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Melinda Gibbons
University of Tennessee

Anna Taylor
Women's Fund of East Tennessee, Knoxville, TN, USA

Emily Brown
University of Missouri-St. Louis, brownemily@umsl.edu

Stephanie Daniels
University of Tennessee

Erin Hardin
University of Tennessee

See next page for additional authors

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Authors

Melinda Gibbons, Anna Taylor, Emily Brown, Stephanie Daniels, Erin Hardin, and Sam Manring

Article

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Melinda M. Gibbons[1], Anna Lora Taylor[2], Emily Brown[3], Stephanie K. Daniels[1], Erin E. Hardin[1], and Sam Manring[1]

Abstract

Social cognitive career theory indicates that perceived barriers negatively affect career and educational self-efficacy beliefs and may also impact interests, goals, and actions. However, measurement of barriers has produced mixed results, and few quantitative studies explore the perceived barriers of rural Appalachian students. In this series of studies, we explored the perceived educational and career barriers of rural Appalachian high school students. Our goal was to identify perceived barriers, but as initial results were analyzed, we then shifted to how best to measure barriers and how culture impacted the reporting of barriers by rural Appalachian students. The results of our mixed-method series of studies offer ideas on how cultural values and beliefs may skew reporting of contextual influences on career and education.

The Appalachian region spans 205,000 square miles from Northern Mississippi to Southern New York (Pollard & Jacobsen, 2017). The region extends through 13 states and consists of more than 25 million people, with 42% of the population considered to be rural (Appalachian Regional Commission [ARC], 2016). Most rural Appalachians demonstrate low educational attainment, with only 15.6% earning a 4-year college degree and one fifth not completing their secondary education (Pollard & Jacobsen, 2017). Additionally, rural Appalachians earn well below the national average, with an average income of only US$19,759 (Pollard & Jacobsen, 2017). These statistics make clear the systemic educational and career barriers facing rural Appalachian youth.

[1] University of Tennessee, Knoxville, TN, USA
[2] Women's Fund of East Tennessee, Knoxville, TN, USA
[3] University of Missouri–St. Louis, St. Louis, MO, USA

Corresponding Author:
Melinda M. Gibbons, Department of Educational Psychology and Counseling, University of Tennessee, 441 Claxton Building, Knoxville, TN 37996, USA.
Email: mgibbon2@utk.edu

Social cognitive career theory (SCCT; Lent, Brown, & Hackett, 1994) posits that self-efficacy, outcome expectations, and goals help direct career development. Empirical support for this theory is strong, and the theory has been successfully applied to explain the career development of diverse populations. Proximal influences, also known as perceived barriers and supports, directly affect self-efficacy beliefs as well as interests and goal intentions. Background variables such as parent education level, socioeconomic status (SES), and environment also influence learning experiences, which, in turn, affect self-efficacy and outcome beliefs (Lent et al., 1994). Qualitative research indicates that higher levels of perceived barriers and challenging background characteristics negatively affect career and educational development, making it more difficult for students to envision themselves continuing their education and being successful in career and college. However, quantitative measures of perceived barriers have produced mixed results, leading to complications in how to effectively measure these influences. In this article, we describe the results of a multistage study exploring the reporting of perceived barriers in rural Appalachian high school students to determine the best methods for assessing this SCCT variable.

Educational Barriers for Rural Appalachian Youth

Qualitative and quantitative research indicate that a variety of barriers exist for rural Appalachian youth. First, there are a number of regional challenges including physical health issues such as higher mortality rates (Meit, Heffernan, Tanenbaum, & Hoffman, 2017), higher rates of alcohol and drug abuse (Meit et al., 2017), and higher rates of depression (PDA, Inc. & The Cecil G. Sheps Center for Health Services Research, 2017). Infrastructure problems and lack of employment also present systemic issues. In fact, some communities lack adequate roads and sewer systems (Pollard & Jacobsen, 2017), while others suffer from waning manufacturing and natural resource mining industries (Hodge, 2016), making it difficult to find or access decent work opportunities. Combined with a low mobility rate (Pollard & Jacobsen, 2017), these regional issues create systemic barriers for youth considering plans after high school.

Specific career and educational barriers exist as well. Appalachian culture often promotes family values such as strict gender norms and the importance of attending to family needs over individual needs that may negatively influence the decision to engage in postsecondary education (Rieder Bennett, 2008; Russ, 2010). Gender role beliefs may influence career choice as well, with students choosing to pursue gender-stereotyped careers that best match family values (Tang & Russ, 2007). Boynton, Carrico, Paretti, and Matusovich (2013) noted the lack of diverse career role models, which can limit learning from vicarious exposure. In interviews with rural college-aged students who did not attend college, Friesen and Purc-Stephenson (2016) identified multiple barriers to college including cost, distance from home, connection to home, parent education level, family responsibilities, and lack of academic preparation and guidance. Ferry (2006) found similar barriers, as well as a lack of local employment opportunities and family involvement in career and educational selection. Additionally, Ali and Saunders (2009) noted the lack of concrete information about career and postsecondary options for rural Appalachian youth. Students often have inaccurate or minimal information about their options, leading them to select from familiar options, which can result in low-wage, low-skill jobs.

SCCT

SCCT (Lent et al., 1994) suggests that self-efficacy, outcome expectations, and goals interact to influence career interests, goals, and performance. Perceived career barriers are a core component of SCCT, postulated to moderate the connection of interests to choice goals and goals to actions and having a direct influence on career choice and self-efficacy beliefs as well (Lent, Brown, & Hackett,

2000). Barriers include a variety of possible influences, ranging from personal characteristics to family influences to societal constraints. However, perceived barriers can be difficult to measure quantitatively and research demonstrates they are not always connected to other SCCT constructs such as self-efficacy or outcome expectations (Lent et al., 2000).

One popular survey for measuring barriers is the perception of educational barriers (PEBs; McWhirter, 1997). Developed to explore ethnic and gender differences in diverse high school students, McWhirter, Rasheed, and Crothers (2000) adapted the original 22-item survey to include a total of 28 possible barriers that students rate regarding likelihood, magnitude, and difficulty to overcome. Researchers often use the likelihood subscale to explore perceived educational and career barriers in diverse middle and high school students (e.g., Raque-Bogdan & Lucas, 2016; Rasheed Ali & Menke, 2014; Turner, Joeng, Sims, Dade, & Reid, 2019; Wettersten et al., 2005). A modified version of the PEB (Gibbons & Borders, 2010), which added 17 items to assess barriers related to environment safety, role models, and postsecondary guidance, has been used with prospective first-generation college students (PFGCSs) and Latino youth (Gibbons & Borders, 2010; Gonzalez, Stein, & Huq, 2013).

Studies yielded mixed results regarding the influence of perceived barriers on other SCCT factors. For example, Turner, Joeng, Sims, Dade, and Reid (2019) surveyed urban and suburban youth from diverse socioeconomic backgrounds and found that barriers inversely correlated with father support, peer support, and self-efficacy, but only minimally. In addition, barriers negatively predicted only self-efficacy. Raque-Bogdan and Lucas (2016) explored differences in career aspirations by parent education level and found that low-SES participants and first-generation college students perceived more educational and career barriers, but these barriers only slightly predicted career aspirations for the non-first-generation students. In a study about career attitudes in rural high school students, Wettersten et al. (2005) found that barriers inversely correlated with career outcome expectations, social support, school engagement, and parent educational attitudes, but only the connection to outcome expectations was robust. In their regression analysis, barriers only predicted career outcome expectations but not academic outcome expectations or school engagement. Rasheed Ali and McWhirter (2006) also explored career aspirations in rural youth and found multiple inverse correlations between barriers and other SCCT variables. In their study, barriers were a strong predictor of aspirations. In a later study of rural Latino youth, however, Rasheed Ali and Menke (2014) found that barriers predicted self-efficacy and outcome expectations but not career aspirations. Gibbons and Borders (2010) used the modified PEB and found that seventh-grade PFGCSs perceived more barriers than their peers and that barriers directly influenced perception of parental and school support and college-going self-efficacy. Among low-income PFGCSs in another study, however, barriers did not predict certainty of career choice (Pulliam, Ieva, & Burlew, 2017).

In summary, mixed results exist regarding the effects of perceived barriers and other SCCT constructs, but qualitative (and some quantitative) research suggests that barriers affecting career and educational outcomes do indeed exist for rural Appalachian youth. Barriers for this population have been explored in different ways, not always using an SCCT framework, but overall, more research is needed. The research questions guiding this study were as follows: (1) How do rural Appalachian high school students rate perceived educational barriers on the modified PEB? (2) How effective is our current measure in identifying perceived educational barriers? and (3) How might we adapt the measure to more sensitively identify perceived barriers in this population?

Method

The surveys for this study were part of a larger study on the college-going and science, technology, engineering, math, and medical (STEMM) beliefs of rural Appalachian high school students

participating in a grant-funded outreach program. The program provides SCCT-based postsecondary and STEMM awareness activities for 10th and 11th graders. Tenth graders participate in a multi-week curriculum designed to introduce them to concrete information about STEMM careers and postsecondary options. Eleventh and twelfth graders are given the option to participate in a STEMM summer camp program and leadership program as well. More information about the program can be found in Gibbons, Hardin, Taylor, Brown, and Graham (2019) and Gibbons, Brown, et al. (2019). Only the results from the Barriers Scale are reported for the purposes of this article.

The research was divided into several different studies based on the analysis of the data collected in each study step. In Study 1, barriers data were collected as part of a larger project on SCCT variables in rural Appalachian high school students. After recognizing that students were not report-ing perceived barriers, we moved to Study 2, where we pulled this data from the main project for further review, revised the instructions, and again administered the survey. After the second admin-istration, we began Study 3, which included qualitative interviews with high school students to identify barriers that were not adequately covered in our current assessment tool. Each study is described in detail below.

Study 1

As part of a larger study on the career and educational development of rural Appalachian high school students, we collected data on perceived educational barriers from high school students (10th and 11th grade) in Spring 2016. Participants were from the three high schools where we provided a large, grant-funded STEMM and postsecondary intervention program. Data for Study 1 were collected during the first year of the intervention, so while all students at the schools participated in the surveys, only some surveyed students participated in the program.

Method

Participants

Data were collected from a total of 489 students who attended high schools that partnered with a large National Institutes of Health-funded research-outreach program that promotes postsecondary education as well careers in STEMM. These high schools were located in three rural communities in two Appalachian counties identified by the ARC (2016) as economically distressed. Furthermore, postsecondary attendance rates in these counties were below state averages (average of 53.4% in one county and 46% in the other county; state average of 61.5%). The three high schools had below average ACT scores (average of 17.5; state average of 19.6). Consistent with the demographics of these communities, the majority of participants (95.2%) were White; ~3% self-identified as biracial or multiracial. Young women comprised 52.9% of the sample, and young men comprised 46.3%; the remaining students indicated they preferred not to answer the demographic question about gender or did not respond. Just over half of the students were in the 11th grade (52.9%), 46.3% were in the 10th grade. The sample included 152 (31.1%) PFGCSs, 280 (57.3%) non-first-generation college stu-dents, and 57 (11.7%) students who were unsure of first-generation status. For the purpose of this study, students with neither parent having any education beyond high school were classified as PFGCSs.

Measures

As part of the larger study, all students provided self-report information on demographic, SCCT, and STEMM variables. For the current study, only certain demographic information (i.e., gender, grade,

race, and first-generation status) and SCCT (i.e., barriers to education and careers) variables were analyzed.

PEBs

To measure students' perceptions of educational and career barriers, the revised version of Mcwhirter, Rasheed, & Crothers (2000) *My Perception of Barriers* scale (revised by Gibbons, 2005) was administered. The scale includes a list of 45 potential barriers and asks students to rate how likely each item is to be a barrier for them. Barrier domains include indecision, unsafe environment, finances, lack of social support, discrimination, lack of role models, negative role models, family issues, lack of planning, academic preparedness, intelligence, and not fitting in. Students were given the following directions.

Below you will find a list of potential barriers (things that might get in the way) that you might face in going to college/training school after high school. For each potential barrier on the list, please select the response that best fits for you. You will circle one response for each barrier—HOW LIKELY it is that it will be a barrier for you.

All items are rated on a 1 (*not at all likely*) to 4 (*definitely likely*) scale. Scores are averaged to create a total barriers score. The PEB has been used as a barrier measure with diverse populations (Raque-Bogdan & Lucas, 2016; Turner et al., 2017) including rural youth (Rasheed Ali & Menke, 2014; Wettersten et al., 2005). Gibbons revised the original measure specifically to increase the scale's relevance with PFGCS samples. Internal consistency for the Barriers Scale in the current sample was high ($\alpha = .93$).

Procedures

Students completed the demographic items and the Barriers Scale as part of a larger battery of instruments on a desktop computer in small groups during the regular school day as part of the program evaluation of the grant-funded project. To determine whether students were carefully reading and responding to the online survey items, we embedded validity check items within each survey (e.g., "Please select B."). Only data from students who successfully passed the validity check in the PEB are included in the following analyses. Parents had the option to decline consent for their student's program evaluation data to be used for research purposes; none did so in 2015–2016. After students completed the program evaluation measures, they were presented with information about how their responses might be used for research and offered the opportunity to provide (or decline) assent for such use.

Results and Discussion

Overall students' total barriers score ranged from 1 to 3.80 with a mean of 1.62 ($SD = .46$). Independent samples *t* tests were conducted to examine gender and grade differences on the Barriers Scale scores. There were no gender differences; male ($M = 1.62$, $SD = .47$) and female ($M = 1.62$, $SD = .45$) students did not differ on perceived barriers, $t(474) = -0.13$, $p = .99$. There were also no grade-level differences between 10th-grade ($M = 1.60$, $SD = .47$) and 11th-grade ($M = 1.64$, $SD = .44$) students, $t(481) = 0.90$, $p > .36$. There was a significant difference by first-generation status, $F(2, 482) = 6.36$, $p < .01$, $\eta_p^2 = .03$. The results of the Tukey's post hoc test showed that non-PFGCSs ($M = 1.57$, $SD = .43$) reported significantly lower barriers compared to students who were unsure of their first-generation status ($M = 1.80$, $SD = .58$). There were no differences between non-first-generation students and first-generation students ($M = 1.64$, $SD = .45$).

These results are not consistent with past research in two ways. First, the overall level of barriers reported by these students is low. Although past research (Gibbons & Borders, 2010; Raque-Bogdan & Lucas, 2016; Rasheed Ali & McWhirter, 2006) has used slightly different versions of the PEB

with different but related populations, levels of barriers have been higher. Rasheed Ali and McWhirter (2006) surveyed rural Appalachian high school students using the original 28-item PEB. Dividing their reported mean by 28, their participants reported a mean score of 1.87 ($SD = .54$), higher than our participants' mean score of 1.62, $t(825) = -7.15$, $p < .001$. In Gibbons and Borders's (2010) survey of seventh graders using the 45-item PEB-R (and thus dividing reported scores by 45), PFGCSs ($M = 2.07$, $SD = .53$) scored higher than our participants $t(590) = -.872$, $p < .001$, who scored similarly to the non-PFGCSs in Gibbons and Borders's study, $M = 1.67$, $SD = .49$, $t(649) = -1.18$, $p > .23$. Lastly, Raque-Bogdan and Lucas (2016) explored perceived barriers in incoming college freshman using a 32-item PEB; dividing their reported scores by 32 and comparing to our scores, both their first-generation college students (FGCAS) ($M = 1.95$, $SD = .81$) and non-FGCS ($M = 1.81$, $SD = .74$) reported higher barriers than our participants, $t(717) = -6.94$, $p < .001$, and $t(2,363) = -5.41$, $p < .001$, respectively.

Second, contrary to past research, there were no differences in barriers between PFGCSs and non-PFGCSs. Gibbons and Borders (2010) compared seventh graders who would be the first in their families to attend college (PFGCSs) to their peers from families with college experience. Using the 45-item PEB identical to the one used in this current study, they found that PFGCSs reported significantly more perceived barriers ($M = 2.06$) compared to their peers ($M = 1.67$). Raque-Bogdan and Lucas (2016) also identified significant differences by first-generation status, with FGCS reporting more perceived barriers. Finally, Stebleton and Soria (2012) completed a large survey of college students using a different barriers survey. First-generation college students in their survey reported higher perceived barriers in 6 of the 10 listed categories including academic skills, family responsibilities, job responsibilities, and study skill problems.

These results also were inconsistent with the objective data from these communities, showing very low rates of college-going and educational attainment, indicating the existence of significant barriers. Moreover, these results were inconsistent with our experiences with these students who were in fact articulating significant educational barriers during our classroom interactions. We therefore suspected that something about the barriers measure itself, such as the instructions or the use of the word *barrier* might have influenced the results. This hypothesis was largely informed by our experience during the data collection, when the most common question raised by participants was what the word *barrier* meant. We tested this hypothesis in Study 2 by modifying the instructions students received.

Study 2

Method

Participants

Usable data were collected in Spring 2017 from a total of 605 10th-, 11th-, and 12th-grade students from the same three high schools as in Study 1. There were 258 female (57.2%) and 187 male (41.5%) students. Approximately 1% of students selected *prefer not to answer* and < 1% of students did not respond. The majority of students (96.2%) self-reported as White. Tenth-grade students comprised 35.9% ($n = 162$) of the sample, 35% ($n = 158$) were 11th-grade students, and 28.8% ($n = 130$) were 12th-grade students. The sample included 155 (34.4%) PFGCSs, 261 (57.9%) non-first-generation college students, and 35 (7.8%) students who were unsure of first-generation status.

Measures and Procedure

As in Study 1, participants completed the 45-item PEB (McWhirter Rasheed, & Crothers, 2000, revised by Gibbons, 2005) and demographics as part of a larger battery of program evaluation

measures. Participants completed the survey battery on individual iPads in their regular classrooms during a standard school day. To test our hypothesis that the specific instructions may have contributed to the underreporting of barriers observed in Study 1, we randomly assigned students to see one of the two versions of the instructions for the PEB. Approximately half (48%) of students with usable data received directions that were nearly identical to those used in Study 1.

Below you will find a list of potential barriers (things that might get in the way) that you might face in going to college/training school after high school. For each potential barrier on the list, please select the response that best fits for you. You will indicate one response for each barrier—HOW LIKELY it is that it will be a barrier for you.

For each of the statements below, how likely is it that it would get in the way of going to college or other training after high school?

The remaining 52% of the participants were randomly assigned to receive these adapted directions:

There are lots of things that may hurt or get in the way of your college and career plans. *We want you to imagine that you wanted to continue your education after high school (2- or 4-year college, technical school).* We realize that you may or may not actually plan to do this, but for the next set of questions, we want you to pretend that you do.

With this in mind, consider each item and *ask yourself how likely it would be that you would experience each situation*. Select the answer that best matches how likely each one is to happen if you planned to continue your education after high school (2- or 4-year college, technical school).

Here is an example: If you wanted to continue your education after high school (2- or 4-year college, technical school), how likely would it be that poor note-taking skills would be something that would get in the way of your educational success?

- If you think that there is no way that poor note-taking skills would get in the way of your educational success, you would select not at all likely.
- On the other hand, if you think it is almost certain that poor note-taking skills would get in the way of your educational success, then you would select definitely likely.

So, selecting definitely likely means that this is something that you predict would definitely get in the way of (hurt) your college plans.

Internal consistency, measured via Cronbach's α, was high for both the Barriers Scale with original directions (α = .96) and the adapted directions (α = .95).

Results

Contrary to our hypothesis, there were no differences in reported barriers based on which set of instructions students received, $t(448) = -0.95, p = .34$. Total barriers scores (i.e., the average of the 45 items) on the scale with the original directions ranged from 1 to 3.81 with a mean of 1.68 ($SD = .53$). Total barriers scores on the scale with the modified directions ranged from 1 to 3.58 with a mean of 1.73 ($SD = .51$). Moreover, average scores were again relatively low and comparable to those found in Study 1.

As no differences or interactions were found between overall averages based on which set of barriers directions students received, barriers total scores were aggregated to include averages from the original directions as well as from the modified directions. As in Study 1, there were no gender differences; male ($M = 1.65, SD = .49$) and female ($M = 1.74, SD = .53$) students did not have significantly different overall averages on the Barriers Scale, $t(442) = -1.81, p = .71$.

A one-way analysis of variance was conducted to examine differences in grade and first-generation status. There was a significant difference in overall averages on the Barriers Scale by

grade, $F(2, 547) = 6.23$, $p < .01$, $\eta_p^2 = .02$. The results of the Tukey's post hoc test showed that 10th-grade students had higher overall barriers averages ($M = 1.72$, $SD = .48$) than 12th-grade students ($M = 1.54$, $SD = .47$). There were no differences in overall barriers averages for 11th-grade students ($M = 1.62$, $SD = .50$) and 10th- or 12th-grade students. There was also a significant difference in total barriers averages based on first-generation status, $F(2, 549) = 6.13$, $p < .01$, $\eta_p^2 = .02$. The results of the Tukey's post hoc test showed that prospective first-generation students reported significantly higher overall barriers averages ($M = 1.72$, $SD = .52$) than nonprospective first-generation student ($M = 1.57$, $SD = .45$). Students who were unsure of their first-generation status did not report significantly different overall barriers averages ($M = 1.70$, $SD = .56$) than either prospective first-generation students or nonprospective first-generation students.

Post Hoc Analyses on Combined Data

To help us understand how students were responding to the quantitative items, we combined the data from Studies 1 and 2 to conduct a post hoc analysis to determine the extent to which specific items were relevant for this population. Less than 10% of participants from the combined samples selected *likely* or *definitely likely* for the following barriers: *friends don't support my plans*, *being treated differently because of my gender*, *people believing kids of my ethnicity/race don't do well in school*, *not feeling safe in my neighborhood*, *pressure from boy/girlfriend*, *sex discrimination*, *racial/ethnic discrimination*, *not having enough people of my ethnicity/race at college*, *feeling guilty about going to college*, *parents don't support my plans*, *people in my neighborhood don't go to college*, *being treated differently because of my ethnicity/race*. To the extent, these items are not relevant in this population (e.g., because of the racial homogeneity of the sample), barriers scores may be artificially low. We excluded these 12 items and recalculated an average score based on the remaining 33 items. However, although paired samples t test did show that average scores on the shorter measure were significantly higher ($M = 1.77$, $SD = .54$) than average scores on the full measure, $M = 1.68$, $SD = .51$, $t(1,159) = -30.45$, $p < .001$, scores remained low, with 68.7% of participants scoring at or below the midpoint of the scale, and 90.1% of participants with average scores of 2.5 or below.

Discussion

As in Study 1, participants reported perceiving only minimal barriers to furthering their education. No differences emerged by gender. Unlike Study 1, we found small differences between 10th-grade students and 12th-grade students as well as between PFGCSs and non-PFGCSs. However, the overall low level of barriers reported on this quantitative measure was still inconsistent with objective indicators of educational attainment, past research on similar populations, and our own experience with these students. Study 2 ruled out the hypothesis that students were simply misunderstanding the instructions or the definition of *barriers*, raising questions about the extent to which the scale was accurately measuring the construct in this population. In Study 3, we therefore used a qualitative approach to try to better understand perceived educational barriers in this rural Appalachian high school population.

Study 3

We initiated Study 3 to further explore the disconnect between the quantitative barriers survey data and actual college-going rates for and anecdotal experience with this population. We completed a concurrent qualitative study, informed by the results of Study 1 and Study 2, to further investigate the research question: *How do rural Appalachian high school students perceive barriers to furthering postsecondary education*?

Method

Participants

Seven students in the 10th grade participated in individual interviews for this study. Participants included six female and one male student. All participants were White and recruited from two of the three high schools from Studies 1 and 2. Two participants were enrolled in honors or advanced placement courses at their high school. All participants indicated postsecondary education plans to attend a 2-year college ($n = 1$; 14.3%), 4-year college ($n = 4$; 57.1%), or either 2-year or 4-year college ($n = 2$; 28.6%). These aspirations are quite similar to those of the 10th graders at our sites. In Spring 2017, of our nearly 500 10th-grade participants, 18.8% aspired to earn a 2-year degree, 61.4% planned to earn a 4-year degree or higher, and only 10.5% planned to directly enter the workforce after high school. Only one (14.3%) of the participants in Study 3 was a PFGCS, less than our overall 10th-grade population, where 34.4% reported being the first in their family to attend college.

Measures

The research team developed a qualitative interview guide to further investigate rural Appalachian students' perceptions of barriers. Questions were based on knowledge of the literature on postsecondary education barriers and experiences conducting interventions in rural Appalachian communities. Our goal was to identify more salient barriers that might help us modify our quantitative survey. Participants were asked to share their ideas about what might stop or keep students from their region from going to college or training programs after high school. The interview guide included nine questions (see Appendix). The interview guide included suggested probes for further exploring participant responses.

Data Collection

Following institutional review board and district approval, participants were recruited for qualitative interviews by outreach intervention team members at two high schools during Spring 2017 (the same semester in which Study 2 was conducted). Students who expressed interest in participating in the interviews were provided parental informed consent and student assent forms. Eight signed consent forms were returned, and seven students completed interviews. Three doctoral students in counselor education and clinical psychology programs who previously interacted with students as a part of the outreach intervention conducted the interviews during or after school hours across a 3-month period. All participants received a small gift item such as a T-shirt or lanyard. Interviews lasted between 14 and 28 min and were audio recorded and verbatim transcribed. Transcripts were deidentified, cleaned, and shared with coding team members.

Data Analysis

A five-member coding team with experience in career interventions in rural Appalachian communities completed data analysis for this project. The coding team included one professor of counselor education, two counselor education doctoral students, one school psychology doctoral student, and one clinical psychology doctoral student. All of the team members received Appalachian cultural sensitivity training as part of their involvement in the grant-funded project, and one of the team members was from a rural Appalachian community. The coding team met to discuss the experience of conducting the interviews and potential assumptions or biases about the research as a bracketing experience before analysis.

The coding team used a process of qualitative content analysis, an approach for systematically analyzing text for meaning (Schreier, 2014). They met to develop a coding frame based on the research goal of understanding postsecondary barriers in rural Appalachia. When developing this framework, the team identified and described eight categories. For example, the identified category of "family responsibilities" was described as pressure to stay at home or nearby or the need to help support the family. Three members of the coding team with advanced training in qualitative research coded each of the seven transcripts using this coding framework, and two members of the coding team coded three transcripts for triangulation purposes. Coding team members used Dedoose (2017) software to organize coding.

Following Schreier's (2014) process of qualitative content analysis, the coding team next met to evaluate trial coding and found the data described both the content of barriers and the context contributing to barriers. The team noted that the context of how barriers were discussed was what truly emerged from the data. Therefore, they modified the coding frame with new awareness of contextual themes emerging from the data. Schreier (2014) noted that data-driven codes often emerge because interviews often contain unanticipated information. The team identified and defined five categories for the modified coding framework. Three coding team members recoded each transcript with this contextual code framework for analysis.

To triangulate findings and reach consensus, one member of the team reviewed the final coding completed by the three team members. Any portions of the transcripts with disagreement were provided to the two additional members of the coding team who did not participate in the main coding. This process allowed for decision-making and agreement in order to present findings.

Findings

Five contextual themes emerged from the data: (1) bootstrapper mentality, (2) positive future mind-set, (3) practical disconnect, (4) lack of urgency, and (5) localism.

Bootstrapper mentality. The phrase "pull yourself up by your bootstraps" characterized a common thread heard from six of the seven students about accessing postsecondary education. There was a collective sense that if a student faced barriers to postsecondary education, those barriers could be overcome through hard work and self-reliance rather than with outside support or assistance. Students felt that going to college could be achieved by determination and having the right mind-set, "I don't think any of us here are held back by anything. I think if we put our minds to it, we can do it. It's just wanting to put your mind to it." Some students recognized that barriers such as finances, family responsibilities, or a lack of preparation may be faced when pursuing a postsecondary education; however, these students were quick to share that those barriers could be overcome. For example, one student mentioned a fear of not fitting in at college but quickly followed by saying "I mean, it's just something that I'll have to work at. It's not going to like stop me because I know what I want to do. I just have to get used to it." Another student shared that she lacked confidence in her ability to succeed in college but followed by saying, "I have to do it in order to get where I want to be. Like I can't have someone holding my hand at all times, and I'm gonna grow up at some point and I'm gonna have to do it by myself."

Positive future mind-set. Three of the students held a positive outlook on how they pictured their life after high school. Participants seemed to be looking forward to the future and felt like college would be a positive change from their current circumstances, "It's kinda crazy. Like just to think that we're all grown up already and movin' on to college, but I think it'll be better. A better experience with like people, and just focusing on what you want to do." Postsecondary education was seen as a valuable next step for students' futures. There was a sense that regardless of the barriers that may exist, the

future was going to be worth the work. "I'm looking at the end result. Like I know it's gonna be like hard and stuff, but it will be definitely worth it."

Practical disconnect. While the previous themes indicate that the majority of students held a positive view of their future and felt that college could be achieved if they worked hard enough, it also became evident that many students had inaccurate or incomplete information about college. Six of the participants demonstrated a practical disconnect between their perceived understanding about college and factual information about college. There were often errors in students' perceptions about concrete tasks associated with college and college preparation such as finances and academic preparedness. For example, students expressed financial misconceptions regarding financial aid, student loans, and college cost. "I've heard that it's about $1,000.00 a year, maybe, to go to college?" Another piece of inaccurate information among multiple participants was that academic preparedness was not important for college success. Statements exemplifying this belief include, "I don't think grades are a big deal" and "You don't always need good grades to be able to go (to college)." It seemed that students were excited about the idea of attending college but lacked concrete information on what steps were needed to make that a reality.

Lack of urgency. Many students had inaccurate or incomplete information about postsecondary education, and five of the participants also did not seem to feel the urgency to gather more information. There was a sense among students that there was plenty of time to figure things out and that everything would work itself out. "I'm really not worried about it. It's just a thing I feel is going to go smooth." While students felt like they would eventually become prepared, most did not have a clear picture of how they would go about becoming more prepared. When asked about this, one student shared:

> I'm definitely not prepared yet. I haven't been prepared at all. It's kind of like in high school when they say, "Well, you're going to go to college if you want," and then that's really all. I think it's just a lot of people aren't talking a lot about it or just even really planning for it. Cause I mean, we don't really feel like we need to yet.

Among the students interviewed, college seemed to be a distant event that did not warrant immediate attention.

Localism. Throughout all of the interviews, there was an overarching value of home, family, and the community. All of the students expressed a strong attachment and responsibility to their home which played an important role in how students thought about their postsecondary education. Many students wanted to remain geographically close to their family ("I want to be close to home so I don't move far away from my mom") and their community ("I just wanna go to either, somewhere surrounding here. Like an hour away or something like that.... I feel like I'd be more comfortable because I can come home to like what I'm used to"). Although many families of interviewees had limited experience with college, it was still important for students to have their family's support. "They like want to help me as much as they can even though they can't really but they're mentally supportive."

Students also discussed a negative stigma that came with being from a small rural Appalachian community. "A lot of people think that since they're from [rural community], we don't really have a lot of options. And we're not really going to go far." Students seem to hear a message similar to this on a regular basis:

> Like I hear people, I hear students talking about it all the time, like, "oh I'm from [rural community] I'm not gonna be able to go there. We got a bad last name so we're not gonna be able to get anywhere in life," and so that mind-set is what causes them to not go anywhere.

This negative stigma seemed to impact the way that some students thought about their future. One student shared that when people hear where she is from, "they're like, oh yeah you're not really going to go anywhere so it kind of makes it hard to think about your future and going to college and like furthering your education."

General Discussion

These studies explored the measurement of perceived educational barriers among rural Appalachian high school students. We initially used a well-validated quantitative survey to explore perceived barriers but found that participants did not identify many barriers to their postsecondary plans. This result contrasted with what we knew about both the population in general and the postsecondary rates of students in these schools in particular. Therefore, we engaged in a qualitative interview process initially designed to identify more salient barriers for our population.

What emerged from these interviews, however, were not additional specific barriers but rather a contextual understanding of why students may not have been reporting barriers. Our interview participants reflected some of the cultural values held by rural Appalachians including a strong sense of self-reliance and attachment to place (Keefe, 2005). The sense of independence was highlighted by their belief that success came solely from hard work and desire. Localism is another Appalachian value, characterized by attachment to the land and influenced by the importance of family needs (Keefe, 2005). Participant responses highlighted this value, with many comments about staying close to home and wanting to honor their community. They also reflected about how the negative views that others hold of rural Appalachia impact their perspective on the future. Specific cultural values have helped shape how these students perceive and understand barriers to career and college.

In addition, the interviews helped highlight the impact that the lack of concrete information and role models related to college going had on their understanding of their next steps. Boynton et al. (2013) noted that limited exposure to college-educated role models can inhibit exposure to various career options and lead to limited understanding of college and career pathways. Relatedly, Ali and Saunders (2009) indicated that rural Appalachians tend to lack accurate information about postsecondary options. It may be that barriers are less salient because of faulty or inadequate of information about future options.

The themes of positive future mind-set and lack of urgency, however, were unexpected and less connected to the prior research on this population. We do know that rural Appalachian students tend to report plans to attend college and feel prepared for college, even when actual statistics demonstrate a much-lower college-going rate (Chenoweth & Galliher, 2004). Summer melt, or the changing of college attendance plans in the summer prior to enrollment, is also particularly high in low-income students in general (Castleman & Page, 2014), so it may be that our participants fully expect to attend college until the very last moment before actual enrollment. We also know that PFGCSs achieve their initial college and career aspirations at much lower rates than their peers from college-educated families (McCarron & Inkelas, 2006), so it is possible that our participants are accurately reporting their perceptions of barriers as they currently view them, and only become aware of additional barriers after beginning college. In all, the lack of urgency and positive future beliefs may actually be related to their lack of concrete, accurate information about the postsecondary experience.

Overall Implications and Limitations

As with all studies, limitations to the current research exist. First, for Studies 1 and 2, only one quantitative measure was used to assess perceived barriers. Although the survey used has abundant evidence of validity and reliability, it is possible that another survey would have better captured our participants' beliefs about perceived barriers. Second, the developmental level of our participants may have contributed to our findings. Adolescents are still developing their abstract thinking skills and it may be that our participants had difficulty understanding the language in the survey. We attempted to address this possibility by offering an alternate set of directions in Study 2, but it may be that our wording was still too abstract for participants. We also have no way of knowing if the participants actually read the original or revised directions, so it is possible that our attempts at clarification were overlooked. Third, our qualitative study only included seven participants, and only one of these was a PFGCS, so it may be that the identified themes do not represent the views of all of our participants. However, the practical disconnect that emerged in these data from primarily continuing generation students is noteworthy, and we might expect this theme to be even more prevalent among PFGCSs who typically have less access to accurate information about postsecondary education. We attempted to use a rigorous model of analysis, achieved saturation in our analyses, and compared our results to prior research, but the small number of qualitative participants may still be seen as a limitation. Additionally, the interview participants were self-selected, another indication that they may not be representative of our full participant group. Lastly, all of the participants, for both the quantitative and qualitative studies, came from one of the three schools receiving our curriculum, so they likely are not representative of all rural Appalachian students. All results should therefore be interpreted with appropriate caution.

Perceived barriers are a major construct within the SCCT model (Lent et al., 2000). Prior studies examining the influence of perceived barriers demonstrate mixed results, with some reporting high levels of barriers and others reporting lower levels. Finding meaningful ways to measure perceived barriers is vital for fully understanding the career development pathways of various cultural groups and for creating meaningful career education interventions. To that end, we offer several implications and future research suggestions designed to help researchers be more intentional and successful in their measurement of this construct.

Identifying salient potential barriers that resonate with one's target population seems vital. For example, Kim and O'Brien (2018) recently reviewed the psychometric properties of the PEB with diverse college women. The authors identified and confirmed nine possible factors from the original items and suggested that different barriers might be more likely than others for particular cultural groups. They also mentioned that unique barriers may exist for a particular cultural group that is not included on measures such as the PEB. Kim and O'Brien (2018) found support for the PEB, and we agree that it is a valid and useful measure, but the question becomes how to effectively measure barriers in certain populations, so that we truly capture the unique issues perceived to affect the group.

One of our steps was to review the items that received particularly low endorsements from our participants. Given that we used the longer version of the PEB (45 items) and that the newest research on the PEB indicates many factors, eliminating nonsalient items seems to be a positive step in using the instrument. For our population of rural Appalachian high school students, 12 items were rarely endorsed as likely or definitely likely to hinder career and postsecondary plans. These included all 4 items related to ethnicity and race, both items related to gender, 3 of the 6 items related to social support, and 1 item each for unsafe environment, family issues, and lack of role models. Five of these items were in the original PEB, and seven came from the extended version. We subsequently decided to drop these items from our ongoing research in order to better capture the salient barriers and reduce the overall number of items on the survey. It is likely that different cultural groups have different career barriers, so measuring these might need to be tailored to the population.

A meaningful way to measure perceived barriers in populations that embrace the themes found in our qualitative analysis—bootstrapper mentality, practical disconnect, localism, positive future mind-set, and lack of urgency—is vital in being able to design and deliver effective and meaningful career education and counseling interventions. Brown et al. (2018) noted that researchers agree barriers negatively impact career and academic beliefs, but questions still exist about the magnitude and direction of these effects on SCCT variables. In the results of their meta-analysis of quantitative studies, they found that barriers only had a small effect on other SCCT outcome variables and suggested that focusing on support building may be more effective than barrier reduction. However, we argue that it is difficult to identify appropriate supports without also knowing what hindrances might exist.

Finding ways to measure barriers in populations such as rural Appalachians remains a challenge. We are left with more questions than answers. Future research can explore the qualitative themes we identified in more detail and with larger and more developmentally diverse samples. For example, perhaps interviews with high school seniors, who are closer to career and college transition, may reveal barriers that are salient for this group. Or, focusing only on PFGCSs will help identify perceived barriers. Building on Kim and O'Brien's (2018) work may also help identify nuances in barriers between cultural groups. Finally, qualitative studies similar to ours can be completed with other cultural groups that are both similar and different from rural Appalachians to identity areas of potential overlap and disconnect.

Appendix

Qualitative Interview Questions

Overall perceptions

1. What is it like to be a student at (name of school) and think of college?
2. What are you most worried or concerned about when thinking of college?
3. What do you think makes it hard for students from your school to go to education or training after high school?

Barriers to postsecondary education

4. Not having money for education or training after high school was one of the main things that students said got in the way. Is this something that makes it hard for you? How difficult would it be to overcome?
5. Some students report that their family responsibilities might make it hard to go to education or training after high school. Describe family issues that might make it hard for students.
6. Students report not feeling prepared enough as something that might make it hard for them to go to college. Describe what this means to you.
7. Describe what it might be like to be at a school or training program with students and teachers not from your county.
8. Some students report a lack of confidence as something that gets in the way. How might your confidence influence your plans for education or training after high school?

Final thoughts
9. What other things that make it hard for students to go to education or training after high school that you or others from your school experience have we missed?

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ORCID iD

Melinda M. Gibbons https://orcid.org/0000-0002-7080-0690

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