

THE DEVELOPMENT AND VALIDATION OF AN ASPIRATIONAL CAPITAL SCALE

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DEDICATION

This work is lovingly dedicated to all students who feel that they are growing up in less than ideal circumstances. Keep going, keep pushing, keep dreaming. It's going to work out better than you expected. I believe in you. Lastly, I tenderly dedicate this work to my elementary and middle school self. You're going to be become the person you always needed. You can finally rest and feel safe now.

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“Last but not least, I wanna thank me. I wanna thank me for believing in me. I wanna thank me for doing all this hard work. I wanna thank me for having no days off. I wanna thank me for never quitting. I wanna thank me for always being a giver and trying to give more than I receive. I wanna thank me for trying to do more right than wrong. I wanna thank me for just being me at all times.”

ABSTRACT

As part of the cultural community wealth (CCW) framework, aspirational capital (AC) is one of six forms of non-dominant capital and defined as the “ability to maintain hopes and dreams for the future even in the face of barriers” (Yosso, 2005, p. 41). AC is theorized to help underrepresented and underserved students traverse through their education journeys despite education institutions praising dominant forms of capital such as middle- and professional cultural and social capital (Bañuelos, 2021; Claussen & Osborne, 2012; Yosso, 2005). While there is an abundance of qualitative research examining students AC, recent quantitative critical research examining the underlying structure of AC has encountered difficulty in effectively measuring the construct (Hiramori et al., 2021; Sablan, 2019).

The purpose of this study was twofold: 1) to understand the dimensions and further build upon the theoretical structure of AC; and 2) to create a reliable and valid scale for community-based organizations (CBOs) to utilize for ongoing programmatic improvements to better the lives of underrepresented and underserved students. In developing the Aspirational Capital Scale (ACS), this study relied on the community cultural wealth (CCW) theoretical framework as well as Carpenter’s (2018) scale development process and included an expert panel review, cognitive interviews, a pilot scale, and a final administration of the ACS. The findings suggested the ACS measured four underlying factors: internal, social, family, and equity motivation. Additionally, the ACS demonstrated strong psychometric properties including high internal consistency reliability as well as content, construct, and convergent validity.

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CHAPTER 1

INTRODUCTION

Overview of the Study

The following study is divided into four chapters. The current chapter, Chapter One, includes an introduction to the study with the statement of the problem, explanation of key concepts, review of relevant literature, significance of the study, and the purpose of the study. The second chapter outlines and discusses the methods and procedures of the study including the data collection process and the population of the study. Chapter Three discusses the results of the study and the final chapter, Chapter Four, contains the discussion of the results, limitations, implications, and conclusions from the study.

Introduction to the Study

This chapter introduces the current study, states the problem investigated, reviews relevant literature, describes the purpose, and outlines the research questions guiding the study. This study which aims to quantitatively measure the latent construct, aspirational capital—defined as the ability to maintain future aspirations despite current circumstances— is an extension of myself in many ways. Throughout my childhood, I sought refuge in school, where several teachers nurtured and enabled my growth, despite and unaware of my abusive, neglectful, and impoverished home. I distinctly remember several teachers taking interest in me as a student and providing me with emotional and academic support regardless of not having all A's. There was not a single year where a teacher did not empower me to succeed academically, while unaware of my home life.

Given my upbringing, I personally understand the impact positive social supports can have on a student during their educational journey, regardless of the circumstances. More

importantly, my personal experience has prompted me to examine the components that promote student aspirations, regardless of their current circumstances, in order to help students with parallel upbringings to my own. Therefore, this study examining aspirational capital is an expansion of myself in many ways. This study aims to develop and validate a scale measuring aspirational capital to better serve and benefit underserved and underrepresented students within educational institutions.

Statement of the Problem

This study uses Yosso's (2005) community cultural wealth (CCW) framework to examine aspirational capital for students enrolled in a community-based organization (CBO) education program. The CCW framework explores how underserved and underrepresented students utilize non-dominant forms of capital from their cultural backgrounds to persist in their educational journeys. Aspirational capital is one of six forms of non-dominant capital and defined as the "ability to maintain hopes and dreams for the future even in the face of barriers" (Yosso, 2005, p. 41). Aspirational capital is theorized to help underserved and underrepresented students traverse through their education journeys despite education institutions praising dominant forms of capital (Claussen & Osborne, 2012; Yosso, 2005). Since the seminal work of Yosso's CCW framework, the large majority of research examining aspirational capital and the other five forms of non-dominant capital is strictly qualitative. However, in the past three years, four studies (Braun et al., 2017; Dika et al., 2018; Hiramori et al., 2021; Sablan, 2019) have been published which seek to quantitatively measure the forms of capital within the CCW framework but encountered difficulty in measuring aspirational capital.

Given the burgeoning qualitative research examining how educational institutions and programs can promote underserved and underrepresented students' cultural capital using an

assets-based approach, there is enough evidence to start considering the development of a culturally-relevant instrument. With the development and validation of such an instrument, students' forms of non-dominant capital, such as aspirational capital, can be measured and further explored. Recently, educational institutions have been called to recognize the unacknowledged capital students embody from their cultural backgrounds and integrate these forms of capital into their instructional and interpersonal practices in order to empower and nurture underserved and underrepresented students (Sablan, 2019). To answer this call to action, there is a need to develop a culturally responsive and valid psychological instrument that educational institutions and programs can use to understand if these underrepresented students are being supported to believe and aspire to goals and dreams despite current challenges and barriers (Sablan, 2019).

Theoretical Framework

Yosso's (2005) CCW theory directly descended from Critical Race Theory (CRT). As noted by Yosso (2005), "CRT is a framework that can be used to theorize, examine, and challenge the ways in which race and racism implicitly and explicitly impact social structures, practices, and discourses" (p. 70). CRT has been applied in education research where scholars have argued that traditional educational practices such as meritocracy, color-blindness, and normative cultural values reinforce the pervasiveness of racism within schools (Crenshaw, 1989, 1993; McKinley & Brayboy, 2005; Solórzano & Yosso, 2001). Thus, CCW echoes the same tenets as CRT in the education research field.

From a CRT perspective, Yosso (2005) argued that Bourdieun capital is more accessible to dominant social and cultural groups that promote deficit thinking, a perspective placing fault on students for not having normed cultural skills and knowledge, as underrepresented students

utilize non-traditional forms of capital to facilitate their educational success which is often disregarded. Therefore, Yosso's (2005) CCW model was developed in response to Bourdieu's human capital model to recognize the "knowledge, skills, abilities and contacts possessed and utilized by Communities of Color to survive and resist macro and micro-forms of oppression" (p. 7). In order to quantitatively examine and develop an instrument that seeks to measure AC, the theoretical framework of CCW will be used to guide the proposed dissertation study.

Terms and Definitions

The following are key concepts that should be understood throughout the study:

- 1) *Community Cultural Wealth (CCW)*: A theoretical framework describing the forms of capital underserved and underrepresented students possess from the "knowledge, skills, abilities and contacts possessed and utilized" by their communities (Yosso, 2005, p. 7).
- 2) *Aspirational Capital*: One of six forms of capital in the CCW framework and is defined as "the ability to maintain hopes and dreams for the future, even in the face of real or perceived barriers," and is evidenced when students "dream of possibilities beyond present circumstances, often without the objective means to attain those goals" (Yosso, 2005, p. 78).
- 3) *Familial Capital*: One of six forms of capital in the CCW framework and is defined as "cultural knowledges nurtured among familia (kin) that carry a sense of community history, memory and cultural intuition" (Yosso, 2005, p. 79).
- 4) *Social Capital*: One of six forms of capital in the CCW framework and is defined as "networks of people and community resources" of "peer and other social contacts [that] provide both instrumental and emotional support to navigate through society's institutions" (Yosso, 2005, p. 79).

- 5) *Resistant Capital*: One of six forms of capital in the CCW framework and is defined as “knowledges and skills fostered through oppositional behavior that challenges inequality [which] includes cultural knowledge of the structures of racism and motivation to transform such oppressive structures” (Yosso, 2005, p. 80).
- 6) *Critical Quantitative (CritQuant) Methodology*: A quantitative methodology approach which applies Critical Race Theory (CRT) to quantitative data, models, and analyses in order to prompt researchers and consumers to harness reflective practices and understand that while quantitative research can be used to uphold racist policies, practices, and systems it can also be used to contribute to critical race dialogues and dismantle racist processes and systems (Gillborn et al., 2018; Sablan, 2019).

Literature Review

This study focuses on developing and validating a psychological instrument measuring underrepresented and underserved adolescent student aspirational capital which is one of six forms of cultural capital in Yosso’s (2005) CCW framework. This section includes an overview of pertinent literature to inform the readers and instrument development process on the importance of applying the CCW framework within educational institutions, reviews the quantitative studies which have attempted to measure CCW capital, and describes the dimensionality of aspirational capital as reported in a large body of qualitative research. This literature review process was conducted using the top databases related to education research (PsychInfo and ERIC) via the University of Tennessee, Knoxville’s online library database. Using “cultural wealth” and “aspirational capital” as the main key search terms within these two databases yielded over 220 results which were further filtered by reading the study abstract and the prevalence of aspirational capital in the results and discussion section. Overall, 127 of these

studies mentioned aspirational capital in their published paper, but 40 articles were deemed appropriate in having strong evidence for aspirational capital within CCW and will be the basis to which this study's argument is centered on. Based on the focus of this study and the content found in the review of literature, the following topics will be discussed in detail in the following sections: The Community Cultural Wealth (CCW) Capital, Measuring CCW, Aspirational Capital, Intersection of Aspirational, Familial, Social, and Resistance Capital.

Community Cultural Wealth (CCW) Capital

The concept of cultural capital in educational research was ideated and developed by the renowned French sociologist Pierre Bourdieu, along with two other forms of capital (social and economic) in the essay “Cultural Reproduction and Social Reproduction” (1977). Bourdieu further defines and explains cultural capital in the famous essay “The Forms of Capital” as forms of knowledge, skills, and educational qualifications an individual has which could, and arguably should, be used to increase their economic and social capital, thus mobilizing individuals up the hierarchical ladder in society (1986). Bourdieu notes that the concept of cultural capital was developed while hypothesizing the reason as to why students from different social classes have “unequal scholastic achievement.” (1977, p. 17) and calls for researchers across the social sciences to attune their focus on better understanding this societal phenomenon. In further developing this theory, he further speculates the interconnection between economic, social, and cultural capital and argues that society tends to “reproduce” mainstream or dominant forms of cultural and social capital, thus perpetuating the value of dominant forms of economic, cultural, and social capital.

While dominant culture is context dependent, Bañuelos (2021) explains that Bourdieu argued that schools inadvertently increased the inequality gap by rewarding students who knew

how to speak, behave, engage with authority (2021). More specifically, families with strong economic capital can easily pass on embodied forms of cultural capital (i.e., habits, tastes, communication style) to their children which might be evidenced by how a child dresses and speaks which might be favored in social situations such as school (Bourdieu, 1986; Bañuelos, 2021). Additionally, families with resources provide their children with objectified forms of cultural capital such as material goods to enhance student learning (e.g., musical instruments for enriched learning) (Bourdieu, 1986; Bañuelos, 2021). Families with high economic and social capital can transfer institutionalized forms of cultural capital to their students to easily enable their children to have better access to selective universities or more competitive positions in the job market (Bourdieu, 1986; Bañuelos, 2021). The promotion of dominant versus non-dominant cultural capital in an educational setting was illustrated in Calaraco's (2014) ethnographic study of a mixed-income elementary school. In this study, middle-class families advocated for special accommodations (institutionalized cultural capital) and taught their children how to advocate for themselves and ask for help (embodied cultural capital). In comparison, working class families accepted the authority of their children's teachers and encouraged their children to independently overcome academic challenges (Calaraco, 2014).

The concept of cultural capital has been a pertinent focus in educational research in that educational systems serve and have the capacity to launch students towards better social and economic opportunities. However, many critical race education researchers have argued that Bourdieu's theory of cultural capital has been interpreted and applied in educational institutions through a deficit lens (Carter, 2005; Denton et al., 2020; Sablan, 2019; Yosso and Garcia, 2007; Yosso, 2005). Deficit thinking in the education research field is generally understood as holding "students from historically oppressed populations responsible for the challenges and inequalities

that they face" by blaming their individual, community, and family environments (Davis & Museus, 2019, p. 119). In a well cited article critiquing the misapplication of Bourdieu's theory of cultural capital, Yosso and Garcia (2007) argue that Bourdieu presents the theory of cultural capital as a critique of society rewarding and perpetuating specific forms of skills, knowledge, and abilities mainly present in white, middle-class culture, however, educational institutions have relied on and implemented this theory in attempts to socially and economically mobilize individuals. The unintended consequence of this application has kept individuals from non-dominant classes from achieving social mobility since these students embody forms of cultural capital that are different from those belonging to white, middle-class culture. Not only are individuals from non-dominant classes restricted and oppressed but are deliberately challenged by feeling the need to expend more emotional, mental, and physical energy if they want to "adhere to the standards of the dominant class" (Sablan, 2019, p. 187).

In efforts to systematically correct the misinterpretation and deficit-based application of Bourdieu's cultural capital theory where certain communities are described as "culturally wealthy" and others as "culturally poor," Tara Yosso developed and proposed the Community Cultural Wealth (CCW) framework which implements an assets-based view for students from nondominant backgrounds (Yosso, 2005). Yosso's CCW framework is grounded in Critical Race Theory (CRT) as it challenges the idea of educational institutions legitimizing dominant cultural capital as the inherent standard for students (2005). As an empowerment and assets-based framework, CCW is based on the foundation of the experiences, assets, and resources of Communities of Color. Yosso defines CCW as "an array of knowledge, skills, abilities, and contacts possessed by and utilized by Communities of Color to survive and resist macro and micro-forms of oppression" (2005, p. 77). In contrast to the deficit lens of Bourdieun cultural

capital, CCW not only recognizes the unacknowledged and unrecognized capital students embody from their unique backgrounds to succeed in their educational pursuits, but calls upon educational institutions to acknowledge and integrate these forms of capital to empower and nurture students.

The original CCW model developed by Yosso identifies and comprises six types of capital students from Communities of Color possess and develop from their cultural environments during their educational pursuits (Yosso, 2005). Yosso's (2005) CCW model includes the following six types of capital:

1. Aspirational capital: "the ability to maintain hopes and dreams for the future even in the face of barriers" (p. 41)
2. Linguistic capital: "intellectual and social skills learned through communication experiences in more than one language and/or style" (p. 43)
3. Navigational capital: "skills of maneuvering through social institutions" (p. 44)
4. Social capital: "networks of people and community resources" (p. 45)
5. Familial capital: "cultural knowledge nurtured among familial (kin) that carry a sense of community history, memory, and cultural intuition" (p. 48)
6. Resistant capital: "legacy of resistance to oppression in Communities of Color and refers to those knowledges and skills cultivated through behavior that challenges inequality" (p. 49)

In the description of these forms of capital possessed by students from Communities of Color, Yosso theorizes that the capitals are not mutually exclusive but are dynamic and interrelated as they overlap, build upon, and promote one another.

During the past 15 years, education researchers have studied these non-dominant forms of capital to better understand 1) their underpinning as experienced by marginalized groups in

their educational pursuits (Huber, 2009; Samuelson & Litzler, 2016; Straubhaar, 2013); 2) how marginalized students utilize these forms of capital to access and navigate higher education (Oropeza et al., 2010); and 3) the various resources that promote or increase these forms of capital (Larrotta & Yamamura, 2011; McGowan & Perez, 2020; Wilson, 2014). To date, many researchers have implemented the CCW model when exploring how students from Communities of Color embody and utilize these forms of capital during their education pursuits. During the process of this literature review, 271 articles were produced from two education-focused databases when using the keyword “community cultural wealth” within the abstract for peer-reviewed, published articles. The large majority of these research articles on CCW is qualitative and examines multiple forms of capital in an exploratory manner to better understand a variety of experiences from those in different groups. However, recent quantitative research has emerged attempting to measure CCW (Braun et al., 2017; Dika et al., 2018; Hiramori et al., 2021; Sablan, 2019).

Measuring CCW

Recently, four studies have sought to measure CCW through the development of psychometric scales. Braun et al. (2017) used the CCW framework along with Bourdieu’s capital framework to develop a 15-item scale, called the Deaf Mentoring Scale, to measure and understand STEM-related mentor relationships within the deaf community. The scale development process included a literature review, focus group interviews, cognitive interviews, and pilot testing before the final survey was administered. The factor analysis revealed that the one item intended to measure aspirational capital did not load with the other CCW items and instead loaded with Bourdieu’s capital. Braun noted that it “may have been difficult for respondents to conceptually separate from the aspirational capital specific to minority

communities" (p. 11). The factors associated with The Deaf Mentoring Scale had acceptable reliability coefficients for the four factors: Being a Scientist ($\alpha = .89$), Deaf Community Capital ($\alpha = .86$), Asking for Accommodations ($\alpha = .80$), and Communication Access ($\alpha = .91$).

However, the loadings for each of these factors had high variability and are not considered tau-equivalent: Being a Scientist (0.937 - 0.567), Deaf Community Capital (0.858 - 0.680), Asking for Accommodations (0.801 - 0.739), and Communication Access (0.991 - 0.493). In another study, Dika et al. (2018) attempted to measure CCW amongst racially/ethnically marginalized upper-level engineering students at a large university. A nine-item scale was developed to measure the six CCW capitals solely using the definitions provided by Yosso (2005), however, a factor analysis was not conducted to assess the instrument and instead reported descriptive statistics of the items developed and mapped to the CCW capitals. Dika et al. (2018) concluded that student participants used aspirational, linguistic, familial, and peer social capital the most often in their educational journeys. Although this study is important for research on underrepresented and underserved engineering students, a more sophisticated scale development approach should be used when developing items for a scale.

Two additional studies, Sablan (2019) and Hiramori et al. (2021), used more rigorous theoretical and methodological approaches. In terms of theory, both research teams took a CRT approach in their studies, and, more specifically, utilized quantitative critical methods (CritQuant). CritQuant is increasingly being utilized within the quantitative research field that applies CRT to quantitative data, models, and analyses in order to prompt researchers and consumers to harness reflective practices and understand that quantitative data can be used to uphold racist policies, practices, and systems (Gillborn et al., 2018). Using a CritQuant approach, both studies' scale development process included literature reviews, expert reviews, cognitive

interviews, and survey piloting prior to the administration of the final instrument. Sablan collected responses from 772 college students enrolled in an Asian, Native American, and Pacific Islander-serving institution. The results from the exploratory factor analysis largely fit with Yosso's conceptualization of CCW, however, items measuring aspirational and resistant capital did not empirically fit these constructs. Specifically, results from the EFA revealed two factors for aspirational capital which were not clearly defined or described in relation to theoretical considerations, but still had acceptable coefficient values (aspirational capital factor 1, $\alpha = .77$ and aspirational capital factor 2, $\alpha = .83$). However, the second factor only comprised two items. During the process of finding a simple structure, Sablan (2019) notes:

The three items removed concerned aspirations from or related to the family, including the aspiration to surpass parents' educational and occupational success [...] More research and consideration may be needed regarding the applicability of the definition of aspirational capital and how to best measure it." (p. 195).

In a similar scale development approach, Hiramori et al. (2021) collected responses from 660 STEM-students across four large universities in the Pacific Northwest to which 62% identified as Latinx/Hispanic. The EFA revealed a total of 8 factors measuring aspirational capital: Social capital (proportion of variance explained = 0.19), Familial capital (proportion of variance explained = 0.18), Resistant capital (proportion of variance explained = 0.16), Internal-aspirational capital (proportion of variance explained = 0.14), External-aspirational capital (proportion of variance explained = 0.12), Monolingual capital (proportion of variance explained = 0.09), Family encouragement/expectations (proportion of variance explained = 0.07), Monolingual capital-creative expression (proportion of variance explained = 0.06). Authors only reported the percent proportion of total variance explained for each factor and the

item factor loadings and did not discuss reliability or validity measures for the scale. Hiramori et al. 's findings further built on and were congruent with Yosso's CCW framework, and their study was the first quantitative study to tap into the external and internal functioning of aspirational capital. Internal aspirational capital items focused on self-motivation and included items such as "I am hopeful for my future" while the external aspiration capital items focused on external motivators such as "My parents inspired me to pursue a STEM major." This study further examines the relationship Sablan reported between aspirational capital and other forms of capital, such as familial, and provides evidence for an interconnection between the forms of CCW capital which is also reported in qualitative studies. While these studies are beginning to pave the way to measure CCW, there is a repeated challenge of effectively tapping into and measuring AC.

Aspirational Capital

Within the CCW framework, aspirational capital is one of six forms of capital students from communities of color draw upon to succeed and persist in oppressive educational institutions. Yosso (2005) defines aspirational capital as "the ability to maintain hopes and dreams for the future, even in the face of real or perceived barriers," and is evidenced when students "dream of possibilities beyond present circumstances, often without the objective means to attain those goals" (p. 78). Many researchers have examined aspirational capital amongst students from nondominant backgrounds (racially, culturally, economically, sexual orientation, able-bodiedness) using qualitative methodologies to better understand how students use, build, and maintain this construct during their educational endeavors. These studies have primarily focused on college-level and high school students who identify as Latinx or Black. In a brief review of literature focusing on aspirational capital, Mobley and Brawner (2019) succinctly

summarized aspirational capital as an internal motivation and resilience which creates a “culture of possibility to succeed against all odds” (p. 357).

Aspirational Capital Internal Motivators

Yosso and other education scholars acknowledge aspirational capital as an internal motivation and resiliency students activate and utilize to overcome economic, social, and institutional barriers faced during their educational journeys (Chang et al., 2017; Mobley & Brawner, 2019; Pooley & Cohen, 2010; Samuelson & Litzler, 2016 ; Yosso & García, 2007). In reviewing the literature, similar themes across studies revealed the different internal motivators and characteristics students embodied when displaying aspirational capital. One of these internal motivators was students’ self-efficacy towards their skills and characteristics which enabled them to believe they could persist and succeed despite real barriers. In several qualitative studies, researchers found that students’ aspirational capital was activated and developed when students were confident in either an academic ability (Baker, 2019; DeNicolo et al., 2015; Habig et al., 2021; Kouyoumdjian et al., 2017; Rincón et al., 2020; Romo et al., 2019) or confident by way of increasing their knowledge and experience in different careers and college processes, (Aragon, 2018; Doyle, 2022; Mobley & Brawner, 2019; Pavlakis & Pryor, 2021; Means et al., 2019).

Students’ notion of distal safety also served as a primary internal motivator which activated aspirational capital. Specifically, students expressed utilizing their aspirational capital in the hopes of achieving personal safety in terms of economic (Doyle, 2022; Pavlakis & Pryor, 2021; Rincón et al., 2020), educational (Chang et al., 2017; Erdemir, 2022; Johnson et al., 2020; Pavlakis & Pryor, 2021; Romo et al., 2019), social (Chin Goosby, 2021; Webb & Sepúlveda, 2020), and occupational opportunities (Doyle, 2022; Erdemir, 2022; Mobley & Brawner, 2019;

Johnson et al., 2020; Means et al., 2019). In these studies, students referred to either one or multiple ideas of personal future safety when conveying their motivators to aspirational capital.

The final primary characteristic revealed in these studies when examining aspirational capital was students' persistence. While persistence was expressed in different ways for students, many students discussed current events which students expressed "failure" when working towards their future goals (Duncheon, 2018; Mobley & Brawner, 2019; Norodien-Fataar, 2016) but chose to continue to "push through while maintaining a positive attitude" (Zamudio, 2015, p. 71). Students also indicated that their persistence in working hard and potentially sacrificing other areas in their life, which created other challenges, helped maintain their future aspirations (Means et al., 2019; Pang et al., 2018). Stanton et al.'s (2022) study interviewing 33 black undergraduate STEM students clearly revealed how students relied on their internal persistence to maintain aspirational capital: "internal motivation was a common strength for success possessed by many participants. We define internal motivation as being self-driven to achieve one's goals. Several participants explained that motivation cannot be solely external, but rather it must originate from within oneself to sustain success" (Stanton et al., 2022, p. 11).

Intersection of Aspirational, Familial, Social, and Resistance Capital

While many studies revealed the common internal motivators and characteristics students possess to maintain and build their aspirational capital, the same as well as other studies indicate other external motivators which also maintain and build aspirational capital. These external motivators are directly related to the other forms of capital within the CCW framework. Specifically, different researchers evidenced students drawing upon familial, social, and resistance capital to build and maintain their aspirational capital (Denton, 2020; Duran et al., 2019; Means et al., 2019; Rincón et al., 2020). Researchers who recognized and reported the

intersection of these three types of capital with aspirational capital was not surprising as Yosso hypothesized that these “various forms of capital are not mutually exclusive or static, but rather are dynamic processes that build on one another” (p. 77). Denton et al.’s (2020) systematic review of education studies examining the CCW framework for students in STEM also noted the repeated pattern of authors reporting aspirational capital in tandem with other forms of CCW capital. In the review of literature for this study, an overwhelming recurring theme of external motivators which assisted in building and sustaining aspirational capital for students was familial, social, and resistance capital. The remainder of this section will discuss the intersection for each of these types of capital and how they assist in building and sustaining aspirational capital.

Aspirational Capital and Familial Capital. Yosso (2005) defines familial capital as “cultural knowledges nurtured among familia (kin) that carry a sense of community history, memory and cultural intuition” (p. 79). Yosso notes that this form of capital forms an individual’s commitment to the well being of their community and includes an expanded meaning of kinship, such as biological and nonbiological extended family. In the large majority of studies reporting how familial capital activated aspirational capital, students expressed how their parental figures constantly verbally encouraged and supported them to obtain a good education or future career to achieve a prosperous future (Aragon, 2018; Basit, 2012; Contreras & Kiyama, 2022; Espino, 2016; Hines et al., 2019; Martinez et al., 2020; Means et al., 2019; Mobley & Brawner, 2019; Pérez & Taylor, 2016; Rincón et al., 2020). In addition to parental supports, students also expressed how siblings and other extended family members (aunts, uncles, grandparents, cousins, etc.) also motivated and encouraged students to aspire to attain advanced education and

careers (Bosit, 2012; Brooms et al., 2021; Contreras & Kiyama, 2022; Hines et al., 2019; Martinez et al., 2020; Rincón et al., 2020; Means et al., 2019).

In addition to biological family, students in these studies also referred to non-biological family units, which they viewed as extended family, that motivated, supported, and encouraged students to build and sustain aspirational capital (Duran et al., 2019; Mobley & Brawner, 2019). In a study by Duran et al. (2019), 12 Latino undergraduate students who identified as queer were interviewed to understand how they maintained aspirational capital during their higher education pursuits. The students described how chosen family members (non-kin) at their institution promoted their aspirations since these members readily understood collegiate experiences and were understanding of their sexuality. Similar sentiments were found in a study by Mobley and Brawner (2019) who interviewed 15 first-generation transfer college engineering students. Several students in this study noted how they made their own family with other transfer engineering students that supported each other within and outside of academics (Mobley & Brawner, 2019). The notion of creating a family network outside of immediate and biological family is important as not all students are afforded with supportive, healthy families. Recognizing and legitimizing family structures outside of biological families is an important consideration when understanding how students embody, build, and sustain aspirational and familial capital.

While familial capital supported and activated aspirational capital via family support and encouragement (support by family), aspirational capital was also activated when students were motivated to aspire and achieve for their family. The difference in distinction between these two concepts is being motivated by family versus being motivated to give back to family by aspiring to achieve a better future. The motivation to aspire for students' family was evident when they

expressed wanting to achieve better education and career opportunities since their parents were never afforded with the opportunity (Aragon, 2018; Ballysingh, 2021; Rincón et al., 2020; Means et al., 2019). Often students expressed wanting to maintain aspirations in order to give back to their parents and family to honor their sacrifices made (Aragon, 2018; Means et al., 2019), aspire and achieve in order to be a role model for younger siblings or other family members (Means et al., 2019), and acquire future financial stability not for themselves but for their family (Ballysingh, 2021).

Aspirational Capital and Social Capital. Within the CCW framework, social capital is defined as “networks of people and community resources” of “peer and other social contacts [that] provide both instrumental and emotional support to navigate through society’s institutions” (Yosso, p. 79). Similar to familial capital, the review of literature showed a strong relationship between enriching sources of social capital and students' aspirational capital. These peer and social contacts manifested primarily in positive interpersonal relationships with adult and peer mentors (Ahn, 2010; Harris & Kiyama, 2015; Liou et al., 2009; Ramirez, 2021). These adult mentors can be expressed in various individuals during a students’ educational journey, such as teachers, program coordinators, counselors, administrations, but overall, these individuals provide supportive mentorship. Rincón et al. (2020) defined these adult mentors as “institutional agents” who are “high-status, non-kin, agents who occupy relatively high positions [...] and go beyond their professional responsibilities and duties as teachers, school personnel, faculty, and administrators to nurture students’ desire to pursue higher education (p. 5). These individuals provide emotional support and intangible knowledge to motivate students to dream of a future beyond their present circumstances which build and sustain aspirational capital.

The positive outcomes of underserved and underrepresented students experience from having supportive adult mentorships is well-documented in the education research field (Harwood et al. 2015; Hines et al., 2019; Jackson et al., 2014; Wyatt, 2009). However, in terms of aspirational capital, studies revealed that aspirational capital was built and sustained when mentors focused on students' existing aspirations rather than imposing their own (Denton et al., 2020; Harwood et al., 2005; Hines et al., 2019; Martinez et al., 2020; Pérez & Taylor, 2016). In addition to, students expressed how these supportive adult mentors increased their self-efficacy to pursue aspirations they believed infeasible, such as pursuing a STEM field (Chang et al., 2017; Czop Assaf & O'Donnell Lussier, 2020; Rincón et al., 2020; Murrilo et al., 2017; Liou et al., 2015).

Supportive social contacts, such as mentors, have similar effects on students' aspirational capital as does supportive family relationships. Similarly, students are also motivated to give back to their community in the same way they aspire for a better future in order to give back to their family. In other words, while students are motivated by specific individuals within their community (social capital), they are also motivated to give back to their communities at-large. These distinct, yet similar, forms of social capital motivate students to build and sustain aspirational capital, however it is unclear if the relationship between these capital is recursive. The concept of aspiring post-secondary education to support their communities was not a surprising recurring theme which emerged from the literature review as Yosso (2005) states "these Communities of Color gave the information and resources they gained through these institutions back to their social networks" (p. 79). This idea was clearly present in a study conducted by Broome et al. (2018) who interviewed 12 Black and Latino male college students serving as mentors in a peer mentor program. These peer college mentors expressed how they

not only found their mentorship responsibilities and activities rewarding, but it also motivated them to excel and expand their aspirational capital as a means of fulfilling a community need (mentoring for students who shared similar cultural identities) as well as their own needs of positive self-efficacy by internalizing and believing the support they provide their mentees. In a broader sense, other studies reported how the needs of students' communities motivate them to aspire and pursue certain education and career pathways (Chang et al., 2017; Duran et al., 2019; Czop Assaf & O'Donnell Lussier, 2020; Pérez & Taylor, 2016; Rincón et al., 2020; Cegile, 2011).

Aspirational Capital and Resistance Capital. Similar to familial and social capital, resistance capital is also strongly associated with aspirational capital. Resistance capital is defined as “knowledges and skills fostered through oppositional behavior that challenges inequality [which] includes cultural knowledge of the structures of racism and motivation to transform such oppressive structures” (p. 80). In the review of the literature, students either expressed their resistance capital which bolstered their aspirational capital when they felt they or their community was being oppressed. Resistance capital expresses itself in a form that is analogous to reactance theory which is a motivational state where individuals act in an opposite behavior if they feel restricted or restrained, but occurs within a context of a cultural context. For example, if students feel stigmatized by their race or ethnicity within an educational institution, they activate their resistance capital to challenge the stigmatized idea that they do not belong, thus activating, building, and sustaining their aspirational capital (Aragon, 2018; Czop Assaf & O'Donnell Lussier, 2020; Espino, 2016; O'Shea, 2016; Stanton et al., 2022). In other words, the feelings of oppression or stigmatization due to their culture motivates them to break free of these oppressive ideologies and actively engage in behaviors to invalidate these ideas.

The relationship between resistance and aspirational capital was clearly illustrated in a study by Stanton et al. (2022) which interviewed 34 Black undergraduate science majors at research-intensive predominately white institutions. Several students expressed how their resistance towards inequality and adversity experienced at these institutions motivated them to succeed “in an environment where [their] ability to succeed is doubted because of race” (p. 11). The results from Stanton et al.’s study illustrated how students’ resistance capital activates their aspirational capital based on community injustices, however, other studies show that a similar activation process occurs when students directly experience the injustices placed on their families due to their cultural background (Aragon, 2018; Epsino, 2016).

The notion of aspirational capital overlapping with familial, social and resistance capital is not only witnessed in Yosso’s (2005) initial theoretical framework of CCW and qualitative studies, but also in the few quantitative studies which attempt to measure all six forms of capital in the CCW framework (Braun et. al, 2017; Dika, 2018; Hiramori et al., 2021; Sablan, 2019). For example, in Braun et al.’s study, aspirational capital factored with the dominant form of social capital (noting it may have been difficult for the respondents to distinguish between the culturally-focused social capital and Bourdieu’s concept of social capital). Similar factoring issues occurred in Sablan’s (2019) study when attempting to measure aspirational capital as it items cross-loaded and loaded onto multiple factors. Hiramori et al.’s (2021) study more carefully conceptualized the dimensions of aspirational capital as their analyses suggested aspirational capital consisted of three sub-dimensions: external-aspirational capital, internal-aspirational capital, and resistant-aspirational capital. Given that quantitative research on CCW is nascent and the literature demonstrates difficulty in effectively measuring AC, additional research is needed to better understand and tap into this latent construct.

Purpose of the Study

In order to contribute to the understanding of the CCW, the purpose of this study was to develop and validate a scale measuring AC. Paired with the CCW framework, the following research questions guided this study to understand how to measure aspirational capital within underrepresented and underserved students as well as explore the factors that promote this capital.

1. What are the underlying dimensions of aspirational capital?
2. How reliable of a measure is the aspirational capital scale for adolescent students who attend an afterschool community-based organization (CBO) education program?
3. Is there a positive correlation between high levels of aspirational capital and high levels of positive interpersonal adult relationships?

Summary

This chapter introduced and described the current study, reviewed relevant literature pertaining to the CCW framework and aspirational capital for underserved and underrepresented students, and described the purpose and the importance of the study. In order to encourage educational institutions to promote and focus on student cultural capital rather than focusing on dominant forms of capital, developing and validating a scale measuring aspirational capital can be a step in the direction for creating culturally relevant instruments institutions and programs can utilize to understand if they are building, sustaining, and maintaining student aspirations despite current barriers and challenges.

CHAPTER 2

METHOD

The purpose for this proposed study were twofold: 1) to understand the dimensions and further build upon the theoretical structure of aspirational capital; and 2) to develop a reliable and valid scale measuring aspirational capital for education institutions and programs to utilize in efforts to better the lives of marginalized students. To develop a scale measuring aspirational capital, this study relied on the community cultural wealth (CCW) theoretical framework and Carpenter's (2018) scale development process. The scale development process included initial item creation from literature review, an expert panel review of items, cognitive interviews with participants, piloting the scale, and full administration of the final scale. Paired with the CCW framework, the following research questions guided this study to understand how to measure aspirational capital within underrepresented and underserved students and to explore the underlying dimensions of this capital:

RQ1: What are the underlying dimensions of aspirational capital?

RQ2: How reliable of a measure is the aspirational capital scale for adolescent students who attend an afterschool community-based organization (CBO) education program?

RQ3: Is there a positive correlation between high levels of aspirational capital and high levels of positive interpersonal adult relationships?

This chapter provides a detailed description of the development of the Aspirational Capital Scale (ACS), explains the scale development process, and describes the sample of students who participated in developing and validating the scale. Additionally, this chapter

details the rationale of the item creation, data collection procedure, an overview of the analyses, and the assessment of reliability and validity.

Research Design

Critical Quantitative (Crit Quant) Methodology

This study utilized the Critical Quantitative (CritQuant) methodological framework to carry out the development and validation of the aspirational capital scale. Crit Quant was conceived from the Critical Race Theory (CRT) framework aims to use quantitative data to uphold the following tenets of CRT in education research (Crawford et al., 2018; Gillborn et al., 2018): “theorize, examine, and challenge the ways in which race and racism implicitly and explicitly impact social structures, practices, and discourses” (Yosso, p. 70). Since the scholarship of CRT in the education field, scholars retort using quantitative methodologies for education-focused research and argue that qualitative methods are instead more suitable (DeCuir-Gunby & Walker-DeVose, 2013). However, CritQuant is increasingly being utilized within the quantitative research field that applies CRT to quantitative data, model, and analyses in order to prompt researchers and consumers to harness reflective practices and understand that quantitative data can be used to uphold racist policies, practices, and systems (Gillborn et al., 2018). Education research scholars have recently argued that quantitative methodologies can further bolster the goals of CRT and provide insights which complement the potential shortfalls of qualitative studies (Crawford et al., 2018; Gillborn et al., 2018; Sablan, 2019). In order to use quantitative methods and use statistics responsibly towards social equality, CritQuant outlines five principles: 1) the notion that racism is pervasive, 2) numbers are not neutral, 3) social categorization is not natural, 4) the importance of voice and insight, and 5) the overarching focus of social justice and equity (Crawford et al., 2018; Gillborn et al., 2018).

Since CCW stemmed from CRT, it is most appropriate to utilize a methodology that aligns with the CCW and CRT framework. Thus, the CritQuant methodological framework was used to carry out this study. In fact, two of the four current studies which sought to develop a quantitative scale to measure CCW employed a CritQuant methodological framework into their studies (Hiramori et al., 2021; Sablan 2019). Sablan (2019) argues that the necessary use of CritQuant methods has the potential to develop and validate culturally relevant measures, specifically through the use of measurement theory when using a relevant social justice lens. Sablan further argues that “counterstories can be incorporated into scale development, and validation techniques can refine asset-based theories” (2019. p. 186).

Specifically, this study took specific actions that align with the five CritQuant principles. For the first principle, the notion that racism is pervasive, the site selected for this study was purposefully selected as an organization which promotes students’ cultural identities instead of being used in a traditional educational institution (further details in the study participants section). Given that numbers are not neutral (second principle), an extensive review of qualitative literature on CCW and aspirational capital was conducted to better understand these psychological components. Thus, published qualitative research heavily influences the initial development of scale items. To safeguard against the unnaturalness of social categorization, care was taken when developing student demographic questions on the final survey. Specifically, questions were presented in an open-response format opposed to a closed-response to avoid further categorizing the students who participated. For the fourth principle (importance of voice and insight), in addition to cognitive interviews being conducted with students to receive their feedback on the scale, the leadership of the organization participating in this study was included in the research process. Lastly, to uphold the focus of social justice and equity, this study took the

form of a research-practice partnership with the organization and students. Furthermore, given that this study focused on supporting CBOs and underrepresented and underserved students, these groups were prioritized and the results will be presented to the organization's leadership and funders. On the notion that no research is objective, the following section presents my positionality as a researcher and how my personal experiences may shape how this study was conducted.

Researcher's Positionality

As an able-bodied cisgender woman born into a low SES Hispanic family, I have certain assumptions and perspectives that are brought into my research. Thus, it is important to recognize that my research is partial in that my background and identities impact the research questions I aim to answer, research methodology, and data interpretation. Currently, many of my visible and hidden identities provide me with privileges in the U.S., while other identities are marginalized. My identities as a White-passing, non-disabled woman with a high-level of formal education has allowed me to gain dominant-types of social capital to further my social elevation. My positionality is grounded within my early upbringing of navigating the world while living in a poor and abusive household as a child seeking refuge in education. It is my life's work to use my privileges to shine a light on marginalized communities within the education field to help elevate those who had similar upbringings to my own.

Following Secules et. al's (2019) orienting reflection questions of researcher positionality, I describe my position for each positionality dimension within the context of this study. Given my personal background, the majority of my research focuses on underserved and underrepresented populations in efforts to better support these communities. Thus, being the large reason why I chose not only this topic but also invited a CBO serving this student

population to participate in this study. My position deeply shapes my view of the world and, specifically, those within underserved communities as I feel closely tied to these communities not only within my own experiences but within the intergenerational experiences passed down in my family. My position also impacts what I observe as a researcher as I tend to be curious by notions that are undocumented and unsaid. I aim to understand why individuals, ideas, and groups may be missing from data at-large. Additionally, my position directly impacts my methodological choices as a trained quantitative methodologist. In recent years, quantitative training has started to bring more awareness to the biased practices of quantitative analysis but has a long history of advertent and inadvertent discrimination and inequality. While I aim to be reflective in my research practices, I disclose that I am limited in fully understanding my own hidden biases. While I strongly identify with this study's population, I recognize the dominant power I have as a researcher with high-level formal education with dominant-types of social capital. Given this dynamic, I simultaneously identify as both a group insider and outsider. In having the opportunity to partner with the participating CBO and students, I recognize the power and access I have and aim to protect students by following the standards and protocols of the CBO when interacting with the students. Lastly, given my dynamic position within this study, I plan on using the strictest means of preserving respondent confidentiality and anonymity. It was through this understanding and choice that no student identifying information is presented in this document nor for the participating CBO.

Study Participants

Within the CCW literature, CBOs tend to design programs that address education inequities within their local communities (Sampson et al., 2019) and, unlike traditional education institutions, are believed to combat dominant forms of social capital for underrepresented and

underserved students by promoting non-dominant forms of capital and student success (Ahn, 2010; Harris & Kiyama, 2015; Liou et al., 2009; Ramirez, 2021). Specifically, these program's use of culturally responsive practices for their students positively impact marginalized students' educational journeys (Baldridge, 2014; Harris & Kiyama, 2015; Sampson et al., 2019; Shiller, 2013; Wong, 2010). Given that aspirational capital and other forms of CCW capital are best examined in an environment that promotes and utilizes students' cultural identities, a CBO with a city-wide afterschool program was recruited and agreed to participate in this study. The CBO is in an urban city located in Central Texas with a large Hispanic population and services over 900 K-12 students through their after school and extracurricular programs. The organization has 2 different locations for their afterschool programs mainly located at public schools, one main afterschool program located on their own facility, and a variety of other extracurricular programs that meet at their main facility. Given that the majority of literature on aspirational capital and CCW focuses on high school and undergraduate populations, all 291 middle and high school students (grades 6-12) enrolled in the 3 after school programs across the city were invited to participate in this study after obtaining parent consent and student assent.

To provide a better profile of the student population at the CBO, the following demographics were obtained in the aggregate from the CBO. For the students enrolled in the CBO, approximately 49% are male and 51% are female. Approximately 80% of students are middle schoolers (grades 6-8) and 20% are in high school (9-12). In terms of ethnicity, 70% of students identified as Latino/Hispanic, 16% identified as Black/African American, 5% as Caucasian (non-Hispanic), 9% as Mixed Race, and less than 1% as Other. At the time of the study, 97% of all students enrolled at the CBO receive free/reduced lunch at their respective schools.

Scale Development

The scale development process for this study largely followed the steps outlined by Carpenter (2018). The information gathered from the literature review was used to generate an initial pool of items for the hypothesized conceptual dimensions comprising aspirational capital (see figure 2.1 for the hypothesized model based on the review of literature). After the item pool was generated (original item pool provided in appendix B), a panel of 4 experts in CCW reviewed the initial pool of scale items. The experts were sent an electronic form via Qualtrics to score each question from the initial item pool based on a 1-4 scale for each of the following components: 1) clarity of the item and 2) relevance of the item related to the construct and dimension. In addition, the form also had a section for the reviewer to provide open-ended responses to suggest item revisions. An example of the electronic form is provided in appendix C. The reviewers on the expert panel were compensated with a \$75 electronic Amazon gift card for their time and effort in participating in this study. Upon receiving expert feedback, the content validity index (CVI) was calculated (Rubio et al., 2003) to serve as one of the assessments for content validity (more information provided on the assessment of validity in the sections below), and appropriate item revisions were made. If item revisions were substantial or if clarification was needed based on the ratings or comments, the reviewers were contacted for clarification purposes.

In addition, cognitive interviews were conducted with two students enrolled in the after-school CBO program to ensure the revised items were understood by the population of interest. The two students were randomly selected (one in middle and one in high school) and were invited to participate in an hour-long cognitive interview for which they were compensated with a \$20 gift card for their time and effort. The cognitive interviewing process followed the

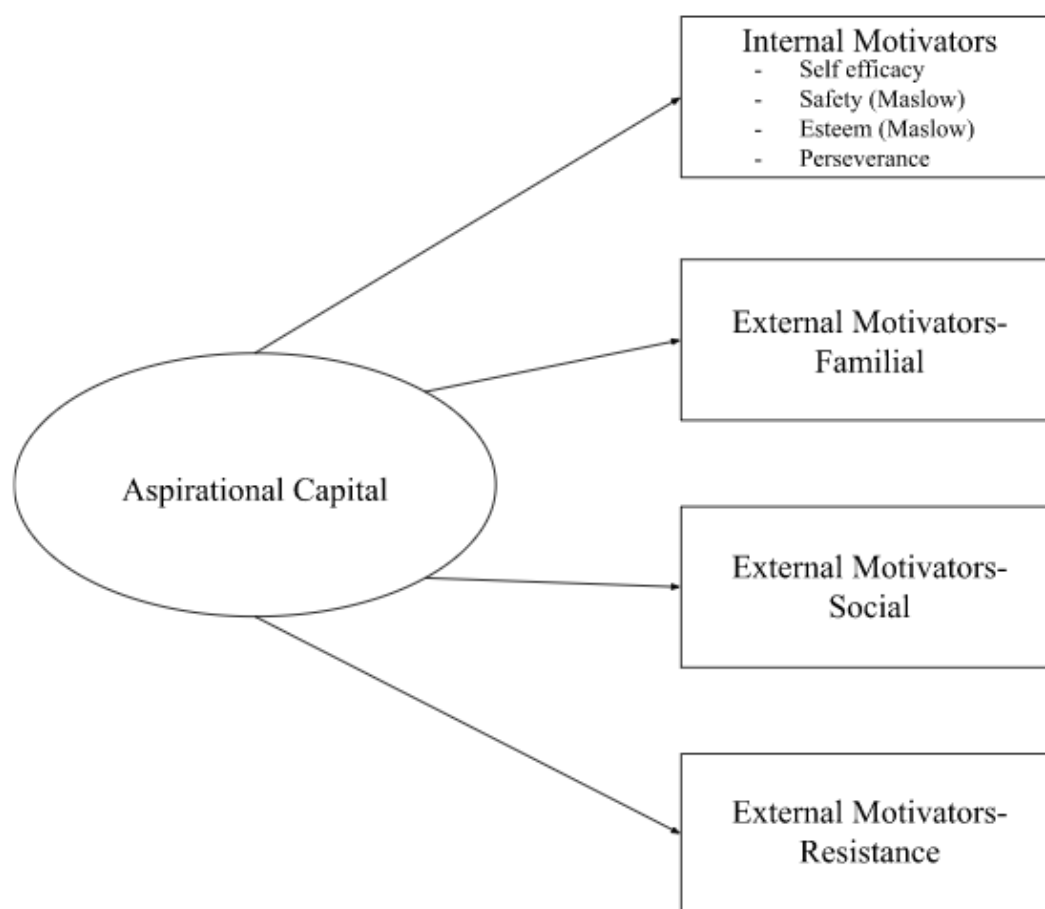


Figure 2.1. Hypothesized aspirational capital model

cognitive interview manual developed by Willis (1999). The process of cognitive interviewing is a widely used method in scale development as it examines if the survey respondents' interpretations of the scale items are consistent with the intended meaning of the items being asked, serving as another form of scale validity (Ryan et al., 2012). Out of the most common techniques used within cognitive interviewing, this study used verbal probing techniques rather than think-aloud protocols to assess respondent interpretations of the questions. Given the demographic nature of the participant population in this study, verbal probing was a more appropriate technique than think-aloud as it lessens the burden on the subjects and does not require the need to train the participants on the process of thinking aloud (Willis, 1999). The cognitive interviews were conducted as semi-structured interviews as scripted probes were developed prior to the interviews and included general probes to assess the participant's comprehension, memory recall, decision process, and response process of each item question (Willis, 1999) (cognitive interview protocol in appendix D). The researcher walked through the directions, questions, and question responses individually with each of the participants. The interviews were audio recorded, transcribed, and analyzed to determine how and which of the scale items required revision.

After the scale items were revised based on the cognitive interviews, the revised item pool was pilot tested with a group of approximately 60 students enrolled at the CBO. The group of students were randomly identified and were invited to participate in the pilot of the ACS. The scale was given to students in a paper format (pilot scale in appendix E). The data from the pilot scale was also used to further refine and revise scale items using item analysis from Classical Test Theory (CTT). Based on the results of the pilot scale, instructions, questions, formatting,

and administration processes were documented and revised prior to the administration of the final scale.

Data Collection Procedure

The data collection procedure for the expert review panel, cognitive interviews, and the pilot scale were described in the section above. For brevity and succinctness, this section will focus on the data collection procedure for the administration of the final ACS. During the data collection phase of this study, I worked closely with the organization's chief operations officer and chief data officer to ensure thorough and straightforward administration of the final ACS. Upon speaking with the chief operations officer, parent/guardian permission forms were sent home with all enrolled 6-12 grade students in English and Spanish four weeks prior to the survey administration window. The program coordinators at each of the locations and myself kept track of the students who returned signed parent/guardian permission forms to identify which students could participate in the full administration of the survey. Throughout this four week period, verbal reminders were given to parents/guardians to remind them to complete and return the permission form if they would like their student to participate in the study.

At the end of February 2023, a two-week survey window opened for the school programs to administer the full ACS to the students who received parent/guardian permission. The two-week window allowed the different locations to choose a date and time that works best for the programmatic schedules and were able to capture students who may have been absent on their original date of administration or those who return late permission forms. The surveys were confidential and anonymous, and no survey responses could be linked back to the students. In order to compensate the students for their time and efforts, students opted to be entered into a raffle drawing where 5 students were chosen randomly to win a \$20 online gift card. In efforts to

preserve anonymity and confidentiality, there was a raffle entry slip appended to the end of the survey which students could tear off from the full survey to write their name and location of their program and hand it to the program coordinator when they handed in the paper survey (final scale in appendix F). The program coordinators collected the completed paper surveys and raffle entries and placed them into two separate large envelopes. After all survey data were collected and processed, 5 randomly selected students were drawn from the raffle. The program coordinators at each of the locations were notified of winners and were given the gift cards to give to the selected winners.

Instrumentation

In development of the ACS, an adapted version of the Child and Adolescent Social Support Scale (CASSS) (Malecki et al., 2002) was used in this study as a means of demonstrating convergent validity (additional information on assessment of validity for the ACS is further detailed in the sections below). The CASSS is a widely used and studied instrument which measures adolescents' perceived social support from family, friends, and school through a 60-item self-reported questionnaire comprised of 12 questions per the following support domains: parent support, teacher, classmate, close friend, and school (Malecki et al., 2002). Over the past twenty years, the CASSS has performed well in reliability and validity in validation samples across grades 3-12 and gender (Malecki et al., 2014). Specifically, Cronbach's alpha across grades and gender for the entire scale is .97 and the range for the subscales demonstrates good to excellent markers of reliability (parents: $\alpha = .88-.96$; teachers: $\alpha = .90-.96$; classmates: $\alpha = .91-.96$; close friends: $\alpha = .96-.97$; school mates: $\alpha = .95-.96$) (Malecki et al., 2014). In addition, the CASSS performed well when evaluating test-retest reliability across the scale ($r = .772, p < .001$) and subscales (parents: $r = .447, p < .001$; teachers: $r = .475, p < .001$;

classmates: $r = .638, p < .001$; close friends: $r = .703, p < .001$; school mates: $r = .447, p < .547$) (Malecki et al., 2014). The CASSS also performed well when evaluating convergent validity with three other scales measuring behavioral and social-emotional traits for adolescents: Strengths and Difficulties Questionnaire (SDQ), Behavior Assessment Scale for Children, 2nd edition (BASC-2), and Social Support Scale for Children (SSSS).

Given that the literature on aspirational capital suggests to be highly related with positive interpersonal relationships (Free & Kriz, 2015; Liou et al., 2015; Martinez, 2012; Murrilo et al., 2017; Straubhaar, 2013), the teacher subscale (12 question items) of the CASSS was adapted and incorporated into the final administration of the aspirational capital scale to examine convergent validity. All items in the teacher subscale begin with “My teacher(s)...” and were replaced with “Program staff...” Out of the 12 subscale items, a total of 9 items were identified as relevant to programming and activities related to the CBO (for example, the item “tells me how well I do on a task” from the original subscale was not included as this item may not be appropriate for the environment at the CBO). Both the adapted and full teacher subscale of the CASSS can be found in appendix G and H. The CASSS teacher subscale contains questions such as “My teacher(s) cares about me” and “My teacher(s) treats me fairly” with answer choices on a Likert scale from 1-6 (Never to Always) to measure frequency and on a scale from 1-3 (Not important to Very important) to measure importance of these interpersonal experiences (Malecki et al., 2014), however, only frequency of support was measured as it was the most related measurement to the ACS. Per the Working Manual on the Development of the Child and Adolescent Social Support Scale (2000), authors note that it is acceptable to only use one or more of the CASSS subscales as long as total scores are adjusted accordingly (Malecki et al., 2014).

Analysis

Scale Development Analysis

Expert Panel. After the feedback from the expert review panel was obtained to rate the clarity and relevance of each scale item, the content validity index (CVI) was calculated for each item and the entire scale (Rubio et al., 2003) as a quantitative measure to establish content validity. The CVI is the most commonly used quantitative technique to measure content validity for a newly developed scale (Rodrigues et al., 2017; Shi et al., 2012). Any item below the threshold of a .80 CVI will be flagged and reviewed for revisions. In addition to the calculation of the CVI, any open-ended comments left by the experts for any scale items were reviewed and considered during the revision process. Scale items were revised using the CVI and the open-ended comments left by the expert review panel.

Cognitive Interviews. Using Willis' (1999) method for cognitive interviews, all interviews were audio recorded after obtaining respondent consent, transcribed, and qualitatively coded and analyzed to reveal dominant trends or themes across interviews that present repeated issues in the survey and "discoveries," which may only have been discovered in one interview but can greatly impact data quality. In revisiting the cognitive interview model, a large focus was placed on the following areas when analyzing interview data: question comprehension, memory recall, response motivation, question sensitivity, mapping respondent response to generated answer choices. Items and other survey components (directions, answer choices, item ordering, etc.) were revised appropriately based on the interview analysis.

Pilot Scale. After scale items were revised based on the outcomes of the expert panel review and cognitive interviews, the revised scale was piloted and pre-tested with a group of 60 students in the study sample to further identify areas of measurement error, misinterpretation of

questions, respondent burden, and question ordering issues (Ruel & Gillespie, 2016). First, skipped items in the pretest were evaluated to assess if the questions were confusing or unclear. Second, excessive selection of answer choices will be examined to understand item issues. Third, variation of responses across respondents and within respondents was evaluated for extreme responses (i.e., respondent selecting the most extreme or least extreme Likert answer choice for most if not all of the items) to understand if there were issues with the comprehension of the items. Lastly, technical issues of the paper surveys were assessed for issues or problems.

The data from the pilot scale was used to conduct an item analysis using Classical Test Theory (CTT) to examine the item endorsement and item discrimination index (Kline, 2005). The results from the item analysis were used to identify items that were highly endorsable, and the discrimination index using the item-test correlation determined if the items is measured what the scale intended to measure (Kline, 2005). The pilot survey included an open-ended question at the end of the survey asking participants if they had any comments or questions while completing the scale. These comments and the six areas listed above from the pretest were reviewed and taken into consideration prior to the final administration of the scale.

Final Scale Administration Analyses

This section details the analysis for the administration of the final revised version of the ACS. The data cleaning and processing will be discussed first then the analyses are broken down into three subsections that correspond with the research questions of this study.

Data cleaning and processing. After the scale data was collected, a codebook was created which includes variables names and labels and value labels for each scale item (Morrow, 2017). All paper surveys were numbered and the answers will be entered manually into a data entry sheet. Data quality checks were conducted to identify entries that are out of bounds

compared to their assigned value labels (e.g., detecting values outside of the Likert scale). Any out of bounds values were flagged and compared to the raw data form using the survey ID number. Additionally, all data entries were double-checked and checked backwards to ensure all data was hand-entered correctly. After survey data was entered, frequencies and basic descriptives were calculated across all variables to identify additional data entry errors (Morrow, 2017).

RQ1: What are the underlying dimensions of Aspirational Capital? In order to answer the first research question, an exploratory factor analysis (EFA) was conducted. The following EFA data quality checks were examined prior to conducting the EFA: adequate sample size, missing data, normality, singularity, and factorability. There are different sample size recommendations within the psychometric literature including a criteria scale (100 cases are considered poor, 200 fair, 300 good, and 500 or more is very good) (Comrey & Lee, 1992), subjects-to-variables ratio (STV) (Beavers et al., 2013), and when factors with four or more items with loadings of .60 and higher, the sample size is irrelevant (Beavers et al., 2013) (which will be relevant to this study as the population size of the CBO is 300). Given the amount of missing data was permissible in the sample, missing data was treated using full-information maximum likelihood (Enders, 2010; Weaver & Maxwell, 2014). Based on the research question of examining the underlying latent factors of aspirational capital, a maximum likelihood approach was used during the factor extraction process. Since multivariate normality is a prior assumption for the maximum likelihood extraction method (Zygmunt & Smith, 2014), multivariate normality was checked (Kahn, 2006; Tabachnick & Fidell, 2018). Additionally, correlations between the factors were assessed to ensure that extreme multicollinearity and singularity among the variables were not present. Lastly, the factorability of the sample data was

evaluated using the determinant of matrix, Bartlett's test, and Kaiser-Meyer Olkin's Test of Sampling Adequacy (KMO) (Beavers et al., 2013).

After the assumptions to conduct an EFA were evaluated, an EFA with a principal axis extraction and oblique rotation will be used to explore the factor structure of ACS. Modifications to the model were made until simple structure was achieved (Beavers et al., 2013) through an iterative process examining factor loadings (Comrey & Lee, 1992), item cross-loadings (Tabachnick & Fidell, 2013), communalities (Tabachnick & Fidell, 2013), and Hoffman's index (i.e., item complexity) (Garson, 2022). Model fit of the final solution was examined using the Root Mean Square Error Approximation (RMSEA). Additionally, a sensitivity analysis was conducted to compare the final model solution to another model to determine the robustness of the final model.

RQ2: How reliable of a measure is the ACS for adolescent students who attend an afterschool CBO education program? To answer the second research question, Cronbach's alpha was calculated for the whole scale and the sub-dimensions revealed from the EFA in order to assess the reliability of the data collected from the ACS in this study. Additionally, other reliability statistics were calculated to examine the quality of each item contributing to the reliability of the scale: inter-item correlations, alpha and scale statistics if-item-deleted, and Omega's McDonald given that factor loadings were not tau-equivalent.

RQ3: Is there a positive correlation between high levels of aspirational capital and high levels of positive mentorship? The final research question was answered by using Pearson's correlation to investigate if the ACS demonstrated adequate convergent validity with the adapted CASSS teacher subscale given that the literature on aspirational capital is suggested to be highly related with positive adult interpersonal relationships (Free & Kriz, 2015; Liou et al., 2015;

Martinez, 2012; Murrilo et al., 2017; Straubhaar, 2013). Swank and Mullen (2017) note the following guidelines for the validity coefficients: correlations greater than .50 are very high, .40 - .49 is high, .21 - .40 is moderate and acceptable, and less than .20 is considered low and unacceptable. For the purpose of demonstrating convergent validity between the ACS and the CASSS teacher subscale, correlation coefficient greater than .21 was considered acceptable.

Summary

This chapter presented and described the methods for developing and validating an instrument designed to measure aspirational capital using a CritQuant methodology. The instrument development process relied on Carpenter's (2018) iterative scale development process and included an expert review panel, cognitive interviews, a pilot scale, and the administration of the final scale. Grades 6-12 students attending a CBO in an urban city located in central Texas were invited to participate in this study. The paper surveys were administered at different locations of the organization and students had the opportunity to enter into a raffle to be compensated for their participation. In order to answer the three research questions, an EFA was conducted to understand the dimensions of aspirational capital and reliability and validity coefficients were calculated using Cronbach's alpha and McDonald's Omega, and Pearson's correlation was used to evaluate convergent validity between the adapted CASSS teacher subscale and the ACS.

CHAPTER 3

RESULTS

Expert Panel

The first data collection phase of this study involved collecting data from an expert review panel. A total of four experts agreed to participate on the expert review panel and were asked to rate the clarity and representativeness of the initial pool of items ($n = 44$) for the aspirational capital scale (ACS). All responses were collected using a Qualtrics survey. For each of the 44 items, experts were asked to rate how representative the item was of aspirational capital using a 4-point scale (1 = Item is not representative, 2 = item needs major revisions to be representative; 3 = item needs minor revisions to be representative; 4 = item is representative) and to rate the clarity of each item using a 4-point scale (1 = item is not clear, 2 = item needs major revisions to be clear, 3 = item needs minor revisions to be clear, 4 = item is clear). The experts were also presented with an open-ended text box to include additional comments regarding revisions for the scale items reviewed. The experts were also invited to review and provide feedback on different response scales to use for the ACS noting that the scale is intended to be given to students between the ages of 11-18 years old. The survey used for the expert review panel is included in appendix C.

The data collected from the expert review panel was assessed and cleaned prior to conducting the data analysis. The missing data analysis revealed that two experts inadvertently left several items missing when asked to rate item representativeness and clarity. These experts were contacted and asked to complete the missing data fields. The responses to these missing data fields were added to the data file and another missing data analysis was conducted to ensure all data fields were complete prior to moving onto the analysis.

After the data were cleaned, the CVI was calculated separately for the representativeness and clarity for each item ($n = 88$) by the experts. Any item with a CVI below .80 for its representativeness or clarity rating was flagged for review (Rodrigues et al., 2017; Rubio et al., 2003; Shi et al., 2012). CVI was calculated by summing the number of experts who rated an item as a three or four then dividing the sum by the total number of experts (Rubio et al., 2003). Of the 44 items rated for its representativeness of aspirational capital, 14 of these items fell below the .80 CVI threshold (13 items with a CVI of .75 and 1 item with a CVI of .50). Similarly, of the 44 items rated for clarity, 14 of these items fell below the .80 CVI threshold (12 items with a CVI of .75 and 2 items with a CVI of .50). Figures 3.1 and 3.2 illustrate the items below the .80 CVI threshold based on representativeness and clarity. Figures 3.3 and 3.4 illustrate all CVI scores for all items based on representativeness and clarity. Seven of the forty-four items had CVIs below .80 for both their representativeness and clarity indicating the need for a scrupulous review.

In addition to calculating the CVIs for the representativeness and clarity for each of the 44 items, the open-ended responses provided by the expert reviewers were also assessed to improve scale items. The open-ended responses were compiled into a document with the items that had a CVI below .80 to help inform the revision process. Scale items that were flagged as problematic based on CVI criteria and open-ended responses were further reviewed and item revisions or deletions were notated and justified based on the results from the expert panel and discussions between the research team. Major revisions from the cognitive interviews are outlined in table 3.1 below. Further minor revisions were made to items to improve item parsimony, grammar, and length in efforts to reduce the cognitive demand from the student population, including the addition of question stems for certain items to increase item readability

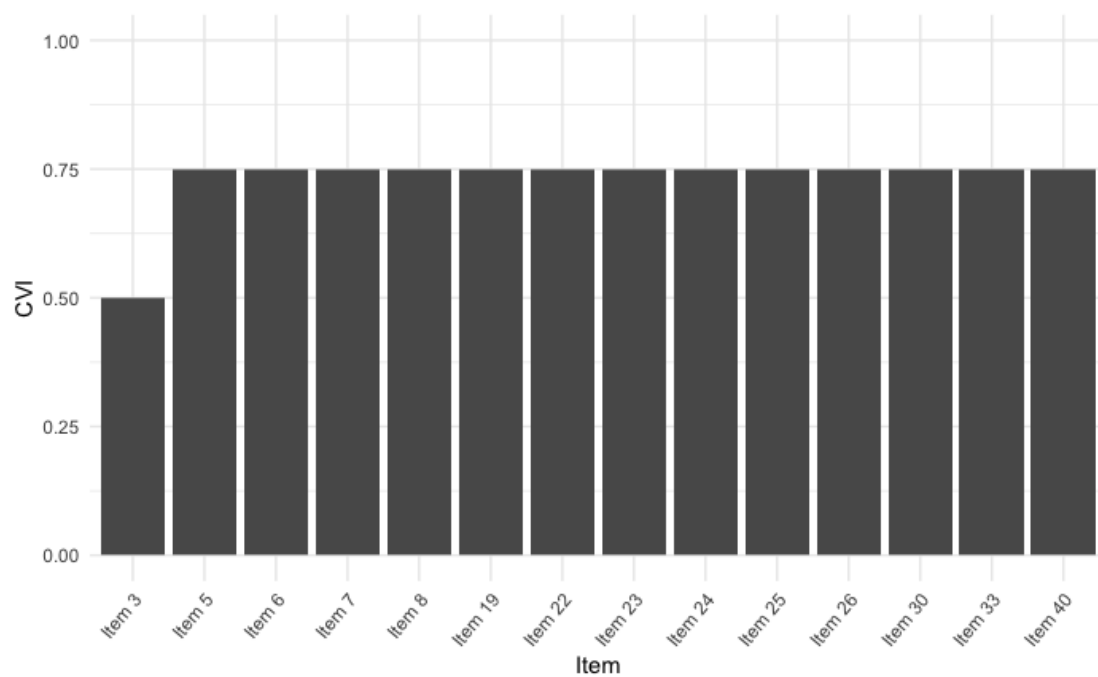


Figure 3.1. Item Representativeness CVI < .80

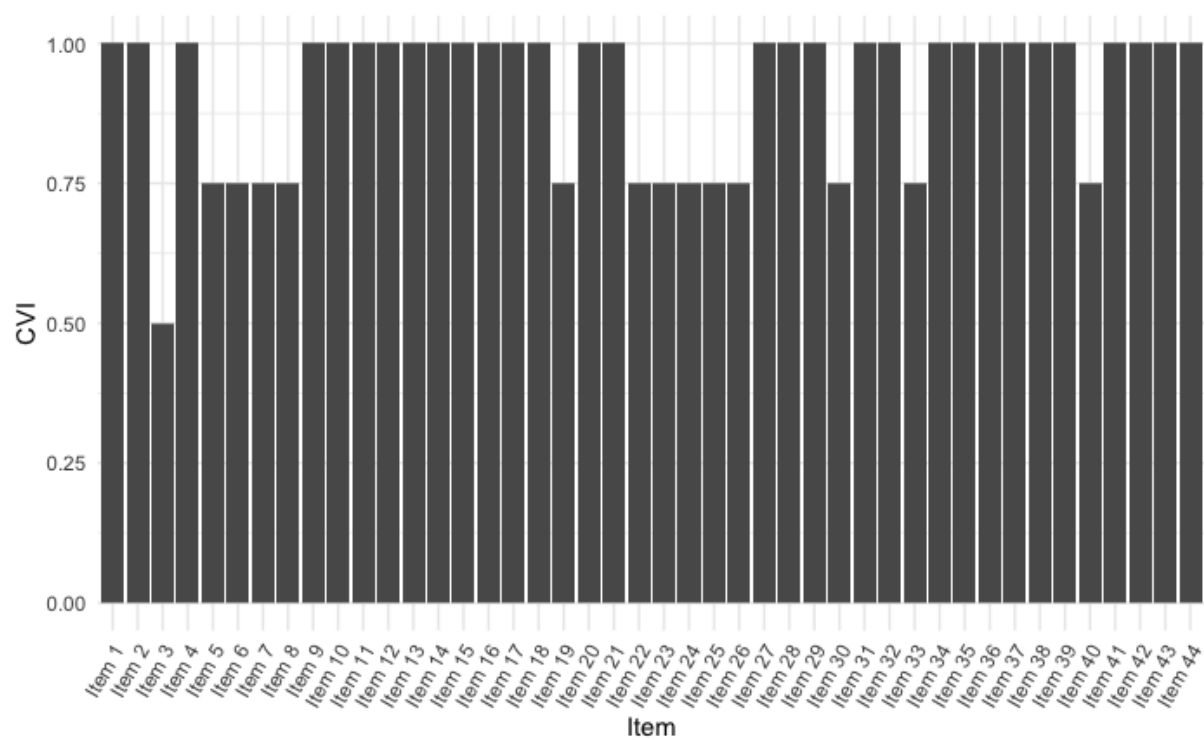


Figure 3.2. All Item Representativeness CVI Scores

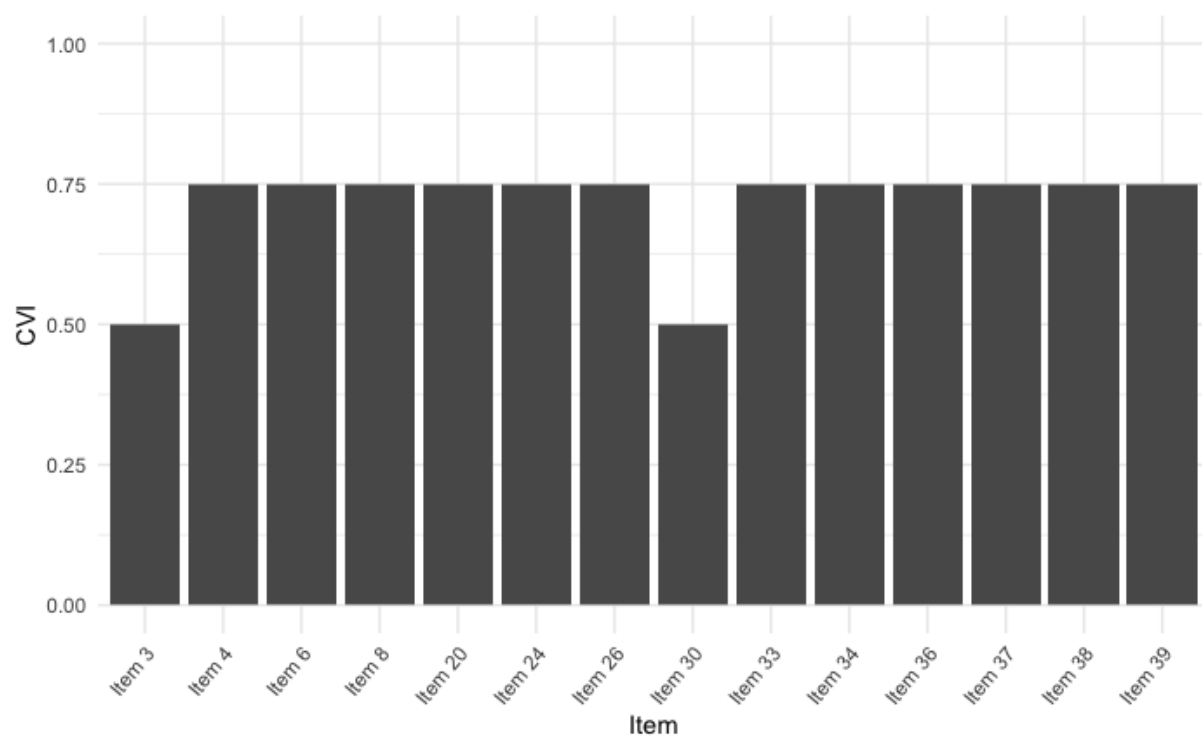


Figure 3.3. Item Clarity CVI < .80

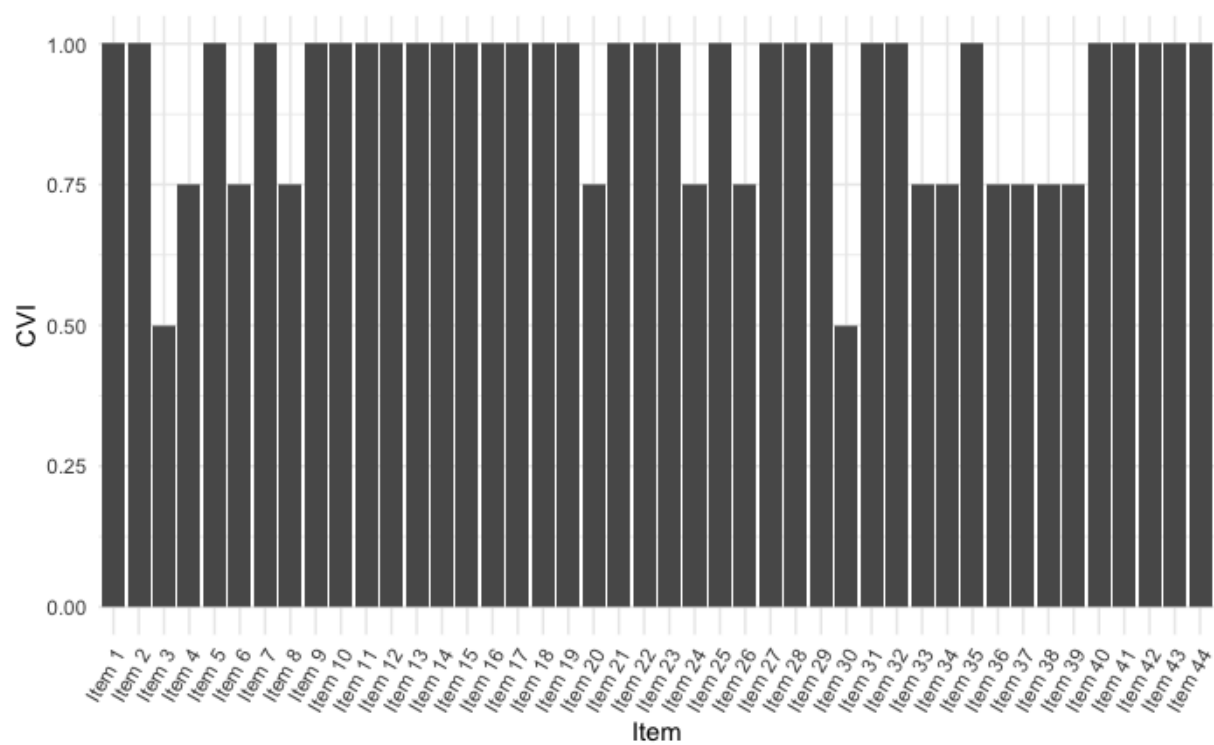


Figure 3.4. All Item Clarity CVI Scores

Table 3.1 Problematic items for expert review panel

Scale Item/Component	Representativeness Issue	Clarity Issue	Revised Item/Component and Justification
Item 3: “I consider myself an ambitious person”	.50 CVI An expert was worried that students will not understand the word “ambitious”	.50 CVI	Item removed. Reason: Items 1, 4, 6 capture this sentiment better. Will test during cognitive interviews to address expert concern.
Item 4: “I maintain my hopes for the future, even when confronted with barriers”	N/A	.75 CVI An expert was concerned that middle school students will not understand the word “confronted”	Revised: “Even when life is difficult... I maintain my hopes for the future” Reason: Revised the wording to be more readable. Question stems were added to the revised scale (e.g., even when my life is difficult)
Item 5: “My confidence in my abilities encourages me to chase my goals”	.75 CVI One expert suggested revising the item into an “I” statement. Two experts wonder what is meant by saying “abilities”. Intellectual abilities, social abilities?	N/A	Revised: “I am confident in my abilities to pursue my goals” Reason: Turning item into an “I” statement was suggested by an expert in the open-ended responses. The word “abilities” was retained for respondent interpretation.
Item 6: “I stay motivated to chase my goals despite barriers”	.75 CVI Research team thought item sounded similar to item 16: “I motivate myself to chase future goals”	.75 CVI	Item removed. Reason: Item deleted given similarity to item 16.

Table 3.1 Continued

Item 7: “I maintain a positive attitude for the future despite challenges”	.75 CVI Originally revised to “I am hopeful for the future despite challenges”	N/A	Item removed. Reason: The new revision is similar to item 2. However, this item will be included as a verbal probe during the cognitive interviews to understand if “maintaining a positive attitude” is the same as being “hopeful”
Item 8: “I am smart enough to chase my goals”	.75 CVI An expert suggested this might tap into academic determination. They suspect students have high aspirations regardless of their perceptions of their intellectual abilities	.75 CVI	Item removed. Reason: Item 9 “my personal strengths allow me to chase my goals” gets at the idea of self-efficacy and academic determination better than saying “I am smart enough” or “I am capable enough”. Item 9 has high CVI.
Item 19: “My siblings inspired me to chase future goals”	.75 CVI An expert noted that students may not have siblings. Will not distinguishing between older/younger siblings be an issue?	N/A	Revised: “My family inspires me to chase future goals” Student may not have siblings
Item 20: “I will chase my goals to honor the sacrifices my family has made”	N/A	.75 CVI An expert was worried that students will not know the meaning of “honor the sacrifices”	Item retained. Reason: Will test during cognitive interviews.

Table 3.1 Continued

Item 22: “I will chase my goals to support my family”	.75 CVI An expert wondered how students would interpret “support”. Might be different based on gender norms	N/A	No revision. Investigate during cognitive interviews.
Item 24: “I will chase my goals so I can make a difference in society”	N/A	.75 CVI	Revised: “I will chase my goals so I can make a difference in the world” Reason: Revised the wording to be more readable.
Item 26: “I will chase my goals to help those like me”	.75 CVI	.75 CVI An expert suggested being specific so students don't have to guess what “those like me” means.	Item removed. Reason: Items 34, 36, 37 better get at this idea (e.g., To show people with similar cultural backgrounds can succeed). Otherwise, being specific may make the item too long.
Item 30: “Seeing successful people with similar backgrounds inspires me to chase my goals”	.75 CVI	.50 CVI	Revised: “Successful people with similar backgrounds inspires me to chase my goals” Reason: Revised the wording to be more readable
Item 33: “I need to chase my goals to be a role model for others with similar backgrounds”	.75 CVI An expert thought this aligns more with social capital than resistance. Will test in EFA.	.75 CVI An expert noted to be more specific by what “similar backgrounds” means	Revised: “I will chase my goals to be a role model for others with similar backgrounds” Reason: Improved readability. Question stems were added to certain items (e.g., I will chase my goals...). Will test student understanding of “similar backgrounds” in interviews.

Table 3.1 Continued

Item 34: “I will chase my goals to help combat stereotypes for people with similar backgrounds”	N/A	.75 CVI One expert noted “stereotypes” might be interpreted negatively. Another expert appreciated this question and use of stereotypes. Another expert noted to be more specific by what “similar backgrounds” means. One expert was concerned if students will understand the word “stereotypes”	Item retained. Check understanding of these concerns in cognitive interviews.
Item 36: “I will chase my goals to prove people like me are capable of doing so”	N/A	.75 CVI	Revised: “I will chase my goals to show people with similar cultural backgrounds can succeed” Reason: Addresses experts’ feedback of being more specific instead of saying “like me.”
Item 37: “I will chase my goals to represent people like me in society”	N/A	.75 CVI	Revised: “I will chase my goals... to represent people from my culture in society” Reason: Addresses experts’ feedback of being more specific instead of saying “like me”
Item 38: “I will chase my goals to address the inequities in my community”	N/A	.75 CVI An expert was concerned if middle school students will know the meaning of “inequity”	Item retained. Check understanding in cognitive interviews

Table 3.1 Continued

Item 39: “I need to achieve my educational goals to prove people from my community can be educated”	N/A	.75 CVI Expert suggested using “Succeed educationally”	Revised: “I will chase my goals... to show people from my community can succeed educationally” Reason: Expert suggested better language. Question stem added to this item.
Item 44: “I need to achieve my career goals to prove people from my community can have a good job”	.75 CVI An expert asked “what does “good job” mean? High earning? Stability?”	N/A	Revised: “I will chase my career goals to show people from my community can have a good job” Reason: Revised the wording to be more readable. Will test expert concern in cognitive interviews.

Figure 3.5 below shows a brief example of the inclusion of question stems in the revised scale.

Lastly, three of the four experts selected response scales which included a neutral point. One expert was hesitant to include a neutral item and others seemed to be fine with the inclusion.

Based on the research for including a neutral option for the age of this student demographic (Borgers & Hox, 2000; Borgers et al., 2004; Chambers & Johnston, 2002; Fuchs, 2005; Marci et al., 2020) and the theory of measuring latent traits (Berka, 1983; El-Den, 2020; Furr, 2008; Robitzsch, 2020; Traub, 1981), a five-point Likert scale (strongly agree, agree, neutral, disagree, strongly disagree) will be tested during the cognitive interviews.

Cognitive Interviews

The second data collection phase of this study included conducting individual semi-structured cognitive interviews with two students (one middle school and one high school student) from the participating community-based organization (CBO). Based on the results of the expert panel, the ACS was revised in order to be tested during the cognitive interviews. The structure of the cognitive interview protocol (included in appendix D) was based on the revised items for the ACS which included student consent, directions, the revised 39 items, and the response scale (5-point Likert scale). Probing techniques were used for each of the 39-scale items to either test item comprehension by using interpretation, paraphrasing, recall, specific, general probes, or a combination of these probes (Willis, 1999). This process included the clarification for any items that were flagged as being potentially problematic during the expert panel phase. Using Willis' 1999 Cognitive Interviewing Guide, each component discussed during the interviews was analyzed based on the comprehension of the question, question recall (i.e., information respondent needs in order to recall to answer the question), decision process (i.e., time spent on

Even when life is difficult...

- 1) I believe my dreams for my future are possible
- 2) I am hopeful for my future

Figure 3.5. Example of question stems for items

each item), and response process (i.e., ability to match answers with the given 5-point response scale).

Cognitive Interview Results

The responses from each of the participants (one middle and one high school student) were compiled into a document for each tested scale item and the respective probing questions to identify item issues. The data from the interviews were thoroughly reviewed based on item comprehension, decision process, and response process. Item comprehension was further checked using question probes. Nearly all scale items had a question probe asking “what does question XX mean to you?” or “can you put that into your own words?” Student responses were used to revise item wording based on the language they used if it improved item clarity for this population. Student decision process was evaluated based on body language (e.g., pausing, thinking), time spent between reading and answering the question, and time spent discussing the item with the interviewer. Items that required a higher cognitive load from the students in evaluating the decision process appeared to be linked to poor item comprehension. Lastly, both students were able to match their answers with the given 5-point Likert scale (Strongly agree, agree, neutral, disagree, strongly disagree). It should be noted that the high school student was the only one who used the “Neutral” response option during the interview. However, no students indicated that they did not know or that the item was not applicable.

Scale items that were deemed to be problematic based on these criteria were further reviewed and item revisions or deletions were notated and justified based on the results from the interviews and discussions between the research team. The compiled document from the cognitive interview results can be found in appendix D which outlines the interview results and revision decisions. Major revisions from the cognitive interviews are outlined in tables 3.2 – 3.5

Table 3.2 Internal motivation items

Scale Item/Component	Issue	Revised Item/Component and Justification
Item stem format (e.g., Even when life is difficult... 1. I believe my dreams for my future are possible)	Participants unintentionally skipped the item stem “even when life is difficult).	Changed survey format to draw more attention to the question stem so it is not skipped. See figure 3.5 of the original question stem format and see figure 3.6 for the revised question stem format.
Item 8: “Even when life is difficult... Having a good career encourages me to chase future goals”	Students used the word “job” instead of career when responding to a probe question.	Revised item: Even when life is difficult... Having a good job encourages me to chase my goals Reason: Align question wording to respondent wording for better comprehension
Item 9: “Even when life is difficult... Not having to worry about money encourages me to chase future goals”	One participant comprehended the item differently than intended due to item wording.	Revised item: Having enough money encourages me to chase future goals. Reason: Improve item comprehension and clarity
Item 12: Even when life is difficult... I motivate myself to chase future goals	One participant did not understand the word “motivate.” Results from expert review indicated item 12 and item 4 might be the same item but worded differently.	Item 12 removed. Participants noted that item 12 is the same as item 4, but item 4 is easier to understand.

Table 3.3 Familial Motivation Items

Scale Item/Component	Issue	Revised Item/Component and Justification
Item 16: I will chase my goals... to honor the sacrifices my family made”	One participant did not understand this question. The other participant understood the sentiment of the question but had difficulty explaining in own words.	Revised item: I will chase my goals to achieve the things my family has never achieved. Reason: Improve item comprehension and clarity

Table 3.4 Social motivation items

Scale Item/Component	Issue	Revised Item/Component and Justification
Item 19: I will chase my goals... so I can help my community	One participant did not know what it meant to help their community. The other participant understood this as helping their environment.	Revised item: I will chase my goals... so I can help people in my community. Reason: Improve item comprehension and clarity
Item 25: Successful people with similar cultural backgrounds inspires me to chase my goals	One student struggled with the phrase “cultural background.” The other participant rephrased this question by saying “people like me.”	Revised item: Successful people like me inspire me to chase my goals Reason: Improve item comprehension and clarity

Table 3.5 Resistant motivation items

Scale Item/Component	Issue	Revised Item/Component and Justification
Item 28: I will chase my goals... To be a role model for others with similar cultural backgrounds	Concerned about the phrase “cultural background” from item 25. The other student revised this question by saying “it’s to kind of be like them, like I was in your shoes.”	Revised item: To be a role model for others like me. Reason: Improve item comprehension and clarity
Item 29: I will chase my goals... to help combat stereotypes for people with similar cultural backgrounds	Both students displayed difficulty in understanding this question. Specifically the word “combat” and the sentiment behind this item.	Revised item: I will chase my goals... to help fight stereotypes for people like me Reason: Improve item comprehension and clarity
Item 31: I will chase my goals... to show people with similar cultural backgrounds can succeed	Concerned about the phrase “cultural background” from item 25. The other student revised this question by saying “even if you have a similar cultural background as me.”	Revised item: I will chase my goals... to show that people like me can succeed. Reason: Improve item comprehension and clarity
Item 32: I will chase my goals... to represent people from my culture in society	Concerned about the phrase “cultural background” from item 25. The first student noted that using the word “world” is easier to understand than “society.” The other student revised this question by saying “to represent people like Mexicans, Asians, or anybody.”	Revised item: I will chase my goals... to represent people like me in the world. Reason: Improve item comprehension and clarity
Item 33: I will chase my goals... to address inequities in my community	There was initial concern about the comprehension of the word “inequity”. Both students noted that the word “unfairness” would be easier to understand.	Revised item: I will chase my goals... to address things that are unfair in my community. Reason: Improve item comprehension and clarity

Table 3.5 Continued

Item 34: I will chase my goals... to show that people from my community can succeed educationally	Both students understood the question. However, one of the students rephrased the item to “show people from my community that you can succeed in school.”	Revised item: I will chase my goals... to show that people from my community can be successful in school. Reason: Improve item comprehension and clarity
Item 35: I will chase my goals... to show people from my community can have a good job	Both understood the question. However, the grammar from the original question was originally poor and one student noted it was a big concept to understand.	Revised item: I will chase my goals... to show that people from my community can have a good job. Reason: Improve item clarity
Item 36: I will chase my goals... to show people from my community can be successful	Both understood the question. Revised for grammar.	Revised item: I will chase my goals... to show that people from my community can be successful. Reason: Improve item clarity
Item 37: I will chase my goals... to combat stereotypes about my community	Both students struggled with this question. One student noted that the word “combat” was confusing. We decided that “fight” is a better word to use. It should be noted that students understood the meaning of “stereotypes” and provided appropriate examples of such.	Revised item: I will chase my goals... to fight stereotypes about my community. Reason: Improve item comprehension and clarity
Item 38: I will chase my goals... even when others think I can’t because of my ethnicity	Both students struggled in understanding the word “ethnicity.” After describing what ethnicity was in both interviews, students re-worded this question and said “people will bring you down because of your race.” We believe the word “race” would be a better word.	Revised item: I will chase my goals... even when others think I can’t because of my race/ethnicity. Reason: Improve item comprehension and clarity

Table 3.5 Continued

Item 39: I will chase my goals... even when others think I can't because of my culture	One of the students noted that this question was confusing to read at first. There were concerns around the word "culture" from earlier in the interviews since the interviewer explained what culture was. When asked what one student thought when thinking about their culture, they said, "Like hanging out with family and all that. Or getting together."	Revised item: I will chase my goals... even when others think I can't because of the way I live. Reason: Improve item comprehension and clarity
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below. Additionally, participants inadvertently skipped the item stems in the survey during the interviews so the survey format was revised to draw more attention to the item stems (figure 3.6 shows revised question stem format).

Further minor revisions were made to items to improve item parsimony, grammar, and length in efforts to reduce the cognitive demand from the student population. For example, any item with the phrase “future goals” (e.g., having a good job encourages me to chase future goals) was shortened to “goals” (e.g., having a good job encourages me to chase my goals). The removal of the word “future” was justified in that students always discussed goals in the future when asked what their goals were without asking what their future goals were. The removal of “future” was in an attempt to shorten the item to reduce cognitive demand and reduce fatigue. Lastly, for consistency in language across items, all items with the word “goals(s)” were revised to be “my goal(s)” for clarity's sake.

Cognitive Interview Themes

Several themes were identified while analyzing the cognitive interview data. Given the small sample size for the interviews, themes were identified if they appeared more than once across at least one of the interviews. The themes are as follows: issues with resistant motivation items (11/12 items), issues with students understanding items containing the word “culture”, students referring to future career goals, and students referencing financial stability.

Eleven of the twelve items developed to measure the hypothesized resistant motivation subdomain of aspirational capital demonstrated to be problematic when tested during the cognitive interviews. Students also had difficulty in understanding items ($n = 6$) with the word “culture” and “cultural background.” The majority of student responses throughout the interviews were framed around their future career goals and aspirations. For example, when

1. **Even when life is difficult...**
I believe my dreams for the future are possible
2. **Even when life is difficult...**
I am hopeful for my future
3. **Even when life is difficult...**
I maintain my hopes for the future

Figure 3.6. Example of the revised question stem format

students were asked what type of goals they thought about when they read question 4 (“I am confident I will chase my goal”) both students referenced their career goals (e.g., NFL player and photographer/engineer). Similarly, when students were asked what their personal strengths were that would allow them to achieve their goal, one student said, “I believe throwing. Like I have a good arm.” While they did not mention their aspirations of becoming a NFL player, their stated personal strength directly related to their career goal of becoming a professional football player. Lastly, financial stability was the final major theme that emerged from the cognitive interviews. One student in particular referenced helping others with their housing rent or being helped if they did not have the resources to pay for their housing rent in the future. When the student was asked to describe what question 9 meant to them (“Having enough money encourages me to chase future goals”) they responded by saying “cuz when I run out of money and can’t pay rent, I could maybe go back to my parent’s house so they could feed me for a bit, and then I get my money up and rent again.” Later in the interview when asked what question 18 meant to them (“I will chase my goals to support my family”) they responded with “to help them and all of that. Like if they need rent or anything like that.” Similarly, when they were asked what question 21 meant to them (“I will chase my goals so I can help my friends”), they responded by saying “if one of my friends needs help like they are behind on rent. I would lend them money.”

Pilot Scale

The third data collection phase of this study included 61 middle and high school students who were sampled from the CBO to participate in a pilot scale testing the revised items post cognitive interviews. The structure of the pilot scale (included in appendix E) was based on the revised items for the ACS which included student consent, directions, the revised 38 items, the response scale (5-point Likert scale), and three open-ended questions. The pilot surveys were

hand entered into a data file and double-checked to correct any data entry errors. After the data was entered and cleaned, the following were examined: missing data, variation of answer choice selection for each item (distractor analysis), and item endorsement and discrimination using CTT techniques (Kline, 2005; Meyer, 2014).

Pilot Scale Results

Out of the 61 students who participated, 18 were high school students (9th, 10th, 11th, 12th grade students) and 43 were middle school students (6th, 7th, 8th grade students). In response to the open-ended question, (*What is your gender?*), the majority of the students who participated in the pilot survey identified as male (54% male, 49% female, and one student who chose not to disclose their gender).

When examining missing data, approximately 1.77% of the pilot survey data were missing. However, it became evident during the data entry process that the answer selection bubbles for question 23 (*Successful people like me inspire me to chase my goals*) failed to print. While approximately a third of the students (38%) of the students created their own bubble to fill in their answer, 87% of the missing data came from question 23 alone. If question 23 is removed from the data set, approximately 0.26% of the pilot survey data is missing without any clear pattern of missingness (i.e., different students across different items). It should be noted that during the data entry process, there were four instances where students selected two answers for a single question (no pattern across students or items). These instances were treated as missing data.

In addition to examining missingness, the variation of answer choice selection for each item was examined (table 3.6). While many of the items on the pilot scale are easily endorsed,

Table 3.6 Proportion of response categories

	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
Item 1	3.28	1.64	14.75	32.79	47.54
Item 2	3.28	3.28	21.31	36.07	36.07
Item 3	1.64	3.28	22.95	34.43	37.70
Item 4	1.64	1.64	19.67	34.43	42.62
Item 5	1.64	4.92	16.39	37.70	37.70
Item 6	0.00	3.28	19.67	26.23	50.83
Item 7	0.00	3.28	14.75	42.62	37.70
Item 8	0.00	1.64	18.03	32.79	47.54
Item 9	3.28	4.92	32.79	22.95	36.07
Item 10	1.64	1.64	8.20	27.87	60.66
Item 11	0.00	4.92	9.84	29.51	55.74
Item 12	0.00	8.20	11.48	18.03	62.30
Item 13	1.64	3.28	19.67	32.79	42.62
Item 14	0.00	1.64	13.11	19.67	65.57
Item 15	3.28	4.92	16.39	24.59	50.82
Item 16	1.64	9.84	21.31	22.95	44.26
Item 17	0.00	3.28	8.20	19.67	68.85
Item 18	1.64	6.56	14.75	36.07	40.98
Item 19	1.64	4.92	26.23	22.95	44.26
Item 20	0.00	6.56	14.75	32.79	45.90
Item 21	1.64	9.84	26.23	21.31	39.34
Item 22	3.28	8.20	21.31	26.23	39.34
Item 23	1.64	1.64	8.20	8.20	26.23
Item 24	0.00	8.20	19.67	24.59	44.26
Item 25	3.28	8.20	18.03	29.51	40.98

Table 3.6 Continued

Item 26	1.64	6.56	29.51	26.23	36.07
Item 27	3.28	4.92	18.03	29.51	42.62
Item 28	0.00	4.92	29.51	24.59	40.98
Item 29	0.00	3.28	9.84	27.87	57.38
Item 30	0.00	1.64	8.20	31.15	59.02
Item 31	1.64	9.84	11.48	32.79	44.26
Item 32	1.64	9.84	21.31	22.95	44.26
Item 33	1.64	1.64	16.39	31.15	49.18
Item 34	0.00	1.64	9.84	32.79	55.74
Item 35	0.00	3.28	19.67	21.31	55.74
Item 36	0.00	8.20	26.23	18.03	47.54
Item 37	0.00	4.92	16.39	27.87	50.82
Item 38	0.00	3.28	14.75	24.59	57.30

over 60% of respondents selected ‘strongly agree’ for items 10, 12, 14, and 17, and between 50-60% of respondents selected ‘strongly agree’ for items 6, 11, 15, 29, 34, 35, 37, and 38. These item percentages are bolded in the ‘strongly agree’ column in table 3.6. It should also be noted that no respondents selected ‘strongly disagree’ for the following items: 6, 7, 8, 11, 12, 14, 17, 20, 24, 28, 29, 30, 24, 25, 36, 37, 38.

While high item endorsement is not automatically unfavorable, items with high endorsement should be further examined to understand if these items are adequately measuring students with low aspirational capital or if the students included in the pilot scale truly have high aspirational capital (Albano, 2018; Boateng, 2018).

Item endorsement and discrimination were also examined based on the pilot scale data. Table 3.7 displays the results from the item endorsement and discrimination analysis. As suggested by the proportion of response categories, the item endorsement and discrimination analysis shows that the distribution of the pilot data is negatively skewed with an inter-item correlation of 0.427 (suggesting that the items are homogenous with sufficient unique variance (Piedmont, 2014)) and Cronbach’s alpha of 0.964 (suggesting strong internal consistency (DeVon, 2007)). The item endorsement index column in Table 3.7 reflects the proportion of respondents who endorsed the item based on the item mean (Meyer, 2014). In other words, this index is the extent to which respondents endorsed the highest response option (strongly agree) based on the item mean.

The large majority of items display proper functioning when examining endorsement and discrimination except for item 9 which has a low discrimination index (0.003) (Wise, n.d.). This low discrimination index suggests this item cannot differentiate between students who have a higher mean rating of the total items on the pilot scale and those who have a lower mean rating.

Table 3.7 Item endorsement and discrimination analysis results

	Missing (%)	<i>M</i>	<i>SD</i>	Skew	Item Endorsement	Discrimination	α if deleted
Item 1	0.00	4.20	0.98	-1.40	0.84	0.528	0.964
Item 2	0.00	3.98	1.01	-0.98	0.80	0.566	0.964
Item 3	0.00	4.03	0.95	-0.79	0.81	0.615	0.963
Item 4	0.00	4.15	0.91	-0.99	0.83	0.598	0.964
Item 5	1.64	4.07	0.95	-0.98	0.81	0.492	0.964
Item 6	0.00	4.25	0.89	-0.81	0.85	0.686	0.963
Item 7	1.64	4.17	0.81	0.72	0.83	0.640	0.963
Item 8	0.00	4.26	0.81	0.72	0.85	0.717	0.963
Item 9	0.00	3.84	1.08	-0.56	0.77	0.033	0.967
Item 10	0.00	4.44	0.85	-1.86	0.89	0.658	0.963
Item 11	0.00	4.36	0.86	-1.27	0.87	0.675	0.963
Item 12	0.00	4.34	0.98	-1.30	0.87	0.583	0.964
Item 13	0.00	4.11	0.95	-0.96	0.82	0.586	0.964
Item 14	0.00	4.49	0.79	-1.35	0.90	0.598	0.964
Item 15	0.00	4.15	1.08	-1.21	0.83	0.701	0.963
Item 16	0.00	3.98	1.10	-0.74	0.80	0.804	0.962
Item 17	0.00	4.54	0.79	-1.73	0.91	0.621	0.963
Item 18	0.00	4.08	0.99	-1.03	0.82	0.779	0.963
Item 19	0.00	4.03	1.03	-0.73	0.81	0.795	0.962
Item 20	0.00	4.18	0.92	-0.90	0.84	0.635	0.963
Item 21	1.64	3.88	1.11	-0.54	0.78	0.692	0.963
Item 22	1.64	3.92	1.12	-0.79	0.78	0.857	0.962
Item 23	54.10	4.21	1.10	-1.35	0.84	0.696	0.963
Item 24	3.28	4.08	1.00	-0.70	0.82	0.675	0.963
Item 25	0.00	3.97	1.11	-0.92	0.79	0.623	0.964

Table 3.7 Continued

Item 26	0.00	3.89	1.03	-0.51	0.78	0.615	0.964
Item 27	1.64	4.05	1.06	-1.06	0.81	0.747	0.963
Item 28	0.00	4.02	0.96	-0.39	0.80	0.648	0.963
Item 29	1.64	4.42	0.81	-1.31	0.80	0.528	0.964
Item 30	0.00	4.48	0.72	-1.29	0.88	0.513	0.964
Item 31	0.00	4.08	1.05	-1.05	0.90	0.721	0.963
Item 32	0.00	3.98	1.10	-0.4	0.82	0.677	0.963
Item 33	0.00	4.25	0.91	-1.21	0.85	0.783	0.963
Item 34	0.00	4.43	0.74	-1.14	0.89	0.534	0.964
Item 35	0.00	4.30	0.90	-0.94	0.86	0.663	0.963
Item 36	0.00	4.05	1.04	-0.56	0.81	0.780	0.963
Item 37	0.00	4.25	0.91	-0.93	0.85	0.683	0.963
Item 38	0.00	4.36	0.86	-1.11	0.87	0.659	0.963

Note: Mean inter-item correlation = 0.427, Cronbach's α = 0.964

In other words, the item does a poor job of discriminating between students who, theoretically, have high aspirational capital and those who have low aspirational capital based on the pilot scale data. When examining the proportion of response categories, this item is one of six items with the highest proportion of students who endorsed “strongly disagree” and has the highest proportion of students who selected “neutral” out of all items. The discrimination analysis suggests that removing this item will increase internal consistency ($\alpha = .967$). Item 9 “having enough money encourages me to chase my goals” was also problematic during the cognitive interviews and there lies concerns that the item still was not refined well enough for students to understand the intent of the item being centered on the notion of financial security.

Given that item 9 performed poorly in the cognitive interviews and item analysis, item 9 was removed from being included in the final scale. In reviewing the items with high endorsement (items 6, 10, 11, 12, 15, 17, 29, 34, 35, 37, 38), item 6 (I am committed to chasing my goals) and item 11 (I will chase my goals) were both removed from being included in the final scale as they were similar to item 4 (I am confident that I will chase my goals) which performed better in terms of response variation. The similarity of wording and understanding of these two items were also tested and confirmed during the cognitive interviews. In order to examine response validity (Renner & DeLamater, 2016) between these three items to quantitatively assess the similarity of these items, the sum of the absolute difference between each pair (item 4 and item 6; item 4 and item 11) was calculated. All but two instances had a sum of less than 2 and the mean of the sum of absolute differences was .80 further suggesting the similarity between item 6 and item 11 with item 4. Thus providing additional evidence to remove items 6 and 11.

Item 10 (I will chase my goals by working hard) was retained for the final scale as item functioning performed well and there were no concerns during the cognitive interviews. Items 12, 14, 15 were all retained for the final scale as item functioning performed well, there were no concerns during the cognitive interviews (if anything, the sentiment behind these items were strongly affirmed in these interviews), and these items make up the majority of items pertaining to the theoretical subdomain of family motivation. Lastly, items 29, 34, 35, 37, 38 were all retained for the final scale for the same reasons items 12, 14, 15 were retained but instead pertain to the theoretical subdomain of resistance motivation.

Lastly, the open-ended comments from the pilot scale were analyzed. Out of the 61 completed surveys a total of 46 students left a response to the open-ended question *Is there anything else you would like to let us know?* Of these, 39 students left comments such as “No” or “NA.” Two students left comments that were not related to the content of the project (e.g., “MJ is the GOAT not Lebron”). Two students commented on their enjoyment of participating in the CBO programs (e.g., “I am thankful for being in [the] club”). The final three students who provided comments commented on their aspirations (see table 3.8 below).

Final Scale

The final data collection phase of this study included a total of 113 middle and high school students enrolled in the CBO after school clubs participated in the final survey effort testing the revised items post pilot scale. The structure of the final scale (included in appendix F) was based on the revised items for the ACS which included student consent, directions, the revised 35 items, the response scale (5-point Likert scale), 9 items from the adapted CASSS teacher subscale, and three open-ended questions.

Table 3.8 Student pilot survey open-ended responses

Student	Comment
Student 1	I'm going to be a tattoo artist!!!!
Student 2	That I will never give up
Student 3	I will succeed

Of the 113 students who participated, 31 (27%) were high school students (9th, 10th, 11th, 12th grade students), 81 (72%) were middle school students (6th, 7th, 8th grade students), and one student (approximately 1%) chose not to disclose their grade. The percentage of students who participated in this study closely represented the distribution of middle and high school students enrolled at the CBO (80% middle and 20% high school). In response to the open-ended question, (*What is your gender?*), the majority of the students who participated in the final scale identified as male (53% male, 43% female, and 4% chose not to disclose their gender). The distribution of students who completed the scale nearly mirrored the overall percentage of students enrolled at the CBO (49% male and 51% female).

The final surveys were hand entered into a data file and double-checked to correct any data entry errors. When examining missing data, approximately 1.90% of the final survey data were missing. Out of the 113 surveys received, 100 (88.5%) of the surveys were complete cases. Missing observations were also examined for each scale item and all items had less than 4% of missing data. There were no missing data patterns across students or items for the final scale. Similar to the pilot scale, there were 22 instances in the final scale where students selected two answers for a single question (13 of these instances were produced from one student survey, but there was no pattern across items). These instances were treated as missing data.

In addition to examining missingness, the variation of answer choice selection for each item was examined. While the distribution of response frequencies for the final scale were left-skewed, there were only two items with over 50% of respondents who selected “strongly agree”: item 11 (52%) item 14 (57%).

RQ1: What are the underlying dimensions of ACS?

In answering the first research question, an exploratory factor analysis (EFA) was conducted to determine the underlying dimensions of aspirational capital. Prior to conducting this analysis, EFA data quality checks were first examined.

EFA Assessment of Data Quality Testing. Adequate sample size was the first quality check tested prior to conducting the EFA. While there are varying sample sizes recommendation in conducting an EFA (Beavers et al., 2013), the sample size for this study does meet the following recommendations: 1) 51 more observations than the number of variables (Lawley & Maxwell, 1971) and 2) the sample size is irrelevant if factors have four or more items with loadings of .60 or higher (Beavers et al., 2013; Fabrigar et al., 1999; MacCallum et al., 2001). In order to examine the strength of the factor loadings, additional data quality checks were examined prior to conducting the EFA.

In order to determine the factorability of the data, a correlation matrix was generated using Pearson's correlation and full information maximum likelihood to account for missing data. Regardless of the Likert-scale used to capture responses, the use of Pearson's correlation rather than polychoric correlations was preferred in generating the matrix as it tends to yield more conservative correlations (Davis, 2021; Kiwanuka et al., 2022) if there are more than 3 response categories, equal distances are assumed between the response scale, and if the sample size used to generate the correlations are rather low (Bentler, 2006). The matrix was then examined to assess if linear combinations are present (determinant of matrix) and not a singular matrix (Beavers et al., 2013). Results showed that the determinant of the matrix did not equal zero which indicates that the matrix has linear combinations and is not a singular matrix. Next, Bartlett's Test was conducted to evaluate if the correlation matrix is factorable or not (e.g., not an

identity matrix). The test was statistically significant ($\chi^2(595) = 4314.574, p < .05$), suggesting the rejection of the null hypothesis that the correlation matrix is equal to an identity matrix (Beavers et al., 2013), thus further providing evidence that the matrix is factorable. Lastly, the Kaiser-Meyer Olkin's Test of Sampling Adequacy (KMO) was conducted to examine the degrees of common variance across items (Beavers et al., 2013). The KMO value for this test indicated a shared variance of 0.92 among items which is interpreted as 'Marvelous' (Friel, n.d). Given the results of these test assumptions, the factor analysis for this data was deemed suitable.

Factor Extraction Assessment. In order to assess the number of factors to extract, an initial factor analysis model using the maximum likelihood method without rotation was assessed using the following criteria: Kaiser's rule (common variance), parallel analysis, and the scree plot. Kaiser's criterion suggests four factors should be retained since their eigenvalues are close/greater than one (20.44, 1.88, 1.22, 0.92, respectively) (Beavers et al., 2013). These first four factors explained 58%, 5%, 3%, and 3% of the variance respectively which accounts for 70% of total variance explained. The parallel analysis is shown in figure 3.7 and suggests 3 factors to be retained (Kahn, 2006). However, the scree plot displayed in figure 3.8 suggests 3 factors to be retained as indicated by factors occurring before the bend in the "elbow" of the plot (Beavers et al., 2013). Given that these factor retention assessments recommend the retention of 3-4 factors, the model development for the EFA will begin by initially extracting four factors until a simple structure is achieved which aligns with the theoretical components of aspirational capital (Beavers et al., 2013; Kahn, 2006).

EFA Model 1: Four Factor Extraction. A solution for four factors was examined using a maximum likelihood extraction method (Kahn, 2006) with an oblique rotation using the oblimin method (Beavers et al., 2013). Items with factor loadings greater than $|\cdot 32|$ (Comrey & Lee,

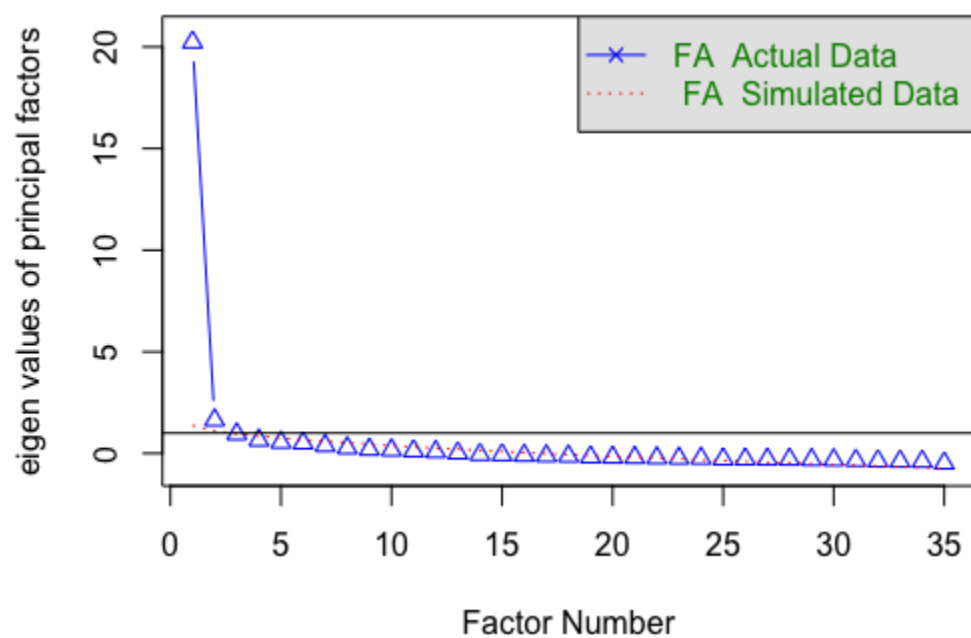


Figure 3.7. Parallel analysis plot

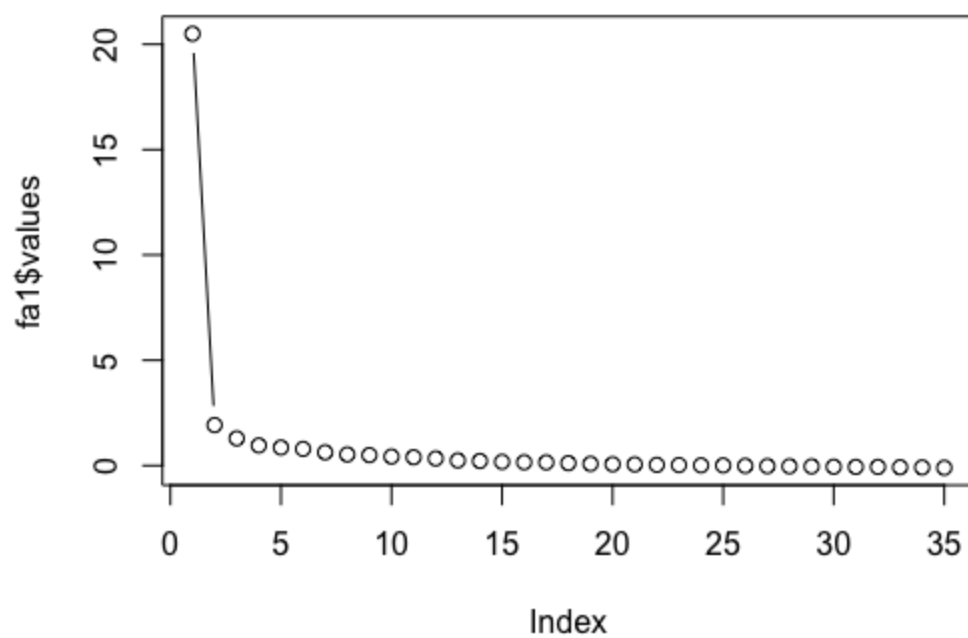


Figure 3.8. Scree plot

1992), communalities greater than $|.35|$ (Tabachnick & Fidell, 2013), cross loadings less than $|.2|$ (Tabachnick & Fidell, 2013), and with Hoffman's index (i.e., item complexity) less than 2.5 (Garson, 2022) were retained. During this process, a total of 3 items were removed due to high item complexity (items q21, q26, and q27). Table 3.9 shows the factor loadings and communalities for the items resulting in a final four factor model with factor loadings using an oblique rotation. In order to assess model fit, the Root Mean Square Error Approximation (RMSEA) was calculated by examining the fit between the observed covariance matrix and the model implied covariance matrix adjusting for model complexity (Kahn, 2006). The RMSEA for the final four factor model was 0.04 suggesting good model fit (Kahn, 2006). Lastly, the model residuals were examined using Shapiro-Wilk's test to assess multivariate normality and showed evidence of non-normality ($W = 0.95, p < .05$). While maximum-likelihood estimation assumes multivariate normality, ML methods are reasonably robust to such violations when the skewness is greater than $|2|$ and the kurtosis is greater than $|7|$ (Pienkowski, n.d.). The skewness and kurtosis for the four factor model residuals is .84 and 3.59, respectively. From the four factor solution, factor 1 accounted for 30% of the variance, factor 2 accounted for 17% of the variance, factor 3 accounted for 13% of the variance, and factor 4 accounted for 9% of the variance.

EFA Model 2: Three Factor Extraction. Given that different factor extraction criteria suggested the extraction of 3 and 4 factors, a three factor model was also assessed to be compared to the four factor solution. Similar to model 1 above, a three factor solution was examined using a maximum likelihood extraction method (Kahn, 2006) with an oblimin oblique rotation (Beavers et al., 2013). Using the same item retention criteria noted above, a total of 3 items were removed due to close cross loadings (q10, q27). Table 3.10 shows the factor loadings

Table 3.9 Model 1: Four factor model loadings and communalities

Items	Factor 1	Factor 2	Factor 3	Factor 4	h ²
To fight stereotypes about my community	.83				.73
To represent people like me in the world	.78				.67
To address things that are unfair in my community	.77				.67
Even when others think I can't because of the way I live	.77				.66
So I can help my friends	.77				.58
To show that people from my community can have a good job	.71				.78
So I can make a difference in the world	.71				.69
Even when others think I can't because of my race/ethnicity	.68				.71
So I can help the people in my community	.65				.57
To support my family	.64			.34	.63
To show that people from my community can be successful	.64				.73
To help fight stereotypes for people like me	.64				.66
To show that people from my community can be successful in school	.60				.68
To achieve the things my family has never achieved	.59				.45
To be a role model for others like me	.58				.65
To be a role model for my family members	.46				.60
Friends encourage me to chase my goals	.39				.49
Having a good education encourages me to chase my goals		.78			.80
I am hopeful for my future		.77			.84
I maintain my hopes for the future		.73			.74

Table 3.9 Continued

I believe my dreams for the future are possible		.70			.80
Having a good job encourages me to chase my goals		.68			.57
My personal strengths will allow me to my chase goals		.64			.69
I will chase my goals by working hard		.56			.75
I am confident that I will chase my goals		.43			.70
A mentor inspired me to chase my goals			.85		.82
A mentor encouraged me to chase my goals			.83		.88
A mentor supports me to chase my goals			.83		.88
Friends inspire me to chase my goals			.37		.44
My family encourages me to chase my goals				.86	.85
My family inspires me to chase my goals				.76	.72
My parent(s)/guardian(s) encourages me to chase my goals		.37		.57	.74

Note. Factor loadings <.32 are suppressed.

Table 3.10 Model 2: Three factor model loadings and communalities

Items	Factor 1	Factor 2	Factor 3	h ²
To fight stereotypes about my community	.85			.73
To address things that are unfair in my community	.84			.68
To represent people like me in the world	.81			.67
So I can help my friends	.80			.58
Even when others think I can't because of the way I live	.78			.66
So I can help the people in my community	.78			.55
Even when others think I can't because of my race/ethnicity	.77			.71
To support my family	.76			.57
To show that people from my community can have a good job	.74			.77
To show that people from my community can be successful in school	.69			.68
To show that people from my community can be successful	.68			.72
So I can make a difference in the world	.67			.67
To achieve the things my family has never achieved	.67			.44
To help fight stereotypes for people like me	.64			.65
To be a role model for others like me	.59			.64
Friends encourage me to chase my goals	.45			.49
To be a role model for my family members	.43			.60
Even when others think I can't	.36			.57
I believe my dreams for the future are possible		.89		.80
I am hopeful for my future		.87		.83
My personal strengths will allow me to my chase goals		.84		.68
Having a good education encourages me to chase my goals		.84		.77
I maintain my hopes for the future		.82		.73

Table 3.10 Continued

My parent(s)/guardian(s) encourages me to chase my goals		.70		.61
I will chase my goals by working hard		.68		.75
Having a good job encourages me to chase my goals		.68		.53
I am confident that I will chase my goals		.55		.70
My family encourages me to chase my goals		.55		.46
Successful people like me inspire me to chase my goals		.38		.63
A mentor inspired me to chase my goals			.80	.81
A mentor encouraged me to chase my goals			.80	.88
A mentor supports me to chase my goals			.79	.88
Friends inspire me to chase my goals			.34	.44

Note. Factor loadings <.32 are suppressed.

and communalities for items resulting in the final three factor model with factor loadings using an oblique rotation. The RMSEA for the final three factor model was 0.05 which suggests good model fit (Kahn, 2006). However, the RMSEA value for the four factor solution was 0.04 suggesting better model fit. Similar to the first model, model residuals using Shapiro-Wilk's test were examined to assess multivariate normality and showed evidence of non-normality ($W = 0.95, p < .05$). However, the skewness and kurtosis for the four factor model residuals is .83 and 3.03, respectively, suggesting reasonable non-normal residuals (Pienkowski, n.d.).

EFA Sensitivity Analysis. In comparing model 1 and model 2, a four factor solution (model 1) is the better model as suggested by theory (Kahn, 2006), simple structure (Beavers et al., 2013), model fit (Kahn, 2006), and communality values. In order to test the robustness of the four factor solution, a sensitivity analysis was conducted using regularized exploratory factor analysis which performs better in estimating latent constructs with small sample sizes (Jung, 2013). The regularized EFA was conducted with the correlation matrix used in model 1 (which includes the exclusion of items 21, 26, 27). The same item retention criteria used for the models above were used. No items were prompted for removal. Table 3.11 shows the factor loadings and communalities for the four factor model using an oblimin oblique rotation for the regularized EFA. The results from the regularized EFA reflect the same results as generalized exploratory factor analysis with the following exception: item 22 (Friends encourage me to chase my goals) loads more strongly onto factor 3 in the regularized EFA model while it loads more strongly onto factor 1 in the generalized exploratory factor analysis model. In addition, another sensitivity analysis was conducted using a principal axis method of factor extraction using a maximum likelihood estimation with a Promax rotation and yielded the same results as model 1.

Table 3.11 Model 3: Regularized EFA loadings and communalities

Items	Factor 1	Factor 2	Factor 3	Factor 4	h ²
Even when others think I can't because of the way I live	.83				.69
To address things that are unfair in my community	.81				.68
To fight stereotypes about my community	.78				.72
To represent people like me in the world	.76				.68
Even when others think I can't because of my race/ethnicity	.70				.71
So I can help my friends	.70				.60
To show that people from my community can have a good job	.69				.76
So I can make a difference in the world	.68				.69
To show that people from my community can be successful in school	.66				.69
To support my family	.62			.36	.64
To show that people from my community can be successful	.59				.72
To be a role model for others like me	.57				.67
So I can help the people in my community	.57				.59
To help fight stereotypes for people like me	.54				.68
To achieve the things my family has never achieved	.53				.45
To be a role model for my family members	.46				.62
Having a good education encourages me to chase my goals		.75			.78
I am hopeful for my future		.74			.82
I believe my dreams for the future are possible		.72			.80
I maintain my hopes for the future		.70			.72

Table 3.11 Continued

Having a good job encourages me to chase my goals		.61			.55
I am hopeful for my future		.74			.82
I believe my dreams for the future are possible		.72			.80
I maintain my hopes for the future		.70			.72
Having a good job encourages me to chase my goals		.61			.55
My personal strengths will allow me to my chase goals		.60			.68
I will chase my goals by working hard		.56			.76
I am confident that I will chase my goals		.43			.70
A mentor supports me to chase my goals			.78		.84
A mentor inspired me to chase my goals			.76		.75
A mentor encouraged me to chase my goals			.73		.81
Friends inspire me to chase my goals			.59		.53
Friends encourage me to chase my goals			.44		.54
My family encourages me to chase my goals				.76	.75
My family inspires me to chase my goals				.75	.71
My parent(s)/guardian(s) encourages me to chase my goals		.36		.58	.74

Note. Factor loadings <.32 are suppressed.

Given the congruence of results between model 1 and the regularized EFA model, model 1 is considered to be robust with the data used in this study and is considered the final model solution with the following factors: Equity Motivators (factor 1), Internal Motivators (factor 2), Social Motivators (factor 3), and Family Motivators (factor 4). There was a total of 32 items from the four factor solution for the AC scale.

RQ2: How reliable of a measure is the ACS for adolescent students who attend an afterschool CBO education program?

In answering the second research question, reliability statistics were calculated for the whole scale and the four underlying factors using Cronbach's coefficient. The overall alpha for the AC scale (32 items) demonstrated excellent internal consistency ($\alpha = .98$). The scale factors also demonstrated good and excellent internal consistency: $\alpha = .93$ for Equity Motivators (17 items), $\alpha = .95$ for Internal Motivators (8 items), $\alpha = .91$ for Social Motivators (4 items), and $\alpha = .89$ for Family Motivators (3 items) (Saidi & Siew, 2019). No substantial increases in alpha for any of the scales could have been achieved by eliminating more items.

Given that the factor items are not tau-equivalent, McDonald's omega was calculated for the whole scale as well as the four underlying factors (McNeish, 2018). The overall total Omega for the AC scale (32 items) demonstrated excellent internal consistency ($\omega_t = .98$). The scale factors also demonstrated excellent to adequate internal consistency when evaluating total omega: $\omega_t = .95$ for Equity Motivators (17 items), $\omega_t = .92$ for Internal Motivators (8 items), $\omega_t = .92$ for Social Motivators (4 items), and $\omega_t = .88$ for Family Motivators (3 items) (Najera, 2019).

Additionally, the mean inter-item correlations for the items on the scales was 0.57 providing evidence for adequate construct validity (DeVon et al., 2007). The descriptive statistics for the four ACS factors ($n = 113$) are provided in table 3.12.

RQ3: Is there a positive correlation between high levels of aspirational capital and high levels of positive interpersonal adult relationships?

In answering the final research question, convergent validity was assessed between adapted teacher subscale CASSS (9 items) and the Social Motivators (4 items) factor of the AC scale using Pearson's correlation. The results of the analysis indicated that student's scores for the adapted teacher subscale of the CASSS were positively correlated with their scores on Social Motivators domain on the AC scale ($r = .50$, $R^2 = .24$, $p < .001$). Additionally, the adapted teacher CASSS subscale was also positively correlated with the other underlying factors of the AC scale: Family Motivation ($r = .30$, $R^2 = .10$, $p < .001$), Equity Motivation ($r = .56$, $R^2 = .31$, $p < .001$), Internal Motivation ($r = .44$, $R^2 = .19$, $p < .001$). While all factors are significantly related to the scores on the adapted CASSS subscale, the Social Motivators and Equity Motivation domains have moderate and large practical significance (effect size), respectively (Cohen, 1988). The strong correlations and significance values between each factor and the CASSS adapted subscale, provided evidentiary support for the convergence of scores between the underlying dimensions of the AC scale and positive adult mentorship (Swank & Mullen, 2017).

In addition to evaluating convergent validity, discriminant validity was also assessed by evaluating the factor correlations. Pearson's correlation between the four factors can be found in table 3.13. As noted by Cheung and Wang (2017), discriminant validity is evidenced when correlations are less than .70 but are still moderate. These moderate correlations suggest that

Table 3.12 Descriptive statistics of the four ACS factors (n = 113)

	No. of items	<i>M</i>	<i>SD</i>	Cronbach's α	McDonald's ω_t
Equity Motivators	17	4.06	1.02	.93	.95
Internal Motivators	8	4.07	.98	.95	.92
Social Motivators	4	3.88	1.14	.91	.92
Family Motivators	3	4.25	.89	.89	.88

Table 3.13 Model 1 factor correlations

	Equity Motivation	Internal Motivation	Social Motivation	Family Motivation
Equity Motivation	–			
Internal Motivation	.62	–		
Social Motivation	.69	.58	–	
Family Motivation	.52	.52	.42	–

these factors are similar to each other (subdomains of AC) and are distinctly measuring related but different subdomains.

CHAPTER 4

DISCUSSION

The purpose of the present study was 1) to understand the dimensions and further build upon the theoretical structure of aspirational capital; and 2) to develop a reliable and valid scale measuring aspirational capital for education institutions and programs to utilize in efforts to better the lives of marginalized students. In developing the Aspirational Capital Scale (ACS), this study relied on the community cultural wealth (CCW) theoretical framework as well as Carpenter's (2018) scale development process. The scale development process started with an initial creation of items based on the findings from the literature. These initial items were then revised based on the findings from the expert review panel (also referred to as the first data collection phase). These revised items were then tested in cognitive interviews with two participants from the study population (referred to as the second data collection phase). Items were further revised based on the findings of the cognitive interviews and tested in a sample of the study population using a pilot scale. Results from the pilot study informed the final revision of items which were then administered as a final scale to study population to answer the following research questions guiding the study:

RQ1: What are the underlying dimensions of aspirational capital?

RQ2: How reliable of a measure is the ACS for adolescent students who attend an afterschool CBO education program?

RQ3: Is there a positive correlation between high levels of aspirational capital and high levels of positive interpersonal adult relationships?

This chapter provides a review of findings from the data collection phase of the instrument development process (i.e., expert review panel, cognitive interviews, pilot scale, final

scale administration). Additionally, this chapter discusses the limitations of the present study, the implications of the study findings, and directions for future research in the community cultural wealth theoretical framework and aspirational capital.

Expert Review

An initial pool of items ($n = 44$) was developed based on the literature to measure aspirational capital and the hypothesized underlying dimensions (internal motivators, familial motivators, social motivators, resistance motivators) (see appendix B). The expert panel was the first data collection phase of this study. Four experts in CCW agreed to participate in the expert review panel and were asked to rate the clarity and representativeness of the initial pool of items using a 4-point scale for each item. The experts were also presented with an open-ended text box to include additional comments regarding item revisions. The survey used for the expert review panel is included in appendix C.

The content validity index (CVI) was calculated for each item's representativeness of AC and clarity ($n = 88$) based on the expert ratings. Items with CVI's below .80 were reviewed in conjunction with written feedback given by the experts. Based on the results from the expert panel review, five of the initial items were removed, eleven items were revised, and five items were flagged to be deeply investigated in the cognitive interviews. A total of 39 items remained after the expert panel review.

The data collection from the expert panel in this study was useful in establishing content validity evidence of the initial item pool developed from the literature review suggesting the original pool of items were valid representation of the hypothesized underlying constructs of aspirational capital. Furthermore, no additional items were provided by the panel of experts, suggesting that a robust review of the literature was conducted. As noted previously, the data

collection phases in the scale development process builds upon each other in efforts to develop highly informed scale items. For example, information collected from the expert review panel not only aided in the revision of items, but flagged items to be examined further in depth in the cognitive interviews. Based on the results of the expert panel, probing questions for the cognitive interviews were developed to better investigate concerns experts noted. These informed probing questions helped investigate deeper understanding students had with regards to the content, comprehension, and wording of the scale items. Additionally, results from the expert panel extended beyond the cognitive interviews and into the analysis of the pilot scale. Problematic items from the pilot scale were reviewed in tandem with their results from the expert panel (low CVI) as well as the cognitive interviews.

While the information from the expert panel was useful it is important to note that several of the item wording revisions suggested from the panel were too specific for student comprehension. For example, one item in the original pool of scale items was written as the following: “I will chase my goals to prove people like me are capable of doing so.” The expert panel noted that the item should be clear in explaining what “people like me” means thus giving the suggested wording: “I will chase my goals to show people with similar cultural backgrounds can succeed.” However, when this item was tested during the cognitive interviews, students struggled to understand or think about what “cultural backgrounds” were and what that meant to them, one student said, “like my race?” After spending time on this item during the cognitive interviews, the item was revised back to a grammatically shortened version of its original form: “I will chase my goals... to show that people like me can succeed.” For future research, recruiting experts and scholars who work directly with middle and high school students would be beneficial in helping review the wording of items to ensure they are developmentally appropriate

for students as well as recruiting an expert in scale development for youth populations to provide insights into developmentally appropriate item wording.

Cognitive Interviews

The second data collection phase of this study included conducting individual semi-structured cognitive interviews with two students (one middle school and one high school student) to test the revised 39 items from the expert panel review. The structure of the cognitive interview protocol (included in appendix D) included student consent, directions, the revised 39 items, and the response scale (5-point Likert scale). Probing techniques were used for each of the 39-scale items to either test item comprehension by using interpretation, paraphrasing, recall, specific, general probes, or a combination of these probes (Willis, 1999). Based on the results of the cognitive interviews, one item was removed, sixteen items were revised, and the scale format was changed to draw more attention to the question stems as they were being skipped during the interviews.

Additionally, a thematic analysis was conducted from these interviews which revealed the following themes: issues with resistant motivation items (11/12 items), issues with students understanding items containing the word “culture”, students referring to future career goals, and students referencing financial stability. Eleven of the twelve items developed to measure the hypothesized resistant motivation subdomain of aspirational capital demonstrated to be problematic when tested during the cognitive interviews. Yosso (2005) originally defines resistance capital as “knowledges and skills fostered through oppositional behavior that challenges inequality [which] includes cultural knowledge of structures of racism and motivation to transform such oppressive structures” (p. 80). The items were developed based on the review of literature and were revised during the expert review panel. However, using Jean Piaget’s

cognitive development theory, the concept of resistant capital may not be developmentally appropriate for younger students in this population (Slavin, 2018), or, relying on Lev Vygotsky's development theory, the words used to convey this higher order concept in these items may not be socially appropriate for students to comprehend (Slavin, 2018) as the majority of the literature review was based on college-aged populations, or a combination of both. The cognitive interviews were paramount in revealing this issue of cognition and were heavily relied upon to revise these items to be more developmentally appropriate.

Students also had difficulty in understanding items ($n = 6$) with the word "culture" and "cultural background." This was an interesting finding as the theoretical framework is centered on the notion of community culture. Items that were originally developed prior to the expert review panel used wording "those like me" to generalize the notion of shared culture, whatever culture that may be. Item wording was changed based on expert feedback of the items being too general. However, the revised item wording proved to be problematic when tested during the cognitive interviews. Students did not know what "cultural background" meant to them until the interviewer started giving examples of their own cultural background. Students then understood the concept of cultural background and began giving examples of their own; one student often noted "those like me" or "Mexicans like me." Another student mentioned their culture in terms of their identified ethnicity but also revealed as belonging to a culture of individuals with dyslexia. While the original definition of community cultural wealth was developed to primarily highlight the capital people of color harness to traverse through the system of education, there are many different forms of community that may experience similar forms of oppression from dominant cultures (e.g., individuals with learning disabilities versus those without learning disabilities). This idea of use of wording may go back to Vgotsky's theory of child development:

the words used to convey this higher order concept in these items may not be socially appropriate for students to comprehend. Again, the cognitive interviews were important in revealing this issue of cognition.

The majority of student responses throughout the interviews were framed around their future career goals and aspirations. For example, when students were asked what type of goals they thought about when they read question 4 (“I am confident I will chase my goal”) both students referenced their career goals (e.g., NFL player and photographer/engineer). Similarly, when students were asked what their personal strengths were that would allow them to achieve their goal, one student said, “I believe throwing. Like I have a good arm.” While they did not mention their aspirations of becoming a NFL player, their stated personal strength directly related to their career goal of becoming a professional football player. While the items were intended to be general statements and were tested to understand the types of goals students focused on, their answers directly aligned with the findings from the literature review.

Lastly, financial stability was the final major theme that emerged from the cognitive interviews. One student in particular referenced helping others with their housing rent or being helped if they did not have the resources to pay for their housing rent in the future. When the student was asked to describe what question 9 meant to them (“Having enough money encourages me to chase future goals”) they responded by saying “cuz when I run out of money and can’t pay rent, I could maybe go back to my parent’s house so they could feed me for a bit, and then I get my money up and rent again.” Later in the interview when asked what question 18 meant to them (“I will chase my goals to support my family”) they responded with “to help them and all of that. Like if they need rent or anything like that.” Similarly, when they were asked what question 21 meant to them (“I will chase my goals so I can help my friends”), they

responded by saying “if one of my friends needs help like they are behind on rent. I would lend them money.” The student’s responses echo the findings from the literature review in that communities are formed for support and the sharing of resources when individuals encounter barriers when pursuing their aspirations (e.g., Czop Assaf & O'Donnell Lussier, 2020; Rincón et al., 2020; Cegile, 2011).

Pilot Scale

The third data collection phase of this study included 61 middle and high school students who were sampled from the community based organization (CBO) to participate in a pilot scale testing the revised items ($n = 38$) post cognitive interviews. The structure of the pilot scale (included in appendix E) was based on the revised items for the ACS which included student consent, directions, the revised 38 items, the response scale (5-point Likert scale), and three open-ended questions.

Results from the pilot scale showed that many items were easily endorsed (over 60% of respondents selected ‘strongly agree’ for items 10, 12, 14, and 17, and between 50-60% of respondents selected ‘strongly agree’ for items 6, 11, 15, 29, 34, 35, 37, and 38). The item endorsement and discrimination analysis show that the distribution of the pilot data is negatively skewed with an inter-item correlation of 0.427 (suggesting that the items are homogenous with sufficient unique variance (Piedmont, 2014)) and Cronbach’s alpha of 0.964 (suggesting strong internal consistency (DeVon, 2007)). Based on the results from the item analysis for the pilot scale, a total of 3 items were removed. One item (item 9) performed poorly in discriminating between students who, theoretically, have high aspirational capital and those who have low aspirational capital as well as performing poorly in the cognitive interviews, this item was removed. Due to multiple areas of poor performance, there lies concerns in item 9 (“having

enough money encourages me to chase my goals”) still not being well refined enough for students to understand the intent of the item being centered on the notion of financial security. Two other items were removed for suspected redundancy with other items on the scale which were confirmed based on the cognitive interviews and item analysis.

Based on the results from the pilot scale, there were concerns about the skewness of the data due to the high endorsement to the overwhelming majority of items. This led to the question if these items underperformed in measuring the full latent spectrum of aspirational capital or if the skewness of data was due to the population characteristics (sampling students with high AC). Overall, it is believed that the skewness of data was due to the population characteristics. Part of the rationale in selecting a CBO to participate in this study centered on the notion that AC and other forms of CCW capital are best examined in an environment that promotes non-dominant forms of capital for marginalized students. The CCW literature suggests that CBOs tend to design programs that address education inequities within their local communities (Sampson et al., 2019) and are believed to combat dominant forms of social capital for underrepresented and underserved students by promoting non-dominant forms of capital and student success (Ahn, 2010; Harris & Kiyama, 2015; Liou et al., 2009; Ramirez, 2021).

Second, there is reason to suspect the occurrence of a priming effect in the ordering of scale items (i.e., survey order effects) (Strack, 1992). The first set of questions on the scale ask about students’ goals and motivations then segues into external factors (family, social, resistance) motivating students to chase after their goals. There is reason to suspect the first set of questions motivate students and inspire students to be confident and positive about their future goals which sets the tone in answering the other sets of questions related to external factors which may be one of the reasons to explain the high proportion of “strongly agree” responses. This suspected

priming effect is further suggested by the open-ended comments students left when asked “*Is there anything else you would like to let us know?*” Out of the five substantive and relevant responses to this general question, three students discussed their future goals and aspirations which were inspiring to read.

Final Scale

The final data collection phase of this study included a total of 113 middle and high school students who were sampled from the CBO to participate in a final scale testing the revised items ($n = 35$) post cognitive interviews. The structure of the final scale (included in appendix F) was based on the revised items for the ACS which included student consent, directions, the revised 35 items, the response scale (5-point Likert scale), 9 items from the adapted CASSS teacher subscale used to establish convergent validity, and three open-ended questions. The results of the final AC scale administration directly answered the three research questions below.

RQ1: What are the underlying dimensions of AC?

An EFA was conducted to answer the first research question. A total of two models were explored (a four factor and a three factor model) as suggested by the factor extraction assessment. In examining both models, it was determined by theory and model fit statistics, that the four factor model better fit the data than the three factor model. In reviewing the items within this final model, the four factors were named the following: Equity Motivators (factor 1), Internal Motivators (factor 2), Social Motivators (factor 3), and Family Motivators (factor 4). This final model largely reflects the hypothesized model (appendix A) in terms of the internal, social, and family factors, however, this model tells a different story in terms of the final factor (equity) compared to the hypothesized factor (resistance). Many of the original items developed to measure the notion of resistance capital (Yosso, 2005) were included in this fourth factor,

however, other items that were developed to measure other hypothesized factors (social and family) also fell into this fourth factor. It should be noted that these items could be considered external motivators (e.g., social and family) rather than the internal motivator. Table 4.1 below shows the 35 items included in the final administration of the ACS and compares the hypothesized factor to the actual factor in which these items fell.

Overall, four items that were developed to measure the hypothetical social motivators factor and three items that were developed to measure the hypothetical family motivators factor, strongly loaded onto a factor with other items that were developed to measure the hypothetical resistance capital motivators. In reviewing the definition of resistance capital, Yosso (2005) defines this type of motivation as “knowledge and skills fostered through oppositional behavior that challenges inequality [which] includes cultural knowledge of the structures of racism and motivation to transform such oppressive structures” (p. 80). While it was surprising for family-related items to strongly load onto this factor, there is literature that suggests that students activate their resistance capital to pursue their goals. For example Aragon (2018) and Espino (2016) found that students of color felt motivated to chase their goals when they experienced injustices placed on their families due to their cultural backgrounds. Thus, it is reasonable for students to use oppositional behavior, being motivated to chase their goals despite barriers, to directly challenge societal inequality by being a role model for family members. Similarly, helping friend, making a difference in the world, and helping others in their community, can be seen as a form of resistance thus activating their aspirational capital. In other words, students may feel more motivated to chase their goals by knowing they can help others in their community as a way to directly challenge injustices.

Table 4.14 Hypothesized factor vs final factor items

Item	Hypothesized Factor	Actual Factor
Even when life is difficult...	—	—
I believe my dreams for the future are possible	Internal	Internal
I am hopeful for my future	Internal	Internal
I maintain my hopes for the future	Internal	Internal
I am confident that I will chase my goals	Internal	Internal
My personal strengths will allow me to chase my goals	Internal	Internal
Having a good education encourages me to chase my goals	Internal	Internal
Having a good job encourages me to chase my goals	Internal	Internal
I will chase my goals by working hard	Internal	Internal
My family encourages me to chase my goals	Family	Family
My family inspires me to chase my goals	Family	Family
My parent(s)/guardian(s) encourages me to chase my goals	Family	Family
I will chase my goals...	—	—
To achieve the things my family has never achieved	Family	Equity
To be a role model for my family members	Family	Equity
To support my family	Family	Equity
So I can help the people in my community	Social	Equity
So I can make a difference in the world	Social	Equity
So I can help my friends	Social	Equity
A mentor inspired me to chase my goals	Social	Social
A mentor encouraged me to chase my goals	Social	Social
A mentor supports me to chase my goals	Social	Social

Table 4.1 Continued

Successful people like me inspire me to chase my goals	Social	NA
Friends encourage me to chase my goals	Social	Equity
Friends inspire me to chase my goals	Social	Social
I will chase my goals...	—	—
To be a role model for others like me	Resistance	Equity
To help fight stereotypes for people like me	Resistance	Equity
Even when others think I can't	Resistance	NA
To show that people like me can succeed	Resistance	NA
To represent people like me in the world	Resistance	Equity
To address things that are unfair in my community	Resistance	Equity
To show that people from my community can be successful in school	Resistance	Equity
To show that people from my community can have a good job	Resistance	Equity
To show that people from my community can be successful	Resistance	Equity
To fight stereotypes about my community	Resistance	Equity
Even when others think I can't because of my race/ethnicity	Resistance	Equity
Even when others think I can't because of the way I live	Resistance	Equity

The intersection of these three motivators, or forms of capital, underlying aspirational capital is not surprising as Yosso (2005) hypothesized that these various forms of capital are not mutually exclusive or static, but rather are dynamic processes that build on one another” (p. 77). Moreover, the two existing quantitative studies attempting to measure CCW also reported aspirational capital overlapping with other factors. Sablan (2019) noted that items were removed from the final model regarding aspirations related to family (e.g., aspiration to surpass family educational/occupational success). Additionally, Hiramori et al. (2021) when attempting to measure CCW found subdomains which they termed internal-aspirational capital external-aspirational capital. The internal-aspirational capital in Hiramori et al.’s study included items such as: “I am hopeful for my future” and “I consider myself an ambitious person” (p. 10). The external-aspirational capital in their study included items related to the students’ family (e.g., “My parents inspire me to pursue a college degree”) and related to the students’ social networks (e.g., “A teacher inspired me to pursue a college degree”) (p.10). The comparison of results between this study and Hiramori et al.’s study is interesting because the items referencing “mentors’ or “teachers” neatly fell into their own factor which was termed the Social Motivators.

While there is overlap between the items designed to measure social and familial motivators of aspirational capital, the other items designed to measure internal motivation, social motivation (e.g., mentor and friendship support), and family motivation segmented out nicely into their respective factors in the final four factor model. These underlying dimensions of aspirational capital illustrate and bolster the findings in both the qualitative and quantitative literature on aspirational capital and CCW.

RQ2: How reliable of a measure is the ACS for adolescent students who attend an afterschool CBO education program?

In answering the second research question, the final AC scale demonstrated to be a reliable measure for middle and high school students who attend an afterschool CBO education program. The overall AC scale demonstrated excellent internal consistency ($\alpha = .93$). The underlying domains/factors of AC also demonstrated good to excellent reliability. However, there does appear to be a relationship between the number of items in each domain and reliability coefficient, except for the equity motivator factor. The family motivator domain has the fewest items ($n = 3$) and has the lowest reliability coefficient ($\alpha = .89$). While the internal motivator domain has the second most items ($n = 8$) and the highest reliability coefficient ($\alpha = .95$). However, the equity motivators domain has the most items ($n = 17$) and the second highest reliability coefficient ($\alpha = .93$). While the Alpha-If-Item-Deleted analysis does not suggest the removal of any item in the equity motivators will improve the reliability coefficient, more research into this domain is prompted given the overlap of social and family related-items in this domain with resistance related-items. Providing evidence on adequate reliability for the AC scale and the underlying domains is important for students, CBOs, and other educational institutions in ensuring measurements are repeatable across individuals and overtime (Drost, 2011). A reliable AC scale will provide confidence in AC being compared across students and tracked over time. This may be beneficial for organizations wishing to track student AC across the duration of a program, academic year, and beyond.

RQ3: Is there a positive correlation between high levels of aspirational capital and high levels of positive interpersonal adult relationships?

To answer the final research question, the adapted version of the teacher subscale in the Child and Adolescent Social Support Scale (CASSS) was included in the final administration of the AC scale in efforts to demonstrate convergent validity with the hypothesized social motivators subdomain of aspirational capital. The final four items which comprised the social motivators subdomain of aspirational (i.e., A mentor inspired me to chase my goals, a mentor encouraged me to chase my goals, a mentor supports me to chase my goals, friends inspire me to chase my goals) demonstrated a strong correlation with the 9 adapted CASSS teacher subscale. The CASSS teacher subscale measures perceived social support students receive from their teachers but the items were adapted by replacing the word “teacher” in the items to “staff members” referencing the youth staff at the CBO. The strong relationship between the CASSS items and the items in the social motivators subdomain was not surprising as the literature notes that student aspirational capital can be fostered through positive interpersonal relationships with adult and peer mentors (Ahn, 2010; Harris & Kiyama, 2015; Liou et al., 2009; Ramirez, 2021).

Additionally, in examining the correlations between the CASSS subscale and the other three domains of the ACS, it was interesting but not surprising that the family motivators domain had the weakest (but still significant) positive relationship. It should also be noted that the lowest factor correlation between the four factors occurred between the social motivators domain and the familial motivators domain ($r = .42$). One explanation for these results may be that students with high family support systems are less inclined to seek out or believe that they need other forms of positive adult-interpersonal support from individuals in their social groups they view as mentors. Similarly, perhaps students who do not have supportive family systems are more

inclined to seek out other forms of positive adult-interpersonal support from their community and social groups.

Providing evidence of convergent validity for the AC scale and its domains is important for researchers and users of the scale to be confident that the scale is accurately measuring student aspirations and the underlying motivations. A valid AC scale will yield student scores for the entire scale and its domains to better target the areas where CBOs and educational institutions can improve support for students in efforts to bolster and increase student AC. For example, a valid AC scale will be telling for these programs and organizations to evaluate if students are reporting low levels of Social Motivators (one of the underlying domains for the AC scale) and provide more or better mentor/adult interpersonal supports for their students in order to increase their AC.

Limitations of Study

This study is not without limitations. The most notable limitation to this study is the small sample ($n = 113$) used to conduct the EFA to establish underlying dimensions of aspirational capital. While a sensitivity analysis was conducted with a regularized EFA, which is designed to better estimate EFA models with small sample sizes, a more robust sample size may provide a clearer illustration of aspirational capital's underlying dimensions. Moreover, a large sample size ($n > 1,000$) could be randomly split in half to first conduct an EFA and then have the model results be tested in using a confirmatory factor analysis.

Second, a more heterogeneous sample could have been recruited for this study. All participants were recruited from the same CBO and may demonstrate little variation (which was witnessed in item responses) in terms of experiences and sentiments regarding aspirational capital. Moreover, 70% of the students enrolled in the CBO identify as Latino/Hispanic. Students

from other ethnic and cultural backgrounds may embody and express aspirational capital as a latent trait differently than the students who participated in this study.

Third, there were concerns regarding the comprehension of items as originally intended. While cognitive interviews were conducted with two students from the sampled population, there were concerns post interviews which raised concerns of item comprehension in the pilot scale. This study could have been improved through the use of conducting more cognitive interviews with students from the sampled population.

Lastly, the reliability of the aspirational capital can be further improved by implementing a test-retest procedure rather than relying on Cronbach's alpha or McDonald's Omega as the primary reliability coefficient as there are concerns regarding the relationship between the number of items in each factor and the strength of the reliability coefficient. In this study, there was a potential opportunity to conduct a test-retest reliability procedure between the pilot scale and final scale administration, but concerns of participant anonymity suggested that the use of Cronbach's alpha was a better option for this study.

Practical Implications

The results of this study have many practical implications for CBOs and research related to CCW. The results indicate that students who participated in this study have high levels of aspirational capital. Moreover, students also report high levels across each of the underlying factors of aspirational capital. However, out of the four subdomains, students report the social motivators factor as the lowest level of motivation related to their aspirational capital ($M = 3.88$). The participating CBO can use the information from this scale to understand where they can better support their students to continue to be motivated in chasing their future dreams and goals despite current or perceived barriers. For instance, CBOs may notice low scores for the item "A

mentor encouraged me to chase my goals” and may develop more small group or one-on-one activities with students specifically designed for students to share about their goals and program staff encourage and support students in ideating about the ways students can reach their goals. CBOs and educational institutions at-large can utilize this preliminary scale to measure student aspirations and the underlying dimensions to understand the areas students could receive more support to boost their motivations in pursuing their goals and dreams.

In terms of practical implications regarding research on CCW, this study further echoes similar results found in Sablan’s (2019) and Hiramori et al.’s (2021) study. The results from both studies reflect the intersection of the different forms of CCW capital, especially in relation to aspirational capital. Similar to Hiramori et al.’s (2021) study, the underlying domains of aspirational capital broke out into internal and external-related factors. However, the results from this study better fleshed out the external-related factors (e.g., social, family, equity motivators), suggesting progress towards the direction in more effectively measuring aspirational capital. Additionally, results from this study could guide future qualitative research on CCW and aspirational capital to further define and understand resistance capital and its manifestation in challenging inequality to transform oppressive structures, particularly in how it may intersect with other types of capital.

Future Research

Based on the results and findings of this study, there are several future research directions to be explored with regards to aspirational capital and its theoretical framework, CCW. Based on the four factor solution produced by the EFA, it was clear that the different domains had a wide range of items within each of their respective domains. For example, the equity motivators domain had the greatest number of items ($n = 17$) and the family motivators domain had the

fewest number of items ($n = 3$). To better parse down the domains suggested by the EFA to efficiently measure these domains (and AC overall), one direction for future research is to collect more data ($n > 300$) and conduct an individual factor analysis for each of the domains as suggested by the EFA and consider dropping items with acceptable but low factor loadings ($< .60$) to better refine the items in each of the domains. The results from this better refined process, and parsimonious scale, can then be tested in a confirmatory factor analysis to examine if these fewer, but reasonable, number of items can still measure aspirational capital and its underlying domains.

In addition, this study urges a more nuanced and specific exploration and understanding of the definition of resistance capital and how it relates to other types of capital. A revised definition of resistance capital as a may be necessary or, at the very least, prompted for consideration. This exploration can be conducted using both qualitative and quantitative methodologies. In terms of scale development, this study is a progressive and positive step in developing a scale aimed to measure aspirational capital. Additional scale development studies are encouraged to better understand the underlying dimensions of aspirational capital spending more time and resources in each of the scale development stages (i.e., expert panel review, cognitive interviews, pilot study, final scale administration). Specifically, more cognitive interviews can be conducted to ensure the items on the scale are well comprehended and understood as intended by the population of interest. Lastly, as noted above, future research directions should consider the inclusion of more culturally diverse populations to understand how the theoretical structure of aspirational capital manifests with more heterogeneous groups.

Conclusion

The purpose of this study was twofold: 1) to understand the dimensions and further build upon the theoretical structure of aspirational capital; and 2) to create a reliable and valid scale for CBOs to utilize for ongoing programmatic improvements to better the lives of marginalized students. In using a scale development process outlined by Carpenter (2018), a scale was developed to understand the underlying dimensions of aspirational capital. The findings of the EFA suggested the aspirational capital had four underlying factors: internal, social, family, and equity motivation. This structure largely mirrored the hypothesized structure of aspirational capital except the deviation between the resistance motivation domain and the equity motivation domain which derived from the results. The equity motivation domain largely contained items related to resistance capital but also included items related to family and social motivators, suggesting that social and family-related instances can prompt oppositional behavior to challenge societal injustices. Given this possibly broader definition of resistance capital, the final factor was labeled as equity motivators as all items related to a form of societal equity. Future research is encouraged to further explore and possibly expand the definition of resistance capital in the CCW framework and how social and family-related contexts intersect with resistance capital.

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APPENDICES
Appendix A
Hypothesized Model

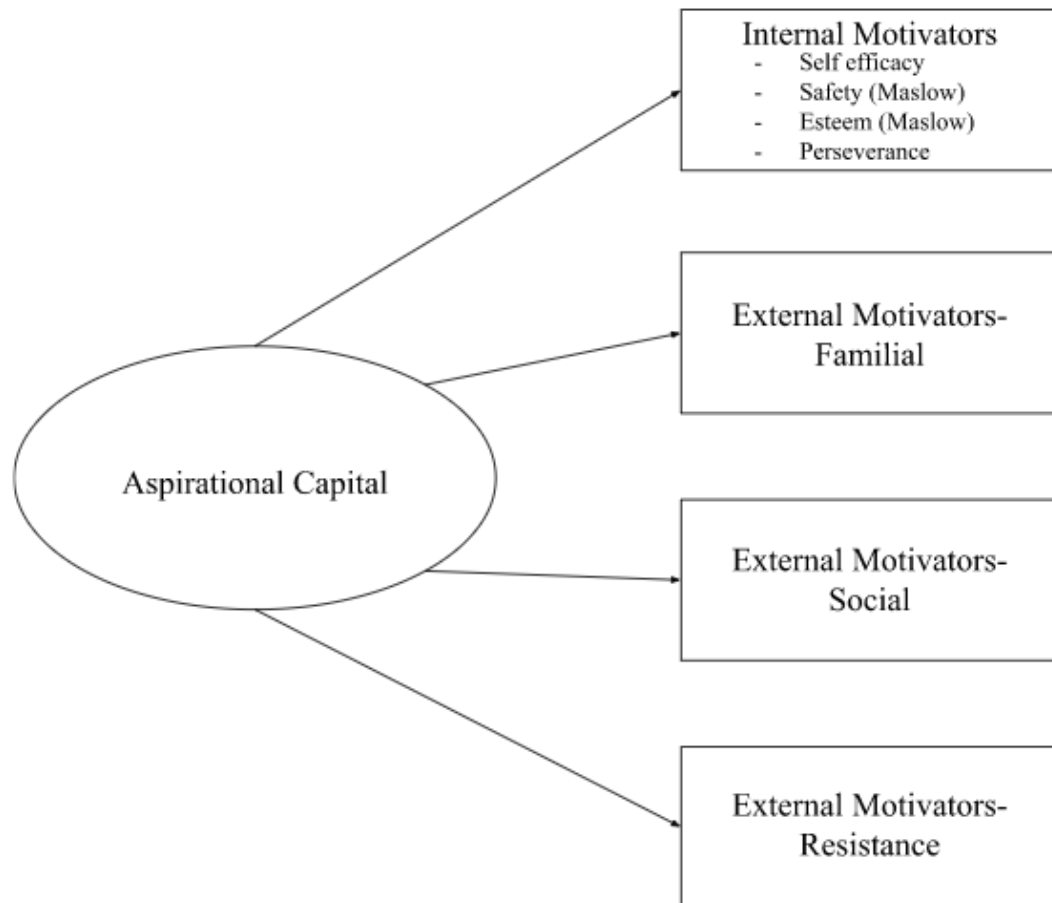


Figure A.1. Hypothesized model

Appendix B

Original AC Item Pool

Aspirational Capital 44-item Scale
Developed Based on Literature Review

DOMAIN AND SUBDOMAIN DEFINITIONS

Aspirational Capital: "the ability to maintain hopes and dreams for the future, even in the face of real or perceived barriers" (Yosso, 2005, p. 78).

Internal motivation: Defined as "being self driven to achieve one's goals" (Stanton et al., 2022, p. 11) which motivates students to maintain their dreams for the future even in the face of barriers.

Familial Capital Motivation: A type of capital defined as "cultural knowledges nurtured among familia (kin) that carry a sense of community history, memory, and cultural intuition" (Yosso, 2005, p. 79) which motivates students to maintain their dreams for the future even in the face of barriers.

Social Capital Motivation: A type of capital defined as "networks of people and community resources" of "peer and other social contacts [that] provide both instrumental and emotional support to navigate through society's institutions" (Yosso, 2005, p. 79) which motivates students to maintain their dreams for the future even in the face of barriers.

Resistance Capital Motivation: A type of capital defined as "knowledges and skills fostered through oppositional behavior that challenges inequality [which] includes cultural knowledge of the structures of racism and motivation to transform such oppressive structures" (Yosso, 2005, p. 80) which motivates students to maintain their dreams for the future even in the face of barriers.

RESPONSE SCALE FOR ALL QUESTIONS

- Strongly disagree
- Disagree
- Agree
- Strongly agree

SCALE ITEMS

Internal Motivation items

- 1) I believe that my dreams for my future are possible
- 2) I am hopeful for my future
- 3) I consider myself an ambitious person
- 4) I maintain my hopes for the future, even when confronted with barriers
- 5) My confidence in my abilities encourages me to chase my goals

- 6) I stay motivated to chase my goals despite barriers
- 7) I maintain a positive attitude for the future despite challenges
- 8) I am smart enough to chase my goals
- 9) My personal strengths will allow me to chase my goals
- 10) I am committed to pursuing my future goals despite barriers
- 11) Having a good education encourages me to chase future goals
- 12) Having a good career encourages me to chase future goals
- 13) Not having to worry about money encourages me to chase future goals
- 14) I will achieve my future goals by working hard
- 15) I will chase my future goals even when life is difficult
- 16) I motivate myself to chase future goals

Familial Capital Motivation items

- 17) My family encourages me to chase future goals
- 18) My parent(s) encourages me to chase future goals
- 19) My siblings inspired me to chase future goals
- 20) I will chase my goals to honor the sacrifices my family has made
- 21) I will chase my goals to be a role model for family members
- 22) I will chase my goals to support my family

Social Capital Motivation items

- 23) I will chase my goals so I can help my community
- 24) I will chase my goals so I can make a difference in society
- 25) I will chase my goals to help my friends
- 26) I will chase my goals to help those like me
- 27) A mentor inspired me to chase my goals
- 28) A mentor encourages me to chase my goals
- 29) A mentor supports me in chasing my goals
- 30) Seeing successful people with similar backgrounds inspires me to chase my goals
- 31) Friends encourage me to chase my goals
- 32) Friends inspire me to chase future goals

Resistance Capital Motivation items

- 33) I need to chase my goals to be a role model for others with similar backgrounds
- 34) I will chase my goals to help combat stereotypes for people with similar backgrounds
- 35) I will chase my goals even when others think I can't
- 36) I will chase my goals to prove people like me are capable of doing so
- 37) I will chase my goals to represent people like me in society
- 38) I will chase my goals to address the inequities in my community

- 39) I need to achieve my educational goals to prove people from my community can be educated
- 40) I need to achieve my career goals to prove people from my community can have a good job
- 41) I need to achieve my goals to prove people from my community can be successful
- 42) I need to achieve my goals to combat stereotypes about my community
- 43) I will chase my goals even when others think I can't because of my ethnicity
- 44) I will chase my goals even when others think I can't because of my culture

Appendix C

Expert Panel Form

Expert Panel Review of The Aspirational Capital Scale

INTRODUCTION

Hello, welcome! Thank you again for agreeing to participate as one of the experts on a panel to review the first round of items for the Aspirational Capital (AC) Scale. This effort is part of my dissertation study which aims to develop and validate a scale measuring student aspirational capital within the Community Cultural Wealth (CCW) framework (Yosso, 2005) for middle and high school students attending an after school program in central Texas.

This survey will present the 44-items developed from an extensive literature on CCW and AC. Based on the review of literature, AC is theorized to have **four subdomains**: 1) **internal motivation**, 2) **familial motivation**, 3) **social motivation**, and 4) **resistance motivation**.

DIRECTIONS

For each of the 44 items, you will be asked to rate each item on its **representativeness** of AC and the targeted subdomain, the **clarity** of each item, map the **subdomain** you think the item belongs to, and provide feedback on the **response scale**. In addition there will be an open-ended question for you to provide additional feedback/revisions for each of the items presented.

To help aid your review, you may open the [Google doc](#) (right-click to open in another tab) listing the 44 scale items in a different tab or browser for your reference.

COMPENSATION

The estimated time to complete this review of the initial AC Scale is approximately 30 minutes. To compensate you for your time and efforts, I am offering a \$75 Amazon gift card for those who choose to participate in the review process. Your responses will be linked to your email in order to send the Amazon gift card unless you wish to provide an alternative email.

CONTACT

If you have any questions or concerns, please do not hesitate to contact myself (Sarah Narvaiz) via email (snarvaiz@vols.utk.edu) or cell phone (210-663-1203), or the chair of my dissertation committee, Dr. Louis Rocconi (lrocconi@utk.edu). Thank you again for your willingness to participate in this research. If you would like to participate and start the review process, please click the arrow button below to proceed.

[illegible][illegible]

Familial Capital Motivation Subdomain Scale Items

Instructions: Please rate each item question below based on 1) how representative the item is of aspirational capital and 2) clarity of each item. There are no right or wrong answers. As a reminder, this scale will be given to students between the ages of 11-18.

*The full list of scale items may be accessed [here](#). (right-click to open in another tab)

[illegible]

18) My parent(s) encourages me to chase future goals	☐	☐	☐	☐	☐	☐	☐	☐
19) My siblings inspired me to chase future goals	☐	☐	☐	☐	☐	☐	☐	☐
20) I will chase my goals to honor the sacrifices my family has made	☐	☐	☐	☐	☐	☐	☐	☐
21) I will chase my goals to be a role model for family members	☐	☐	☐	☐	☐	☐	☐	☐
22) I will chase my goals to support my family	☐	☐	☐	☐	☐	☐	☐	☐

Please provide additional comments below regarding revisions for any or all of the items presented above.

Social Capital Motivation Subdomain Scale Items

Please read the instructions below *carefully*.

Instructions: Please rate each item question below based on 1) how representative the item is of aspirational capital and 2) clarity of each item. There are no right or wrong answers. As a reminder, this scale will be given to students between the ages of 11-18.

Definition: **Aspirational capital** is defined as "the ability to maintain hopes and dreams for the future, even in the face of real or perceived barriers" (Yosso, 2005, p. 78).

*The full list of scale items may be accessed [here](#). (right-click to open in another tab)

[illegible]

Please provide additional comments below regarding revisions for any or all of the items presented above.

Resistance Capital Motivation Subdomain Scale Items

Please read the instructions below *carefully*.

Instructions: Please rate each item question below based on 1) how representative the item is of aspirational capital and 2) clarity of each item. There are no right or wrong answers. As a reminder, this scale will be given to students between the ages of 11-18.

Definition: **Aspirational capital** is defined as "the ability to maintain hopes and dreams for the future, even in the face of real or perceived barriers" (Yosso, 2005, p. 78).

*The full list of scale items may be accessed here. (right-click to open in another tab)

	Representativeness				Clarity			
	1- Item is not representative	2- Item needs major revision to be representative	3- Item needs minor revisions to be representative	4- Item is representative	1- Item is not clear	2- Item needs major revisions to be clear	3- Item needs minor revisions to be clear	4- Item is clear

[illegible]

43) I will chase my goals even when others think I can't because of my ethnicity	☐	☐	☐	☐	☐	☐	☐	☐
44) I will chase my goals even when others think I can't because of my culture	☐	☐	☐	☐	☐	☐	☐	☐

Please provide additional comments below regarding revisions for any or all of the items presented above.

Based on the review of literature, aspirational capital is theorized to have **four subdomains**: 1) internal motivation, 2) familial capital motivation, 3) social capital motivation, and 4) resistance capital motivation.

Instructions: Please select the subdomain you believe each item belongs to.

The full list of scale items and subdomain definitions may be accessed [here](#). (right-click to open in another tab)

	Internal Motivation	Familial Capital Motivation	Social Capital Motivation	Resistance Capital Motivation
1) I believe that my dreams for my future are possible	☐	☐	☐	☐
2) I am hopeful for my future	☐	☐	☐	☐
3) I consider myself an ambitious person	☐	☐	☐	☐
4) I maintain my hopes for the future, even when confronted with barriers	☐	☐	☐	☐
5) My confidence in my abilities encourages me to chase my goals	☐	☐	☐	☐
6) I stay motivated to chase my goals despite barriers	☐	☐	☐	☐
7) I maintain a positive attitude for the future despite challenges	☐	☐	☐	☐
8) I am smart enough to chase my goals	☐	☐	☐	☐
9) My personal strengths will allow me to chase my goals	☐	☐	☐	☐
10) I am committed to pursuing my future goals despite barriers	☐	☐	☐	☐
11) Having a good education encourages me to chase future goals	☐	☐	☐	☐
12) Having a good career encourages me to chase future goals	☐	☐	☐	☐
13) Not having to worry about money encourages me to chase future goals	☐	☐	☐	☐
14) I will achieve my future goals by working hard	☐	☐	☐	☐
15) I will chase my future goals even when life is difficult	☐	☐	☐	☐

16) I motivate myself to chase future goals	☐	☐	☐	☐
17) My family encourages me to chase future goals	☐	☐	☐	☐
18) My parent(s) encourages me to chase future goals	☐	☐	☐	☐
19) My siblings inspired me to chase future goals	☐	☐	☐	☐
20) I will chase my goals to honor the sacrifices my family has made	☐	☐	☐	☐
21) I will chase my goals to be a role model for family members	☐	☐	☐	☐
22) I will chase my goals to support my family	☐	☐	☐	☐
23) I will chase my goals so I can help my community	☐	☐	☐	☐
24) I will chase my goals so I can make a difference in society	☐	☐	☐	☐
25) I will chase my goals to help my friends	☐	☐	☐	☐
26) I will chase my goals to help those like me	☐	☐	☐	☐
27) A mentor inspired me to chase my goals	☐	☐	☐	☐
28) A mentor encourages me to chase my goals	☐	☐	☐	☐
29) A mentor supports me in pursuing my goals	☐	☐	☐	☐
30) Seeing successful people with similar backgrounds inspires me to chase my goals	☐	☐	☐	☐
31) Friends encourage me to chase my goals	☐	☐	☐	☐
32) Friends inspire me to chase future goals	☐	☐	☐	☐
33) I need to chase my goals to be a role model for others with similar backgrounds	☐	☐	☐	☐
34) I will chase my goals to help combat stereotypes for people with similar backgrounds	☐	☐	☐	☐
35) I will chase my goals even when others think I can't	☐	☐	☐	☐
36) I will chase my goals to prove people like me are capable of doing so	☐	☐	☐	☐

37) I will chase my goals to represent people like me in society	☐	☐	☐	☐
38) I will chase my goals to address the inequities in my community	☐	☐	☐	☐
39) I need to achieve my educational goals to prove people from my community can be educated	☐	☐	☐	☐
40) I need to achieve my career goals to prove people from my community can have a good job	☐	☐	☐	☐
41) I need to achieve my goals to prove people from my community can be successful	☐	☐	☐	☐
42) I need to achieve my goals to combat stereotypes about my community	☐	☐	☐	☐
43) I will chase my goals even when others think I can't because of my ethnicity	☐	☐	☐	☐
44) I will chase my goals even when others think I can't because of my culture	☐	☐	☐	☐

Please provide additional comments below regarding the items and the subdomains.

Response Scale

Please read the instructions below *carefully*.

Instructions: Please select the response scale you believe would be the most appropriate for the proposed Aspirational Capital Scale. You may select multiple scales. There are no right or wrong

answers. As a reminder, this scale will be given to students between the ages of 11-18. You may need to open the list of scale items provided in the link below for this review.

*The full list of scale items and definitions of subdomains may be accessed [here](#). (right-click to open in another tab)

☐

Strongly disagree; Disagree; Agree; Strongly agree

☐

Strongly disagree; Disagree; Neutral; Agree; Strongly agree

☐

Not at all true; Hardly true; Moderately true; Exactly true

☐

Very untrue of me; Untrue of me; Somewhat untrue of me; Neutral
Somewhat true of me; True of me; Very true of me

Please provide additional comments below regarding the response scale options

Please provide additional comments regarding the items or subdomains presented in this review or anything that should be taken into consideration when revising scale items.

END OF SURVEY FORM

Appendix D
Cognitive Interview Protocol

Aspirational Capital Scale: Cognitive Interview Protocol Draft

*Note: Items in **bold** will be verbally asked to the student. Normal unbolded text will be presented to students to read.

Verbal Consent/Cognitive Interview Introduction Script

Thank you again for volunteering to talk to me about several survey questions I have developed to understand how students continue to believe in their future dreams and goals even when they face certain challenges while doing so. Today we will be going through 39 questions that ask about your experience in believing in your future dreams and goals.

The purpose of our chat is for me to understand how you interpret the questions being asked. For example, if I ask “this food is bussin,” I want to understand what the word “bussin” means to you. With that being said, there are absolutely no right or wrong answers during our conversation. I truly want to understand your understanding of these questions so your feedback is very important to me. Your feedback will help me improve these survey questions I am creating.

Our conversation will last about an hour and we will take a brief break about half way through. Please know that your participation is completely voluntary and we can stop at any time without any worries or concerns. Our conversation is also confidential so your name will not be linked to your responses. This conversation is only to better understand how I can improve these survey questions. To thank you for your participation, you will be given a \$20 gift card at the end of our conversation today.

During our conversation, I will be taking a few notes on how I can improve these questions. To help me take notes, do you mind if I audio record our conversation today? Saying no will not impact our conversation or the gift card in any way.

Do you have any questions or concerns before we get started?

TITLE: Student Aspirational Capital Scale**SURVEY INTRODUCTION**

Thank you for agreeing to participate in this survey! This survey was designed to understand how students at the program continue to believe in their future dreams and goals even when they face certain challenges while doing so. Your participation is important and we would love to provide you with this opportunity to have your voice heard!

Your answers to this survey cannot be linked back to your name or identity in any way. The survey will take approximately 30 to complete. There are no right or wrong answers to these questions and you may choose to stop at any time.

To thank you for participating, there will be a chance to enter your name into a raffle to win a \$20 gift card at the end of the survey.

If you have any questions during the survey, please raise your hand and someone will come to help you.

To start the survey, please click on the “Start” button below.

QUESTIONS TO ASK RESPONDENT ABOUT INTRODUCTION

- 1) **Do you have any questions or comments about the instructions we just read?**
- 2) **Can you tell me what it means when we say “Your answers to this survey cannot be linked back to your name or identity in any way?”**

GREAT, THANK YOU! THAT WAS VERY HELPFUL! LET’S MOVE ONTO SOME SURVEY QUESTIONS.

INTERNAL MOTIVATION

Directions: Please mark how much you agree or disagree with the following sentences. There are no right or wrong answers!

QUESTIONS TO ASK RESPONDENT ABOUT DIRECTIONS

1) Do the directions make sense for you?

Even when life is difficult...

1) I believe that my dreams for my future are possible

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **STEM: What does it mean to you when you think “even when life is difficult”? Same has confronted with barriers?**
- **What do you think of when we ask if you believe your dreams for the future are possible?**

Even when life is difficult...

2) I am hopeful for my future

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **What does being hopeful for your future mean to you?**

Even when life is difficult...

3) I maintain my hopes for the future

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **What types of hopes do you think of?**

- **Do you think this question is asking the same thing as question 2 above?**
- **Would you answer this question differently if we asked “I am an ambitious person?” Or do you think they are the same question?**
- **What does ambition mean to you?**
 - **In terms of school? Tasks in general? Future goals?**

Even when life is difficult...

4) I am confident that I will chase my goals

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **What types of goals do you think of when you read this question?**

Even when life is difficult...

5) My personal strengths will allow me to chase my goals

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **What does this question mean to you?**
- **What do you think of when you hear the phrase “personal strengths”?**

Even when life is difficult...

6) I am committed to chasing my future goals

- Strongly disagree
- Disagree
- Neutral
- Agree
- Neutral
- Strongly agree

QUESTION:

- **What does this mean to you?**

Even when life is difficult...

7) Having a good education encourages me to chase future goals

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **What do you think of when you hear this question? What type of education? What does having a good education mean to you? A good education now or in the future? How far in the future?**

Even when life is difficult...

8) Having a good career encourages me to chase future goals

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **What do you think of when you hear this question? What does having a good career mean to you? A good career now or in the future? How far in the future?**

Even when life is difficult...

9) Not having to worry about money encourages me to pursue future goals

- Strongly disagree
- Disagree
- Agree
- Strongly agree

QUESTION:

- **What does do you think when you hear this question?**

Even when life is difficult...

10) I will chase my goals by working hard

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **What does working hard mean to you? What types of goals do you think of? How far away are these goals?**

Even when life is difficult...

11) I will chase my future goals

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **What does this mean to you?**

Even when life is difficult...

12) I motivate myself to chase future goals

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **What does this mean to you? Can you give me an example? Do you think this question is the same as question 4 “I am confident that I will chase my goals”**

FAMILIAL CAPITAL MOTIVATION

Directions: Please mark how much you agree or disagree with the following sentences. There are no right or wrong answers!

13) My family encourages me to chase future goals

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **What does this mean to you? What types of goals do you think about when asked this question? What do you think about when you think of the word “family” in this question? Mom/dad? Brothers/sisters?**

- What if the sentence said “my closest family encourages me to chase future goals?”
- What if the sentence said “my extended family encourages me to chase future goals?”

14) My parent(s)/guardian(s) encourages me to chase future goals

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- What does this mean to you? What types of goals do you think about? Who do you think about when you think of your “parents”? What does encouragement mean to you?

15) My family inspires me to chase future goals

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- What does this mean to you? Do you think this question is similar to question 17?
- What does inspire mean to you?

I will chase my goals...

16) To honor the sacrifices my family made

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- What does this mean to you? Do you think your peers would know what “honoring sacrifices means?” Do you think this sounds negative, positive in anyway? What types of sacrifices do you think of when this question is asked? What does it mean to you when we ask “to honor

the sacrifices your family has made”? Who do you think of when this question is asked? Can you give an example?

I will chase my goals...

17) To be a role model for my family members

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **What does this mean to you? Can you give me an example? What types of family members do you think of? What types of goals do you think of?**

I will chase my goals...

18) To support my family

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **What does this mean to you? What does it mean to support your family? Your current family or future family? What types of goals do you think of?**

SOCIAL CAPITAL MOTIVATION

Directions: Please mark how much you agree or disagree with the following sentences. There are no right or wrong answers!

I will chase my goals...

19) So I can help my community

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **What does this mean to you? When asked this question, what does it mean to help your community? What types of goals do you think about?**

I will chase my goals...

20) So I can make a difference in the world

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **What does this mean to you? What does making a difference in the world mean to you? What types of goals do you think about?**

I will chase my goals...

21) So I can help my friends

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **What does this mean to you? What types of goals do you think about? Can you give me an example?**

22) A mentor **inspired** me to chase my goals

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **What does this mean to you? What type of person do you think of when you hear the word “mentor”? Can you give me an example?**

23) A mentor **encouraged** me to chase my goals

- Strongly disagree
- Disagree
- Neutral

- Agree
- Strongly agree

QUESTION:

- **Do you think this is the same question as the question above? Is there a difference between being inspired and being encouraged?**

24) A mentor **supports** me to chase my goals

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **Do you think this is the same question above the ones above? Is there a difference between being supported and being encouraged by a mentor?**

25) Seeing successful people with similar cultural backgrounds **inspires** me to chase my goals

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **What does this question to you? What do you think about when you hear “successful people with similar cultural backgrounds”? Can you give me an example? What types of goals do you think about when you hear this question?**

26) Friends **encourage** me to chase my goals

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **What does this question mean to you? Can you give me an example? What types of goals do you think about?**

27) Friends **inspire** me to chase my goals

- Strongly disagree

- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **What does this question mean to you? How would a friends inspire you to chase goals? Does this question mean the same as the question above? Is there a difference between friends inspiring and friends encouraging? How would you put this question into your own words?**

RESISTANCE CAPITAL MOTIVATION

Directions: Please mark how much you agree or disagree with the following sentences. There are no right or wrong answers!

I will chase my goals...

28) To be a role model for others with similar cultural backgrounds

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **What does this question mean to you? What does it mean to be a role model for others with similar cultural backgrounds? What types of similar backgrounds do you think of? Can you give me some examples?**

I will chase my goals...

29) To help combat stereotypes for people with similar cultural backgrounds

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **What does this question mean to you? What does it mean to “combat stereotypes for people with similar backgrounds”? Do you think your peers will understand the word “stereotypes”? Do you think this question sounds negative or positive? Can you give me some examples?**

I will chase my goals...

30) Even when others think I can't

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **What does this question mean to you? Who do you think of when this question is asked? What types of goals do you think of? Can you give me some examples?**

I will chase my goals...

31) To show people with similar cultural backgrounds can succeed

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **What does this question mean to you? Who do you think about? Can you give me some examples?**

I will chase my goals...

32) To represent people from my culture in society

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **What does this question mean to you? What does it mean to “represent people from my culture”? Can you give me some examples? Would saying “world” be better?**

I will chase my goals...

33) To address the inequities in my community

- Strongly disagree
- Disagree
- Neutral
- Agree

- Strongly agree

QUESTION:

- **What does this question mean to you? What does “inequity” mean to you? What do you think of when you hear “address inequities in my community”? Can you give me some examples?**

I will chase my goals...

34) To show people from my community can succeed educationally

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **What does this mean to you? Can you give me some examples? What types of educational goals do you think of?**
- **When you think of people from your community, what types of people do you think of?**
- **When you think of people from your culture, what types of people do you think of?**

I will chase my goals...

35) To show people from my community can have a good job

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **What does this mean to you? Can you give me some examples? What does a good job mean to you?**

I will chase my goals...

36) To show people from my community can be successful

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION:

- **What does this mean to you? What types of goals do you think about when you hear this question? What does success mean to you when you hear this question? Can you give some examples?**

I will chase my goals...

37) To combat stereotypes about my community

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION

- **What does this mean to you? What types of goals do you think about?**

I will chase my goals...

38) Even when others think I can't because of my ethnicity

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION

- **What does this mean to you? What types of goals do you think about? Can you give me an example of when this might have happened to you or others you know?**

I will chase my goals...

39) Even when others think I can't because of my culture

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

QUESTION

- **What does this mean to you? What types of goals do you think about? What do you think about when you think of your culture? Can you give me an example when this might have happened to you or others you know?**

END OF INTERVIEW

GREAT THAT'S IT! IS THERE ANYTHING ELSE YOU WOULD LIKE TO ADD OR TELL ME? DID YOU HAVE ANY QUESTIONS ABOUT ANYTHING WE TALKED ABOUT TODAY? WAS ANYTHING CONFUSING OR DID ANYTHING INTEREST YOU OR GET YOU CURIOUS? OK GREAT! I'M GOING TO STOP THE RECORDING RIGHT NOW. THANK YOU AGAIN FOR SHARING YOUR KNOWLEDGE AND POINT OF VIEW WITH ME. IT'S GREATLY HELPFUL AND APPRECIATED! IF YOU HAVE ANY QUESTIONS AFTER THIS INTERVIEW, YOU CAN ASK ONE OF THE PROGRAM STAFF YOUR QUESTION OR THAT YOU WANT TO TALK TO ME AND WE WILL GET TOGETHER AGAIN TO ANSWER ANY QUESTIONS OR CONCERNS YOU MIGHT HAVE. THANKS AGAIN!

Appendix E
Pilot Survey

Student Aspirational Capital Scale

Thank you for agreeing to participate in this survey! This survey was designed to understand how students at the program continue to believe in their future dreams and goals even when they face certain challenges while doing so. Your participation is important and we would love to provide you with this opportunity to have your voice heard!

Your answers to this survey cannot be linked back to your name or identity in any way. The survey will take approximately 30 minutes to complete. There are no right or wrong answers to these questions and you may choose to stop at any time.

To thank you for participating, there will be a chance to enter your name into a raffle to win a \$20 gift card at the end of the survey.

If you have any questions during the survey, please raise your hand and someone will come to help you.

To start the survey, please continue to the **back** of this page (page 2).

Directions: Please mark [x] how much you agree or disagree with the following sentences. There are no right or wrong answers!

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. Even when life is difficult... I believe my dreams for the future are possible	☐	☐	☐	☐	☐
2. Even when life is difficult... I am hopeful for my future	☐	☐	☐	☐	☐
3. Even when life is difficult... I maintain my hopes for the future	☐	☐	☐	☐	☐
4. Even when life is difficult... I am confident that I will chase my goals	☐	☐	☐	☐	☐

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
5. Even when life is difficult... My personal strengths will allow me to my chase goals	☐	☐	☐	☐	☐
6. Even when life is difficult... I am committed to chasing my goals	☐	☐	☐	☐	☐
7. Even when life is difficult... Having a good education encourages me to chase my goals	☐	☐	☐	☐	☐
8. Even when life is difficult... Having a good job encourages me to chase my goals	☐	☐	☐	☐	☐

Directions: Please mark [x] how much you agree or disagree with the following sentences. There are no right or wrong answers!

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
9. Even when life is difficult... Having enough money encourages me to chase my goals	☐	☐	☐	☐	☐
10. Even when life is difficult... I will chase my goals by working hard	☐	☐	☐	☐	☐
11. Even when life is difficult... I will chase my goals	☐	☐	☐	☐	☐

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
12. My family encourages me to chase my goals	☐	☐	☐	☐	☐
13. My family inspires me to chase my goals	☐	☐	☐	☐	☐
14. My parent(s)/guardian(s) encourages me to chase my goals	☐	☐	☐	☐	☐

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
15. I will chase my goals... To achieve the things my family has never achieved	☐	☐	☐	☐	☐
16. I will chase my goals... To be a role model for my family members	☐	☐	☐	☐	☐
17. I will chase my goals... To support my family	☐	☐	☐	☐	☐

Directions: Please mark [x] how much you agree or disagree with the following sentences. There are no right or wrong answers!

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
18. I will chase my goals... So I can help the people in my community	☐	☐	☐	☐	☐
19. I will chase my goals... So I can make a difference in the world	☐	☐	☐	☐	☐
20. I will chase my goals... So I can help my friends	☐	☐	☐	☐	☐

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
21. A mentor inspired me to chase my goals	☐	☐	☐	☐	☐
22. A mentor encouraged me to chase my goals	☐	☐	☐	☐	☐
23. A mentor supports me to chase my goals	☐	☐	☐	☐	☐
24. Successful people like me inspire me to chase my goals	☐	☐	☐	☐	☐

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
25. Friends encourage me to chase my goals	☐	☐	☐	☐	☐
26. Friends inspire me to chase my goals	☐	☐	☐	☐	☐

Directions: Please mark [x] how much you agree or disagree with the following sentences. There are no right or wrong answers!

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
27. I will chase my goals... To be a role model for others like me	☐	☐	☐	☐	☐
28. I will chase my goals... To help fight stereotypes for people like me	☐	☐	☐	☐	☐
29. I will chase my goals... Even when others think I can't	☐	☐	☐	☐	☐
30. I will chase my goals... To show that people like me can succeed	☐	☐	☐	☐	☐

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
31. I will chase my goals... To represent people like me in the world	☐	☐	☐	☐	☐
32. I will chase my goals... To address things that are unfair in my community	☐	☐	☐	☐	☐
33. I will chase my goals... To show that people from my community can be successful in school	☐	☐	☐	☐	☐
34. I will chase my goals... To show that people from my community can have a good job	☐	☐	☐	☐	☐

Directions: Please mark [x] how much you agree or disagree with the following sentences. There are no right or wrong answers!

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
35. I will chase my goals... To show that people from my community can be successful	☐	☐	☐	☐	☐
36. I will chase my goals... To fight stereotypes about my community	☐	☐	☐	☐	☐
37. I will chase my goals... Even when others think I can't because of my race/ethnicity	☐	☐	☐	☐	☐
38. I will chase my goals... Even when others think I can't because of the way I live	☐	☐	☐	☐	☐

Directions: Please write in your answers for the next three questions.

39. What grade are you in?

40. What is your gender?

41. Is there anything else you would like to let us know?

End of Survey! Thank You!

Appendix F
Final AC Scale

Student Aspirational Capital Scale

Thank you for agreeing to participate in this survey! This survey was designed to understand how students at the program continue to believe in their future dreams and goals even when they face certain challenges while doing so. Your participation is important and we would love to provide you with this opportunity to have your voice heard!

Your answers to this survey cannot be linked back to your name or identity in any way. The survey will take approximately 30 minutes to complete. There are no right or wrong answers to these questions and you may choose to stop at any time.

To thank you for participating, there will be a chance to enter your name into a raffle to win a \$20 gift card at the end of the survey.

If you have any questions during the survey, please raise your hand and someone will come to help you.

To start the survey, please continue to the **back** of this page (page 2).

Directions: Please mark [x] how much you agree or disagree with the following sentences. There are no right or wrong answers!

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. Even when life is difficult... I believe my dreams for the future are possible	☐	☐	☐	☐	☐
2. Even when life is difficult... I am hopeful for my future	☐	☐	☐	☐	☐
3. Even when life is difficult... I maintain my hopes for the future	☐	☐	☐	☐	☐
4. Even when life is difficult... I am confident that I will chase my goals	☐	☐	☐	☐	☐

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
5. Even when life is difficult... My personal strengths will allow me to chase my goals	☐	☐	☐	☐	☐
6. Even when life is difficult... Having a good education encourages me to chase my goals	☐	☐	☐	☐	☐
7. Even when life is difficult... Having a good job encourages me to chase my goals	☐	☐	☐	☐	☐
8. Even when life is difficult... I will chase my goals by working hard	☐	☐	☐	☐	☐

Directions: Please mark [x] how much you agree or disagree with the following sentences. There are no right or wrong answers!

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
9. My family encourages me to chase my goals	☐	☐	☐	☐	☐
10. My family inspires me to chase my goals	☐	☐	☐	☐	☐
11. My parent(s)/guardian(s) encourages me to chase my goals	☐	☐	☐	☐	☐

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
12. I will chase my goals... To achieve the things my family has never achieved	☐	☐	☐	☐	☐
13. I will chase my goals... To be a role model for my family members	☐	☐	☐	☐	☐
14. I will chase my goals... To support my family	☐	☐	☐	☐	☐

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
15. I will chase my goals... So I can help the people in my community	☐	☐	☐	☐	☐
16. I will chase my goals... So I can make a difference in the world	☐	☐	☐	☐	☐
17. I will chase my goals... So I can help my friends	☐	☐	☐	☐	☐

Directions: Please mark [x] how much you agree or disagree with the following sentences. There are no right or wrong answers!

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
18. A mentor inspired me to chase my goals	☐	☐	☐	☐	☐
19. A mentor encouraged me to chase my goals	☐	☐	☐	☐	☐
20. A mentor supports me to chase my goals	☐	☐	☐	☐	☐
21. Successful people like me inspire me to chase my goals	☐	☐	☐	☐	☐

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
22. Friends encourage me to chase my goals	☐	☐	☐	☐	☐
23. Friends inspire me to chase my goals	☐	☐	☐	☐	☐

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
24. I will chase my goals... To be a role model for others like me	☐	☐	☐	☐	☐
25. I will chase my goals... To help fight stereotypes for people like me	☐	☐	☐	☐	☐
26. I will chase my goals... Even when others think I can't	☐	☐	☐	☐	☐
27. I will chase my goals... To show that people like me can succeed	☐	☐	☐	☐	☐

Directions: Please mark [x] how much you agree or disagree with the following sentences. There are no right or wrong answers!

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
28. I will chase my goals... To represent people like me in the world	☐	☐	☐	☐	☐
29. I will chase my goals... To address things that are unfair in my community	☐	☐	☐	☐	☐
30. I will chase my goals... To show that people from my community can be successful in school	☐	☐	☐	☐	☐
31. I will chase my goals... To show that people from my community can have a good job	☐	☐	☐	☐	☐

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
32. I will chase my goals... To show that people from my community can be successful	☐	☐	☐	☐	☐
33. I will chase my goals... To fight stereotypes about my community	☐	☐	☐	☐	☐
34. I will chase my goals... Even when others think I can't because of my race/ethnicity	☐	☐	☐	☐	☐
35. I will chase my goals... Even when others think I can't because of the way I live	☐	☐	☐	☐	☐

Directions: These following questions ask **how often** you receive **help** from **program staff**. Please mark [x] your answer. There are no right or wrong answers!

Program staff...	Never	Almost Never	Some of the Time	Most of the Time	Almost Always	Always
36. Cares about me	☐	☐	☐	☐	☐	☐
37. Treats me fairly	☐	☐	☐	☐	☐	☐
38. Makes it okay to ask questions	☐	☐	☐	☐	☐	☐
39. Explains things that I don't understand	☐	☐	☐	☐	☐	☐
40. Shows me how to do things	☐	☐	☐	☐	☐	☐

Program staff...	Never	Almost Never	Some of the Time	Most of the Time	Almost Always	Always
41. Helps me solve problems by giving me information	☐	☐	☐	☐	☐	☐
42. Tells me I did a good job when I've done something well	☐	☐	☐	☐	☐	☐
43. Nicely tells me when I make mistakes	☐	☐	☐	☐	☐	☐
44. Spends time with me when I need help	☐	☐	☐	☐	☐	☐

Directions: Please **write in** your answers for the next three questions.

45. What grade are you in?

46. What is your gender?

47. Is there anything else you would like to let us know? _____

End of Survey! Thank You!

[illegible][illegible]

[illegible][illegible]

VITA

During the duration of this dissertation study, Sarah was PhD candidate in the Evaluation, Statistics, and Methodology program at the University of Tennessee. She was born and raised in San Antonio, Texas and proudly calls Texas her home. Sarah identifies as a research scientist within the education field with interests in survey research, psychometrics, and data science. With her technical skills and knowledge as a research scientist, she has dedicated her career to support underserved and underrepresented populations across in the education field. Sarah firmly believes most of her work could not have happened without the support of her faculty inside and outside of her PhD program. After graduating with her PhD this spring, Sarah plans to continue her career commitment in supporting underserved and underrepresented communities through her research.