

# The Stepping Stone Phenomenon:

Exploring the Role of Positive Attrition at  
an Early College Entrance Program

**Nancy N. Heilbronner**

*Western Connecticut State University*

**Elizabeth E. Connell**

*The University of Georgia*

**Sally M. Dobyns**

*University of Louisiana at Lafayette*

**Sally M. Reis**

*University of Connecticut*

**a** Acceleration is one way to meet the academic needs of gifted students, and early college entrance programs represent one type of acceleration. Students typically enter these programs between the ages of 14 and 16, sometimes leaving home to live on campus if the programs are residential. Students who transfer out prior to graduating often do not return to high school. Instead, they choose to enter universities that are more selective or provide a larger selection of majors. In the current study, researchers used quantitative and qualitative methods to examine the reasons for student attrition at one all-female early college acceleration program.

## Review of the Literature

Acceleration may take place by enabling talented students to move more rapidly than usual through a curriculum or by

This study explored the differences between students who remained at one early college acceleration program and those who left. Students who left appeared to seek what they perceived as a greater academic challenge or more specialized academic majors than were provided by the host college, a phenomenon that lends credence to the notion of positive attrition. Programs and their host institutions need to acknowledge and consider whether positive attrition is acceptable and then structure their screening policies accordingly. Programs would also do well to ensure that screening takes into account students' talents and interests, for by ensuring an appropriate match, or "fit," between the candidate, the program, and the host college or university, administrators and staff may help to improve retention and the overall quality of the experience for the early college accelerant. Appropriate screening is the key to improving academic fit, and the first step in improving screening may be for an institution to determine whether positive attrition is desirable or not. It is important during the screening process to match students' interests and talents with academic courses and opportunities offered by the college or university. Level of challenge is also a consideration, and part of the screening process should consider whether courses offered at the college are sufficiently challenging for the candidate. Administrators of these programs may wish to consider expanding current course offerings to include more majors and courses or recruiting the strongest students into the most challenging courses and majors that they currently offer. Participants enter early entrance programs at a very young age and may not be academically ready to select a major or a career in their teens, so more career counseling may be required than is normally provided at many colleges.

## Summary

exposing students to curriculum at a younger age than is traditional. *A Nation Deceived* (Colangelo, Assouline, & Gross, 2004) discussed the benefits of acceleration. Most importantly, much research has documented the positive effects of acceleration on academic achievement (Colangelo et al., 2004; Janos, 1987; Kulik, 1992; Noble et al., 2007).

Programs that allow students to skip high school and enter college years ahead of schedule represent one type of acceleration. By their nature, these programs enroll students who are academically quite strong, and many accelerants continue to thrive academically after matriculating. If participants have attended high school, those who are successful in early acceleration programs may have earned more Advanced Placement credit than nonaccelerated students (Brody, Assouline, & Stanley, 1990), and they may have scored higher on the SAT-Mathematics (SAT-M) and SAT-Verbal (SAT-V) than their nonaccelerated counterparts (Brody et al., 1990). They demonstrate greater academic gains in a year than their traditional freshmen counterparts (Janos & Robinson, 1985) and may earn more advanced degrees and awards (Brody et al., 1990).

Despite the academic qualifications of accelerants, early college acceleration programs that are residential sometimes experience a higher attrition rate, defined as the percentage of students leaving the program prior to graduating, than either high schools or some 4-year colleges. The entering classes at one early college acceleration program experienced attrition rates of 53%, 32%, and 44% in 2000, 2001, and 2002, respectively (E. Connell, personal communication, March 15, 2007). These attrition rates are substantially higher than the 18% high school dropout rate, which is based on the number of individuals who do not graduate on time with a high school diploma (Mishel & Roy, 2006). The rates are comparable to the overall 40% attrition rate cited for regular college students (Porter, 1990) and defined as the percentage of students who enter higher education and leave before earning a 4-year degree (Porter, 1990). However, it is important to note that the calculation of these two sets of rates differ in one important aspect: *The early college entrance program rates do not account for*

*whether the students went on to achieve a college degree.* To fully understand the issue of attrition at early college acceleration programs, one must consider what happens to these advanced students (e.g., whether they achieve college degrees at some point) and why they leave early entrance programs in the first place.

Although a common perception is that accelerants regret leaving high school, studies have repeatedly demonstrated that early college accelerants regret little about leaving high school (Cornell, Callahan, & Lloyd, 1991; Muratori, Colangelo, & Assouline, 2003), including missing the prom. Accelerants have repeatedly indicated that they entered programs because they needed academic challenge (Noble et al., 2007). This is not surprising: Research suggests that advanced students may enter elementary or secondary classrooms in September already knowing as much as 50% of the curriculum to be covered that year (Reis et al., 1993). Another popular myth is that parents want their children to return home; however, research indicates that many parents are satisfied that their children are leaving high school to pursue a greater level of challenge (Noble, Childers, & Vaughn, 2008).

Why, then, would students leave an early college entrance program? Researchers have explored the notion that the needs of the accelerant should match the academic offering of the program. For example, Noble and Childers (2008) found that a host of factors, including academic environment and intellectual rigor within the university, were important in determining whether students remained in or left the program prior to graduating. Other researchers have discussed the need for the residential program to be a good fit overall with the student. Muratori et al. (2003) found that some accelerants made the transition from high school into the program well, whereas others did not, depending on how academically and emotionally fit the student was for the program. Students who were not an appropriate match often left the program.

Although much research has focused on the academic and social-emotional adjustment of accelerants (Muratori et al., 2003; Noble & Childers, 2008), little research has explored in-depth the experiences of students who leave early college acceleration programs and their reasons for doing so. Given the advanced

academic abilities of most accelerants (Brody et al., 1990), it appears reasonable to suggest that at least some students who leave programs do so because they require additional challenge or academic options that cannot be provided at the host college or university. This type of attrition could be viewed as *positive attrition*. Whereas negative attrition might involve a student leaving to return to high school for reasons of distress (e.g., homesickness or lack of ability to perform academically), positive attrition would indicate that the student has moved on to a greater level of challenge, and the role of the acceleration program would be akin to a stepping stone, enabling the student to reach more challenging goals earlier than usual (e.g., attendance at a more prestigious or rigorous institution, acquisition of earlier postdoctoral fellowships, or achievement in the student's chosen field).

The current study used survey methodology to explore academic reasons for students' attrition at the Program for the Exceptionally Gifted (PEG), an early college residential program located at Mary Baldwin College (MBC) in Staunton, VA. Qualitative and quantitative items explored the perceptions of former students—those who left prior to graduating and those who remained.

## Background

The Program for the Exceptionally Gifted is an early college entrance program hosted at Mary Baldwin College. Founded in 1842, Mary Baldwin is situated in the rural foothills of the Blue Ridge Mountains in Staunton, VA. The college serves more than 800 undergraduates who live on campus and another 1,400 who commute, as well as 196 graduate students (MBC, 2009). In 2008, 92% of the students were female (Campus Corner, 2009). MBC offers two undergraduate degrees—a Bachelor of Arts and a Bachelor of Science—as well as several advanced degrees, a Master of Arts in Teaching, a Master of Letters, and a Master of Fine Arts (MBC, 2009). The college currently offers more than 40 majors and minors, although some of these majors have been

recent additions. Majors include offerings in the social sciences (e.g., African American studies), math and science (e.g., mathematics and physics), the humanities (e.g., English), the arts (e.g., film), religion (e.g., ministry), and business (e.g., management; MBC, 2009). The average entering SAT score during 2008 was 1010, and the average ACT score was 20 (Campus Corner, 2009). U.S. News and World Report (2009) ranks MBC as *selective*. The student to faculty ratio is 10:1 (MBC, 2009), and the graduation rate, defined as the percentage of students who remain and earn an undergraduate degree within 6 years is 49% (Wintergreen Orchard House, 2009).

PEG, a female residential early college entrance program located at MBC, was founded in 1985 with 11 students. Today, the program has grown to 70 students. Approximately 35 new students between the ages of 12-16 are accepted each year and are screened for admission using SAT or ACT scores, grades, and letters of recommendation. Each applicant must submit a series of essays, participate in two separate intake interviews, and stay overnight in the PEG dormitory. PEG students are admitted as early as the end of seventh grade and then spend subsequent years taking classes at MBC, living together in PEG housing on campus for at least a year or until they reach the age of 16, when they may move into dormitories with other MBC students (MBC, 2009).

Participants in the current study attended PEG during the years 1995-2005, and so it is important to understand the climate of the program during this period. The average early entrant SAT-V score during the years participants attended was 500, and the average SAT-M score was 550. PEG students were required to take a number of special classes in addition to their MBC undergraduate course load. These classes included an orientation to college; a course in composition ("PEGlish"); and courses in humanities, social sciences, mathematics, and physical education. In addition, students were required to complete service projects while at PEG (E. Connell, personal communication, March 15, 2007; MBC, 2009).

Participants lived under the supervision of a day staff consisting of several program administrators, as well as nighttime resident advisors (RAs) while living in the PEG dormitories. These RAs were often young women, usually in their early 20s, who (during the period participants attended) did not have formal training in meeting the needs of adolescents or gifted children. RAs were responsible for the supervision of their PEG charges during the evening hours, which included enforcing a 10 p.m. curfew and dealing with any social or emotional concerns that might arise. RAs also conducted Goal Setting and Feedback meetings to encourage students to share ideas and concerns (E. Connell, personal communication, March 15, 2007; MBC, 2009). Few academic or emotional support services, apart from the RAs and the normal academic guidance provided by MBC, were provided to participants during their time at PEG and MBC.

## Methodology

### Research Questions

Several questions were explored in the current research, including:

1. Are there differences in perceptions regarding academic experiences between participants who left PEG prior to graduating and participants who remained?
2. Why did some participants leave PEG? Do they regret their experiences at PEG?

### Sample

A purposeful sample of participants consisted of the 179 former PEG students who attended the program during the years 1995–2005. By selecting only students from these years, researchers were better able to probe more recent and in-depth knowledge than if the potential pool of former students had been expanded to include older participants. Some participants (referred to here

as attrition participants) left the program as early as the end of their second semester, while others remained until graduation (retention participants).

Participants ( $N = 179$ ) were mailed an information sheet describing the purpose and procedures of the study, as well as the PEG Alumnae Survey. Forty-three participants responded, and researchers followed up with phone calls to nonrespondents in an attempt to verify addresses. Of the 136 nonrespondents, address verification was successful for 36 participants, and the remaining participants were unable to be contacted due to inaccurate or incomplete information. Therefore, 43 out of a total of 79 participants who were located and could be contacted returned surveys. Thirty of these participants were classified as retention participants because they graduated from the PEG program, and 13 were classified as attrition participants because they had left prior to graduating.

## Instrumentation

Participants were mailed the PEG Alumnae Survey, which was designed to explore their experiences at PEG and the reasons for some students' attrition. According to Pett, Lackey, and Sullivan (2003), items for surveys may be generated by a careful delineation of a construct, the development of a coding system to manage information, and a list of empirical indicators. Researchers developed the PEG Alumnae Survey after a thorough review of the literature on college attrition in general and more specifically, attrition from early college acceleration programs. See the Appendix for a listing of survey items related to the current discussion.

Following the steps outlined by McKenzie, Wood, Kotecki, Clark, and Brey (1999), researchers created a draft of the instrument with 120 closed and open-ended items. These items were grounded in research on attrition from colleges and early college entrance programs and included questions on:

- *demographic information* including parental education, participants' educational histories, SAT and ACT scores, and undergraduate majors;
- *reasons for entering PEG* including opportunities for advanced learning, intellectual stimulation, same-sex learning, social interaction with similar students, parental requirements, lack of high school resources, and independence;
- *reasons for leaving PEG (if applicable)* including several items related to social adjustment, lack of major, academic workload, and difficulty following rules, as well as an item that asked participants to provide information on their activities after leaving PEG;
- *academic subscale* including items that measured the academic climate at MBC and PEG, such as questions related to the level of challenge, the quality of MBC instructors, and the quality of facilities; and
- *four open-ended items* a) Would you recommend PEG to another student? Why or why not? (b) Why do you think some students leave PEG prior to graduating? (c) What would you change about PEG if you could? (d) Do you have any additional comments or concerns?

The survey was subsequently reviewed by eight content experts in the field of educational psychology, who were asked to validate items by placing them correctly into a factor category, to rate their certainty regarding these placements, and to rate how relevant they believed the items to be. Following the recommendations of Gable and Wolf (1993), only items that were placed by 90% of content experts into the correct category were rated as *fairly sure* or *sure* and were deemed *moderately* or *highly relevant* were included on the final instrument. Of the initial pool of 120 items, 79 were selected for inclusion in the final instrument. Closed-ended items included a Likert response scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

## Data Analysis

Research Question 1, Are there differences in perceptions regarding academic experiences between participants who left PEG prior to graduating and participants who remained?, was analyzed using descriptive and inferential statistics through the Statistical Packages for Social Sciences (SPSS), version 13.0. Demographic data were explored, as well as reasons that students entered or left PEG. A 5-point Likert academic subscale was also created from 10 items related to participants' academic experiences while at PEG. The construct of academic experiences was defined as: (a) appropriateness of the level of academic challenge, (b) quality of MBC instruction, (c) quality of facilities (e.g., laboratories), and (d) level of academic preparation for graduate school or careers that was provided by PEG and MBC. Because the sample size was limited, an exploratory factor analysis could not be conducted. However, the Academic subscale, assessed using Cronbach's alpha coefficient, demonstrated adequate reliability ( $\alpha = .83$ ). Inter-item correlations for subscale items are provided in Table 1. Several of these correlations were small or even negative, indicating that the subscale may not be entirely unidimensional. Despite this fact, researchers decided to proceed with the subscale analysis, supplementing the procedure with an analysis of individual items.

Research Question 2, Why did some participants leave PEG? Do they regret their experiences at PEG?, was explored qualitatively. First, researchers manually open-coded participants' responses on the four open-ended survey items using Strauss and Corbin's (1990) data coding paradigm, a process in which the data were broken into individual conceptual words or phrases. Next, researchers examined these open-code phrases, looking for relationships between the codes. For example, various statements that expressed how students felt about discipline at PEG were grouped together. Then they combined these open codes into broader categories in axial coding. For example, the discipline open codes were grouped into a broader category relating to "life at PEG." Finally, core categories emerged from axial codes, in

**Table 1**  
*Academic Subscale Inter-Item Correlations*

Variable	1	2	3	4	5	6	7	8	9	10
PEGLish prepared me for writing	---									
PEG prepared me for a career	-.004	---								
Variety in classes	.192	.196	---							
Gaps in knowledge (reverse scored)	.262	-.048	-.110	---						
Struggled with organizational skills (reverse scored)	.138	-.239	-.152	.274	---					
Academic stress (reverse scored)	-.092	-.170	.303	.164	.407	---				
Enough majors	.188	.028	.706	-.168	.123	.223	---			
Adequate facilities	.157	.212	.381	-.124	-.190	-.089	.461	---		
Appropriately challenged	.306	.486	.390	-.043	-.236	-.188	.541	.613	---	
Class time used appropriately	.324	.346	.490	-.184	-.090	-.081	.611	.491	.793	---
In-depth learning	.383	.382	.340	.098	-.126	-.036	.383	.516	.643	.626

the final phase, during selective coding. The core categories that emerged represented large concepts that a majority (more than 50%) had mentioned in their responses. As a final step to ensure trustworthiness, coding categories were confirmed by two additional researchers with advanced expertise in the field.

## Results

### Closed-Ended Survey Items

**Demographic information.** Overall, retention and attrition participants were similar demographically. Participants were 19–29 years old at the time of the survey (see Table 2), and they were involved with a wide range of occupations, from attending graduate school (44.4%) to working in fields that included teaching, banking, law, project management, and retail management (55.6%). All participants entered PEG during the years 1995–2003, and the average age of entry was 15 years. Age of entry for attrition participants ( $M = 15.4$  years) was similar to age of entry for retention participants ( $M = 14.8$  years),  $t(41) = -1.97, p = .06$ . A majority of participants had attended only *public* schools prior to entering PEG (65.1%), fewer participants (16.3%) had attended only *private* schools, and the remainder (18.6%) were either home-schooled or had attended both public and private schools. The percentage of participants that had attended public versus private schools did not differ by attrition status,  $\chi^2(1, N = 43) = .161, p = .92$ . More than 65% of participants had attended a gifted program prior to entering PEG, while the remainder (35%) had not. Again, the percentage of participants who attended a gifted program did not differ by attrition status,  $\chi^2(1, N = 43) = .105, p = .75$ . Participants who responded to this item cited a variety of reasons for not attending gifted programs, including: a program was not available (18.6%); the student was never screened (4.7%); the student did not qualify (2.3%); or the student took some classes, but was never in a formal program (9.3%).

Participants reported that their parents' educational levels ranged from some high school to advanced degrees. However,

**Table 2**

*Participant Demographics*

Characteristic	All participants		Retention participants		Attrition participants	
	<i>n</i>	Valid percent	<i>n</i>	Valid percent	<i>n</i>	Valid percent
Current ages						
19–24	31	70.0	21	70.0	10	77.0
25–29	12	30.0	9	30.0	3	23.0
Amount of input						
High	37	86.0	24	80.0	13	100.0
Moderate	4	9.3	4	13.3	0	0.0
Low	2	4.7	2	6.7	0	0.0
Education						
Public only	28	65.1	19	63.3	9	69.2
Private only	7	16.3	5	16.7	2	15.4
Combination	8	18.6	6	20.0	2	15.4
Gifted program						
Program not available	28	65.1	20	66.7	8	61.5
Never screened	8	18.6	4	13.3	4	30.8
Did not qualify	2	4.7	1	3.3	1	7.7
Did not qualify	1	2.3	1	3.3	0	0.0
Took special classes, but no formal program	4	9.3	4	13.3	0	0.0
Highest level of education						
4-year degree	19	44.2	13	43.3	6	46.2
Master's degree	15	34.9	11	36.7	4	30.8
Ph.D. or equivalent	9	20.9	6	20.0	3	23.1
Highest level of parental Education: Mother						
Some high school	1	2.4	1	3.4	0	0.0
Graduated high school	6	14.3	4	13.8	2	15.4
Some college	5	11.9	4	13.8	1	7.7
Graduated college	15	35.7	11	37.9	4	30.8
Advanced degree	15	35.7	9	31.0	6	46.2
Highest level of parental education: Father						
Some high school	3	7.1	2	6.9	1	7.7
Graduated high school	3	7.1	3	10.3	0	0.0
Some college	8	19.0	7	24.1	1	7.7
Graduated college	12	28.6	7	24.1	5	38.5
Advanced degree	16	38.1	10	34.5	6	46.2

most participants' parents were well-educated: An overall 71.4% of mothers and 66.7% of fathers had completed a baccalaureate degree or obtained an advanced degree. Mothers' levels of education did not differ between retention and attrition participants,  $\chi^2(1, N = 42) = 1.45, p = .84$ . Similarly, fathers' levels of education did not differ between retention and attrition participants,  $\chi^2(1, N = 42) = 3.56, p = .46$ .

Participants' self-reported SAT and ACT scores taken at the end of middle school were also high (see Table 3). Retention participants' SAT-M scores ( $M = 577.92, SD = 65.07$ ) were similar to attrition participants' scores ( $M = 603.75, SD = 75.01$ ),  $t(30) = -.937, p = .36$ , and retention participants' SAT-V scores ( $M = 597.92, SD = 80.92$ ) were similar to attrition participants' scores ( $M = 611.25, SD = 69.37$ ),  $t(30) = -.417, p = .68$ . Retention participants' ACT scores ( $M = 22.6, SD = 3.78$ ) were also similar to attrition participants' scores ( $M = 25.6, SD = 3.85$ ),  $t(8) = -1.22, p = .25$ . Participants' self-reported grade point averages (GPA) while at MBC were high ( $M = 3.67$ ), considering that most of the participants would have been taking college classes much earlier than usual. Retention ( $M = 3.68, SD = .26$ ) and attrition participants' ( $M = 3.63, SD = .43$ ) GPAs were, once again, similar,  $t(32) = .349, p = .73$ . Participants had eventually attained a high level of education, in that more than half had attained a master's, a Ph.D., or equivalent (56.7% for retention participants and 53.9% for attrition participants). The percentage of participants that had attained either a master's or a Ph.D. (or equivalent) did not differ by attrition status,  $\chi^2(1, N = 43) = .029, p = .86$ .

**Reasons for entering and leaving PEG.** Participants were provided a choice of items related to why they entered PEG and were instructed to select as many as applicable (see Table 4). Chi-square analyses determined that, overall, retention and attrition participants were similar in their reasons for entering PEG. Participants frequently selected reasons for entering PEG related to the need for academic or intellectual stimulation. A large majority of retention participants (76.7%) and attrition participants (84.6%) reported wanting advanced learning. A majority of retention participants (80%) and attrition participants (69.2%)

**Table 3**  
*SAT and ACT Scores and Overall College Grade Point Average by Retention Status*

	Overall			Retention participants			Attrition participants		
	n	M	SD	n	M	SD	n	M	SD
SAT-Verbal	32	601.25	77.3	24	597.92	80.9	8	611.25	69.4
SAT-Math	32	584.38	67.4	24	577.92	65.1	8	603.75	75.0
ACT	10	24.10	3.9	5	22.60	3.8	5	25.6	3.8
Overall college grade point average	34	3.67	0.3	30	3.68	0.3	4	3.63	0.4

Table 4

*Reasons for Entering PEG*

Reason	Retention participants		Attrition participants		<i>p</i>
	<i>n</i>	Valid %	<i>n</i>	Valid %	
Advanced learning	23	76.7	11	84.6	.56
Intellectual stimulation	24	80.0	9	69.2	.44
High school lacked resources	14	46.7	5	38.5	.62
Social	8	26.7	4	30.8	.78
Wanted independence	11	36.7	6	46.2	.56
Parental requirement	5	16.7	0	0.0	.12
Wanted same-sex learning	1	3.3	1	7.7	.53
Other	6	20.0	2	15.3	.72

also reported wanting intellectual stimulation. Comparatively few participants entered PEG for same-sex learning (3.3% of retention and 7.7% of attrition participants).

Attrition participants were provided a choice of items related to why they left PEG and were instructed to select as many as applicable (see Table 5). Participants cited primarily academic reasons for leaving PEG, although several also reported social-emotional reasons. Specifically, all 13 attrition participants selected one or more of the following academic reasons for leaving PEG: major not offered ( $n = 5$ ; 38.5%); wanted a larger university ( $n = 2$ ; 15.4%); wanted a “better program” ( $n = 1$ ; 8%); wanted a “better college” ( $n = 1$ ; 8%); or wanted to learn in a coeducational environment ( $n = 5$ ; 38.5%). Fewer women, or 5 out of the 13 attrition participants, reported leaving PEG for social-emotional reasons, and these reasons were related to the fact that they missed family and friends ( $n = 5$ ; 38.5%). No attrition participants selected the difficulty of the workload at MBC, missing high school or extracurricular activities at high school, or social difficulties at college as reasons for leaving.

Further analyses conducted on the responses of the 13 attrition participants to the question, “Why do you think some students leave PEG?” revealed that only two participants cited leaving *primarily* because they were not socially or emotionally

**Table 5***Reasons for Leaving PEG*

Reason	<i>n</i>	Valid % (of attrition participants)
Major not offered	5	38.5
Difficulty following rules	1	8.0
Difficult workload	0	0.0
Social	0	0.0
Personal circumstances (e.g., illness in family)	2	15.4
Missed family and friends	5	38.5
Wanted coed learning environment	4	30.1
Missed high school	0	0
Missed extracurricular activities	0	0
Other:		
Wanted larger university	2	15.4
Wanted a "better program"	1	8.0
Wanted to be in a larger city	1	8.0
Wanted a "better college"	1	8.0

mature enough to handle living independently. These participants suggested that, prior to leaving, they had participated in flagrant rule-breaking. The remaining 11 attrition participants reported that they had left PEG primarily for reasons more closely aligned with *positive attrition* (e.g., to obtain a degree from a more prestigious or rigorous institution or to pursue a major not offered at MBC), and although they expressed fondness for the program, they also explained that they had regarded it as a type of "stepping stone" out of high school. Several participants mentioned that they had never planned to stay at MBC until graduation, but they believed it would help them to apply and be admitted to a more prestigious university or a university with majors that more closely matched their interests. Unlike their counterparts who left for reasons of negative attrition, these young women left to move into a university setting that was a better fit.

**Academic subscale.** The hypothesis that there would be mean differences between attrition and retention participants on the Academic subscale was tested and confirmed using an

independent samples  $t$  test with participants' graduation status (retention or attrition) as the independent variable. The results indicated that there were large mean differences between retention and attrition participants,  $t(41) = 4.052, p < .001, d = 1.94$ , using Cohen's (1969) descriptors of effect sizes. The mean subscale score for retention participants was *greater* ( $M = 4.16, SD = .52$ ) than the mean score for attrition participants ( $M = 3.45, SD = .52$ ) indicating that retention participants rated their academic experiences at PEG more highly than attrition participants.

It would appear reasonable that participants who had remained at PEG would express a higher level of satisfaction with academic life, so further quantitative and qualitative analyses were conducted to determine more specifically how these perceptions varied. Individual analyses were conducted on the means of items within the subscale. Rather than use a strict Bonferroni adjustment that may obscure important results (Perneger, 1998; Rotherman, 1990), researchers opted to use a conservative yet not overly restrictive level of .01 to test mean differences between retention and attrition participants on these items. Means differed between retention and attrition participants on a number of items (see Table 6), including the number of majors, adequacy of the facilities, and opportunities for in-depth learning. In each of these cases, item means for retention participants were greater than item means for attrition participants, indicating that participants who remained at PEG viewed these items with more satisfaction than participants who left PEG.

### Open-Ended Survey Items

Open-ended survey items were analyzed qualitatively (see Table 7) to explore students' perceptions about their experiences at PEG, including why some students leave (Research Question 2), and to triangulate quantitative items related to Research Question 1. Two major themes emerged during the coding of the open-ended survey items: (a) Overall, most participants (including attrition participants) viewed PEG positively, citing numerous benefits, and would recommend the program to other

**Table 6**  
*Academic Subscale: Item Analysis*

Variable	Retention participants			Attrition participants			Cohen's <i>d</i> effect size	
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>		<i>p</i>
PEGlish prepared me for writing	30	2.6	1.5	13	1.6	1.4	.05	.69
PEG prepared me for a career	30	3.4	1.2	13	3.6	1.3	.47	.16
Variety in classes	30	4.0	.95	13	3.1	1.2	.01	.84
Gaps in knowledge (reverse scored)	30	4.17	.72	13	4.15	1.19	.97	.02
Struggled with organizational skills (reverse scored)	30	3.42	.97	13	3.23	1.24	.60	.17
Academic stress (reverse scored)	30	3.67	.88	13	2.77	1.59	.08	.73
Enough majors	30	3.87	1.14	13	2.77	1.17	.006	.95
Adequate facilities	30	3.80	.85	13	2.54	1.27	<.001	1.9
Appropriately challenged	30	4.03	.85	13	3.31	.95	.02	.80
Class time used appropriately	30	4.20	.61	13	3.69	.75	.02	.75
In-depth learning	30	4.43	.68	13	3.70	1.03	.008	.85

Table 7

*Core Coding of Open-Ended Questions*

Core Category/Axial Coding and Representative Statements	
One: Students view PEG positively and would generally recommend the experience.	
1.1 Benefits of the program	PEG kept [my dream] alive by keeping me motivated.
1.2 Girls' views of PEG	After all I've said, I still have to say thank you, PEG, for the experience.
Two: The quality of the PEG experience depends on the "fit" of the student	
2.1 Importance of overall fit	It is suited to a very unique set of qualities . . . not just smart girls.
2.2 Academic fit	I would recommend PEG to someone who is academically ready.

talented young women; and (b) participants believed that PEG is not for everyone, and that one component of a student's success at PEG is the academic fit of the student, or the match between a student's academic characteristics and what the program offers.

**Benefits and positive memories.** A majority of participants (58%) either remembered their time at PEG as a positive experience or would recommend PEG to another qualified student. Some former students commented on how they thrived in the more challenging academic environment at PEG. Interestingly, almost half (46%) of students who left the program viewed PEG positively or would recommend it to other talented students. Several of these attrition participants 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." Some participants suggested that they had thrived at Mary Baldwin, stating 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 us entered the program intending to use it as a stepping stone to get into our dream colleges. . . .”

Many participants believed that their time at PEG had been a special period in their lives. Several participants commented that they had enjoyed the PEG experience and would not change it, commenting, “I look back fondly, even though I’ve had my share of struggles then and later.” Participants also understood that the opportunity had been out of the ordinary, as one commented, “PEG is a fantastic opportunity. . . .” Many participants believed that PEG had been the correct choice for them: “PEG still remains the best choice I have ever made.” Some participants expressed a sense of gratitude to PEG for providing them with the early college entrance experience, as one young woman summed up, “I experienced so much and grew *so* much. I am a much better person for it. After all I’ve said, I still have to say thank you, PEG, for the experience.”

**Recommendations to others.** Almost two thirds (63%) of participants indicated that they would recommend, sometimes with qualifications, the PEG experience to other talented girls, as this young woman commented, “I think PEG is a wonderful program. . . . I really want to see women come out of PEG smart and strong, realizing they have more options than they think.” However, participants were split as to whether they would provide an unconditional recommendation to talented young women or would only recommend PEG to students who were suited to the program, who were ready for the experience, and who were aware of the choice they would be making. Several students unconditionally recommended the program, as this young woman stated, “I would definitely recommend PEG.” Others expressed a concern that the student and the program should be a good match: “Potentially [I would recommend PEG], depending on what their goals are in attending either college early or sticking with high school.” Finally, some participants indicated that “Yes, I would recommend PEG to someone who is . . . ready.”

**Academic fit.** More than half (53%) of the participants mentioned that, because PEG is a specialized program, the student must be academically prepared and a good academic fit for the

experience. One participant commented, "It is suited to a very unique set of qualities, and *not* just smart girls." Additional analysis attempted to identify the characteristics that would determine student fit. What were the academic characteristics that enabled a girl to remain at PEG, as opposed to characteristics of other girls who left PEG prior to graduating, either to attend a different college or to return to high school?

A large majority of participants (81%) discussed the importance of being academically fit for the PEG experience. They believed that PEG students who were a good academic fit were academically prepared, ready for a higher level of challenge, and a good match for the classes offered at MBC. Participants indicated that students who thrive at PEG arrive academically prepared because they bring organizational and academic skills that enable them to succeed. These students don't have to be told to do their homework—they feel a sense of responsibility to do so. As one participant stated, "Many of the skills, you just had to bring with you." Another mentioned, "It actually takes hard work to succeed."

Participants also revealed that they did not object to the hard work. Indeed, they expressed a need for a higher level of challenge, as one participant commented, "Some of us *needed* PEG . . . academically." Another participant wrote that PEG suits students who "are lacking academic challenges in their high school/middle school."

Many (47%) participants indicated that they believed students often would leave PEG to go to other colleges or universities if the classes and majors offered at MBC did not fit their needs or interests. Of the 13 students in the study who left PEG early, 11 left for reasons of positive attrition (e.g., transferring to other universities). Although these students did not stay at MBC, they explained that PEG provided the "stepping stone" to the next, more appropriate placement for the student. Sometimes they transferred because, "the major they would like to pursue was not offered at MBC." Others left for additional academic challenge, as this attrition participant stated, "Many leave to get a degree at a more difficult and advanced school." Finally, some-

times it was a matter of prestige, summed up by one participant who said, “Most girls who leave PEG are leaving to go to more prestigious schools. PEG is a program for ‘gunners’ and gunners like to shoot for the best.”

## Discussion

In what ways do students who remain at early college acceleration programs differ from students who leave, and how can program administrators identify students who are good matches for their programs, then encourage and support these students? Confirming the findings of previous research (Brody et al., 1990; Noble & Childers, 2008; Noble et al., 2007), data from the current study suggest that students who remained at PEG were a good “fit” for the program in that their academic characteristics and needs were a good match for PEG and MBC academic program characteristics. Students who do not arrive with this type of fit may leave for reasons related to academics.

Differences on the academic subscale means indicated that retention participants believed that PEG was academically challenging for them while attrition participants did not. Especially when one considers the individual items on the subscale for which there were significant differences (majors, in-depth learning, and facilities), it becomes clearer that many attrition participants believed that even the college-level courses they were encountering at such an early age were academically uninspiring, and so transferred out to gain access to more challenging academic work or a wider spectrum of majors. It is also possible that attrition participants and their parents were more highly attuned to a college’s national reputation and prestige and were hoping to use the PEG program as a stepping stone to more selective institutions. Yet, most participants recalled PEG with fondness, and many participants suggested that they had used PEG as a stepping stone to escape the lack of academic challenge they had experienced in high school. As one young woman stated, “It was my plan all along . . . [to transfer out].”

**Table 8***Recommendations to Improve Retention at Early College Acceleration Programs: Improving Academic Fit*

Number	Recommendation
1.	Determine the focus of screening procedures: <ul style="list-style-type: none"> <li>• Will positive attrition be acceptable?</li> <li>• What type of academic challenge is required by the candidate?</li> <li>• What are the candidate's interest and talents?</li> </ul> Fine-tune screening procedures to match the desired student fit.
2.	Provide more academic and career guidance than is normally offered at the college level.
3.	Ensure that level of coursework is appropriately challenging for incoming students, and provide a wide variety of majors.

It may be tempting to assume that attrition participants did not benefit from their time at PEG. However, findings from the qualitative data suggest otherwise: The majority of participants, even attrition participants, remembered PEG positively and viewed their time at PEG as a valuable opportunity. A few students did leave because they missed family and friends, so social-emotional reasons must be taken into account. However, more students left to further their academic careers. It could be that for this type of student the opportunity presented by transition programs such as PEG is an invaluable one, for otherwise she could stagnate in an academically unchallenging environment. By entering PEG, students gain the freedom to thrive to find academic challenge even if they do not remain.

## Implications

The current study's implications for improving the PEG experience for future generations of young women are presented in Table 8. Some of these implications take the form of suggestions that come directly from the participants, but caution must be taken not to generalize these suggestions to other early entrance

acceleration programs because the academic, social, and emotional structures vary widely from program to program. However, some of the suggestions (such as those involving improving student fit) may be applicable to other early college entrance programs, as even the most rigorous institutions, if not a proper academic match for the student, may experience positive and negative attrition. The stepping stone phenomenon, then, may apply to a wide range of colleges and universities with early entrance programs.

Because students who enter college early are expected to take advanced courses years earlier than usual, administrators of these acceleration programs may wish to consider the overall academic student fit when screening candidates for admission. A comparison may be made to gifted identification procedures used in grades K-12, in that it has been noted that students benefit when identification matches services (Renzulli & Reis, 1997). For example, it is not appropriate to identify a mathematically talented student and then place that student in a gifted program designed to promote talents in reading or language arts. Similarly, it is inappropriate to identify a student with a talent for writing who expresses the desire to be a reporter and then place him or her in an early college acceleration program that does not offer journalism as a major.

A similar need exists for better screening procedures that would result in improved academic fit, an increased amount of academic guidance beyond what is normally provided at college, demanding coursework, and a wide variety of majors. Appropriate screening is the key to improving academic fit, and the first step in improving screening may be for an institution to determine whether positive attrition is acceptable or not. If positive attrition helps a student who may be stagnating in high school to achieve his or her potential, then an early entrance program may be seen as a stepping stone, and positive attrition may be acceptable. In that case, examining candidates at risk of leaving for reasons of negative attrition may be the primary focus of screening, which may then revolve around poor academic habits or other concerns that would result in a lack of institutional integration.

It is important during the screening process to match students' interests and talents with academic courses and opportunities offered by the college or university. Although not every student has defined academic goals at such a young age, many of the positive attrition participants in the current study demonstrated an early awareness of academic goals and left PEG. Level of challenge is also a consideration, and part of the screening process might be to consider whether courses offered at the college are sufficiently challenging for the candidate. Administrators of these programs may wish to consider expanding current course offerings to include more majors and courses or recruiting the strongest students into the most challenging courses and majors that they currently offer.

Participants enter early entrance programs at a very young age, sometimes as young as 12 years old. These students may not be academically ready to select a major or a career in their teens, so more career counseling may be required than is normally provided at many colleges. If students are to remain in a program, classes should be stimulating and offer a wide variety of majors. If this is not practical, perhaps programs could offer transportation to other nearby colleges and universities so that students might pursue other majors.

## Limitations and Future Research

The current study explored reasons for retention and attrition at one early college acceleration program, so caution must be taken when applying these findings and suggestions to other programs. Also, PEG experienced changes between the years 1995–2005, so this study represents one snapshot of a program in an evolving representation of the program under different administrators, policies, and staff. Future research is needed to determine whether the findings of the current study are applicable to other early college acceleration programs, and the types of screening procedures that might help to ensure a better student program fit.

Finally, sample size (43 participants) limits the current study due to the possibility of nonresponse bias. However, when response rate is low, examining the characteristics of respondents and comparing them with the overall population may be helpful in assessing the representativeness of the sample. During the years that participants attended PEG (1995–2000), the grade point average for the entire student population was similar ( $M = 3.5$ ) to the grade point average for participants in the sample ( $M = 3.6$ ; S. Ferguson, personal communication, June 8, 2009). SAT-M scores for the population ( $M = 550$ ) and the sample ( $M = 584$ ) were also similar. However, during the same period, SAT-V scores varied between the population of PEG students ( $M = 500$ ) and the sample ( $M = 601$ ; S. Ferguson, personal communication, June 8, 2009), which could indicate that responders may have been more verbal and likely to respond. However, retention participants' scores on both assessments were closer to the population averages than were attrition participants' scores. Thus, retention participants may be more typical academically of students who remain at PEG, and attrition participants are not, a supposition that would tend to support the conclusions of the current research.

## Conclusion

This study explored the differences between students who remained at one early college acceleration program and those who left. Students who left appeared to seek what they perceived as a greater academic challenge or more specialized academic majors than were provided by the host college, a phenomenon that lends credence to the notion of positive attrition. However, PEG was successful in launching even these talented students into a variety of educationally appropriate settings. Programs and their host institutions need to acknowledge and consider whether positive attrition is acceptable and then structure their screening policies accordingly. Programs would also do well to ensure that screening takes into account students' talents and interests. By ensuring an

appropriate match, or “fit,” between the candidate, the program, and the host college or university, administrators and staff may help to improve retention and the overall quality of the experience for the early college accelerant.

## References

- Brody, L., Assouline, S., & Stanley, J. (1990). Five years of early entrants: Predicting successful achievement in college. *Gifted Child Quarterly*, *34*, 183-192.
- Campus Corner. (2009). *Mary Baldwin College profile*. Retrieved from <http://www.campuscorner.com/virginia-colleges/mary-baldwin-college.htm>
- Cohen, J. (1969). *Statistical power analysis for the behavioral sciences*. New York, NY: Academic Press.
- Colangelo, N., Assouline, S. G., & Gross, M. U. M. (2004). *A nation deceived: How schools hold back America's students: The Templeton National Report on Acceleration* (Vols. 1 and 2). Iowa City: The University of Iowa, The Connie Belin & Jacqueline N. Blank International Center for Gifted Education and Talent Development.
- Cornell, D., Callahan, C., & Lloyd, B. (1991). Socioemotional adjustment of adolescent girls enrolled in a residential acceleration program. *Gifted Child Quarterly*, *35*, 58-65.
- Gable, R. K., & Wolf, M. B. (1993). *Instrument development in the affective domain: Measuring attitudes and values in corporate and school settings* (2nd ed.). Boston, MA: Kluwer Academic Publishers.
- Janos, P. (1987). A fifty-year follow-up of Terman's youngest college students and IQ-matched age mates. *Gifted Child Quarterly*, *31*, 55-68.
- Janos, P., & Robinson, N. M. (1985). The performance of students in a program of radical acceleration at the university level. *Gifted Child Quarterly*, *29*, 175-179.
- Kulik, J. A. (1992). *An analysis of the research on ability grouping: Historical and contemporary perspectives* (Research Monograph No. 9204). Storrs: University of Connecticut, The National Research Center on the Gifted and Talented.
- Mary Baldwin College. (2009). *In a nutshell*. Retrieved from <http://www.mbc.edu/about/fastfacts.asp>

- McKenzie, J. F., Wood, M. L., Kotecki, J. E., Clark, J. K., & Brey, R. A. (1999). Establishing content validity: Using qualitative and quantitative steps. *American Journal of Health Behavior, 23*, 311-318.
- Mishel, L., & Roy, J. (2006). *Rethinking high school graduation rates and trends*. Washington, DC: The Economic Policy Institute.
- Muratori, M., Colangelo, N., & Assouline, S. (2003). Early-entrance students: Impressions of their first semester of college. *Gifted Child Quarterly, 42*, 219-238.
- Noble, K. D., & Childers, S. (2008). A passion for learning: The theory and practice of optimal match at the University of Washington. *Journal of Advanced Academics, 19*, 236-270.
- Noble, K. D., Childers, S., & Vaughan, R. C. (2008). A place to be celebrated and understood: The impact of early university from parents' points of view. *Gifted Child Quarterly, 52*, 252-268.
- Noble, K. D., Vaughan, R. C., Chan, C., Childers, S., Chow, B., Federow, A., & Hughes, S. (2007). Love and work: The legacy of early university entrance. *Gifted Child Quarterly, 51*, 152-166.
- Perneger, T. V. (1998). *What's wrong with Bonferroni adjustments*. Retrieved from [www.bmj.com/cgi/content/full/316/7139/1236?view=full&pmid=9553006](http://www.bmj.com/cgi/content/full/316/7139/1236?view=full&pmid=9553006)
- Pett, M. A., Lackey, N. R., & Sullivan, J. J. (2003). *Making sense of factor analysis: The use of factor analysis for instrument development in health care research*. Thousand Oaks, CA: Sage.
- Porter, O. F. (1990). *Undergraduate completion and persistence at four-year colleges and universities: Detailed findings*. Washington, DC: National Institute of Independent Colleges and Universities.
- Reis, S. M., Westberg, K. L., Kulikowich, J., Caillard, F., Hébert, T., Plucker, J., . . . Smist, J. M. (1993). *Why not let high ability students start school in January? The curriculum compacting study* (Research Monograph No. 93106). Storrs: University of Connecticut, The National Research Center on the Gifted and Talented.
- Renzulli, J. S., & Reis, S. M. (1997). *The Schoolwide Enrichment Model: A comprehensive plan for educational excellence*. Mansfield Center, CT: Creative Learning Press.
- Rotherman, K. J. (1990). No adjustments are needed for multiple comparisons. *Epidemiology, 1*, 43-46.
- Strauss, A., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques* (2nd ed.). Newbury Park, CA: Sage.
- U.S. News and World Report. (2009). *Best colleges*. Retrieved from <http://colleges.usnews.rankingsandreviews.com/college/items/3723>

Wintergreen Orchard House. (2009). *Virginia mentor: Mary Baldwin College*. Retrieved from [http://www.virginiamentor.org/campustour/undergraduate/744/Mary\\_Baldwin\\_College/Mary\\_Baldwin\\_College3.html](http://www.virginiamentor.org/campustour/undergraduate/744/Mary_Baldwin_College/Mary_Baldwin_College3.html)

## Author Note

This research was made possible by a grant from the Belin-Blank Foundation.

## Appendix

### PEG Alumnae Survey: Relevant Items

#### Demographic Information

Year of birth: \_\_\_\_\_

Year you entered PEG: \_\_\_\_\_

Parents' education

Mother:

- Some high school
- Graduate high school
- Some college
- Graduated college
- Advanced degree

Father:

- Some high school
- Graduate high school
- Some college
- Graduate high school
- Graduate high school

Type of school(s) attended prior to PEG:

- Public    Private

Were you in a gifted program prior to PEG? (Check all that apply)

- Yes
- No  Not available where I lived
- No  No interest on my part
- No  Was never screened
- No  Was screened, but did not qualify
- Other (specify): \_\_\_\_\_

What were your scores?

SAT-Math: \_\_\_\_\_ SAT-Verbal: \_\_\_\_\_

ACT: \_\_\_\_\_

What was your undergraduate GPA at Mary Baldwin College (if known)?

- Year 1: \_\_\_\_\_
- Year 2: \_\_\_\_\_
- Year 3: \_\_\_\_\_
- Year 4: \_\_\_\_\_
- Overall: \_\_\_\_\_

What was/were your undergraduate college major(s)?

### Academic Subscale Items

	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
The PEGlish class is adequate academic preparation for writing well in courses at MBC.	1	2	3	4	5
I believe PEG prepared me for my career or later academic experiences.	1	2	3	4	5
There was enough variety of classes at MBC.	1	2	3	4	5
PEG students often suffered from gaps in academic knowledge because most did not attend high school.	1	2	3	4	5
Many PEG students struggled with time management and other organizational skills.	1	2	3	4	5
There is a great amount of academic stress at PEG.	1	2	3	4	5
There were enough majors offered at MBC.	1	2	3	4	5
Academic facilities (including labs) were adequate (or better) at MBC.	1	2	3	4	5
PEG students are appropriately challenged by MBC classes.	1	2	3	4	5

	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
Class time was used appropriately at MBC.	1	2	3	4	5
There are opportunities for in-depth learning while at MBC.	1	2	3	4	5

**Reasons for Entering PEG**

Why did you enter PEG? (check all that apply):

- Wanted opportunities for advanced learning
- Wanted an intellectually stimulating atmosphere
- Lack of high school resources
- Believed I did not fit in socially at home
- Wanted to live independently away from parents
- Parents wanted me to go to PEG
- Wanted a same-sex school
- Other: \_\_\_\_\_

How much input did you have in the decision to come to PEG (as opposed to parents and/or guardians)?  High  Moderate  Low

**Reasons for Leaving PEG**

Why did you leave PEG? (check all that apply):

- My intended major was not offered at MBC.
- I had difficulty following PEG rules.
- I had difficulty adjusting to the academic workload.
- I had difficulty adjusting to the social atmosphere.
- Circumstances such as illness, family problems or needs required that I leave.
- I missed family and/or friends.
- I missed learning in a coed environment.
- I missed high school experiences (social events, clubs, etc.).

- I wanted to participate in extracurricular activities offered at high school (band, debate, etc.).
- Other (please specify): \_\_\_\_\_

After leaving PEG, what did you do?

- Enrolled in another college: \_\_\_\_\_  
Overall GPA at that institution: \_\_\_\_\_
- Returned to high school
- Other: \_\_\_\_\_

**Open-Ended Items**

Would you recommend PEG to another student? Why or why not?  
Why do you think some students leave PEG prior to graduating?  
What would you change about PEG if you could?

Additional comments or concerns: