences of PEG students. Students can be admitted to the PEG program when they are as young as 12 or 13 years old. Many of the girls enter the program for academic reasons. They excelled with the advanced curriculum and enjoyed the social support of like-minded peers. However, some students entered the program to “escape parents or home setting.” This study highlights the issue of long-voiced concern about assessing the social-emotional maturity for students who wish to be accelerated, and it raises a question about the non-academic factors (such as family dynamics) that may influence decisions to enter college early.

Micheal Sayler compared the effects of acceleration on the personal thriving (psychological, academic, and personal success) of students who entered the University of North Texas early through the TAMS program and students of similar ability who entered UNT at a traditional age and who participated in the Honors College. Sayler offers a number of comparisons between the groups of students on measures such as the Personal Wellbeing Index-Adults, the General Perceived Self-efficacy Scale, and the Satisfaction with Life Scale. Sayler’s work is notable for its focus on the personal satisfaction, happiness, and thriving of gifted adolescents.

The final article in this volume, by Rose Mary Webb, David Lubinski, and Camilla Benbow, presents perspectives on acceleration from adults who were accelerated as students. The positive long-term academic and social effects of acceleration have been established from the research based on the Study of Mathematically Precocious Youth (SMPY) participants. Now in their early 30s, SMPY participants, who participated in a 20-year follow-up study of the top 1 in 10,000 students, share personal reflections on their own acceleration and their views regarding possible acceleration for their children. The SMPY participants benefited from multiple forms of acceleration while in the K–12 setting, but many expressed a desire to have had the opportunity for mentoring. The SMPY participants also reported that they were likely to request acceleration for their own children, with a greater likelihood of requesting content-based rather than grade-based forms of acceleration. This study is important because it reinforces the value of acceleration as an intervention for profoundly gifted students and it shows that the benefits of acceleration can carry over to beliefs about how one’s children should be educated.

Conclusion

We are confident that the research presented in this volume will encourage thoughtful discussion about the role of acceleration in the education of high-ability students and the development of new research projects on acceleration. We are grateful to the authors for directing their research efforts toward questions about acceleration and for allowing us to share their research in these proceedings.

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Academic Acceleration and Giftedness:

The Research from 1990 to 2008 A Best-Evidence Synthesis

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Educational acceleration as a curricular option has been a divisive issue among educators since its first documented implementation (grade skipping) in the St. Louis, Missouri, schools in 1862 (Rogers, 1992). As recently as 2004, the *Nation Deceived* report (Colangelo, Assouline & Gross, 2004) discussed the prevailing myths that guide educators' actions and attitudes toward—and against—acceleration as a set of management strategies. Often the negative actions and attitudes have had little connection with what the research has concluded about the efficacy of acceleration for gifted learners. Likewise, general attitudes among educators have often focused on acceleration as a single strategy rather than as an array of strategies either for shortening the years spent in K–16 or for the provision of access to advanced content and skills beyond age or grade expectations.

The purpose of this study was to conduct a variant of meta-analysis on extant research studies on the 18 forms of academic acceleration recognized by the *Nation Deceived* report (Colangelo et al., 2004). Slavin's (1984, 1986) form of meta-analysis, "best-evidence synthesis," was used to calculate the effect sizes for academic, social, and psychological outcomes of the various forms of acceleration when provided for gifted learners. This study extended the initial best-evidence synthesis conducted by the present author in 1991, which covered all research from 1862–1990 on 12 forms of academic acceleration. The current study addressed the following research questions:

1. What are the academic, social adjustment, and psychological adjustment effect sizes of all forms of grade-based and subject-based academic acceleration with regard to intellectually gifted and academically talented students, years K–16?
2. Do the effects reported for all forms of academic acceleration differ from previous syntheses of research, in particular, the meta-analyses of Kulik and Kulik (1984, 2004a, 2004b) and Kent (1992), as well as the best-evidence syntheses of Rogers (1990, 1991, 1992, 2002, 2005)?

In an effort to collect all publications on the forms of acceleration, seven database searches were undertaken to cover the years 1990 through 2008. Citations produced from *ERIC*, *PsychINFO*, *Dissertations and Theses*, *Sociological Abstracts*, *Child Development & Adolescent Studies*, *Education FullText*, and *Academic Search Premier* were collected. All general descriptors for "gifted" listed for each database were used in conducting this search, as were all keywords involving each form of acceleration. The publications were categorized by type of publication, form of accelerative option, research or non-research base, and type of research design. Further analysis of the research-based articles tabulated by year of publication, topic, number of variables studied, study strength, sample size, study design, and type of research question or hypothesis posed was conducted.

Based upon this descriptive information for each acceleration category, the best-evidence technique was used to: (a) identify the well-designed, valid studies of each acceleration option, i.e., the "best evidence," and (b) synthesize results for each option using the effect size metric. All qualitative research studies and those for which effect sizes could not be calculated were alternatively subjected to Light and Pillemer's (1984) outcome direction technique, denoting significant positive, non-significant positive, no difference, non-significant negative, and significant negative outcomes. Then, Slavin's (1987) procedure for providing numerical values, equal to the median effect size for the range of studies in that category with positive or negative values for which effect sizes could be calculated was used.

Through these search and analysis procedures, the effects of 24 forms of academic acceleration were found, increasing the knowledge base for both grade-based (i.e., shortening the number of years in the K–16 system) and subject-based (i.e., providing access to specific domain content and skills beyond expected age or grade level) accelerative strategies. There were 234 studies located for the time period 1990 through 2008, of which 62 were qualitative studies and 172 were quantitative studies. Seventeen forms of acceleration afforded quantitative outcomes that could be calculated using mean effect sizes, averaged across all

the studies of each respective acceleration strategy. Effect size is a measure of the standardized difference between means among comparison groups (i.e., gifted students who received the acceleration strategy and gifted students who did not receive it). The statistic indicates both the direction and the magnitude of quantitative research findings. Generally the standardized mean difference effect size is calculated using the formula:

$$ES = \frac{M_{\text{Experimental group gain}} - M_{\text{Control group gain}}}{S_{\text{pooled}}}$$

Additional formulas have been derived from this general procedure from correlations, ANOVAs, t-tests, and other statistics reported in respective published studies. In general, Cohen's ranges for interpreting the effect size statistic (Cohen's *d*) have been used in determining the magnitude of an effect. No impact on outcomes ranges from -.20 to +.20, and a small impact encompasses -.35 to -.21 and +.21 to +.35. Moderate impact ranges from -.65 to -.36 and +.36 to +.65, and substantial/large impact encompasses -1.00 to -.65 and +.65 to +1.00. In general, however, a mean effect size of >.30 across multiple studies as reported in a meta-analysis is considered of practical significance in terms of classroom or student outcomes for studies taking place "in the field." **Table 1** lists the 24 acceleration options, defines each, and identifies how many studies and outcomes were reported and were quantifiable for each option.

In general, the qualitative and quantitative research was fairly balanced across acceleration forms. Approximately two quantitative studies were reported for each qualitative study, especially for the options of Advanced Placement, competitions, dual enrollment, honors college programs, and mentorships. The forms of acceleration for which most studies were quantitative included: compacting, computerized on-line courses, credit by examination, distance learning, early college admission, early entrance to school, individualized curriculum, Saturday classes, subject acceleration, summer university courses, and talent search programs. Those forms of acceleration for which most studies were qualitative included grade telescoping, home-schooling, multi-age classes, and radical acceleration.

As part of this best-evidence synthesis, effect sizes were calculated for each reported outcome of each individual study. In searching for patterns among the effect size results, one might conclude that almost every out-of-school accelerative option produced moderate to substantial academic effects. In other words, when gifted students participated in an out-of-school accelerative option and then returned to their home schools, their academic progress was substantially improved. These results were especially positive for computerized on-line courses, summer university courses, accelerated or residential high schools held on university campuses, Saturday university courses, individualized computer-delivered coursework, and talent search programs. In-school accelerative options also produced sizeable effects academically, especially for Interna-

tional Baccalaureate programs, Advanced Placement courses, subject acceleration, and grade skipping.

Self-efficacy showed a less consistent pattern, with strong gains for grade skipping, summer university classes as in-school options, computerized on-line courses, and accelerated/residential high schools on university campuses (out-of-school options), but a small negative effect for early entrance to school. Socialization also showed less than consistent effects, with a small negative effect for accelerated or residential high schools, to an equally positive effect for grade skipping. In general, the qualitative studies on self-efficacy and socialization were in many ways more satisfactory in describing "real" outcomes or effects than those measured quantitatively via standardized instruments assessing these "softer" constructs. Furthermore, the quality of these qualitative studies was remarkably strong, despite concerns one might raise about systematicity and objectivity of observations and participants' responses.

As summarized in **Table 2**, the academic effects of acceleration were consistently positive, ranging from a small difference in effect (ES = .22 in mentorship programs) to substantial (ES = 2.35 in individualized curriculum). When all forms of acceleration were clustered together, the overall effect size for academic outcomes, comprised of 69 studies and 175 reported outcomes, was .68, which is considered a strong academic effect. The social effect sizes ranged from a low of -.30 (moderate negative effect for accelerated residential high school) to 1.35 (strong effect for SMPY Talent Search). A clustered mean effect size for social outcomes, comprised across 27 studies, reporting 51 social outcomes, was .14, which is a very small, but positive, overall effect. The effect sizes for psychological adjustment ranged from -.24 (small negative effect for early entrance to school) to +.53 (strong positive effect for self-acceptance in mentorship programs). A clustered mean effect size for psychological adjustment outcomes was .20, averaged across 49 studies that reported 149 psychological outcomes. This is, again, a small but positive effect. The most consistently positive effects across academic, psychological, and social outcomes were found for grade skipping.

Conclusions that might be drawn about this most current research synthesis suggest that in general there is a powerful academic effect to be gained from engaging in a variety of forms of acceleration, either grade-based or subject-based and either as an in-school option or an out-of-school option. The focus of research on acceleration between the years of 1990 through 2008 has centered on Advanced Placement, early admission to college, subject acceleration, summer university courses, and talent search programs. One might also conclude that the social and emotional implications of academic acceleration, while generally positive, are not directly impacted as fully as many other aspects of schooling, family interactions, and place in community. It must be noted that many of the outcomes reported depend upon having a well-controlled study design, in which compari-

son groups were judiciously selected to address the research questions posed in the study. The majority of the dissertation studies included in this best-evidence synthesis were more carefully designed and conducted with seemingly more judicious and valid conclusions than were those studies conducted by entities that were also providing the programs they were evaluating or about which they were reporting. These latter studies often appeared to use convenience sampling for the selection of comparison groups, making it more difficult to establish equivalent comparison and treatment groups. Of concern as well were the increasing number of “glorified case studies” as the primary research design, in which a survey approach was taken in describing an accelerative option, most often early admission to college and university summer programs, with comparison groups, again used from accessible, convenience samples rather than planned equivalence studies. Inferential statistics were then applied to these survey approaches, without strong equivalence established.

Another concern of the general research direction in studies across the past 17 years has been the neglect of studies on certain forms of acceleration that still may be commonly implemented in schools and a dearth of studies for certain age levels of schools. Compacting continued to garner few studies as did multi-age or continuous progress studies. The number of studies on grade skipping was also down compared to previous syntheses, whereas the number of studies on Advanced Placement courses, International Baccalaureate programs, summer university courses, subject acceleration, and mentorships was considerably higher than in previous decades.

Although studies of the elementary grades comprised the majority of research in Rogers’s previous best-evidence synthesis on accelerative options (1991), most studies since 1990 have centered on middle school and high school students, thus rounding out the studies conducted across time on academic acceleration options for gifted learners. Moreover, the focus in the last 17 years appears to have been on either academic or psychological adjustment effects, with the latter being a welcome addition to the general understanding of accelerative effects. Nonetheless, more needs to be done to understand the social implications of many forms of acceleration.

Based on the synthesis of studies conducted here, some tentative recommendations for further research include:

- A focus on credible ways to measure social adjustment outcomes both quantitatively and qualitatively;
- Survey study designs that include more than frequencies and percentages when reported in scholarly journals and dissertations. Although increasingly sophisticated inferential statistical analyses are possible, there were a surprising number of quantitative studies that did not even report basic descriptive statistics such as means and standard deviations; in other words, there were still too many quantitative studies that did not result in viable effect size calculations; and,
- A continued emphasis on the effects of several accelerative options, including credit by examination, dual/concurrent enrollment, individualized programs, grade telescoping, home schooling, distance learning programs, honors college programs, multi-age classrooms, and forms of acceleration centered on elementary-aged gifted and talented learners.

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Table I. 1990–2008 Acceleration Forms in the Gifted Research Base

Option	Definition	Grade/ Subject- Based?	Study Numbers	Outcome Numbers	Quantify Effects?
Accelerated/ honors high school classes	Advanced students are regrouped together for curriculum that goes beyond general education outcomes	S	2	6	Y (2)
Accelerated residential high school curriculum	Students, usually in grades 11–12, live on university campus that offers access to both remaining high school and college coursework	S	14	28	Y (3) N (11)
Advanced Placement® courses	Students take AP® classes in specific content areas and take external national exam to attain scores that provide for advanced college placement in content areas (AP classes offer college-level content/skills)	S	23	48	Y (8) N (15)
Compacting	Student is pre-assessed for mastery of course or unit content and mastered work is replaced with extended explorations in content area	S	5	22	Y (2) N (3)
Competition programs	Co-curricular, academically-oriented programs that allow students to work at their limits against others with similar talents for local, state, national, international standing	S	8	13	N
Computer on-line courses	Students enroll in on-line advanced, often individualized, courses during the school day in lieu of courses at school site	S	10	13	Y (5)
Credit by examination	Students take test to ensure mastery of content area in order to place them at higher content level	S	1	1	N
Distance education courses	Students take televised course from home school along with students from other sites enrolled in the same course	S	1	1	Y
Dual enrollment	Students take advanced courses at higher building level for part of their school day	S	2	2	N
Early college admission	Students begin full-time college without high school diploma or 2 or more years earlier than expected age	G	23	59	Y (12) N (11)
Early entrance to school (K–1)	Students enter kindergarten or first grade more than a year younger than usual age for entry	S	11	23	Y (6) N (5)
Grade skipping	Student bypasses a full grade level in order to start at more advanced level in all subject areas	G	9	22	Y (4) N (5)
Grade telescoping	Group of students completes 3 years of school in 2 years' time	G	1	2	N

Option	Definition	Grade/ Subject- Based?	Study Numbers	Outcome Numbers	Quantify Effects?
Home schooling	Student studies at advanced levels outside of regular school	S	1	2	N
Honors college programs	Students of similar talent enrolled in differentiated advance-level courses in college	S	3	8	Y (1) N (2)
Individualized acceleration	Students work at own pace through continuous progress content and skill outcomes	S	4	7	Y (1) N (3)
International Baccalaureate program	Students participate in full college-level curriculum in high school, receiving advanced standing at university if they score highly on international diploma examination	S	6	8	Y (2) N (4)
Mentorship/ coaching	Student is placed with content expert to extend learning in expert's content area (1-year placement)	S	15	29	Y (4)
Multi-age classrooms	Several grade-level curricula are accessed as students are ready to learn them in a single classroom setting	S	2	5	N
Radical acceleration	Students engage in multiple forms of acceleration, usually reaching university level 4 or more years earlier	G	8	18	N
Saturday classes	Students attend weekly all-day Saturday class in subject area across whole year	S	3	6	Y (1) N (2)
Subject acceleration	Students are provided access to out-of-level curriculum in subject area either by attending "older" class or working on the "older" tasks in own classroom	S	22	41	Y (15) N (7)
Summer university courses	Students attend 1–4 week summer enrichment program working on advanced subject matter, often receiving credit in their home schools for their work	S	47	69	Y (19) N (26)
Talent search programs	Students take the out-of-level tests provided by one of the regional or national talent search programs (e.g., Duke's TIP) and on the basis of their performance are provided with information about various advanced enrichment offerings	S	21	26	Y (7) N (19)

Note: G = grade-based accelerative option; S = subject-based accelerative option; Y = yes; N = no

Table 2. Mean Effect Sizes for Academic Acceleration Options

Acceleration Option	Number of Studies	Type of Effect	Number of Outcomes	Mean Effect Size
Accelerated honors/special schools	2	A	2	1.04
	1	S	2	-.30
	5	P	11	.53
Advanced Placement® courses	7	A	12	.62
	2	P	5	.10
Compacting	1	A	18	.20
	1	P	1	.17
Computerized/on-line courses	5	A	20	.74
	2	P	3	.40
Early college admission	11	A	20	.25
	6	S	13	.20
	9	P	24	.29
Early entrance to school	5	A	8	.30
	5	S	7	.10
	5	P	12	-.24
Grade skipping	4	A	4	.37
	4	S	4	.34
	3	P	3	.42
Individualized curriculum	1	A	1	2.35
International Baccalaureate program	2	A	6	.54
	1	S	2	.07
	1	P	2	.03
Mentorship	4	A	9	.22
	1	S	2	.71
	2	P	2	.16
Saturday classes on university campus	1	A	1	156
Subject acceleration	9	A	34	.48
	4	S	14	.03
	8	P	55	-.05
Summer university courses	11	A	19	.45
	5	S	7	.007
	11	P	31	.36
Talent search programs	6	A	21	.34
	4	S	4	1.35
Totals	69	A	175	.68
	27	S	51	.14
	49	P	149	.20

Note: **A = academic effects**, including achievement, time on academic task, subsequent choice of advanced courses, grade point average, academic competency, perceptions of challenge, school satisfaction, concept attainment, clarity of instruction, honors/awards/ scholarships received, intellectual efficiency, school aptitude, grasp of main idea, information processing speed, perceptions of school climate, success on exams, number of university credits awarded, school/subject aptitude, academic progress, education level attained, educational/ career aspirations, college graduation age, sense of preparation for advanced coursework, college ranking, PhD received, adult income, patents received, calibre of career

S = social adjustment effects, including social cognition level, social maturity, engagement/leadership in organizations, co-curricular participation, friendship, peer acceptance, socialization, social presence, family harmony, social confidence, introversion or extraversion, social skill level, level of social problems, perceptions of social interference in learning, perceptions of parent/ social support, level of social interaction, social self-concept, level of competitiveness, perceptions of popularity

P = psychological adjustment effects, including perceptions of appeal and meaning of academic effort, task commitment, trait anxiety, positive/negative emotions, perceptions of well-being, self-efficacy, self-regulation levels, worry, attitude toward subject, satisfaction with teachers, life satisfaction, global satisfaction, cheer, seriousness, mood levels, independence/autonomy, self-acceptance, flexibility, mental health, self-concept/esteem, self-confidence, stability, self-worth, mental attention, conduct, sense of integration, responsibility, persistence, distress, perceptions of relevance, perceptions of difficulty, locus of control, academic interest, motivation to learn, perceptions of readiness, priorities, intellectual satisfaction, happiness, intrinsic motivation, sensitivities, levels of psychological distress (i.e., depression, phobia, paranoia)

Acceleration Options in Canada: What's Permitted and What's Happening?

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Almost 100 years of research on the effects of all types of educational acceleration on academic, social, and emotional development of highly able learners provides convincing evidence of the benefits of acceleration (e.g., Kulik & Kulik, 1984; Rogers, 1991); nonetheless, acceleration remains one of the most controversial practices in education. The different forms of acceleration should be essential features of every system of education involving gifted students, as gifted students' achievement "falls dramatically when they are required to do routine work at a routine pace" (Kulik, 1992, p. 7). More than 25 years subsequent to Kulik's indictment, the *Nation Deceived* report (Colangelo, Assouline & Gross, 2004) confirmed that neither the pace nor the challenge of education in the United States had risen sufficiently to address this concern. The present study was undertaken to determine the extent to which bright students in Canadian schools suffer the same plight.

Grade-skipping may be the most familiar form of acceleration, but it is only one means of enabling high-potential students to move through school more quickly. Other forms of acceleration include: early entrance to kindergarten, first grade, middle or high school; continuous progress; self-paced instruction; subject-matter acceleration; combined classes; curriculum compacting; telescoping; mentoring; extracurricular programs; correspondence courses; early high school graduation; concurrent enrollment in university; Advanced Placement® (AP®) courses; and credit by examination (Southern & Jones, 2004). The purpose of the survey research reported here was to estimate the extent to which each of these forms of acceleration was permitted and practiced in Canada's public school districts in the 2006–2007 school year.

Methods

Participants

All Canadian provinces and territories were included in this study. Each of the 366 public school districts identified in the Canadian Education Association's 2006 *Directory of Key Contacts in Canadian Education* (Canadian Education Association, 2007) was first contacted by phone and asked to identify the individual responsible for gifted programs or the

individual most likely to have answers to questions related to acceleration practices. The research materials were then sent to this individual.

Instrument

A 17-item survey had been developed and refined in two earlier studies of acceleration practices in British Columbia (Kanevsky, 2005). Each item addressed one type of acceleration described in Southern and Jones (2004) and had two elements. In the first part of each question, we asked if the district allowed the specified type of acceleration. In the second part of each question, we asked if any students had experienced this form of acceleration during the 2006–2007 school year. Single- and multi-year grade skipping were addressed separately. An item addressing International Baccalaureate (IB) courses was included, as the content is above grade level, and strong IB exam performance results in advanced standing in many universities. English and French versions of all research materials were developed and distributed. Research materials included a cover letter, the survey, and a glossary of definitions for the types of acceleration.

Procedure

Two rounds of survey materials were sent to school districts in each language. The first mailing in English went out in late April 2007, the second at the end of May. Francophone school districts were not responding to the first mailing of English materials, so they were translated. The first round of materials went out in June 2007, the second in September 2007.

Author note: Portions of this text are drawn from a paper presented at the annual meeting of the Canadian Society for Studies in Education and from a manuscript to be submitted to *Exceptional Education Canada*.

Table I. Percentages of Canadian school districts that allowed and engaged in different types of acceleration during the 2006–2007 school year.

	% Allowed	% Did Not Allow	% Engaged
Correspondence courses	89.0	7.4	76.5
Subject-matter acceleration	76.1	19.0	62.3
Early high school graduation	75.5	14.1	31.9
Curriculum compacting	73.0	16.6	50.6
Extracurricular programs	72.8	21.0	53.4
Credit by examination	72.5	18.1	35.9
Mentors or tutors	67.5	22.7	36.0
Continuous progress	67.9	30.8	56.7
Self-paced instruction	65.6	28.8	55.9
Early entrance to middle or secondary school	65.8	29.7	28.0
Grade skip: One grade	64.1	34.0	29.9
Combined classes	62.9	32.7	58.0
Telescoped curriculum	44.1	29.8	44.0
Early entrance to kindergarten	37.0	58.6	28.8
Early entrance to grade 1	34.8	60.2	16.0
Grade skip: More than one grade	11.1	71.8	0.0
Advanced placement *	--	--	44.1
Concurrent enrollment *	--	--	26.7
International Baccalaureate *	--	--	21.5

Note: *No data are available regarding permission rate for each of these forms of acceleration. The 2006–2007 survey asked only if students engaged in each of them.

Results

One hundred sixty-three completed surveys were returned, resulting in a 44.5% response rate. **Table I** provides the national permission and participation rates for each type of acceleration. *Permission rate* was calculated by determining the percentage of school districts that allowed each type of acceleration. The percentage of districts indicating they explicitly disallowed each type of acceleration is also included. Some forms of acceleration were more popular than others, and some were extremely unpopular (i.e., early entrance to kindergarten or Grade 1, and skipping more than one grade). *Participation rates* indicate the percentage of school districts that indicated at least one student had undertaken each type of acceleration in order to achieve advanced standing during the 2006–2007 school year.

Enrolling in correspondence courses was the form of acceleration permitted most frequently, with 89.0% of school districts reporting they allowed it. Subject-matter acceleration (opportunities to study advanced content while remaining in mixed-ability classes with age-mates) ranked second nationwide (allowed in 76.1% of the districts responding). Completing high school early ranked third overall (75.5%). Curriculum compacting, out-of-school (extracurricular) coursework, and earning credit for courses by taking an exam had similar permission rates in the low 70% range.

Permission and participation rates varied greatly across provinces and territories. Those with the largest enrollments (British Columbia, Alberta, Saskatchewan, and Ontario) allowed the greatest range of accelerative options. A larger student population appears to generate a critical mass of advanced learners and the demand needed to support a wide range of options. British Columbia (BC) school districts reported the highest permission rates for 14 of the 19 forms of acceleration included in the survey and were second on one more. Alberta was second to BC on 12 types. Québec had the curious honour of having the highest for three and lowest for five. Enrolling students in correspondence courses was allowed and occurred more frequently than any other form of acceleration across Canada; skipping more than one grade was allowed least frequently, and did not occur in the 2006–2007 school year in any of the responding school districts.

Types of acceleration involving adjustments to curriculum (e.g., correspondence courses, subject-matter acceleration, compacting) were permitted and implemented more commonly than those that involved students in learning experiences with older students (e.g., grade skipping, early entrance) in all provinces except one. Québec was again the exception. In Québec, the forms of acceleration that involved moving students to settings with older students, rather than accelerating curriculum, were most popular. Québec led the nation with the greatest percentage of school boards allowing early entrance to Kindergarten (94.2%) or grade 1 (88.2%), and

skipping one grade (82.4%). This is due to “Article 49,” which came into effect in the 1980s (B. Shore, personal communication May 21, 2008). This is a provision allowing for an “exception to the age of admission to school” (dérogation à l’âge d’admission à l’école). As a result, the proportion of school districts responding that allowed children to begin Grade 1 early was almost twice that of Alberta (46.4%), the province with the second highest permission rate for this option.

Participation rates (“percent engaged” in Table 1) were consistently lower than permission rates. In fact, half or less than half of districts permitting early high school graduation, “testing out” (credit by examination), early entrance to middle or secondary school, and skipping one grade reported having engaged in these forms of acceleration during the 2006–2007 school year.

Discussion

Educational acceleration is underway in its various forms across Canada. School districts and boards in provinces with Ministry-level policies supported and engaged in the 18 acceleration practices surveyed more than those without (Kanevsky & McGrimmond, 2008). More districts claimed to support various types of acceleration than actually engaged in them during the 2006–2007 school year. Rates of support and participation at the national level ranged from none in multi-grade skipping to 89% of districts allowing students to enroll in correspondence courses to access advanced content and earn advanced credit. Acceleration options that kept advanced learners with age-mates while they pursued content beyond their grade level were supported and implemented to a greater extent than those that involved moving students in to settings with older students. Québec was the notable exception to this pattern.

Tracking patterns of change evident in comparisons of this data with the 2007–2008 and future datasets will provide a sense of the direction, if any, of change in commitment to enabling Canadian students who can learn quickly to do so. These findings will be complemented by an analysis of government documents (e.g., policy documents, manuals of procedures, gifted education resource guides) in an upcoming publication (Kanevsky, in preparation). Preliminary analyses suggest some districts may be defying provincial policies by refusing students opportunities to accelerate in particular ways. Thus, it appears Canada, like the United States, may also be a “nation deceived.”

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The Efficacy of Academic Acceleration for Gifted Minority Students

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Many researchers propose acceleration as a viable means of curricular or instructional differentiation for gifted students (Kulik & Kulik, 1991; Southern, Jones, & Stanley, 1993; Van-Tassel-Baska, 1992). Empirical evidence has revealed positive academic outcomes for acceleration (Kulik, 1992; Kulik & Kulik, 1992; Rogers, 1991; Rogers & Span, 1993). Compared to non-accelerated students, students who were accelerated by various means, such as early entrance to formal schooling, grade skipping, subject acceleration, or placement in pullout enrichment programs, demonstrated better academic performance and were more likely to pursue higher education and professional degrees (Brody & Benbow, 1987; Colangelo, Assouline, & Gross, 2004; Gagné & Gagnier, 2004; Gross & van Vliet, 2005; Muratori, Colangelo, & Assouline, 2003; Saylor & Lupkowski, 1992).

Benefits of acceleration are not restricted to academic attainments but include students' psychosocial development. Few psychosocial disadvantages result from acceleration (see Colangelo et al., 2004; Gross & van Vliet, 2005; Neihart, 2007, for summaries), and students' own perceptions of acceleration support its positive effects on their psychosocial and academic talent development. For example, most accelerated students were satisfied with and enjoyed academic challenges, desired more acceleration, and viewed acceleration as beneficial towards acceptance of their own abilities and building positive relationships with peers (Benbow, Lubinski, & Suchy, 1996; Charlton, Marolf, & Stanley, 2002; Gross, 1992, 2003; Janos & Robinson, 1985; Muratori, Colangelo, & Assouline, 2003; Noble & Drummond, 1992).

Despite these favorable outcomes, educators tend to use acceleration rarely or not at all, particularly with gifted low-income or minority students who are not served by many gifted programs (Bernal, 2002; Ford, Harris, Tyson, & Trotman, 2002; Grantham, 2003; Lee, Matthews, & Olszewski-Kubilius, 2008; Morris, 2002; Worrell, 2007; Wyner, Bridgeland, & Diiulio Jr., 2007). Only a few studies to date (e.g., Olszewski-Kubilius, 2006, 2007; Olszewski-Kubilius, Lee, Ngoi, & Ngoi, 2004) have studied minority students' participation in accelerative programs, and thus a serious deficit exists in research on the perceptions and effects of acceleration for this underserved population.

About This Study

This study is an in-depth qualitative investigation of the perceptions and experiences of academically talented minority students, their parents, and educators about being accelerated in mathematics during middle school. A group of elementary to middle school students was selected for the study from a larger group of students who were participating in Project EXCITE, an accelerative program designed to help minority gifted students prepare for advanced tracks in high school.

The purpose of this study was to gain a better understanding of the factors that need to be considered in using acceleration effectively with minority students who have strong academic abilities but limited opportunities to fulfill their talents in math and science. This study explored beliefs and attitudes toward acceleration, perceived obstacles and facilitators, and perceptions of the impact of acceleration on students' academic and social lives. Specifically, the following questions were examined in interviews with the students, their parents, and seven educators: Did minority students, their parents, and educators have positive or negative views about acceleration? What were the perceived benefits and challenges of acceleration? Did the students feel prepared for acceleration? Were concerns about the effects of acceleration on social status more or less salient for this population given their minority status? How did students with varying levels of success with acceleration feel about the experience? Did minority students experience negative peer relationships or peer pressure following acceleration? What factors facilitated or impeded successful acceleration?

Method

Participants

This study included 30 students in grades 4 through 9, their parents, and seven educators who had been involved in the development and implementation of Project EXCITE. The students had participated for one to six years in Project EXCITE, a collaborative program of Northwestern University through its Center for Talent Development (CTD) and

Evanston school districts 202 and 65. The short-term goals of Project EXCITE are to enable minority students to enter high school in grade 9 accelerated at least one year in math and to be prepared for honors-level courses in science. The long-term goal is to decrease discrepancies in achievement between minority and majority students (see Lee, Olszewski-Kubilius, & Peternel, 2009, for discussion about the program).

All 30 students qualified for the program by demonstrating potential for high achievement, such as high performance on state-level criterion-referenced tests (e.g., the student “meets” or “exceeds” standards on a subtest for Illinois Standards Achievement Tests) or on standardized norm-referenced tests (e.g., the student scores at the 80th percentile or above on a reading or math subtest of the Iowa Tests of Basic Skills), and by the recommendation of teachers for work habits, achievement, ability, and interest. Males ($n=16$) outnumbered females ($n=14$). The majority of student participants ($n=21$) were of African American descent, four were multiracial and five were Hispanic/Latino. During grades 6 through 8, 17 of the 30 students were accelerated in mathematics by one or two years. Five of these students who had been accelerated in math repeated the accelerated class the following year because of poor performance. Thirteen of the 30 students had not yet been accelerated but were expected to be accelerated before they left middle school.

Twenty-nine Project EXCITE parents participated in the interviews. Predominantly, only mothers ($n=23$) were interviewed; both mothers and fathers were interviewed for 6 of the 30 students. The seven educators who were interviewed had previously taught math or science classes in school. Four of them were teaching math or science courses, and three were administrators at the time of the interview. Five were of Caucasian/White descent and two were African American.

Data Collection and Analysis

Semi-structured interviews were the primary data for this study. From July to November 2007, a 45- to 60-minute interview was conducted with each student, parent, and educator. Interviews took place in the Center for Talent Development’s (CTD) conference room or at the educators’ workplaces.

Following interviewees’ consent and assent, interviews were tape-recorded and transcribed verbatim. Initials were used to protect the participants’ identities. Interview transcripts were analyzed from January through April 2008, using the three-way coding procedure consisting of open, axial, and selective coding (Glaser & Strauss, 1967; Strauss, 1987; Strauss & Corbin, 1990). Examples of core themes found in the interviews were perceptions of being in advanced math, peer relationships, parent support, factors leading to success in advanced math, and performance in advanced math. For data

triangulation, three staff from CTD’s research department reviewed the interview transcripts to confirm the validity and consistency of the collected data. Member checks were also used to ensure if results were plausible.

Major Findings

Overall, this study found that the students, parents, and educators had positive views and experiences regarding acceleration in general and their acceleration experiences in particular. The following are summaries of the major findings of the study:

1. The academically talented minority students, their parents, and their educators perceived that taking advanced math classes in middle school helped the students prepare for math in high school and sustained their interest in math and across academic subject areas.
2. Many of the students felt bored at school and were looking for challenges that made them excited, alert, and ahead of others in high school. Greater academic challenge was thus the most liked aspect of taking advanced math for both accelerated and pre-accelerated students. Enhanced academic confidence and a self-image as talented and smart were other benefits perceived by the students and their parents.
3. In general, the successfully accelerated students felt that they were ready for advanced math when they first took the class. They admitted they had to study more for the advanced math classes compared to regular math classes. About half of the students were content with their performance in the higher-level course. In contrast, all five students who repeated the advanced class for two consecutive years did not feel that they had been ready for the class the first time. Students who repeated the course, however, did feel more content, confident, and they reported that they learned more the second time around. No negative feelings or consequences were reported from students who took the same course twice.
4. Many of the accelerated students did not identify the specific study skills they used for the advanced class. Preparations for tests and quizzes on a daily basis with a focus on completing all homework/assignments were the strategies used by the most successful students. No differences were found between the successfully accelerated and unsuccessfully accelerated students in using special study skills for the advanced class.
5. Both accelerated and pre-accelerated students said that the presence of close friends in the advanced class did not or would not affect their academic performance. They believed that hard work is more important than having

friends in order to be successful in the advanced math classes, and so did their parents. Less than half of the accelerated students made new friends in the accelerated math class.

6. All the accelerated students would recommend to other students that they take advanced math if they were capable and willing to work hard.
7. Overwhelmingly, the parents were excited and supportive of their child taking advanced math. They believed or expected that their child would gain needed academic stimulation from the class that would improve their child's academic achievement.
8. Most of the parents were not worried about their child taking advanced math because they believed in the child's abilities and hard work. Accelerated placement did not change their own expectations regarding their child's achievement though most of them got more involved in their child's schoolwork following the accelerated placement.
9. All of the educators identified social and emotional maturity and readiness for academic acceleration as the most crucial factors for successful acceleration in math in general. Good study habits, mastery in reading, organization skills, perseverance, and self-confidence were other contributing factors to success in advanced classes identified by the educators.
10. Most of the students and parents did not experience any negative effects from peers, either in terms of competition or peer pressure in association with being accelerated. In stark contrast, 6 of 7 educators viewed peer pressure as a critical issue for many minority students who are accelerated and expressed concerns that high achievement is regarded as "acting White" by minority students and can negatively impact their achievement.

Discussion

The results of this study supported the use of acceleration for minority gifted students in a single academic subject. Like many majority students in advanced classes, the minority students viewed taking advanced math as exciting, beneficial, but also challenging. The students were steadfast in the belief that advanced placement in math did or would enable them to be more likely to succeed in high school math classes and/or high school in general and to be better prepared for college admissions. They liked working ahead and having a "leg up" compared to other students. For many students, acceleration in math infused them with a special feeling as gifted and talented, and increased their academic motivation and confidence, which they believed boosted their educational achievement.

No special learning strategies or study skills were identi-

fied by the students who had been accelerated; this is true for those who were successfully accelerated and those who repeated the accelerated coursework. Successful and unsuccessful accelerators studied hard for tests and their daily homework. The students who had not yet been accelerated reported that participation in Project EXCITE helped them gain confidence to take higher-level courses in the future. Parental support, in the form of increased interest in their child's academic achievement and engagement in their child's schoolwork were identified as benefits of accelerated placement. It was also noteworthy that both accelerated and pre-accelerated students gave priority to academic achievement over other activities or their social lives. Therefore, a myth concerning devaluing of education and academic success among minority students and families was not found for these minority students and parents.

Parents expressed beliefs that acceleration makes students, regardless of ethnicity, excited and stimulated and enhances their academic achievement if they are capable and willing to work hard. Parents did not believe that there were other issues to be taken into consideration in accelerating minority gifted students other than ability and motivation. Whereas parents believed in their child's abilities and generally endorsed acceleration, educators were more cautious and stressed the need to demonstrate readiness for acceleration. Educators also expressed concerns about negative consequences.

An issue that warrants further examination is negative peer pressure and competition for minority gifted students. In this study, there were no indications of a negative peer culture regarding high achievement, and the presence of close peers in the class was not an influence on whether the students took the advanced math. Many students showed strength and resilience to focus on their academic goals and to prioritize their academic goals over other social, peer-oriented activities. Although only a few students and parents hinted at issues regarding peer pressure or competition, most of the educators were outspoken about this matter based on their own teaching experience. Apparently, the students, parents, and educators are dissimilar in their views on this issue. The one educator who strongly denied negative peer pressure for high-achieving minority students was African American. However, there was another African American educator who believed in the existence of negative peer culture. It is not clear what accounted for these different responses among the interviewees. Perhaps our students were lucky to be surrounded by supportive friends in their class or they did not sense a level of negative peer issues serious enough to speak of because academics always took priority for them.

This study provides a preliminary examination of the use of academic acceleration with minority gifted students. Though the students were not radically accelerated and were accelerated in a single subject area by taking one or two advanced courses one or two years earlier than regular students, perceptions of acceleration in math were consistently positive.

As emphasized the educators, solid preparation for academic acceleration, by means of a preparatory educational program such as Project EXCITE, will enhance the likelihood of a positive experience. Research regarding the long-term effects of acceleration via a follow-up study of accelerated students in high school and beyond would be useful also.

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Trait and Process Determinants of Advanced Placement Exam Performance

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The Advanced Placement® (AP®) program represents a highly sought-after set of opportunities for accelerated study among talented high school students. However, little is known about the ingredients for success in the AP programs beyond some general information regarding student aptitudes and abilities. One central question is whether individual differences in personality, interest, and motivational traits can be used in combination to predict individual differences in success on an AP test. The ultimate practical aim of this research is to develop a brief self-assessment instrument that can be used by various stakeholders (e.g., students, parents, teachers, and counselors) to provide an efficient and accurate prediction of future AP test performance, from measures administered prior to course enrollment, so that students and AP courses can be more optimally matched. The other issue addressed in this research was to examine how personal traits related to the student self-perceptions during the AP course, namely: how stressed the students felt about the course, how confident they were about their performance in the course, their self-efficacy for good AP test performance, and their perceived

preparation for the AP Exam. To address these questions, this study involved an assessment of a small set of key cognitive, affective, and conative trait complexes and a set of monthly questionnaires of student behaviors, attitudes, and self-evaluations in a sample of 128 students enrolled in AP Biology courses, across 10 different high schools, during 2007–2008 academic year. Evidence was found for changes in students' perceptions and attitudes during the academic year, but also evidence was found for substantial consistency of individual differences in the same measures. In the final analysis, three variables were found, such that when combined, provided an excellent prediction of AP Biology Exam performance. These variables were student cumulative grade point average (GPA), student interest in Biology, and student self-efficacy for AP Biology Exam performance. These results suggest that, subject to cross-validation and generalization to other subject areas, it may be possible to provide feedback to stakeholders that yields an accurate prediction of future AP Exam performance, prior to the completion of the AP course, based on a very brief assessment.

Pathways to Success for African American Students in Advanced Placement Courses

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In 1999, the National Task Force on Minority High Achievement published *Reaching the Top*, a report highlighting the under-representation of African American students in the population of highest-achieving students at all levels of schooling, including in Advanced Placement® (AP®) courses and in college, regardless of socioeconomic status (College Board, 1999). This report highlighted a chronic and long-standing problem (e.g., Borland, 2004; Gandara, 2004; Miller, 2004). Because the opportunity to experience college-level challenge while in high school confers many long-term benefits to students, ensuring successful participation of all ethnic and racial groups in AP courses is essential to achieving educational equity (see Hertberg-Davis, Callahan, & Kyburg, 2006).

Recent efforts by the College Board and the Federal Government to rectify the problem (see, for example, U.S. Department of Education, 2006) have resulted in a dramatic increase in the participation of minority students in AP courses, but this increase has not been echoed in the percentage of minority students performing above the generally accepted passing score of “3” on AP exams (College Board, 2006)—a score which has been found to be an indicator of later college performance (Dougherty, Mellor, & Jian, 2006; Geiser & Santelices, 2004). In 2005, 62% of AP exams taken by White students received a score of 3 or higher, whereas only 27% of AP exams taken by African American students received a 3 or higher (College Board, 2006). These findings suggest that AP courses may not provide the same benefits to African American students as they provide to White students. Some literature suggests that providing African American students with formal supports during high school (e.g., lunch groups, study groups, and pre-AP courses) may contribute to increased participation and success in AP courses (e.g., Beitler, 2004). However, the degree to which these ideas hold up in practice has not been investigated, nor has the long-term impact of these support structures on students’ feelings of preparedness for and performance within college courses. Furthermore, no studies have focused on high-achieving African American students enrolled in AP coursework to identify common factors, beyond support structures, that impact their AP course experiences. The

present study was designed to provide a preliminary exploration into how the provision of AP support structures in high school shapes the experiences of African American students within AP courses and, subsequently, in college, and to identify key factors in the AP course experiences of high-achieving minority students that might provide insight into needed areas of support.

Accordingly, this exploratory study sought to examine the following two research questions.

Research Question 1 (RQ1): How do support structures for African American students taking AP courses shape the experiences of these students within AP courses and, subsequently, in college?

Research Question 2 (RQ2): Beyond these support structures, what are common factors in the AP course experiences of high-achieving African American students?

Methods

Sample and Data Collection: Stage 1

In order to obtain our sample, we contacted the deans of the Offices of African American Affairs of top-tier liberal arts colleges and universities in the Mid-Atlantic (top-tier defined as ranked in the top 25 schools in either the liberal arts or national public university category by *U.S. News and World Report*), asking them to identify first- and second-year African American students at their colleges who had taken AP courses in high school. Participating deans sent letters to first- and second-year African American students, inviting those who had taken AP courses in high school to participate in a research study probing their experiences within these courses. Interested students were asked to send an e-mail to the researchers indicating their willingness to participate in the study. This process yielded 37 inquiry e-mails from students at four universities in the Mid-Atlantic. An e-mail reply containing the link to the on-line survey was sent to each respondent. Twenty-three students from three universities completed the

survey; of these students, seven reported participating in organized support structures for all students taking AP courses. The remaining 16 students reported that their high schools did not provide organized support structures for students taking AP courses.

All participants completed a 34-item survey containing Likert scale-type items and open-ended questions via SurveyMonkey, an on-line survey tool. Likert scale-type items were included on the survey to provide preliminary information regarding the types of support provided to high-achieving minority students in high schools, the degree to which students who had received formal AP course support believed that these support structures were helpful within and beyond AP courses, and the degree to which participation in AP support structures impacted AP exam scores and perceptions of preparation for college. Open-ended survey questions probed students' experiences in and perceptions of their AP courses and support structures (if they had taken them); performance in AP and college courses; and feelings of preparedness for the challenges of college courses. Eight participants received follow-up e-mails to clarify statements in their surveys that were confusing (e.g., "The different type of studying methods involved with the college-level courses forced the students to better learn how to manage time regarding academics as a whole") or merited elaboration (e.g., "I didn't learn anything in my AP classes") in order to obtain complete, rich data.

Sample and Data Collection: Stage 2

A subsample of six students was randomly chosen from the larger sample of 23 for in-depth interviews probing the AP experiences of high-achieving African American students. Each student in the subsample was interviewed multiple times using a semi-structured interview protocol developed from a review of the literature; interview questions probed nuances of students' social and academic experiences within AP courses.

Data Analysis

Because of the exploratory and largely qualitative nature of this study, a small sample of students was sought. To investigate RQ1, descriptive statistics were calculated for Likert scale-type survey items. Open-ended survey responses were analyzed and coded to examine whether—and to what extent—support structures impacted students' experiences in AP courses and subsequent feelings of preparedness for college, and to identify common patterns in students' AP experiences. Data from each student were first analyzed separately to build independent profiles and to probe the uniqueness of each student's experience. The profiles of graduates of schools providing AP support structures were then examined to determine common patterns and themes. Profiles of graduates of schools with no AP support provisions were analyzed similarly. Patterns across

groups were then compared for common and unique themes.

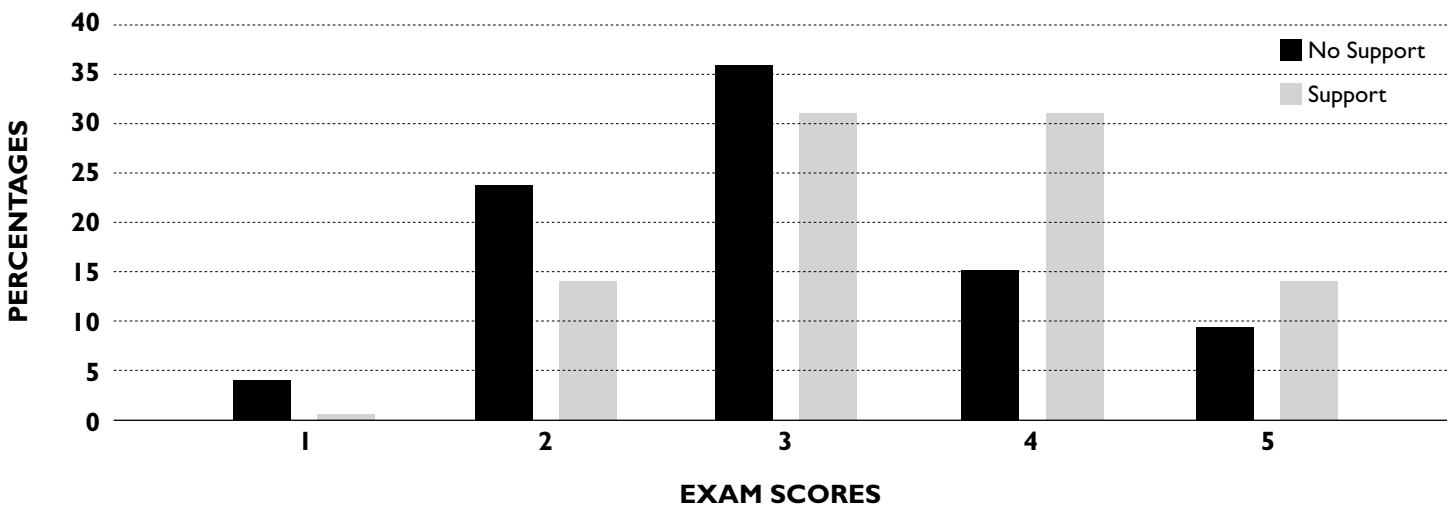
In order to answer RQ2, the open-ended survey questions and interview transcripts of the subsample of six students were read and coded. Individual profiles were developed for each student and then compared to illuminate common factors defining their experiences as high achievers within AP courses.

Results

Research Question 1: How does participation in support structures for students taking AP courses shape the experiences of African American students within AP courses and, subsequently, in college?

Likert scale-type items were included on the survey to provide preliminary information regarding the types of support provided to high-achieving minority students in high school, the degree to which students who had received formal AP course support believed that these support structures were helpful within and beyond AP courses, and the degree to which participation in AP support structures impacted AP exam scores and perceptions of preparation for college. Of the students responding to our survey, seven had received formal AP course support in high school. The support structures that these students most commonly reported participating in while in high school were: (a) formal peer study groups ($n=6$); (b) regularly scheduled extra help sessions with teachers ($n=5$); (c) summer AP preparation courses ($n=3$); and (d) pre-AP courses ($n=3$). Of these support structures, students rated regularly scheduled extra help sessions with teachers as the most helpful in preparing them for success within AP courses (mean helpfulness rating of 2.67 on a scale of 3, where 1=not helpful at all, 2=somewhat helpful, and 3=extremely helpful), followed by formal peer study groups (mean helpfulness rating of 2.25), summer preparation courses (mean helpfulness rating of 2), and pre-AP courses (mean helpfulness rating of 2).

Students from schools offering AP support structures also reported higher AP exam scores than students from schools not providing those structures. The mean reported AP exam score for students from schools offering support structures was 3.5; the mean reported AP exam score for students from schools without those supports was 2.9 (**Figure 1**). Additionally, students from schools offering AP support structures reported feeling better prepared for the academic challenges of college than did students from schools not offering these supports. Although all students who received AP course support reported that their AP experiences prepared them for the academic challenges of college, only slightly more than half (53%) of the students from schools providing no AP support reported that their AP courses adequately prepared them for the challenges of college.

Figure 1. AP Exam Score Comparisons of Students With AP Support and Those With No AP Support.

Specifically, students from schools offering AP support structures mentioned feeling particularly ready for college because of the set of academic tools they had developed in high school. Among these tools, students most frequently mentioned having developed confidence in their ability to tackle challenge and knowing how to seek the type of support they needed to successfully navigate challenge. One student wrote, “I saw that I can rise to the challenge and complete a difficult course. Knowing that college courses would be similar gave me a big boost of confidence that I could be successful in college.”

Other students noted that they had learned from their high school experiences with AP to be proactive about seeking support when confronting challenge—particularly through forming peer study groups and seeking assistance from the instructor. One student who participated in a peer study group and regularly scheduled teacher help meetings revealed how her high school experiences had helped her successfully navigate the challenges of college courses. She had found these support structures so helpful in high school that she independently reproduced them when she got to college, as indicated in this excerpt of the interview with her:

Taking an AP course is not just demanding with the difficulty of the course work, but it also makes you manage your time better. In college you have to have good time management skills. In general AP courses taught me other ways to tackle your course work. For example, creating study groups, asking questions in and after class, and creating a relationship with your teacher so you can get that extra help. Which in college it is very important to get to know your professor.

Another student noted that he reproduced the support structures he had experienced in high school once he was in college: “AP classes prepared me for college in many ways besides academically. While taking AP courses, creating study groups was stressed. Therefore, when I got to college I encouraged my peers to work in study groups.”

Conversely, students who had not experienced these support structures in high school did not mention having initiated a study group or seeking the help of professors once in college, but instead characterized the types of skills they acquired in AP courses as skills of endurance. “You learn to take on a heavy workload. Hours of homework. It’s good to get that in high school so you’re not sunk when you get into that first year of college.” Another student compared his AP courses to training for college. “Most of my AP classes were lecture-styled so I did not have to adapt to that type of teaching when I got to college. The courses also prepared me for all of the out-of-class time I have to spend learning.”

The difference between developing skills of endurance (being used to dealing with difficulty) and developing skills of navigation (being able to create different paths toward success) is subtle, but may ultimately have an impact on students’ feelings of control over their success and learning.

Research Question #2: Beyond these support structures, what are common factors in the AP experiences of high-achieving African American students?

Numerous areas of shared experience emerged across the six students randomly selected for in-depth interviewing. Although all of these students were interviewed independently of one another, their stories of being high-achieving minority students in high school were strikingly similar in many ways.

Students reported feeling that their experiences in AP courses were shaped and characterized by: (a) their desire to fight racial academic stereotypes; (b) the phenomenon of frequently being the only minority in their AP courses; (c) receiving little encouragement from teachers to take AP and other advanced courses; and (d) receiving special treatment from teachers and administrators once they had distinguished themselves as academically successful.

Fighting Racial Stereotypes

Nearly all of the interviewed students reported that one of their primary motivations for taking AP courses was to fight stereotypes regarding minority students and academic performance. Most of the interviewed students indicated that they believed that the stereotype that African American students are not high achievers is alive and well in high school: “We had to get into certain AP courses and most people wondered why I was accepted. I was the only Black in the Econ program and many Blacks, Whites, Asians, women, etc., were denied. This was sometimes difficult to deal with.” Another student noted, “Sometimes it was difficult in my AP courses because I was quicker in some classes than others and people were not excited that a minority would learn it faster.”

These students indicated that they felt a strong sense of responsibility and duty to provide a counter-example to this stereotype. “It made me feel good [to be in an AP course] because at least there was one minority in the class.... If there were none, I would have felt awful, especially if I had the capabilities to be in the program. I felt good that at least I was one.” Students also indicated that they felt a good deal of pressure to do well once within AP courses to defy racial stereotypes. “I was always motivated to be the best because it is important to me to see minority students differently, and I wanted people to perceive me and other minority students differently. It was difficult because sometimes I felt pressure to always do well.” An African American female who had taken upper-level AP math and science courses indicated that she felt pressure to combat stereotypes of both African Americans and females in these disciplines: “I would challenge myself to be better because I didn’t want people thinking I was a token Black female.”

Being “The Only One”

Another prevalent pattern within students’ narratives was the fact that these students were often the only, or one of the only, minority students within their AP courses. This held true even in minority-majority schools. “My high school was 56% Black and about 20% White. The AP classes only had me and maybe two other African Americans. At our school there weren’t many African Americans taking those classes.” Another student echoed, “Being a minority in my school wasn’t difficult because we had a diverse population, but you could see

the discrepancy when you got to high-level courses. We didn’t have too many minorities in AP or honors courses, and I think that was terrible.” This pattern only became more marked in upper-level AP courses. “As you got into upper math and science classes, the minority population dwindled and eventually I became the only minority.”

Little Encouragement from School to Take AP Courses

Many students, when asked to consider why they believed there were so few other African Americans in their AP courses, indicated that they did not feel that they—and other African American students—were directed toward advanced courses by teachers or the administration. One student indicated that the environment at his school was “not one...that encouraged African American students to take the advanced classes.” Another noted, “Since the school was so diverse, it was strange that there were so few African Americans in AP courses! I don’t think we were encouraged enough to sign up for them. No one ever mentioned it to me, and I was an A student.” A third student said, “Where I am from, there wasn’t much support from the outside for us.” Many students reported that this lack of support actually encouraged them to doggedly pursue taking—and remaining in—AP courses. “I know sometimes people wondered why I was in there, you know, but I didn’t. I was going to do this, whether they wanted me there or not.”

Special Treatment

Interestingly, although most students felt that there was little attention paid to encouraging minority students to take advanced classes, numerous students reported that, once they had visibly distinguished themselves academically (either by taking AP courses or by receiving an award), they were from then on singled out and given special attention by the faculty and administration. By and large, students attributed this attention to the school’s desire to produce academically successful minority students. “I would say I was given a lot of support because the teachers wanted to ensure that the few minorities were successful and it looked good for the school to say that they have strong, successful minorities who are working hard and being successful in the class and on the exams.”

Other students indicated that once they were marked as achievers, they were repeatedly asked by their schools to serve as models and mentors. “I was the first student to become a National Achievement Scholarship finalist at my school ever, which was a big deal. I received the award personally from the principal and he was then interested in my progress. I was the most visible, and people often looked to me to help people and I was like the example of the not underachieving minority.” Most of the six interviewed students pointed to times when they were singled out and asked to serve as a “model” or “inspiration” for other students at the school, either as a tutor

or as a mentor. One student-athlete said, “They still ask me to come back to my school and give talks to the athletes about being a successful student.”

Overall, a Positive Experience

Interestingly, although most students who were interviewed reported facing some challenges and dissatisfaction with the social environment within and related to AP courses, they uniformly indicated that their AP courses provided highly positive academic experiences. Students indicated that they felt challenged by the classes, enjoyed the coursework, felt that their teachers were fair and helpful, and believed that they emerged from the courses better prepared for the challenges of college than they would have been without them. Many students indicated that AP courses provided them with their first experiences of true academic challenge and taught them to persist in the face of difficulty. “Initially, my AP courses were difficult because I was not used to doing much to be successful. I initially considered dropping out. But I am one of those people, if I start something, I have to finish. It was a good experience for me to face the challenge of the class and not give up.” Another student said, “When I got to college, I realized, I already knew how to do this—I knew how to deal with having more work than you know how to do. You sit down, and you do it.”

Overall, students indicated that their AP courses were a positive experience. They enjoyed the challenge that they encountered and felt better prepared for success in college as a result of taking them. And, although students acknowledged experiencing the social and emotional challenges presented above, many of the students reported that these challenges were not unexpected, nor were they unique to AP environments. The interviews indicated that, for better or for worse, the challenges that students faced within AP courses—feeling different from their peers in advanced courses and facing low expectations of their academic performance—were challenges they had been experiencing throughout most of their academic careers.

Discussion and Implications

A few areas with implications for educational practice within and outside of AP courses arose from the findings of this study and merit further investigation. First, the fact that the students in our survey sample who received formal support structures before and during AP course enrollment reported higher scores on AP exams than those who did not receive support and reported being better prepared for the challenges of college suggests a flaw in the logic of the conventional notion that providing students with extra help and support during high school does them a disservice once in college.

Our study’s results seem to indicate the opposite: instead of making students reliant upon extra help, the support structures seemed to provide students with the necessary confidence to succeed on the AP exams and, later, in college. Additionally, students reported independently re-creating the support structures they had been provided in high school once they were in college—encouraging their peers to form study groups and developing relationships with and seeking assistance from professors. Given that there is a body of literature suggesting that African American students are often hesitant to ask for help in academic settings for fear of appearing unknowledgeable (e.g., Beitler, 2004; Chesler, 1997; Kyburg, Hertberg-Davis, & Callahan 2007), and given Treisman’s (1985) theory of the importance of peer interaction during study time, particularly for African American students, it seems that learning these self-advocacy skills in high school may have important consequences for student learning in college.

Another finding of interest is that most of the students who were interviewed indicated that combating racial stereotypes was a strong factor in their decision to take and succeed in AP courses. An earlier study of students’ experiences within AP courses with a sample of largely White, middle-class students found that the primary motivation for taking AP courses was “getting into a good college” (Hertberg-Davis, Callahan, & Kyburg, 2006). This suggests that there may be different motivations for—and different stakes attached to—taking AP courses for students from different racial and socioeconomic backgrounds. This, and the fact that African American students in the present study reported a history of feeling different from and sensing resentment from their classmates over their high achievement, suggests that there may be different social and emotional issues facing African American students taking AP and other advanced courses than those facing their peers. Increasing the participation and success of minority students within advanced academic environments may necessitate support structures that go beyond mere academic support. Providing social and emotional support for students—supports such as mentoring, a school counselor trained in the needs of high-achieving minority students, and time for these students to meet and discuss issues related to race and high achievement with peers—may prove to be as important to their success within AP courses as providing support with study skills.

Recommendations for Practice

Increasing the number of students from traditionally underrepresented populations taking and succeeding in AP courses involves more than recruitment efforts. Preliminary research indicates that high schools should offer a variety of support structures for students from underrepresented populations who are interested in taking and/or who are currently enrolled in advanced courses. These support structures should

include traditional academic support, such as support in the content area, and work on the writing, study, and time management skills that are so important in AP courses. However, the findings of this study indicate that structured peer study groups are also important to increasing the success of AP students on exams and, later, in college. Additionally, schools and classroom teachers need to be particularly attuned to the quality of minority students' social experiences within advanced courses and should create classroom environments at all school levels that communicate equally high expectations to all students.

Recommendations for Further Research

Further research is needed to investigate whether providing social and emotional support (such as mentoring and a counselor trained in the issues facing many high-achieving minority students) is an important piece in increasing the participation and success of minority students in advanced courses. Further empirical research with a larger sample size is needed to determine the relationship between participation in AP support structures and student success in AP courses, on AP exams, and in college. Additionally, further research is needed to tease out which types of support structures—e.g., peer study groups; formal teacher supports; direct writing, time management, and study skills instruction; or some combination of supports—have the greatest impact on student success within and beyond AP courses.

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Investigating Attrition in a Residential Early College Entrance Program for Girls:

Reflections of a Former PEG Director and Former Teachers of the Gifted

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“On my swim team, the fastest kids practice in the same lane so that they won’t be held back. Age doesn’t matter. We are grouped by ability. Our coaches encourage us to strive for a personal best in every race, and when we do this, we qualify for new challenges and can move up a level. Kids are never teased for doing well! Being pushed to do something you didn’t know you could do feels really good. Too bad school can’t be more like that.”

Eighth grade athlete and gifted student

Academic acceleration for talent development in schools is controversial. At a time when the focus is on meeting minimum standards, little attention is paid to those already exceeding those standards. Despite evidence reported by Colangelo, Assouline, and Gross (2004), many still believe academic acceleration to be a last resort—that it leads to numerous social and emotional difficulties that are difficult to overcome and that outweigh any potential benefits of permitting students to work with their intellectual peers and at an appropriate level of challenge. As with any educational program, the cognitive and affective needs of the individual student must be considered; for individual needs to be well facilitated, adequate long-term and short-term support must be provided, both at home and at school.

Early entrance to college is one type of acceleration that enables students to skip high school and enter college years ahead of schedule. A handful of programs across the country offer special early entrance to college. Students in these programs may skip one or more years of high school and begin their college education early. The Program for the Exceptionally Gifted (PEG) at Mary Baldwin College (MBC) is one such program. Now in its 23rd year, PEG is the only residential early-entrance-to-college program in the country that admits

gifted females as young as 12 or 13 years of age. Students leave their families and enter PEG with a cohort of similarly aged peers from across the United States that share their academic interests and passion for learning.

Not surprisingly, early-entrance-to-college programs, such as PEG, experience a higher attrition rate—which is defined as a student leaving the program prior to graduating—than high schools or four-year college institutions. By their very nature, early-entrance-to-college residential programs serve students who may be less certain about their academic goals at enrollment than are traditional age students. Students who leave early-college acceleration programs sometimes return to high school or, as is more often the case, transfer to another college (C. Rhodes, personal communication, September 15, 2005). In this complex environment, what are the major factors that contribute to fluctuating retention and attrition rates, and what level of attrition might be considered to be unavoidable, or even positive? What educational needs lead students to these programs? How can we best meet those needs and contribute to the cognitive, social, and emotional development of these exceptional students? Most importantly, what can we learn from the students who choose to attend early-entrance-to-college programs?

Overview of Methodology and Results

The current study involved the development and administration of a survey designed to measure three components that may affect student integration into an academic institution: social support, academic integration, and institutional climate. Heilbronner, Connell, Reis, and Dobyms (in press) found that

students who remained at PEG and graduated from the program and Mary Baldwin College did so for four reasons: (a) they made strong social and emotional connections with intellectual peers in their cohort and with faculty and staff; (b) their strengths and interests were nurtured in small classes; (c) they benefited from the single-sex environment of the college and the program; and, (d) the level of academic challenge was appropriate. Students left PEG for three main reasons: (a) they sought additional academic challenge or academic majors that could not be provided by the host college; (b) they desired a larger academic institution and/or one that provided a co-educational environment; and, (c) they missed their homes and families and were not emotionally ready to be away from home to attend college. Each of the following three reflections is introduced by data from the open-ended survey questions.

Reflections

Reflection 1: Seeking Challenge

“PEG allows a girl to escape the stifling ‘system.’

Schools do not handle gifted students well.”

Most students who enter PEG do so for academic reasons. They have not been sufficiently challenged in their middle school and high school settings. They are frustrated by a lack of educational opportunity in their communities, and although very bright, many of these students begin to lose interest in learning and are at risk for dropping out (Colangelo et al., 2004). They are denied opportunities for acceleration due to system-wide or local school policies, and they feel stifled by the efforts of school administrators to provide the same experiences to all students when some would benefit from a faster pace and additional challenge. They have taken advantage of as many enrichment opportunities as possible, such as Saturday programs at local colleges or universities, weekend or summer courses offered through national talent searches, and online college courses. They are hungry for more (Dobyns, Connell, & Whitlock, 2007).

Some former students stated that they flourished in the more challenging academic environment of PEG. Even students who left the program early expressed a sense of gratitude at being able to leave their high schools to come to a more academically stimulating environment: “I couldn’t have done all that I have without it. PEG gave me a chance to do the things I was capable of, rather than biding my time in high school.” (Heilbronner et al., in press). Some participants thrived at Mary Baldwin College, stating that they “appreciated the hands-on opportunities of a smaller, more intimate college.” Other participants believed that “PEG kept [my] dream alive by keeping me motivated.” Still others saw PEG and MBC as a path to an even more challenging academic environment: “Most of the girls I saw benefit from the program already had

clear goals for their lives. They entered the program with a plan – they knew where they wanted to be in 10 years, and PEG was simply a stepping stone to get there.” (Heilbronner et al., in press).

Reflection 2: Seeking Social Acceptance and a True Peer Group

“PEG gave me a chance to be myself. I thrived in an intellectual environment where being smart and curious was not merely okay, but expected.”

Participants commented on social-emotional benefits of the program. In adolescence many bright girls begin to “dumb down” in order to fit in with peers (Reis, 1998); many participants expressed relief at leaving those pressures behind and entering a program with a cohort of other gifted girls. Several participants stated that for the first time in their lives they had been able to make friends because “the basic magic of PEG is that it brings gifted girls together as a peer group.” Some made lifelong friends. One participant commented, “Later on, and to this day, my closest friends from MBC are PEG students.” Some of these young women most appreciated PEG for an atmosphere in which they could try new things and develop their talents. As one participant stated, “Girls can benefit from the atmosphere and opportunities to find oneself.” In this atmosphere many of the girls thrived and several participants expressed concerns that they might not have done well without the opportunity to leave their communities where achievement in school was not highly valued and where they were not appropriately challenged and stimulated in school. “PEG was there to steer me away from making a mess of my life and putting my abilities to a more productive use...pointing me in the right direction.” There was a sense in these young women that PEG had empowered them to become more than they would have been had they remained in high school: “It definitely changed my life and enabled me.” (Heilbronner et al., in press).

Reflection 3: Seeking an Escape From Parents or Home Setting

Several of the participants in this study commented on girls they knew who had gone to PEG to escape their families or home settings. These bright girls had been clever enough to manipulate their parents and admissions staff at PEG into thinking that they were socially and emotionally ready for college and that they were driven by a thirst for knowledge, when their true motivation was related to a rebellious nature and desire for a level of independence that they were not yet equipped to handle. These girls wanted to leave home a few years early and did not prove to be serious about academics. They were not successful in the program or at the college and many of them left within their first or second years. As one

participant pointed out, “The benefits of PEG come, I think, not from the program itself (which is more a vehicle by which a young woman can attend college early) but from the mindset and motivations of the girls attending.” (Heilbronner et al., in press).

Summary

The number of early-entrance-to-college programs in the United States that serve very young adolescents in a residential setting can be counted on one hand, and each one serves a particular niche. Although many gifted adolescents wish to accelerate their intellectual and social growth and experience new freedoms and responsibilities, leaving one’s family after middle school is a decision to be considered carefully by all stakeholders. Options for acceleration and enrichment that are available close to home should be thoroughly explored before making the decision to leave middle school or high school for college. No matter how qualified and prepared a student might be for the academic demands of college-level work, the social and emotional maturity of the student and her desire to go to college because of a genuine thirst for knowledge must be carefully assessed. The institutional climate and level of academic and social support for young students must also be a good fit for each student in terms of her goals, strengths, and weaknesses. For those students who have exhausted local resources and still seek a greater challenge, an early-entrance-to-college program can be a very positive and life-changing experience.

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The Effects of Acceleration on Personal Thriving:

Psychological Well-Being and Academic and Personal Successes of Gifted Early College Entrants

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The most effective talent development opportunities are those that match or slightly exceed the gifted individual's current levels of performance (e.g., Colangelo, Assouline, & Gross, 2004; Feuerstein, 1979; Kanevsky, 1992; Morelock, 2000; Sternberg, 2001; Vygotsky, 1978). The personal development of a gifted individual encompasses more than fostering academic and career talent. Personal happiness and satisfaction involve more than doing things well, although instruction and life experiences that allow a gifted person to develop strong academic and career talents are important and fundamental to the gifted individual's life-space thriving.

The model of *gifted and thriving* (Sayler, 2009) is an attempt to understand and explain the life-span development of a gifted person. It suggests that personal flourishing occurs when the gifted individual's high levels of natural abilities, temperaments, and predispositions are transformed over time by development, training, friendships, and spirituality, as well as personal, environmental, and supernatural catalysts. This model expands the concept of talent development such as that given in the *differentiated model of giftedness and talent* (Gagné, 1985, 2005) by adding to the goal of talent development the more encompassing, holistic goal of personal thriving. Thriving incorporates talent development, but it also incorporates the developmental impact of friendship and spirituality. The thriving model seeks to understand and guide the development of gifted individuals at any age toward purposeful, productive, satisfying, healthy, and beneficial lives.

Adolescence is an important transition point in a gifted person's life (McCrea et al., 2002). What academic interventions, personal experiences, and other people, events, and occurrences lead to a life of thriving for a gifted adolescent? Early college entrance is one intervention for the highly gifted that often provides appropriate and cost-efficient opportunities for addressing unmet academic and social needs (Colangelo et al., 2004).

This study provides an initial, though limited, exploration of the psychological, academic, and personal success of

two groups of gifted adolescents: students attending the Texas Academy of Mathematics and Science (TAMS) at the University of North Texas enter college two or more years earlier than their age peers, and students in the University of North Texas Honors College have entered the university after graduating from high school with their age peers but are of similar ability to TAMS students.

The Texas Academy of Mathematics and Science (TAMS) is a full-time, early-college-entrance intervention for exceptionally talented math and science students in Texas (Sayler, 2006). The academy opened at the University of North Texas (UNT) in 1987. Each year approximately 200 students enter the program. These high school-aged students radically accelerate their education by taking only college courses while at TAMS. The college courses include at least the first two years of a mathematics or science bachelor's degree. Students attend TAMS for two years and at completion of the program they have earned at least 57 university semester hours and a high school diploma.

The Honors College at UNT admits freshmen who are in the top 20% of their high school graduating class and who earned a combined score of at least 1200 on the verbal and quantitative sections of the SAT® or who have a composite score of 27 on the ACT®. National Merit Finalists admitted to UNT are required to participate in the Honors College. Students may major in any discipline in the undergraduate curriculum at UNT.

Method

Participants

Data in this study came from 119 freshmen students entering the Honors College at the University of North Texas in fall 2007 and fall 2008 and from 141 TAMS students entering in fall 2008. Permission to collect data from the 2007 Honors College freshmen was requested during summer orientation.

Parental permission was obtained from Honors College freshmen younger than 18. Due to low participation in fall 2007, a second cohort of Honors College freshmen (those who entered the college in fall 2008) was invited to participate.

Comparative data gathered in 2004–2005 came from a cohort of students who completed the TAMS programs one to five years earlier (Boazman & Sayler, in press). Additional comparative data came from norm samples of young adults on The Wellbeing of Australians survey data files from 2001 through 2005 (The International Wellbeing Group, 2006).

Materials and Procedures

Parent and student participants received an electronic survey that included multiple embedded scales and requests for information. Seven psychological constructs were assessed in this study. Scales assessing each construct were administered to the Honors College freshmen cohort. Various scales were administered in two earlier studies of TAMS students and were used for comparison when available.

General Perceived Self-efficacy Scale (GSE; Jerusalem & Schwarzer, 2000; Schwarzer & Jerusalem, 1995). This scale assesses optimistic self-beliefs about being able to cope successfully with difficult demands in life. The scale does not assess efficacy related to any specific domain.

Adult State Hope Scale (Snyder et al., 1996). This scale contains four pathways questions that assess an individual's ability to generate plans for surmounting obstacles and reaching unmet goals. It also contains four agency questions that assess the individual's emotional responses in relation to attaining the plans to surmount obstacles and reach unmet goals. A composite score for hope is created by summing the pathways and agency scores.

Personal Wellbeing Index-Adult (PWI-A; The International Wellbeing Group, 2005). The PWI-A is an eight-item survey. One of the eight items is used for validity purposes and is not counted in the composite score. The overall concept of well-being is deconstructed into the seven domains of well-being assessed by the PWI-A: standard of living, achieving in life, personal safety, future security, personal health, personal relationships, and community connectedness. The PWI-A is used widely internationally but has had limited use in the United States.

Data on well-being in spirituality/religion was also collected from TAMS and Honors College freshmen who entered UNT in 2008. However, because a spirituality/religion score was not available for all TAMS and Honors College students and because the score was not reported in the PWI-A norm samples, the spirituality/religion scores were not included in the composite PWI-A score.

Satisfaction with Life Scale (SWL; Diener, Emmons, Larsen, & Griffin, 1985). This five-item scale measures subjective

well-being through global judgments of satisfaction with one's life. It was included to assess concurrent validity of the PWI-A.

Theories of Intelligence Scale (TOI; Dweck, 2000). This six-point Likert scale assesses the individual's beliefs about whether intelligence is a fixed or malleable trait.

Gratitude Questionnaire (GQ-6; McCullough, Emmons, Tsang, 2002). This six-item self-report questionnaire assesses the individual's level of gratitude in daily events and life.

Brief Resilient Coping Scale (BRCS; Sinclair & Wallston, 2004). This scale assesses the individual's response tendencies when adaptive behaviors are required.

Results

The PWI-A is used widely internationally, but not often in the United States. The Satisfaction with Life Scale (SWL) is the instrument that is typically used in research on happiness in the United States. To help understand how the PWI-A functions with Americans, data from the Honors College and TAMS freshmen on the PWI-A and the SWL were correlated. The correlation between the instruments was .62 ($p \leq .001$). The reliability estimates were $\alpha = .82$ for the PWI-A composite and $\alpha = .81$ for the SWL score. As measures of well-being, both the composite PWI-A and the SWL appear to be measuring the same construct. The deconstructed PWI-A used in this study allowed a more nuanced look at the well-being of gifted college freshmen and comparisons between those who enter college early and those who enter at the traditional time (after high school graduation).

Correlations between the PWI-A deconstructed scores and the scores of other variables in this study are reported in **Table 1**. The strongest and most consistent correlations were between the composite score for hopefulness and its two component parts. As might be expected, scores on the deconstructed subscales of the PWI-A had moderate but not high correlations with each other; this generally supports the deconstruction of well-being as conceptualized in the PWI-A instrument. Correlations among all variables (including only the PWI-A composite score, not the deconstructed subscores) are reported in **Table 2**. Interestingly, but not unexpectedly, correlations were significant between general self-efficacy (SWL) and well-being (PWI-A), all aspects of hopefulness, gratitude, and resilience. The belief that intelligence was a fixed trait was correlated with greater hopefulness, resiliency, and gratitude.

How alike are Honors and TAMS freshmen on their deconstructed well-being scores (see **Table 3**)? Two areas of well-being—satisfaction with their standard of living, $t(258) = 2.052, p < .05$, and satisfaction with personal relationships, $t(258) = 1.97, p < .05$ —favored the Honors College students,

Table I. Correlations between PWI-A deconstructed scores and other study assessments ($n=260$).

PWI-A Deconstructed Well-being Subscales	GPA after 1 semester in college	Adult Dispositional Hope Scale – Composite Score	Hope Scale - Pathways	Hope Scale - Agency	Theory of Intelligence - fixed	Theory of Intelligence -malleable	PWI-A Standard of Living	PWI-A Health
Standard of living <i>p</i>	.11 0.08	.12* .048	.10 0.10	.13* 0.03	-.06 0.37	.14* 0.03		
Health <i>p</i>	.21*** 0.001	.19** 0.003	.15* 0.02	.21*** 0.001	-.02 0.263	.00 0.97	.45*** 0.000	
Achieving in life <i>p</i>	.08 0.23	.21*** 0.001	.14* 0.02	.26*** 0.000	.04 0.95	.02 0.75	.42*** 0.000	.48*** 0.000
Relationships <i>p</i>	.00 0.97	.19** 0.003	.16** 0.008	.21*** 0.001	-.03 0.62	.05 0.41	.28*** 0.000	.32*** 0.000
Safety <i>p</i>	.04 0.53	.19** 0.003	.19** 0.002	.18** 0.006	-.03 0.61	.04 0.55	.53*** 0.000	.40*** 0.000
Community <i>p</i>	.06 0.38	.12* 0.05	.11 0.08	.13* 0.04	.02 0.76	.03 0.61	.34*** 0.000	.32*** 0.000
Future security <i>p</i>	.13* 0.05	.07 0.26	.06 0.36	.08 0.22	.07 0.25	-.00 0.97	.30*** 0.000	.39*** 0.000
Spirituality/religion <i>p</i>	-.03 0.66	.13* 0.05	.01 0.93	.23*** 0.000	.09 0.163	.28 0.67	.18** 0.008	.16* 0.014

Note: * significant at $p \leq .05$ two-tail test; ** $p \leq .01$; *** $p \leq .001$

PWI-A Achieving in Life	PWI-A Personal Relationships	PWI-A Safety	PWI-A Community	PWI-A Future Security
.39*** 0.000				
.35*** 0.000	.30*** 0.000			
.43*** 0.000	.48*** 0.000	.47*** 0.000		
.51*** 0.000	.23*** 0.000	.40*** 0.000	.51*** 0.000	
.28*** 0.000	.34*** 0.000	.21*** 0.001	.31*** 0.000	.27*** 0.000

but the effect sizes were small ($d=.25$ and $d=.24$, respectively). One area of well-being—satisfaction with one's future security, $t(258) = 2.298$, $p < .05$ —favored the TAMS students (small effect size $d=.28$). The scores of the TAMS and Honors College freshmen and scores of the TAMS graduates are plotted and presented in **Figure 1**, along with scores for a normative sample of Australian young adults (International Wellbeing Group, 2006).

TAMS students and Honors College freshmen also were compared on their personal theories of intelligence (whether they saw intelligence as fixed or malleable) and resilience. TAMS students were more likely to have a fixed theory of intelligence, $t(257) = 3.799$, $p < 0.001$, a result with a medium effect size of .50. Conversely, Honors College freshmen were more likely to have a malleable theory of intelligence, $t(258) = 2.245$, $p < 0.05$. This difference had a small effect size of .27. Honors College students' scores were greater than the TAMS students' scores on: gratitude ($t(230) = 2.472$, $p < 0.05$; $d=.37$), hopefulness overall ($t(254) = 6.607$, $p < 0.001$; $d=.58$), hopefulness in terms of seeing pathways ($t(255) = 6.248$, $p < 0.001$; $d=.55$), and hopefulness in agency ($t(257) = 6.633$, $p < 0.001$; $d=.62$). There were no differences in grade point average between the two groups after the first semester of college, although there was a small effect for the Honors College students ($d=.23$).

Summary

Data in this preliminary study suggest that gifted students in college, regardless of whether they entered college early or at a traditional age, have a strong overall sense of well-being. Differences favoring each group appear when well-being is examined in its deconstructed forms. Specifically, UNT Honors College students are more satisfied with their current standard of living and their personal relationships than TAMS students. TAMS students, who enter college two or more years earlier than typical, understandably might be less satisfied with these two dimensions. Longitudinal follow up of TAMS freshman may reveal whether these patterns in well-being remain constant or change. There is some evidence from a study of TAMS graduates (Boazman & Sayler, in press) that TAMS students' satisfaction with community connectedness increases over time. One explanation for this increased sense of satisfaction with community is that the students spend several days together during the summer preceding their entry into college, and they also spend a week together in common activities and living arrangements immediately prior to the start of their initial fall semester. All TAMS students live in the same residence hall. The Honors College students, in contrast, have no common times prior to or during the semester, and only a small portion of the Honors students live in a common residence hall.

Table 2. Correlations of all study scales ($n=201$).

	GPA 1st semester	General Self- efficacy Scale	Theory of intelligence- malleable	Theory of intelligence- fixed	PWI-A Composite Mean	SWL	Adult Hope Scale	Hope Scale-Pathways	Hope Scale-Agency	Gratitude
General Self-efficacy Scale <i>p</i>	-.08 .22									
Theory of intelligence- malleable <i>p</i>	-.03 .70	-.08 .181								
Theory of intelligence- fixed <i>p</i>	.11 .08	-.01 .82	-.60*** .000							
PWI-A Composite <i>p</i>	.13* .04	.30*** .000	.06 .33	-.02 .79						
SWL <i>p</i>	-.03 .63	.30*** .000	-.02 .73	-.01 .88	.62*** .000					
Adult Hope Composite <i>p</i>	-.15* .02	.34*** .000	.07 .30	-.48*** .000	.22*** .000	.28*** .000				
Hope Scale – Pathways <i>p</i>	-.18** .006	.38*** .000	.07 .28	-.46*** .000	.19** .003	.23*** .000	.98*** .000			
Hope Scale – Agency <i>p</i>	-.12 .074	.28*** .000	.06 .355	-.47*** .000	.24*** .000	.31*** .000	.98*** .000	.91*** .000		
Gratitude <i>p</i>	.00 .99	.24*** .000	-.08 .26	.15* .02	.37*** .000	.31*** .000	.32*** .000	.13* .05	.37*** .000	
BRCS <i>p</i>	-.17** .009	.41*** .000	.01 .83	-.19** .002	-.01 .87	-.01 .84	.46*** .000	.50*** .000	.40*** .000	-.09 .17

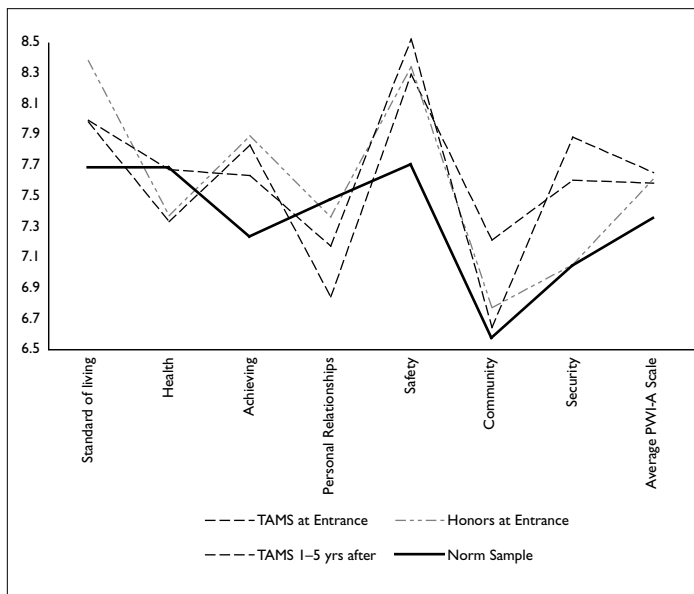
Note: PWI- A = Personal Wellbeing Index-Adult; SWL= Satisfaction with Life Scale; BRCS = Brief Resilient Coping Scale

Table 3. Deconstructed Personal Well-Being of TAMS and Honors College (HC) Freshmen on PWI-A Scale

Scale / Measurement		<i>N</i>	Mean	<i>SD</i>	<i>t</i>	<i>p</i>	<i>df</i>	<i>d</i>
Standard of living	TAMS HC*	141 119	7.98 8.38	1.78 1.40	-2.052	0.04	258	0.25
Personal health	TAMS HC	141 119	7.33 7.37	1.78 2.00	-.186	0.85	258	0.02
Achieving in life	TAMS HC	139 119	7.83 7.89	1.75 1.51	-.274	0.79	256	0.03
Personal relationships	TAMS HC*	141 119	6.84 7.36	2.14 2.08	-1.970	0.05	258	0.24
Personal safety	TAMS HC	141 119	8.29 8.34	1.76 1.46	-.265	0.79	199	0.03
Community connectedness	TAMS HC	140 118	7.21 6.77	1.96 1.89	1.838	0.07	265	0.23
Future security	TAMS* HC	141 119	7.60 7.05	1.74 2.08	2.298	0.02	258	0.28
Spirituality/religion	TAMS HC	141 90	7.70 7.39	2.47 2.61	.899	0.37	229	0.12
Composite score (does not include Spirituality/Religion)	TAMS HC	138 118	7.58 7.61	1.31 1.20	-.238	0.81	254	0.03

Note: * significant favoring this group ($p \leq .05$)

Figure 1. Comparisons of Honors College freshmen and two TAMS cohorts in well-being.



Being hopeful appears to be a common disposition of gifted college students. What is not known from this study is how hopeful college students in general are. Gifted college students who are hopeful appear to have a stronger sense of self-efficacy, to be happier, and to express greater satisfaction with their lives. As first-semester freshmen, a belief that intelligence is fixed (and by inference that they are sufficiently intelligent to be an early college entrant) is associated with hopefulness, gratitude, and efficacy.

Gifted college students, regardless of their entry path to college (early entrance or entrance at a traditional age), appear overall to be happy and generally to possess a disposition that facilitates their success, at least during the first semester of college. It is reasonable to expect this facilitation to continue. The challenge of college, especially for the early entrants, should increase their senses of resiliency, efficacy, hopefulness, and gratitude over time. Tracking longitudinal changes in these variables and using them to understand any changes in well-being over time is one of the long-term goals of this study.

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Perceptions of Academic Acceleration of Profoundly Gifted Adolescents 20 Years Later

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Discussions of academic acceleration are frequently focused on educational interventions such as grade skipping or early entrance to college. However, academic acceleration includes much more than that. Broadly construed, acceleration can refer to any kind of educational program through which students either progress through a curriculum at a faster-than-typical rate or experience content at an earlier-than-typical age. An authoritative report, *A Nation Deceived*, outlined 18 different kinds of academic acceleration, including the aforementioned traditional (and more extreme) measures, but also early entrance to kindergarten, advanced placement courses, enrollment in college courses while in high school, single-subject acceleration, and mentoring, among others (Colangelo, Assouline, & Gross, 2004). The range of accelerative options is virtually limitless.

The effects of acceleration have been widely researched, and results have consistently found positive academic, social, and emotional effects of acceleration. Both quantitative (meta-analytic) and qualitative reviews of empirical studies on the academic effects of acceleration have demonstrated short- and long-term academic benefits (e.g., Kulik & Kulik, 1984). However, the long-term outcomes examined in most studies are limited to 5 or 10 years, at most. The current study extends the time frame to 20 years and examines a broad array of views and educational experiences.

The Current Study: Introduction & Method

The Study of Mathematically Precocious Youth (SMPY) is a longitudinal study of the development of intellectual talent throughout the lifespan (Lubinski & Benbow, 2006; Stanley, 1996). SMPY has completed a 20-year follow-up survey of its most able cohort of participants, upon which this study relies. When initially identified in 1980–1983, these participants met top .01% (top 1 in 10,000) selection criteria by scoring at least 700 on the SAT-M or 630 on the SAT-V before age 13. At time-1, extensive information was gathered on participants'

cognitive and noncognitive attributes, including information from several psychometric instruments (e.g., Strong Interest Inventory, Study of Values) and extensive background educational and familial information.

In the 10-year follow-up of these participants, we documented several noteworthy findings regarding their accelerative educational experiences (Lubinski, Webb, Morelock, & Benbow, 2001). For example, 95% of participants reported using various forms of acceleration, including advanced subject-matter placement (82%), Advanced Placement® or other exams for college credit and advanced study (82%), college courses while still in high school (57%), grade-skipping (49%), special courses (44%), tutors or mentors (25%), and early entrance to college (19%). Most participants (71%) reported satisfaction with the level of acceleration they experienced. Additionally, at the 10-year follow-up, participants reported favorable perceptions of the effects of acceleration on their educational and personal development, including their educational growth, general academic progress, and social and emotional development.

Of particular interest was the lack of regrets and negative perceptions reported by the participants. For example, participants indicated that their accelerative educational experiences had no effect on their ability to get along with their age peers. Moreover, of those participants who did not indicate satisfaction with their accelerative experiences, the majority indicated that they would have preferred to accelerate even more not less. The accelerative experiences afforded to these and other SMPY participants through Advanced Placement opportunities were further investigated by Bleske-Rechek, Lubinski, and Benbow (2004), who found that gifted youth who participated in AP programs expressed greater satisfaction with their educational experiences and were more likely to complete advanced degrees than individuals who had not participated in AP programs.

These participants were surveyed in a comprehensive 20-year follow-up using individually-tailored, Web-delivered surveys in 2003 and 2004. With an overall response rate of

more than 80%, we secured follow-up surveys from 286 men and 94 women. Lubinski, Benbow, Webb, and Bleske-Rechek (2006) described the educationally- and vocationally-related achievements of the participants, which were remarkable. For example, 52% had earned doctoral-level credentials and 11% had secured tenured or tenure-track academic postings. Of the participants who were employed in academic positions in highly ranked universities (top-50 institutions, as ranked by *U.S. News & World Report*), 22% had already achieved the rank of full professor. Given the mean age of 33.6 years at the time of the 20-year follow-up, these are extraordinary accomplishments. The relatively young age at which some of these individuals have accomplished things typically reserved for individuals a decade older suggests that their developmental trajectories have progressed at a different rate than usual, at least. Given their early accelerative experiences and their educational and vocational accomplishments, the current study was designed to explore their perceptions of the role of academic acceleration in the development of intellectual talent.

Results

We assessed participants' views regarding academic acceleration in multiple ways. First, we asked participants about their overall perceptions regarding the importance of providing accelerative educational opportunities to intellectually gifted youth in four age groups: preschool–kindergarten, 1st–4th, 5th–8th, and 9th–12th grades. Averaging across all age groups, more than 80% of participants indicated at least a moderate level of importance in providing accelerative opportunities. The importance ratings were even higher for older children, with 93% indicating at least moderate importance for the two older age groups. Moreover, we asked participants what additional resources they would have liked to have had available to them during their educational and career development. Although many participants reported that their academic needs were met through other accelerative options, many would have liked to have more opportunities to receive mentoring.

Given their extensive firsthand experiences with programs for gifted youth, we also asked them an open-ended question about how they thought intellectual talent could best be developed. A qualitative analysis informed the development of a coding scheme for categorizing these data. Despite the wide variety of idiosyncratic responses yielded by this open-ended inquiry, approximately half of the respondents spontaneously indicated that children's personal interests should be supported and encouraged, and approximately a quarter of respondents noted that accelerative and enrichment opportunities should be provided for intellectually talented youth.

Finally, because of their firsthand experiences with educational acceleration and because these participants were at an age (early 30s) when they were beginning to have their own children, we surveyed them regarding their likelihood of pursuing various accelerative opportunities for their own children. Respondents reported strong likelihoods of using advanced coursework (e.g., AP courses, college courses in high school), special programs (e.g., academic camps, contests, enrichment opportunities), and mentoring opportunities to supplement the educational experiences of their own children if they were gifted. Less strong, but nevertheless positive, support was found for more salient accelerative options that separate gifted students from their age peers such as grade-skipping and early admissions (e.g., to kindergarten, to college).

Discussion

Long-term (20-year) reports regarding academic acceleration were assessed from the perspectives of profoundly gifted individuals. Because almost all of the participants in this study had extensive accelerative experiences as adolescents, they were well-positioned to evaluate the long-term costs and benefits associated with acceleration. Their responses regarding academic acceleration were consistently and strongly positive, and they supported the use of varied accelerative opportunities for intellectually talented youth. These findings illustrate the vast array of accelerative opportunities that can be utilized for this population. The many combinations of accelerative options facilitates finding an optimal match between a student's specific needs and a particular program or programs. Using these options may be largely a function of creative scheduling in many cases.

Not only is the range of accelerative options incredibly varied, but the expense and the difficulty associated with implementing many of these options are typically reasonable as well. Unlike many interventions for other special populations of students, educational interventions for gifted students include options that are often already available in schools, albeit intended for older students. By allowing students to take advantage of pre-existing programs at an earlier age or at a rate that is appropriate for them, the expense and the difficulty of implementation of many accelerative options are minimized.

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2008 IRPA Grant Recipients

Comparing Accelerated and Non-Accelerated Gifted Development at the Secondary and College Levels: Chinese Experiences

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The proposed study would make a series of comparisons between gifted students who graduated from acceleration programs and their older counterparts who graduated from non-acceleration gifted programs, and between gifted students who were accelerated at the secondary level at the age of 10 and those accelerated at the tertiary level at the age of 15, and within the accelerated groups, between those who were “well adjusted” and those who encountered academic or social and emotional problems. The comparison dimensions we focus on are: (a) academic interests and challenges at various junctures and aspects of their acceleration program; (b) motivational, self-regulatory, and coping-related issues regarding their self and future; and (c) social skills, student-teacher relations, peer relations, and friendship. The purposes of the study are to discern unique patterns of issues and challenges facing accelerated students at different developmental stages, and identify factors leading to a successful academic acceleration and factors that impede positive development associated with academic acceleration. For these purposes, two acceleration programs in China will be selected as target groups, and two matching groups of students from non-accelerated gifted programs will be selected as comparison groups. Semi-structured interviews will be conducted with the graduates of these programs as well as homeroom teachers in the programs.

The Role of Academic Acceleration in the Development of Scientific Talent: The Case of Nobel Laureates

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The proposed project is about the role of academic acceleration in the development of scientific talent in the case of Nobel Laureates in science, starting with the first Laureate, who received his prize in 1901, and ending with the most recent Laureates, who received their prizes in 2009 ($N=601$). Winning a Nobel Prize represents the pinnacle of accomplishment possible in science. Despite the ever-increasing role of science in society and the quite evident importance of Nobel Laureates in contemporary science, one should acknowledge that their academic acceleration has never been studied. Nobel Laureates during their childhood encompassed a wide range of abilities. Their divergent trajectories of talent development ultimately led to the same result: zenith in science. Using the case-study method and the interview method, the proposed research aims to understand the role of academic acceleration in achieving this result and what lessons can be derived for the education of today's gifted children. The discovery of the impact of academic acceleration on the educational development of Nobel Laureates will allow educators to accordingly improve, develop, modify, and transcend areas in the current curriculum in an attempt to cultivate scientific talent, of Nobel caliber, in future generations. The project is of great potential impact on the topic of academic acceleration because for the very first time it will explore this phenomenon in Nobel Laureates and thus begin the systematic study of its role in the development of outstanding scientific talent. Its impact on achieving tremendous success in science will be one of the sound arguments in favor of this educational option.

Accelerating Progress: Evaluating the Impact of State Acceleration Policy on Local Practice

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In the last three years, Ohio has implemented a comprehensive plan that has included a statewide study, enacted legislation requiring districts to implement research based acceleration policies, developed a state model acceleration policy, and updated data tracking systems to better facilitate monitoring data on the use of acceleration. Even with strategies in place, however, use of acceleration remains inconsistent across the state, suggesting that significant barriers to acceleration remain in some schools and communities. The purpose of this project is to evaluate the impact of Ohio's acceleration strategy to date, and investigate why accelerative options continue to be underutilized despite widespread support. Qualitative data will be used to support and explain self-report data from districts on practices related to acceleration.

Trait and Process Determinants of Advanced Placement Test Performance

Phillip Ackerman

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The Advanced Placement® (AP®) program represents a highly sought-after set of opportunities for accelerated study among talented high school students. However, little is known about the ingredients for success in the AP programs beyond some general information regarding student aptitudes and abilities. The proposed study will examine 150 students in an AP course. The study will involve assessment of a small set of key cognitive, affective, and conative trait complexes and a set of monthly questionnaires of student behaviors, attitudes, interests, and self-evaluations to evaluate the role of trait and process determinants of individual and gender differences in AP test performance success. The results are expected to provide important information about the determinants of success in AP test courses, that may in turn, be expected to help identify students who are best suited to these courses.

Dr. Ackerman's work was funded in 2007 and 2008.

The Institute for Research and Policy on Acceleration (IRPA)

IRPA, the first institute of its kind in the world, was established in 2006 at The Connie Belin & Jacqueline N. Blank International Center for Gifted Education and Talent Development at The University of Iowa.

www.accelerationinstitute.org

IRPA is dedicated to the study of curricular acceleration for academically talented children.

The primary purposes of the Institute are to:

- provide educators, parents, policy makers, and the general public with current information on the many aspects of acceleration;
- serve as an international clearinghouse for research and policy on acceleration;
- conduct and support research on the factors that moderate success with different forms of acceleration; and,
- provide leadership in developing and implementing acceleration policy.

The Institute's Web site (www.accelerationinstitute.org) provides this information for practitioners, the public, and researchers.

At IRPA's Website, you can:

- find answers to basic questions (What is acceleration? What forms does it take? Why should students be accelerated?);
- obtain advice on the acceleration decision-making process, including information on the *Iowa Acceleration Scale (3rd ed.)*, a tool for making objective decisions about grade-based acceleration;
- download for free *A Nation Deceived* in English (Volumes I and II) and nine other languages (Volume I);
- download for free *Guidelines for Developing an Academic Acceleration Policy*;
- read personal stories about experiences with academic acceleration submitted by students, parents, and teachers;
- download a free presentation on acceleration;
- view information on acceleration practices and policies in each state; and,
- review an annotated bibliography on research about acceleration.

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- Disseminates information through conferences and publications
- Leads in local, national, and international policy formation
- Enhances educational opportunities through technology
- Collaborates with the worldwide gifted community
- Promotes access, diversity, and equity in developing talent

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