Success in a Career-Technical Education Program:

The Role of Individual Strengths and Contextual Assets

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Abstract

The purpose of this research was to assess student progress in and completion of a career-technical education (CTE) program. This study focused on the Williamson College of Trades (WC) in Media, PA and explored the relation between student strengths of school engagement and vocational identity, and contextual assets, of program quality and family support, in predicting success operationalized as graduation, grades, and disciplinary record. One way ANOVAs and linear regressions were used to assess these relations. Analyses revealed that self-perceived skill in the second year of education differentiated students who graduated or did not graduate. In addition, cognitive school engagement and leadership opportunities predicted grades. These results, their limitations, and implications for the WC program and policies are discussed. Suggestions are made for future research, policies, and trade programs beyond those at WC.

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Chapter 1: Introduction

In the United States post-recession economy of the second decade of the 21st century, two large issues dominate political and popular discourse. The first issue is availability of jobs that are high-wage, high-skill, and high demand (Association for Career and Technical Education [ACTE], 2015). The second issue is the training associated with such jobs. A gap exists between the U.S. labor market and the availability of a skilled workforce. One reason that this gap exists is that, at this writing, there is not a strong or centralized program of training and education for young people to enter such high-wage, high-skill, and high-demand jobs (ACTE, 2015; Barabasch & Rauner, 2012; Zirkle, 2012). According to the U.S. Department of Education (2014), more than eight million students were seeking a career-technical education (CTE) certificate or degree in the 2011-2012 school year. Employment was projected to increase by 15.6 million jobs by 2022, and the occupations which require at least some post-secondary education were projected to grow at a faster rate (Bureau of Labor Statistics [BLS], 2015). Young people who are able to access post-secondary CTE may be able to fill this gap, and may out-earn others in their field by 37% (Carnevale, Rose, & Hanson, 2012). The fields of construction and manufacturing typically associated with trades such as carpentry, masonry, power technology, and machine technology will need 5.7 million workers and 3.5 million workers, respectively (ACTE, 2015, 2016). The average salary associated with these fields is about $65,000 to $75,000 (ACTE, 2015, 2016).

The field of CTE is experiencing renewed interest in the current context of job growth following the economic recession of the first decade of the 21st century. As such, there has been a focus on the gap between available jobs and the availability of a skilled workforce (Office of Career, Technical, and Adult Education [OCTAE], 2015). There is bipartisan support for CTE

programs as a pathway out of poverty and as a way to address the skills gap (e.g., Biden, 2014; GOP, 2016; M. Obama, 2015; Workforce Innovation and Opportunity Act [WIOA], 2014). As a result of a focus on CTE specifically, and workforce development more broadly, it would be useful to look in-depth at CTE programs that are successfully educating youth toward thriving and productive adulthood. One unique and historic program is the Williamson College of the Trades (Barlow, 1976).

The purpose of the present research was to understand the post-secondary training and progress of young, working class men enrolled in a post-secondary CTE program, that is, Williamson College of the Trades (WC), during their transition to adulthood. WC is unique among colleges and unique among trade schools because its curriculum and educational philosophy integrates character education, civic education, and CTE skill development. WC has a strong record of producing successful graduates who are all placed in jobs which provide them with financial stability and success. However, not all students successfully complete the rigorous training involved in a WC education. Given the value of successful completion of the WC education (i.e., close to 100% job placement), it is important to look at the differences between students who persist in this school, and those who leave, or are asked to leave, WC.

This research was derived from ideas linked to the relational developmental systems (RDS) metatheory, which is associated with the process-relational paradigm (Overton, 2015). An RDS approach suggests that the fundamental unit of analysis in human development is the relation between an active organism and a dynamic context (Lerner & Overton, 2008). Specifically, then, I explored how specific individual attributes, such as vocational identity and school engagement, and specific contextual features, such as program quality and family support, may be linked to success at WC. I conceptualized success in two ways. First, I assessed the

individual-context relations related to graduation. Then, for the students who did graduate, I assessed their school success in the form of grades and disciplinary record. Before I discuss research pertinent to these potential influences on school progress, I describe the relational developmental systems metatheory which frames the present research and its relevance for understanding the development of young men at WC.

The Relational Developmental Systems Metatheory

The study of human development involves assessing intraindividual change and interindividual differences in intraindividual change across the life span (Baltes, Reese, & Nessleroade, 1977). Therefore, the goal of developmental science is to describe, explain, and optimize such changes across the life span (Lerner, 2012).

In contemporary developmental science, human development is understood as not arising solely from the innate characteristics of the individual or as a result of environmental influences acting on a passive organism. Rather, human development results from mutually influential relations between an active individual and a changing context (Lerner & Overton, 2008; Overton 2015). These relations are represented as individual ⇔ context relations. Both the individual and the context will shape, and are shaped by, the other through developmental regulations, that is, through the influences one component of the system has on other components (e.g., Brandstädter, 1998). At WC, students are shaped by teachers, administrators, and the curriculum. However, they are not passive recipients of the tactics of the school. These students also shape the school by participating in extracurricular activities, leadership opportunities, by engaging with the curriculum, and by facilitating relationships with mentors.

All individuals are unique, and all contexts are unique (Lerner, 2012; Rose, 2015). As a result, the potential exists for virtually infinite combinations of individuals and contexts to

produce varied instantiations of individual ⇔ context relations and, furthermore, this variation is linked to multiple pathways through adolescence, and throughout the life span (Lerner, 2006, 2012). These multiple pathways of development may be key to understanding the ways through which individuals successfully transition to adulthood. WC students do not all experience the effects of WC equally. In addition, despite the focus in the present analyses on aggregate group differences, the WC students' embodied experience at the school is the result of their unique developmental trajectories, including family relationships, connections to the trades, and prior experiences at schools.

These experiences are filtered through multiple levels of organization of the developmental system. The interrelations of these levels involve biology through culture and history in their influences on development. Indeed, there are multiple influences on students who may be involved in CTE at each of these levels. For example, there are biological maturational changes associated with the ability to be involved in CTE (Shrigley, 1908), and there are historic influences on availability of such programs through educational policies or philosophies (Barlow, 1976; Wonacott, 2003). In expanding levels of the context, there are peer or family influences on the type of education a student pursues, or has made available to him/her. There is also the availability of such programs, or targeting of such programs toward certain populations of students. Indeed, CTE has been criticized as "tracking" options for young people whose cognitive capacity may be perceived to be lacking (Crosnoe & Benner, 2015; Eccles & Wigfield, 2002), for example, minority students, students from low-income backgrounds, or male students whose physicality is prioritized over mental capacities. Integration of these levels and consideration of what student, with what types of

motivations, in what schools or districts, in what historical moment, receive or benefit from what types of education is integral in promoting thriving across the life span.

An RDS approach transcends Cartesian dualisms (i.e., splits in influences on human development) and, as noted, supports an integrated view of individual and context, rather than a split reductionist approach (Lerner, 2006, 2012; Overton, 2015). Just as the splits between nature/nurture, continuity/discontinuity, and stability/instability are false, vocational education and CTE have been marked by several false splits. For example, one might consider the split between theory and applied learning to be a false split in that one learns theory by understanding application, and one applies knowledge though understanding theory or reasoning behind such application. Indeed, skills learned in one domain may transfer to another (Fischer & Bidell, 2006). Another often discussed split in the field of education is that between physical, vocational, and liberal education (e.g., Snedden, 1910). Indeed, the contemporary field of education may benefit from integrating the technical and liberal aspects of student schooling (Fesmire, 2016; Hamilton & Hamilton, 1999). The synthesis or integration of the variety of influences and perspectives on development may be useful in understanding development across the life span. Indeed, an RDS approach may help to integrate some of the splits which demarcate CTE from the broader system of education and schooling.

Through synthesizing the varied influences on people across the life span, the individual and the context may be considered active, dynamic, and fused in function (Lerner, 2006; Overton, 2015; Witherington, 2014). Together, the individual and the context co-create and co-act to produce development. In applying this idea of coaction to WC students, the processes and outcomes and student ⇔school relations associated with school progress and success would be interpreted as nested within several layers of the ecology. These layers may include the history

of the school, the influence of the family, the physical location of the school, the political and public context of CTE and vocational education, and the U.S. economy.

Development of young people (and people across the life span) arises as a result of mutually influencing individual-context relations with the multiple levels of organization previously described. For example, students at WC are participating in school derived from a particular post-industrial and urban context. Their ability and willingness to conform to the codes of these educational institutions represents one level of student ⇔school relations and individual⇔context relations.

When the mutually influencing individual ⇔ context relations are also mutually *beneficial*, they are termed adaptive developmental regulations (Brandstädter, 1998). Adaptive developmental regulations involve an individual acting to support the context that is supporting the individual, for example, when a student at WC participates in a volunteer opportunity, or joins student leadership groups. In other words, adaptive developmental regulations exist when a young person's social world is "supportive, nurturing, and growth promoting," and when an individual reciprocates positive actions that support the environment (Lerner, 2004, p. 44). When young people are engaged in such positive relations, then they may be on a trajectory toward thriving (Lerner, 2004). The potential for positive development and thriving as a result of adaptive developmental regulations may be constrained or facilitated as the result of relations between levels of the ecology which vary across time within contexts, and within time across contexts (Dannefer, 1992; Lerner, 2002, 2006). For example, a student who has had a developmental trajectory marked by a lack of family support, or mistrust in authority, or an insufficient high school education, may not perceive WC to be a healthy and supportive environment.

In addition to varied manifestations of individual⇔context relations, interindividual differences, and intraindividual changes, there are changes within contexts and differences across contexts within time. As a result, human lives, and processes of development, are unique within and across people, settings, and time (Elder, Modell & Parke, 1993; Elder et al., 2015; Rose, 2015). This diversity is a defining feature of RDS - based theories (Lerner, 2006; Overton, 2015). The academic decisions and vocational opportunities a young person makes may be the result of individualized experiences, for example within a family, or in a community. This experience is shaped by group membership (e.g., race, class, gender), physical location (e.g., rural/urban, national affiliation), and historical context. The central role of diversity, both intraindividual and interindividual, within the developmental system influences another defining feature of the developmental system: the potential for plasticity. Plasticity refers to the potential for systematic change in individual⇔context relations (Lerner, 1984), to the capacity for meaningful (as compared to random) change in the face of experience. Young people transitioning to adulthood are in a particular phase of the life span in which their changing relationships to institutions takes primacy (Hamilton & Hamilton, 2009). The potential for such plasticity exists within the relational developmental system because of temporality (i.e., the arrow of time or history).

The temporality of the developmental system, that is, the constancy of change, provides a basis for emergent changes throughout ontogeny (Lerner, 1984). As a result, it is important to capitalize on the plasticity of young people's developmental trajectories by promoting efforts aimed at supporting and facilitating mutually beneficial individual ⇔ context relations. Indeed, Isaiah V. Williamson founded the school to capitalize on the plasticity of boys and intervene on "idleness, vice, and crime and constituted a threat to society" (Barlow, 1976, p. 49). By

promoting such relations, developmental scientists can facilitate the processes through which young people thrive, either at the level of the individual, or at the level of the context. Intervening at one level, for example with a student, will influence change on another level, ideally in the communities where these students live (Lerner, 2004, 2006).

Temporality exists as a result of the fusion of levels of influence on development with history. Therefore, the potential for plasticity (i.e., systematic and successive change) exists across the life span and, in particular, for young people transitioning to adulthood in the second decade of life. However, such plasticity is always relative. The system that promotes change can also serve to diminish change (Lerner, Agans, DeSouza & Hershberg, 2014), and the agency of a young person is always constrained and facilitated by the affordances of the system. For example, the opportunity to participate in CTE may facilitate positive development by promoting a sense of competence and confidence, and financial stability, but participation in CTE may also constrain opportunities for young people for whom CTE is not a good fit (Crosnoe & Benner 2015; Fesmire, 2016; Eccles & Wigfield, 2002).

In short, there are variations in developmental regulations and in the potential for plasticity across individuals and across groups. This diversity in development and interindividual differences in intraindividual change is fundamental to understanding development across the life span. There are multiple pathways toward school success or failure, given individual and contextual features. However, plasticity and diversity provide reason to be optimistic, creative, and committed about facilitating the alignment between individuals and contexts to promote positive development across individuals, across groups, and across ecologies.

The Transition to Adulthood

Some scholars describe young adulthood as an extension of adolescence; however there are at best only limited conceptual ideas and empirical evidence to suggest that young adulthood is in fact a unique developmental stage (Côte, 2014). Instead, changes in developmental focus may occur. There are biological, social, psychological, and legal markers of adulthood (Settersten, Ottusch & Schneider, 2015); however, the transition to adulthood is primarily characterized by "changes in institutional roles and relationships" (Hamilton & Hamilton, 2009 p.492). In the transition to adulthood, youth may be physically and emotionally separate from parents, and may begin to establish independent and self-sufficient lives. Indeed, the transition to adulthood is "central to both the reproduction of social class hierarchy and the alleviation of poverty," and this transition is shaped by institutions in the context of youth (Hamilton & Hamilton, 2009, p.492). Participation in higher education is one marker of the transition to adulthood (Settersten, Ottusch & Schneider, 2015). Different types of higher education, for example, four year universities, community colleges, junior colleges, or trade colleges, may constrain or facilitate the developmental trajectories of young people (Stettersten Ottusch, & Schneider, 2015).

Post-secondary degree attainment is associated with health outcomes (Hauser & Koenig, 2011), marriage rates, and the health outcomes of the next generation of students (Bornstein, 2015). Completion of a degree signifies to society and specifically employers "perceived differences in skill, competence, and value" (Crosnoe & Benner, 2015, p. 277). Furthermore, educational attainment offers access to cultural, social, and cognitive resources (Crosnoe & Benner, 2015; Lynch, 2003).

Structural Lag and the Transition to Adulthood

Postsecondary education, particularly in the CTE field, may help facilitate the transition to adulthood and also bridge the gap between a skilled workforce and the job market. Given that the changes associated with the transition to adulthood are primarily associated with institutions, and that individual⇔context relations are the bases of intraindividual development, it is important to focus on what happens when institutions in the context do not exist to support individual needs, or do not align with individual needs. This misalignment may be referred to as structural lag (Hareven, 1994; Hamilton & Hamilton, 2009; Riley, Kahn, and Foner, 1994).

One relevant instance of structural lag is the skills gap in the U.S. labor market that characterizes the first two decades of the 21st century (OCTAE, 2015; Symonds, Schwartz, & Ferguson, 2011). The gap in skills is of particular relevance to the 3.6 million youth in the U.S. who were looking for but have not found opportunities to work (U.S. BLS, 2014, 2015). At this writing, it is projected that, by 2020, 65% of U.S. jobs will require some type of postsecondary education or training (Carnevale, Smith, & Strohl, 2013). In addition, there will be a shortage of three million workers with at least an associate college degree, and a shortage of five million workers overall (Carnevale, Smith, & Strohl, 2013). However, if young people are able to access postsecondary training in a CTE field, it is estimated they will out-earn others in their field by 37% (Carnevale, Rose, & Hanson, 2012).

Hamilton and Hamilton (1997) described seven principles that facilitate the school-to-work transition and are derived from apprenticeship programs that, in several respects, are similar to CTE programs, at least as they are instantiated at the WC: 1. Technical competence, 2. Breadth, 3. Personal and social competence, 4. Expectations and feedback, 5. Teaching roles, 6. Academic achievement, and 7. Career paths. Actions linked to these principles may lead to a

successful transition from school to work, and they may subsequently facilitate positive development.

Given these benefits to the country, to employers, and to youth (M. Obama, 2015), it is important to address structural lag with respect to young people, and specifically the lag that occurs when the training of youth does not align with the needs of institutions and the economy. One way to address this lag is by promoting programs that are evidenced to work for youth and for those transitioning to adulthood. Although there are a variety of ways that job-training programs promote success and graduation (e.g., DOL, DOC, DOE, DHHS, 2014; Hamilton & Hamilton, 1997), it is also important to think about the philosophies underlying these programs which may also support the success of youth and help to address issues of structural lag.

The Positive Youth Development Perspective

One way to address structural lag and to promote thriving, productivity, and self-sufficiency is to capitalize on the strengths and agency of youth and facilitate opportunities (e.g., for job training) through which they may experience success in both their personal and professional lives. The positive youth development (PYD) perspective suggests that when the strengths of youth are aligned with assets in their community, they will thrive (Lerner et al., 2005; Geldhof et al., 2014). In the U.S., beginning in the 1990s, and persisting through this writing, there have been a variety of youth programs implemented (e.g., 4-H) and evidence gathered (e.g., Roth & Brooks-Gunn, 2002) derived from the PYD perspective.

There are several models of PYD (e.g., Benson et al., 2006; Eccles & Wigfield, 2002, Travis & Leech, 2014). The research project from which most PYD data were derived has involved the Five Cs model of PYD (Lerner et al., 2005; Geldhof et al., 2014). The Five Cs model suggests that, when the strengths of youth are aligned with the assets in their community,

positive development occurs. In this approach, positive development is operationalized as competence, confidence connection, caring, and character (Lerner, 2004). When young people exhibit these Five Cs, they will contribute to themselves, to others, and to civil society (Lerner, 2004).

The Five Cs model is the most empirically tested and supported model of PYD (Geldhof et al, 2014). There are specific characteristics of youth development (YD) program quality that are associated with these Five Cs (Roth & Brooks-Gunn, 2002). The three characteristics most often connected with the Five Cs are 1. Mentoring, 2. Skill development, and 3. Opportunities for leadership and participation (Lerner, 2004). These characteristics are termed the "Big Three" (Lerner, 2004).

PYD has been directly related to education and to schooling (Eccles et al., 1993; Wigfield et al., 2006), and job readiness is also considered a key process and outcome of PYD (Hamilton & Hamilton, 1997). Therefore, CTE may be considered a field which can inform, and be informed by, the PYD perspective.

CTE as a PYD Program

This description of CTE programs can be related to the Big Three defining features of PYD programs. Similar to traditional schools, CTE offers youth the opportunity to interact with adults through academic training. Of course, not all of these adults will become mentors. However, the apprenticeship model of many CTE programs provides a unique opportunity in which a mentoring relationship may arise (Hamilton & Hamilton, 2009). At WC in particular, students are placed within a degree program (shop), with one instructor who they work with across all three years.

As in PYD programs, various skills are developed during participation in CTE programs (Hamilton & Hamilton, 1999). These attributes may be physical skills (e.g., mixing cement for a stonemason) or social skills (e.g., productive collaboration with others on a project). These vocational skills may extend to other domains in a young person's life, in that physical skills may lead to better overall health and social skills may lead to better relationships beyond those at WC (Arbeit, Hershberg, Rubin & DeSouza, 2016).

Leadership may be derived from competency-based learning and by preparation for careers. Indeed, it is part of the curriculum at WC that students take on more responsibility as they progress through the program, and are expected to carry out these responsibilities to the school and the students with integrity. Leadership is subsequently promoted within this type of schooling, as youth are encouraged to be both collaborative and self-directed. This training may lead to opportunities to work, which is beneficial to individuals as well as to families and to civil society.

CTE and PYD at the Williamson College of the Trades

Barlow (1976) describes four phases to the history of vocational education, now termed Career-Technical Education: The awakening, independent action, the vocational age emerges, and coming of age. It was during the emergence of the vocational age (i.e., the third phase), that the trade school movement and the manual training movement were established. It was also during this time when the Williamson Free School for the Mechanical Trades (1888) was founded.

Williamson Colleges of the Trades (WC) was founded in 1888 by Isaiah Vansant Williamson as the Williamson Free School for the Mechanical Trades. WC prepares deserving young men to be useful and respected members of society. To accomplish the mission,

Williamson provides students with academic, trade, technical, moral, and religious education, and a living environment based on the Judeo-Christian perspective that fosters the values of faith, integrity, diligence, excellence, and service (Williamson College of the Trades [WC], 2015).

Among trade schools, Williamson College of the Trades (WC) is an historically significant, and a contemporarily unique educational environment (Barlow, 1976, Shrigley, 1908). This school is an all-male, three-year, post-secondary trade school. WC provides deserving young men (i.e., who are "able bodied," in good health, unmarried, without children, and legal U.S. residents) the opportunity to be productive and respected members through a (privately funded) free education in the trades.

With some few exceptions, students are from families living at or below 250% of the U.S. poverty line. In order to gain admission, students must complete the Armed Services Vocational Aptitude Battery, and have an interview with school administrators. If students are admitted, they agree to adhere to a strict code of conduct. Included in this code of conduct is the expectation of appropriate and respectful language, punctual adherence to a schedule, and full participation and completion of academic and community activities (i.e., attending chapel service, participating in an extracurricular activity). Violation of this code of conduct results in receiving points (similar to demerits) or "hours," that students must give up of their relatively limited free time to complete tasks for the school. In addition, as part of their admission, students agree to not consume alcohol or illegal drugs, although they have been permitted to use tobacco products (but not to spit). In order to enforce this policy, students are subject to random drug and alcohol testing. If students do not pass a drug and alcohol test (or decline to take the

test), or if they accumulate excessive demerit points or "hours," they are dismissed from the school.

In return for adhering to the school's code of conduct, students are provided with a free education, and the near guarantee of job placement. The school environment is designed to promote the values of the school (i.e., faith, integrity, diligence, service, and excellence), in addition to promoting skills in students' areas of study. Students may earn an Associate degree in Specialized Technology in Carpentry, Masonry, Horticulture, Machine, Paint, or Power Plant. Their education in each of these mechanical trades includes theory and an applied component (i.e., a shop experience). Another unique aspect of this school environment is that students are responsible, in part, for the maintenance and operations of the school. These duties may include food service, cleaning, or repairs.

It is important to note that students who attend WC are relatively high functioning for their levels of risk (e.g., associated with SES, gender, life experiences). Because of these high qualifications of the school (e.g., that they are interviewed, take a standardized test, and are drug tested), this group may be prone to better outcomes than their peers of similar experience and demographic characteristics who attend other trade schools, community colleges, or are not attending schools.

This school may be considered a youth development (YD) program, in that it is intentionally designed to intervene upon individual ⇔ context relations to promote positive outcomes such as good character in, and economic opportunities for, youth. Inspection of the features of the WC program suggests evidence that the Big Three exist at this institution. Students are mentored by their shop teachers over the course of three years. They develop life skills as part of the code of conduct, and vocational skills as part of their shop training. Finally,

they are given the opportunity to participate and lead in their shop and extracurricular activities and, as they advance to senior status, they are given responsibility over junior students.

The WC Theory of Change

The theory of change for the WC is aligned with the mission and the vision of Isaiah Williamson. The theory of change suggests that "If 1. Healthy, able-bodied young men who are 2. Intellectually and emotionally prepared, honest, frugal, entrepreneurial, temperate, and industrious; and who are given 3. A curriculum that educates them with the knowledge and skills needed to pursue a good mechanical trade; in the context of a school setting that 4. Provides Judeo-Christian ethic and values; then 5. They will succeed in life" (WC, 2015).

Success for the school is in graduating Williamson men and placing them in jobs. Accordingly, in this research I operationalized success as graduation from WC. I asked whether specific relations between individual attributes and contextual resources, that is, individual ⇔context relations, linked to the students' family and/ or school context, were associated with school success (i.e., graduation from WC). In addition, among those students who did graduate, I then assessed if variation in these two domains of individual ⇔ context relations was associated with interindividual differences in WC performance (i.e., academic grades, shop ratings, and demerit hours). In addition to graduation, per se, these constructs may differentiate students who show different post-WC career paths. Although such post-college assessments were not able to be observed in this study, the assessment I was able to make of the students may provide a useful baseline against which future WC research can be conducted. Accordingly, it is useful to focus next on the specific constructs of interest in regard to the individual ⇔ context relations previously described as key to an RDS-based PYD approach to development within the WC.

A Measurement Model Linked to the WC Theory of Change

In an RDS-based approach to PYD, both individual strengths and contextual assets need to be aligned to instantiate thriving. WC students may have such strengths and, as well, assets that reflect their families, and/or the WC itself. I explored these possibilities in this research.

Student Strengths. All youth have strengths (Lerner, 2004), and the WC students in particular are selected based on their character strengths. Whereas other work has assessed dimensions of WC student strengths with respect to interpersonal connection (Arbeit et al., 2016) and character attributes (Hershberg et al., 2016; Johnson et al., 2015), the present research assessed two dimensions of student strengths that may lead to success: school engagement (linked to WC) and vocational identity. These two aspects are important parts of CTE (Hamilton & Hamilton, 1997, 2009), and may be integral to progress and success at WC.

School Engagement. Schools are a primary context of development, and engagement underlies all other indicators of academic success (Crosnoe & Benner, 2015). Engagement facilitates indicators of school success, such as compliance with a code of conduct or grades (Crosnoe & Benner, 2015; Fredricks, Blumenfeld & Paris, 2004). Similarly, disengagement is associated with less desirable outcomes (e.g., discipline or drop out) (Crosnoe & Benner, 2015). The engagement-achievement (i.e., success) connection is complex and also bidirectional (Crosnoe & Benner, 2015), and both arise from the student ⇔ school relation, when the individual strengths connect with the "norms, process, and characteristics of the school context" (Crosnoe & Benner, 2015, p. 278).

The PYD perspective suggests that school engagement plays a key role in promoting thriving for youth (Li & Lerner, 2011). There are three components of school engagement: cognitive, behavioral, and emotional (Fredricks, Blumenfeld & Paris, 2004). *Behavioral*

engagement pertains to participation, for example, attendance and effort. Behavior engagement at WC may include compliance with the norms and rule structure of the school. *Emotional engagement* pertains to positive feelings about the school and a sense of belonging in the school. At WC, this construct might have to do with fit, endorsing the model of education, and positive relations with others in the school. Finally, *cognitive engagement* pertains to investment in academic challenges and value for educations and ideas about learning (Chase et al., 2014; Fredricks, Blumenfeld & Paris, 2004, Li & Lerner, 2011). School engagement has been linked to academic achievement and success, and also to decreased problem behaviors (Eccles & Roeser, 2011; Li et al., 2011; Li & Lerner, 2011).

Vocational Identity. A key developmental task of adolescence and the transition to adulthood is to establish a sense of continuity in self-definition (Côté, 2009). There may be multiple aspects to identity (e.g., civic or ethnic). There are also role identities, for example as a parent or a worker. Occupational identity, is the "conscious awareness of oneself as a worker" (Skorikov & Vondracek, 2011 p. 693). Occupational identity, worker identity, and vocational identity are related and are key parts of this developing sense of self (Erikson, 1968; Porfeli et al, 2011). Work, and the identity development which is derived from this experience facilitates transitions to adulthood such as leaving the family of origin, individual residence, and potentially marriage and parenthood (Mortimer et al., 2015).

Porfelli et al. (2011) have proposed three parts to vocational identity: career exploration, career commitment, and career reconsideration. Prior qualitative research has shown that WC students also have meaningful connections to the trades, either through school, prior work experiences, or family (Johnson et al., 2015). For these students career commitment making may be the most adaptive, because they extent to which they identify with their chosen career (i.e.,

shop) may shape the way they perform in their classes, and their persistence in remaining in the school. In addition, "commitment to craftsmanship" is part of the shared identity of students, teachers, and administrators at WC.

Contextual Assets. As previously described, institutions play a central role in the development of young people transitioning to adulthood. Institutions may refer to formal organizations such as schools or programs, or to customs and practices (Hamilton & Hamilton, 2009). Families are considered a key institution of human life (Hamilton & Hamilton, 2009). In addition, both the family and the school represent microsystems of development (Bronfenbrenner & Morris, 2006). For students at WC, the interrelations of the two settings may have a unique impact on student success. In short, it may be that a young person's vocational identity is, at least in part, a product of family support for a particular vocational career.

Family Support. Schulenberg, Vondracek, and Crouter (1984) suggest that the family is a primary context for vocational identity development, and that the family mediates the three sources of developmental influence (i.e., age graded, history graded, and nonnormative; Baltes, Cornelius & Nesselroade, 1979). Family support for the trades may indicate a type of academic socialization, or a type of communication about education related to particular educational aspirations or expectations of success (Crosnoe & Benner, 2015).

Past research involving WC students, as well as students from comparison samples, suggests that one way in which WC students are connected to the school is through family involvement in the trades (Johnson et al., 2015). In addition, in prior qualitative research students described family instability and complicated relationships with caregivers as part of many of these students' experiences (e.g., Arbeit et al., 2016; Johnson et al., 2015). One explanation for this instability and complicated relationships may be that economic stress can

shape the way parents are involved in or discuss education in the home (Crosnoe & Benner, 2015). Based on prior research (Johnson et al., 2015), I expected that family support for schooling, or lack thereof might shape the way students are able to gain entrance to the school, progress throughout the program, and persist in completing their education.

Program Quality. The question of program quality is of particular importance when taking an RDS approach to evaluating YD programs, in that it is explicitly a component of the process of development in relation to a program (Vandell, Larson, Mahoney, & Watts, 2015). Quality of a program may be appraised by how youth experience their engagement with a program (Vandell et al., 2015). For instance, what do they see as the key features of their program experience and how do they evaluate these experiences? The processes which are related to program quality include, but are not limited to, interactions with adults, skill building, and "choice and voice" in activities (Vandell et al., 2015).

Research and theory link the experience of program quality to specific features of activities and programs. In their assessment of program goals, atmosphere, and activities, Roth and Brooks-Gunn (2003) found that YD programs promote healthy development by ensuring that the environment is supportive and empowering, and that this environment has activities that provide opportunities to build skills and broaden horizons. Eccles and Gootman (2002) suggest eight features relevant to program quality: Physical and psychological safety, appropriate structure, supportive relationships, opportunities to belong, positive social norms, opportunities for efficacy and mattering, opportunities for skill building, and integration of family, school and community efforts. Another useful way to review program features is using the SAFE (i.e., sequenced, active, focused, explicit) method (Durlak et al., 2010). These types of programs have

been shown to be related to positive developmental outcomes such as increased academic achievement, more positive behaviors, and reduced problem behaviors (Durlak et al., 2010).

Lerner (2004) suggests other conceptions of program quality involve three program content features that matter most for ensuring the effectiveness of YD program quality. As noted, these "Big Three" program content features include positive and sustained youth adult relations, skill-building activities, and opportunities for participation and leadership; when enacted within safe spaces for youth, these Big Three are linked to positive youth outcomes (Lerner, 2004). It is possible to theorize about how these three features of YD programs may be directly related to the Five Cs. For example, a positive and sustained mentoring relationship may promote caring and connection. Skill building may lead to an increased level of confidence and, as well, a sense of competence. Leadership and collaborative participation opportunities may promote the development of good and ethical character, that is, character virtues (e.g., Lerner & Callina, 2014). It is also important to focus on the way that youth perceive program quality, in that such perceptions may moderate their engagement with the program, and ultimately their completion of such a program. I measured such perceptions in the proposed research (DeSouza, 2016).

Adult mentoring. The presence of mentors may be the most important contextual asset for PYD (Theokas & Lerner, 2006). A mentor is not just an adult with an organizational role within a program (Hamilton & Hamilton, 2009). Mentoring relationships are built on mutuality, trust, and empathy, and can facilitate social-emotional development, cognitive development, and identity development (Rhodes & Lowe, 2009). Mentors are also a source of social capital, connecting youth to opportunities (Hamilton & Hamilton, 2009).

Similar to traditional schools, trade schools offer youth the opportunity to interact with adults. Of course, not all of these adults will become mentors. However, the apprenticeship model of training provides a unique opportunity in which a mentoring relationship may arise (Hamilton & Hamilton, 2009).

Skill development. The development of a skill refers to a contextually specific capacity to act (Fischer & Bidell, 2006). Skills develop in real situations and may subsequently be extended to other contexts (Fischer & Bidell, 2006). Young people can be skilled in multiple domains (e.g., socially, emotionally, physically, and cognitively) (Fischer & Bidell, 2006). YD programs are one such context in which youth may develop skills to be extended into other domains of their lives. The development of life-skills and vocational-skills are typically a substantive focus within a youth development program and are particularly important for positive and successful adulthood. Vocational skills may prepare youth for employment, and for meaningful participation in a changing economy (Symonds, Schwartz, & Ferguson, 2011). Similarly, life-skills, such as interpersonal skills, may prepare youth for healthy relationships as adults (Brown & Larson, 2009), and civic engagement in their communities (Lerner & Callina, 2014). Although separate sets of competencies, both types are skills are necessary to develop for the transition to adulthood.

There are certain vocational and life skills that will develop during a trade education. As noted earlier, these may be physical skills (e.g., mixing cement for a stonemason) or social skills (e.g., productive collaboration with others on a project). These vocational skills may extend to other domains in a young person's life, in that physical skills may lead to better overall health, and social skills may lead to better relationships.

Leadership and participation. YD programs also provide opportunities for leadership and participation. Opportunity for leadership is key in the PYD perspective, because offering youth the chance to lead suggests that they are problem solvers and assets, able to produce their own positive development (Benson, 2006; Lerner & Busch-Rossnagel, 1991). One way to conceptualize youth leadership is as "a relational process combining ability … with authority… to positively influence and impact diverse individuals, organizations, and communities" (MacNeil, 2006, p. 29). Indeed, youth leadership is not only good for developing into adult roles (e.g., Gardner, 1990), but is also found to be good for the functioning of organizations as a whole (Zeldin, 2004). The opportunity for leadership is particularly important during the transition to adulthood, because leadership roles may help youth to develop agency and autonomy (Eccles & Gootman, 2002; Hamilton & Hamilton, 2009; Mahoney et al, 2009). Programs with an intentional focus on this feature prepare youth for role transitions, and also community engagement (Hamilton & Hamilton, 2009).

It is difficult to be a passive student in a trade school, in that when information is received, it is immediately and directly applied to a real-world task. Therefore, a trade school is an environment which facilitates heightened participation. Leadership is subsequently promoted within this type of schooling as youth are encouraged to be both collaborative and self-directed.

Conceptualization of Success

WC administrators view success in a comprehensive way. They are interested in the success of the individual and of the community, both in the short, and the long term. In the short term, the young men are held to high standards in their trade, in their academics, and in their personal lives. In the long term, WC envisions the success as "building a better world by building better families, better organizations and better communities" (Rounds, 2015). The

aspirational idea of the "Williamson Man" is a unifying theme among students, faculty, administration, and alumni. In order to successfully embody the Williamson Man identity, the students must persist in completing the rigorous curriculum for three years. Accordingly, graduation from WC is a key marker of such success. As such, this marker was the main focus of this research.

The Present Study: Aligning Strengths and Assets to Promote Success

What predicts the success (i.e., graduation) of WC students? In the present study I assessed individual strengths and contextual assets which I hypothesized were related to success at WC. Consistent with the school's conceptualization of success, I operationalized success at WC as graduation. However, to obtain a more nuanced view of the performance of WC graduates (and of WC students who did not graduate) I also assessed grades, and disciplinary records. I assessed group differences in these strengths and assets between graduates and non-graduates. I then appraised the effects of each strength and asset in predicting grades and disciplinary points. The method through which I conducted these assessments is presented in the next chapter.

Chapter 2: Method

This research is derived from the larger Assessment of Character in the Trades (ACT) Study, a three year mixed-method, multi-reporter, longitudinal study assessing character, citizenship, and vocational development in a sample of young men attending trade schools and community colleges in the greater Philadelphia area (Johnson et al., 2015). The main aim of ACT was to evaluate the theory of change associated with WC (see Figure 1). Participants were followed over three waves (i.e., at the beginning, middle, and end of their education) using a cohort-sequential longitudinal design (Baltes, Reese & Nesselroade, 1977; Collins, 2006; Nesselroade & Baltes, 1974). Data collection was completed in May 2015. Figure 2 provides an overview of the cohort-sequential design, and the data collection timeline. Overall, 412 WC students participated in at least one wave of this study along with 644 male students from comparisons schools located in Pennsylvania.

Procedure

All procedures were approved by the Tufts University SBER Institutional Review Board. Surveys at WC were completed at times designated by the school administration. In the first and second waves of testing, students were given a block of free time in which they were able to complete the survey, if they consented. In the third wave of data collection, the research team administered the survey to students during class time. The electronic survey took about 45 minutes to complete, and included items about academics, social relationships, character-related attributes, and self-description. In addition, a subsample of students was selected to participate in qualitative interviews about themselves and about their experiences at WC. Full details of the study may be found in Johnson et al. (2015).

Participants

The sample for the present study is the "target" cohort, represented in bold in Figure 2. About one hundred students are admitted to WC each year. These students were in their freshmen year at the beginning of the study (N = 98) and graduated from WC in the final year of the study (N = 70). During the 2012 freshmen orientation, when this survey was administered, there were 98 students enrolled. Self-reported programs of training for these students were 16.9% carpentry, 15.7% horticulture, 16.9% machine technology, 14.6% masonry, 14.6% paint and coatings technology, and 19.1% power plant technology. Ninety four of the 98 students enrolled participated in the survey during their freshmen orientation. Of these 94 students, 53 students participated in the two subsequent waves (56.4%). Table 1 displays the comparison in attrition rates between school enrollment and survey participation. In short, for the present sample, there was 70% retention of WC student enrollment, and 70.2% retention of students (both who graduated, and did not) in the ACT survey from Time 1 to Time 3.

These students self-identified as 86.2% White. Students reported self-perceived socio-economic status while growing up as 86.1% working class, lower middle class, or middle class. Free and reduced lunch program participation may be considered another indicator of socioeconomic status, and 26.7% of WC students reported participation in this program. Students' self-reported living situation was in primarily suburban communities (60%), with relatively fewer from urban (21.5%) or rural (18.5%) backgrounds. On average, when students entered WC they were 18.34 years old (SD = .62) and when they graduated they were about 21.30 years old (SD = .62).

About half of WC students reported their primary caregiver as a mother (55%), 23.8% reported a father, 5% reported both, 2.5% reported a grandparent, and 13.8% reported a different

primary caregiver. When asked to report the education level of their primary caregiver, students reported 1.1% 8th grade or less; 41.8% high school diploma or GED; 9.9% 2 year degree; 12.1% some college; 18.7% 4 year degree; 7.7% graduate degree; and 8.8% were unsure. When asked who their secondary caregiver was, 20.3% named a mother, 50.7% named a father, 11.6% named a grandparent, and 17.4% named a different secondary caregiver. When asked to report the education level of their secondary caregiver, student reported 4.0% 8th grade or less; 4.0% some high school; 38.7 % High School diploma or GED; 13.3% 2 year degree; 10.7% some college; 13.3% 4 year degree; 6.7% graduate degree; and 9.3% were unsure.

In the present sample there are several indications of connections to the trades. For example, when in high school, 29.1% of the sample participated in a vocational-technical, or a career-technical education program for part or all of the school day. Several students had a family history in the trades taught at WC: 14.3% of primary caregivers and 29.4% of secondary caregivers were involved with one of the trades included within the WC curriculum.

Measures

To assess the individual and contextual relations that may lead to graduation and academic success, I used several measures from the ACT survey that were relevant to the four constructs of interest. I also used administrative data collected by the school. School engagement and program quality were measured at Wave 2, and vocational identity and family support were measured at Wave 1. Alphas and descriptive information for all measure are shown in Table 2.

School Engagement. I used a subset of items developed by Li, Lerner, and Lerner (2010) to assess school engagement across three subscales: behavioral, emotional, and cognitive engagement. The original measure has 15 items; however in this study, 10 indicators were used

based on which had the strongest factor loadings in analyses performed on data from Wave 8 of the 4-H Study of Positive Youth Development (Johnson et al., 2015).

The *behavioral engagement* subscale included three items regarding preparation, skipping class, and working hard to do well. The measure focuses on students' voluntary behaviors within the school context, to minimize possible confounding effects of non-student related variables. The response format ranged from 1 = *Never* to 5 = *Always*. A sample (reverse coded) item is, "how often did you come to class unprepared (homework unfinished, forget to bring books or other materials, etc.)?"

The *emotional engagement* subscale includes three items assessing students' sense of belonging and affect toward school. A sample item is, "I felt part of my school," with response options ranging from 1 = *Strongly Disagree* to 5 = *Strongly Agree*.

Cognitive engagement was measured by four items designed to assess the extent to which students valued education and the things learned at school, as well as their thoughts about learning. More specifically, goal orientation, identification with school, and perceptions of the link between students' lives and school were included as core indicators of cognitive engagement. One item, "I want to learn as much as I can at school," tapped one's goal orientation. Two items that asked whether school learning is meaningful and important were used to measure students' perceptions and beliefs. A sample item is: "I think the things I learn at school are useful." The response format was also a five-point Likert scale, ranging from 1 = *Strongly Disagree* to 5 = *Strongly Agree*.

Program Quality. The Big Three was used to indicate program quality (Lerner, 2004). The three dimensions of the Big Three are mentoring, student skill development, and leadership. As with school engagement, it made the most sense in this study to assess student perception of

the Big Three in Wave 2, when students were in the middle of their training and deeply embedded in the WC context. Prior analyses of the Big Three include content validity tests using expert raters, and exploratory factor analyses to derive the present items (DeSouza, 2016).

Based on these prior analyses (DeSouza, 2016), *mentoring* was assessed using four items from the Perceived Teacher Caring instrument developed by Teven and McCroskey (1997). The full measure has nine items with three dimensions: competence, caring, and character. Items were scored on a seven point scale; higher scores reflected greater perceived teacher caring and lower scores reflected lower teacher caring. The four selected items were from the caring and character subscales.

Skill development was assessed with five items that pertained to two constructs: self-perceived skill and work preparedness. Self-perceived skill was assessed with two items, created for the ACT Study. Participants were asked how they perceived their own skills, and how they expected others to rate their level of skill. Responses were scored on a five point scale, with 1=*Novice* and 5=*Professional*. Work preparedness was assessed with three items from the short version (eight items in full) of the Occupational Self- Efficacy Scale (Schyns & Von Collani, 2002). A sample item is: "My past experiences in my job have prepared me well for my occupational future." Responses were rated on a scale from 1 = strongly disagree to 5 = strongly agree.

Leadership was assessed with three items measuring integrity from the Search Institute's Profiles of Student Life: Attitudes and Behaviors (PSL-AB; Leffert, Benson, Scales, Sharma, Drake, & Blyth, 1998). Participants were asked to rate how important each item is in their lives, with responses ranging from 1 = *Not at all Important*, to 5 = *Extremely Important*. An example item is "Doing what I believe is right, even if my friends make fun of me."

Family Support. To assess participants' perceptions of their family members' support for their trade education, the ACT team developed seven items, based in part on other measures of family support of various careers (e.g., family support of science; Stake & Mares, 2001) and schooling. Sample items include "My family has encouraged me to study the trade in which I am interested" and "People in my family are interested in the trades." Response options ranged from 1 = *Strongly Disagree* to 5 = *Strongly Agree*, with higher scores indicating greater family support of the student's trade education. In the present analyses, six items were retained for analyses. Family support will be used as a predictor at Wave 1, or the students' freshmen year.

Vocational Identity. To assess vocational identity, I used the *Identification with Career Commitment* subscale of the Vocational Identity Status Assessment (VISA; Porfeli et al., 2011). The original VISA contained five items per dimension. In the ACT Study, this subscale was reduced to three items by choosing items with strong factor loadings (according to Porfeli et al., 2011). These items also made conceptual sense for use with the sample. Participants rated items on a scale from 1 = S*trongly Disagree* to 5 = S*trongly Agree*; higher scores reflected greater Career Commitment.

Graduation. Seventy students from the target cohort graduated at WC in 2015. This list of student graduates was received from WC administrators.

Grades. Grades were used as an indicator of school success. Students were asked to give consent for the project to view their official transcripts. The administrators gave access to these transcripts and students who did not give consent to have their grades viewed were deleted from the file. Grades at WC are divided into three domains: general, technical, and trade education. General education includes courses such a math and business ethics, technical courses include drafting or hazardous materials, and trade courses are shop-based and are relevant to horticulture,

masonry, paint, carpentry, and power plant. Cumulative grades were computed in each of these three domains.

Disciplinary Points. The disciplinary point system at WC is used to assist students in complying with the school code of conduct, previously described. Faculty and staff may cite students for violations. Points are issued in increments of four and are categorized as major violations or minor violations. Examples of minor violations include lateness (4 points), and disrespect (8 points). For committing a major violation, for example violation of safety rules, lying/cheating/ stealing, possession of weapons, students typically immediately receive 32 points. Students also may receive 16 points for a major violation at the discretion of the supervisor in cases such as insubordination.

The points for seniors who graduated from WC were provided by the school. In this sample, 42.3% of students had accumulated zero points through their senior year, 18.3% had four points, 12.7% had eight points, and 26.6% of students had between 12 and 40 points. Average point accumulation was 8.34 (*SD* = 11.04).

Chapter 3: Results

The present research had two goals. The first goal was to identify potential group differences in individual strengths (i.e., school engagement and vocational identity), and contextual assets (i.e., perceived program quality and family support) available to students who graduate or leave WC. The second goal was to look more deeply at how these strengths and assets might lead to success at the school (i.e., grades and discipline). Before conducting the central analyses, I performed preliminary and exploratory analyses to determine the most appropriate use of these variables.

Analysis Plan

To study success operationalized as graduation from WC, I planned to conduct a set of analyses to assess which of the previously described individual strengths (i.e., school engagement and vocational identity) and contextual assets (i.e., the Big Three and Family Support) predicted student graduation. In addition, I planned to assess if links between these strengths and assets would better predict student graduation. These questions were to be investigated using logistic regression analyses, because the dependent variable – graduation – is dichotomous. Three separate logistic regressions were to be computed. In the first regression, main effects would be assessed. That is, the predictors would have been the two individual strengths, and the two individual assets. In the second logistic regression, the plan was to address interactions. I again would use one individual strength and one contextual asset as components of the analysis. Because of the link between vocational identity and family processes, family support and vocational identity would be paired, and, in turn, program quality and school engagement would be paired in the second analysis.

Next, for the students who graduated, the plan was to address three dimensions of success: academic grades, shop ratings, and disciplinary points/restriction hours through separate multiple regression analyses. Again, the first analysis was to involve main effects as described previously, and the next two analyses would involve interaction effects with the same pairings, as also previously described. In each analysis the two individual strengths (i.e., school engagement and vocational identity) and two contextual assets (i.e., family support and perception of program quality), would be used as predictors of each dimension of academic success (i.e., general, technical, and trade grades, and disciplinary points). Based on RDS metatheory which suggests the person ⇔ context relation as the unit of analysis, I would have expected that, whereas each predictor would be important independently, the interactions of the predictors would more strongly predict success than the strengths and assets alone.

Exploratory Analyses

There were two sets of exploratory analyses which shaped the present research. First I tested the utility of the scales using Confirmatory Factor Analysis (CFA). I then evaluated the manifest responses on the constructs of interest based on wave of survey participation.

CFA. I conducted CFAs using MPlus for each predictor of interest in order to determine if the scales were appropriate to use in this sample. Each construct of interest was evaluated in a different CFA model. For example, program quality and its associated subscales of mentoring, skill development, and leadership were evaluated in one model. Fit statistics for the four constructs of interest are provided in Table 3. As a result of these analyses, one item was eliminated from the family support scale. This item was "one of my siblings is thinking of having a career in the trades." This item had a low factor loading and elimination improved fit indices. One other item was eliminated from the leadership indicators, also because of poor

loading in the CFA. This item was "In the past year, how often have you been a leader in a group or organization?" The remaining set of indicators was relevant to the integrity component of leadership. Table 2 presents the descriptive statistics for the constructs of interest, Table 3 presents the fit statistics for all factors, and Table 4 presents the Pearson product-moment correlations among the predictors and outcomes.

Attrition Analyses. Two constructs were intended to be used as predictors from Wave 2. However, there was low response rate in Wave 2 (see Table 1). Because of this study attrition, I conducted a one way ANOVAs to assess group differences for those participants missing at Wave 2, based on Wave 1 predictors. If there were differences based on variables in the study, I would be able to impute the data for Wave 2. There were no significant differences in any of the predictor variables at Wave 1 based on missingness at Wave 2. In addition, there were no differences in study constructs beyond these predictors (e.g., character attributes, or the Five Cs). There were demographic differences in missing data such that White students were less likely to have missing data. However these demographic differences are not sufficient for imputing Wave 2 data.

Based on these exploratory analyses, I found that with Wave 2 predictors, I did not have a sufficient sample size to compare students who graduated (n = 50) and who did not graduate (n = 5) in this data set. I also did not have enough power to run a logistic regression or a multiple regression with these 50 students that involved the proposed interactions. Therefore, the original plan of analysis described above had to be abandoned and, as such, I conducted a series of one way ANOVAs and linear regressions to elucidate more information about the relationship between the four individual and contextual constructs and the associated school success outcomes.

ANOVAs

The purpose of conducting one way ANOVAs was to look at group differences between students who graduate or who did not graduate based on the four constructs of difference (i.e., school engagement, program quality, family support, and vocational identity). Results of these analyses are displayed in Table 5. The only difference in graduation was in self-perceived skill, a subscale of program quality. I also assessed whether there were group differences based on school success (i.e., cumulative grades). This analysis showed that cumulative grades in each of the three domains (i.e., general, technical, and trade), are different between students who graduated and who did not graduate a certainly unremarkable finding. After assessing these group differences, I turned to linear regressions to try to ascertain more information on students who complete their education and the potential role of the four constructs of interest in predicting school success.

Linear Regressions

I computed four linear regressions using each of the four key constructs in the present research – school engagement, program quality, family support, and vocational identity – to predict each of the four outcomes of interest: disciplinary points, general grades, technical grades, and trade grades. Of these sixteen regressions, two findings were significant. First, one subscale of school engagement, cognitive school engagement, predicted general (β = .57, p = .00), technical (β = .57, p= .00), and trade (β = .60, p = .00) grades. One subscale of program quality, leadership, also predicted general (β = .37, p = .02), technical (β = .31, p =.05), and trade (β = .64, p = .03) grades. No constructs were significant in predicting point distribution. Full results including regression coefficients, p values, and R statistics are included in Table 6.

In sum, the overall results of the analyses I conducted indicated that most of the students in the sample used in this study graduated from WC (i.e., 90.9%) and, not surprisingly, they had better grades than student who did not graduate, in turn, of 16 regression analyses assessing the links between individual-level student and school or family contextual variables and academic outcomes, only two analyses (12.5%) resulted in significant findings. One individual-level construct (school engagement) and one component of the Big 3 features of effective programs – opportunities for youth leadership – predicted academic variables. I discuss these findings and the overall value of the present research in the next chapter.

Chapter 4: Discussion

Career technical education, is an important model for preparing young people for productive and thriving adulthood (ACTE, 2016). Historically, CTE provided a means of supporting the capacities of developing young people, while also preparing them to fill particular social roles. Although support for this field has ebbed and flowed throughout history, the significance of this field persists. Young people who are educated in CTE are able to meaningfully participate in the economy (Carnevale et al., 2013), and are able to develop skills that may transfer to other domains of their lives (Fischer & Bidell, 2006).

There is great variation in the way that CTE is implemented. Some CTE programs are in secondary schools, some are in post-secondary schools, and some exist independent of schooling systems (e.g., in apprenticeship programs; Hamilton & Hamilton, 1997, 2009). Evaluation of the outcomes associated with such programs in the U.S. are ongoing (DOL, DOC, DOE, DHHS, 2014). Indeed, there are strengths and challenges to implementation of CTE in different environments, and with different demographic groups. One way to contribute to this burgeoning knowledge about the system of CTE in the U.S. is to examine a CTE program which has anecdotal evidence of success, and also is historically significant in the evolution of the field (e.g., Barlow, 1976; Shrigley, 1908).

Accordingly, the purpose of this study was to understand the process of school success of young, working class men enrolled in a post-secondary trade program, that is, Williamson College of the Trades (WC), during the transition to adulthood. Specifically, I explored how individual attributes, such as vocational identity and school engagement, and contextual features such as program quality and family support, were linked to promote school success, operationalized as graduation from the school, grades, and disciplinary points. The initial plan

was to assess the relation between these features as interactions in a series of logistic regressions and multiple regressions.

I had anticipated that the interactions (i.e., the combination of school engagement with program quality, and vocational identity with family support for vocation) would be stronger predictors of student success, than as individual predictors (Bornstein, 2015; Crosnoe & Benner, 2015; Mortimer et al., 2015; Schulenberg, Vondracek & Crouter, 1984). I also anticipated the WC students who have higher family support and higher vocational identity, and also those who are more engaged in school and perceived the program to be high quality, would be more likely to graduate from WC (Bornstein, 2015; Crosnoe & Benner, 2015; Mortimer et al., 2015; Schulenberg, Vondracek & Crouter, 1984). If these students were not likely to graduate, then this finding might have suggested that there are other features of the developmental context for example, other individual attributes such as grit (Duckworth, 2016), or other contextual resources such a peer groups (Rubin et al., 2015), that are influencing the individual's likelihood of graduation.

For the results of the multiple regressions, I expected that greater school engagement and perception of program quality would lead to higher grades and lower demerits. As in the previous possible analysis, non-significant results might have indicate that other processes, perhaps processes of the school and/or administration (e.g., school climate, Crosnoe & Benner, 2015), are more influential in WC student success.

However, there were limitations in the data set that precluded my computation of these possible analyses. That is, there was a lack of power and a lack of variation in responses. Thus, the analyses that I was able to conduct were as follows. First a series of one-way ANOVAs were conducted to evaluate group differences between students who graduated and who did not

graduate from WC. Results indicated that the only difference between students who graduated, or did not graduate was in self-perceived skill during their second year of education. There was no difference in any of the individual-level constructs (i.e., school engagement, and vocational identity), or perceived contextual-level constructs (i.e., program qualities of mentoring and leadership, and family support).

Next, I tested the influence of these individual and contextual constructs on disciplinary points received by students in their final year of education using regression analyses. There was no effect of any of these features in predicting disciplinary points.

Finally, I evaluated the effect of these individual and contextual features on the general education, technical education, and trade education grades received by students cumulatively across their three years of education. Cognitive engagement in school predicted cumulative general education grades. No other predictors had an influence on general education. No predictors had in influence on technical education. Leadership predicted trade education grades. No other predictors influenced trade education.

I undertook these analyses in order to evaluate potential influences on graduation and school success so that WC specifically and CTE programs generally would be able to have information relevant to helping students persist and complete these programs. Completion is important in these programs because students will become more financially secure in their post-graduation life (Carnevale, Rose, & Hanson, 2012). I was also interested in conducting these analyses given aspects of the WC model of education that results in many students being dropped from the rolls of the school (i.e., 30% of the present class did not complete the program). This level of non-completion of the program is a relatively large proportion for a

competitive and privately funded school, and it would have been interesting to understand features of the student and their context that shape the educational trajectories of these youth.

However, because of the features of the data set that obviated my conducting analyses that would have potentially enabled nuanced scrutiny of these issues, I was left with relatively "blunt" statistical procedures to assess the individual and contextual features of student and school life that may have been associated with success at WC. However, as I will note below, and although using "blunt" instruments, the results of the analyses I was able to conduct nevertheless, allowed me to speculate about the processes of individual-context relations that are involved in successful completion of a trade education at WC. However, these implications of the present research need to be framed within an understanding of the limitations of the present research.

Limitations

This study is marked by several limitations. The first limitation is sample size. Because this school only admits 100 students in each cohort, the types of analyses that can be conducted are limited. Student participation in this research was voluntary; however, participation rates were relatively high in Year 1 (96%) and Year 3 (89.4%) and somewhat lower in year two (64%). This rate of participation may suggest that this study, at least in Years 1 and 3, involved a representative sample of WC students.

That is, although this sample is small, it is relatively representative of those who join the building trades: largely white and male (BLS, 2015). However, these findings may not be generalizable to other populations engaging in career technical education (CTE) programs.

Because the predictors involved in this research were based on self-report data, the items may have involved a social desirability bias, such that the students reported higher levels of

school engagement, for example. Although confidentiality of responses was explained to these students, the setting of high surveillance, in which their character is constantly reviewed, and in which they have relatively little privacy, may have elicited skepticism and shaped their responses to these items.

Another limitation may involve the measures of individual and contextual constraints. The school engagement and vocational identity measures are empirically validated and scale scores for these measures in the WC sample showed good reliability. The measure of family support was established specifically for this study. Whereas it also showed good reliability, it could be that this measure represents a construct other than family support to the WC students. The assessment of program quality (i.e., the Big Three; DeSouza, 2016), was also derived from this data set, albeit also using the input of expert raters. The measure showed good reliability on each of the subscales. However this measure might not be relevant in this sample.

Implications and Future Research

The lack of significant findings in the present research was surprising, but not inconsistent with other results of evaluations derived from the study of WC (Lerner, Johnson, & Callina, 2016). Indeed, the main difference between WC students and the comparison sample over three years of education was in sense of purpose and in faith.

There are several ways to interpret these findings. One could be that there is not enough power to find any important but subtle results in this sample. Another reason for the negative results of this research could be that the measures used did not perform well in this sample as appropriate indicators of the predictors of interest. Future research could explore the utility of such measures by conducting cognitive interviews relevant among students and/or using different quantitative measures.

Another explanation could be that student retention is relatively arbitrary at this school. In addition to no differences in graduation based on the previously described predictors, there were no differences in students who graduated or did not graduate based on any of the character related attributes of importance to WC, or on the Five Cs of PYD (Lerner, Johnson, & Callina, 2016). Future studies should evaluate qualitative data from students and teachers to better elucidate how and why students leave WC.

Although the measures used for indexing family support did not prove to be useful in the present analyses, the role of family support should not be discounted in helping students to persist and complete post-secondary education. The developmental literature and education literature all emphasize the role of the family in education and success (Bornstein, 2015; Crosnoe & Benner, 2015). Again, qualitative data should be consulted in future research to better understand the role of the family in promoting educational success in CTE programs (e.g., Arbeit et al., 2015).

Future research should consider other factors and variables which may shape the educational trajectories of young men at WC. The results of the present research do not elucidate a clear pattern to program completion. Therefore, nuances in these educational trajectories may be better assessed using a life-course approach. For example, their life histories may be marked by different patterns of stressors which may converge with student experience (e.g., Center for Promise, 2014; Dupere, Leventhal, Dion, Crosnoe, Archambault & Janosz, 2015). These cumulative stress processes may elucidate better information about which students graduate from WC. For instance, divorce or parental incarceration may influence dropout (Dupere et al., 2015). These are events evaluated in prior research about WC (e.g., Arbeit et al.,

2016; Johnson et al., 2015), but these events have not been directly connected to graduation and academic success.

Peer relations may also shape student graduation or non-graduation. Peers may socialize students to show positive school participation and engagement (Crosnoe & Benner, 2015). Peers may also have a negative effect on school completion if students experience peer victimization or bullying (Brown & Larson, 2009; Crosnoe & Benner, 2015). At WC, both the experience of brotherhood and community are reported by students. Both current students and alumni describe positive relations with other students (e.g., Arbeit et al., 2016), which may persist beyond the boundaries of the school. In addition alumni, administrators, and students have reported victimization as part of a process of school socialization (e.g., hazing). Disparate peer experiences may also account for variation in school success.

Program quality could be assessed through ethnographic research, or through data from teachers and administrators relevant to mentoring, skill development, and leadership. Whereas there were no results across analyses about the role of mentoring in graduation or school success, the literature is clear about the positive role of mentoring in positive development (Rhodes & Lowe, 2009) and workforce development (Hamilton & Hamilton, 1999, 2009). It is interesting that leadership specifically did predict trade education grades. It is part of the WC curriculum that senior students mentor junior students in shop courses, and perhaps propensity to be a leader helps one to perform well in this arena.

Vocational identity is complex within the transition to adulthood and in a trade school environment (Mortimer et al., 2015). Whereas students are directly and specifically being trained in their future career, they are not in their career at the moment, and this situation may shape responses to indicators of vocational identity. Vocational identity in the transition to

adulthood may still be fluid, and perhaps is a construct more appropriately measured in later adulthood, once established in a career.

The absence of significant findings in the present research also brings up a series of questions relevant to the role of students in this school and their ability to be agentic, as well as to pedagogic practices of administrators. How much control do students have over grades and receiving points? How tied to the codified system of assessment (grades and disciplinary points), is the actual distribution and deployment of these assessments? It is possible that teachers give points out at different rates, and that students in different shops will receive points accordingly?

Future research may reconsider the role of school engagement in school completion and success. Given that there are relatively few findings about predictors of graduation, or grades, it may be that school engagement is the *outcome* which is most indicative of schooling success, rather than a predictor of school success. WC students are trained to be engaged in school and subsequently engaged in their communities. Once they graduate they are all placed on equal standing with respect to the jobs they earn and standing in the community. Therefore, understanding how school engagement develops may elucidate better information about student experiences at WC.

In addition, motivation at school may shape educational experiences (Ryan & Deci, 2000), and may have an influence on student graduation and success. If a student is intrinsically motivated by his trade education, that is, if he enjoys, and values his craft, he may be more likely to graduate, and to have better grades. Many students may also be extrinsically motivated toward success at WC. They may see this school as a means to an end, in that it provides a free education, a relatively certain job guarantee, and relational support. Students who are

extrinsically motivated may either experience school success because they are oriented toward a goal of completion, or they may not be successful, because they have less of a connection to the schooling. These types of motivation may be useful to educators in facilitating student success at school. Future research may look at qualitative reports of student motivation and how this construct shapes potential graduation and school success.

What is the utility of a model of education such as WC? Students who graduate are all employed immediately after graduation (WC, 2015). There is also anecdotal evidence of success later in their careers. The ACT Study involved a sample of alumni; however this sample is a very select one, involving alumni who volunteered to be involved in this study. Future research could survey a broader group of alumni, in order to get a sense of the long term impact of WC on employment and family life.

In sum, there are several important directions for future research, ones that will address the limitations of the present research. However, despite this study's limitations and the need for additional research, the present work does afford some potentially important recommendations for the structure and function of WC.

Recommendations for Williamson College

WC is a model of a successful school system that provides students with a free and rigorous education and places them in high-skill, high-wage, and high-demand jobs. However there are several adaptations to school structure and function that could enhance WC practices and the school's impact on student experiences and achievements.

First, WC could update its data management processes. For example, we are not able to access disciplinary records of students who do not graduate. In addition, there are no disciplinary records for students' years of schooling prior to their graduation. In order to get a

better assessment of student school success, these records must be maintained across years. In addition, transcripts should be used as an indicator of organizational assessment, in addition to individual assessment. In addition to evaluating grades across classes to provide information about student school success, such evaluation could also provide information about program and teacher quality. In addition, patterns in grades across three years of schooling may provide information about whether a student will graduate.

Second, the school could re-evaluate the use and deployment of the zero tolerance disciplinary policy, that is, the elimination of students from the school who may have had legal trouble or who have consumed alcohol. This change in policy also may be a way for WC to show institutional forgiveness, and to capitalize on the plasticity of developing young people. Giving students the opportunity to complete their education may also be good for school climate, and may have positive effects in the community.

Third, WC would benefit from connecting to the broader CTE community. Although they are a school set apart because of their historic role and their unique curriculum, there are some practices of other programs (e.g., data management and program evaluation), which would benefit WC functioning. In addition, other programs have and share information about meeting the needs of young people from challenging backgrounds. Participation in the broader CTE schooling systems will also provide visibility for the school and their model of education.

Conclusions

Williamson College of the Trades has evolved in tandem with the history of vocational education in the U.S. (Barlow, 1976). It was one of the first mechanical schools (as they were referred to in that time), and considered a model for other programs as they were being developed in that era (Barlow, 1976; Shrigley, 1908). Today, WC continues to educate young

men in the greater Philadelphia area, such that they contribute to their families and to their communities. WC continues to be a model for education grounded in the philosophies of PYD and for preparing a civically prepared and skilled workforce.

The research reported in this dissertation provides some insight into the individual and contextual bases of success of the unique CTE institution that is WC. As such, the findings reported in this study may be a basis for further understanding of how WC produces tradesmen of character and, as well, how CTE more generally might put young people on a positive life path marked by vocational and personal success. If so, the major contribution of the present research will be its impetus for future studies of trade education in the U.S.

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Table 1.

Comparison of Sample Size and Student Enrollment

Class	Survey Participants	Enrolled Students	
Freshmen (Year 1)	94	98	96.0%
Junior (Year 2)	55	86	64.0%
Senior (Year3)	68	76	89.4%
Graduated	-	71	

Note: All male participants and students

Table 2.

Descriptive Statistics for Predictor and Outcome Variables

		N	Alpha	Mean (SD)	Min. – Max.	Skew	Kurtosis
Predictors							
School Engagement	Emotional	55	.89	3.96 (0.90)	1.00 – 5.00	-1.31 (.32)	2.50(.63)
	Cognitive	53	.79	4.08 (0.71)	2.25 – 5.00	-.40 (.32)	-.66 (.63)
	Behavioral	54	.532	4.38 (0.53)	3.00 – 5.00	-.96 (.33)	.63 (.64)
Prog Quality:	Mentor	53	.83	5.41 (1.17)	1.5 – 7.00	-.73 (.32)	1 (.63)
	Skill Development	53	.79	3.82 (0.50)	2.60 – 4.80	-.18 (.32)	-.19 (.63)
	Leadership	53	.71	4.10 (0.63)	2.50 – 5.00	-.64 (.32)	-.06 (.63)
Family Support		46	.86	4.41 (0.64)	1.60 – 5.00	-2.17 (.34)	6.88 (.67)
Vocational Identity		53	.74	3.71 (0.71)	2.00 – 5.00	-.22 (.32)	-.10 (.63)
Outcomes							
Graduation		99	-	-	0 – 1.00	-	-
Disciplinary Points		71	-	7.61 (10.44)	0 – 40.00	1.48 (.30)	1.18 (.60)
Grades: General		88	-	3.08 (0.57)	1.65 – 4.00	-.29 (.26)	-.43 (.51)
Grades: Technical		86	-	2.94 (0.59)	1.48 - 3.98	-.29 (.26)	-.32 (.51)
Grades: Trade		88	-	2.93 (0.59)	1.50 - 4.00	-.31 (26)	-.53 (.51)

Note: School engagement and program quality are measured at Wave 1; family support and vocational identity are measured at Wave 2; grades are cumulative.

Table 3.

Model Fit Statistics for Predictors

	χ^2	df	*p*	RMSEA	90% CI	CFI	TLI	SRMR
School Engagement	48.87	32	0.03	0.05	0.02 - 0.08	0.96	0.94	0.05
Program Quality	56.09	40	0.05	0.05	0.01 - 0.07	0.98	0.97	0.06
Family Support	16.88	8	0.03	0.08	0.02 - 0.13	0.98	0.96	0.03
Vocational Identity	55.23	24	0.00	0.08	0.05 - 0.11	0.93	0.89	0.05

Note: RMSEA= root mean square error of approximation; CFI= comparative fit index; TLI = Tucker-Lewis Index; SRMR = standardized root mean square residual.
Latent correlations and item loadings for the subscales are available upon request.

Table 4.

Correlations between Predictor and Outcome Variables

Outcomes												
		1	2	3	4	5	6	7	8	9	10	11	12
1.	Grades: General	1	.85***	.81	-.37**	.30**	.18	.51	.12	.02	.16	.325*	.01
2.	Grades: Technical		1	.87***	-.38**	.14	.07	.41**	.12	.12	.27	.34*	.03
3.	Grades: Trade			1	-.34**	.24	.06	.46***	.10	.30*	.33*	.04	.04
4.	Disciplinary Points				1	-.25	.02	-.29*	-.15	-.07	-.08	-.25	.00
Predictors													
5.	Behavioral School Engagement					1	.49***	.52***	.07	.26	.27*	.28*	.16
6.	Emotional School Engagement						1	.56***	.07	.34*	.12	.12	.01.16
7.	Cognitive School Engagement							1	.16	.22	.13	.37**	-.01
8.	Family Support								1	.35*	-.16	.22	.12
9.	Prog Quality: Mentoring									1	.24	.41**	.07
10.	Prog Quality: Skill Development										1	.31*	.02
11.	Prog Quality: Leadership											1	-.21
12.	Vocational Identity												1

Note: N's range from 53 to 88; all participants male
** p < .05; **p < .01; *** p < .001*

Table 5.

Differences between Students who Graduate or Leave WC

			n	Mean (SD)	*df*	F	*p*
School Engagement	Emotional	Non-Grad	5	3.53 (1.50)	54	1.05	.31
		Grad	50	3.97 (0.83)			
	Cognitive	Non-Grad	5	3.70 (0.93)	54	1.56	.22
		Grad	50	4.12 (0.69)			
	Behavioral	Non-Grad	4	4.13 (0.51)	53	1.15	.29
		Grad	49	4.40 (0.54)			
Prog. Quality	Mentoring	Non-Grad	5	5.15 (1.46)	54	.26	.61
		Grad	50	5.43 (1.16)			
	Skill	Non-Grad	5	4.32 (0.50)	54	.577	.02
		Grad	50	3.78 (0.48)			
	Leadership	Non-Grad	5	4.13 (0.69)	54	.02	.90
		Grad	50	4.10 (0.63)			
Family Support		Non-Grad	21	3.73 (1.15)	79	.344	.07
		Grad	59	4.11 (0.61)			
Vocational Identity		Non-Grad	22	3.92 (0.85)	85	.08	.78
		Grad	64	3.86 (0.70)			

Note: School engagement and program quality are measured at Wave 1; family support and vocational identity are measured at Wave 2.

Table 6.

Standardized Coefficients from Linear Regression Analyses Predicting Disciplinary points, general grades, technical grades, and trade grades

		β	*p* value	R
Disciplinary Points				
School Engagement	Emotional	.27	.10	.15
	Cognitive	-.31	.07	
	Behavioral	-.22	.19	
Program Quality	Mentor	.03	.87	.07
	Skill	.00	.98	
	Leadership	.-27	.10	
Family Support		-.15	.25	02
Vocational Identity		.12	.35	.01
Grades: General				
School Engagement	Emotional	-.20	.21	.29
	Cognitive	.57	.00	
	Behavioral	.10	.51	
Program Quality	Mentor	-.16	.29	.13
	Skill	.08	.57	
	Leadership	.37	.02	
Family Support		.12	.33	.01
Vocational Identity		.07	.56	.01
Grades: Technical				
School Engagement	Emotional	-.24	.14	.22
	Cognitive	.57	.00	
	Behavioral	-.04	.77	
Program Quality	Mentor	-.06	.71	.15
	Skill	.19	.18	
	Leadership	.31	.05	
Family Support		.12	.31	.02
Vocational Identity		.09	.46	.01
Grades: Trade				
School Engagement	Emotional	-.31	.05	.27
	Cognitive	.60	.00	
	Behavioral	.07	.62	
Program Quality	Mentor	-.17	.24	.18
	Skill	.24	.09	
	Leadership	.34	.03	
Family Support		.10	.41	.01
Vocational Identity		.13	.28	.02

Note: Each of the four constructs was evaluated in a separate linear regression

Figure 1.

Williamson College Theory of Change

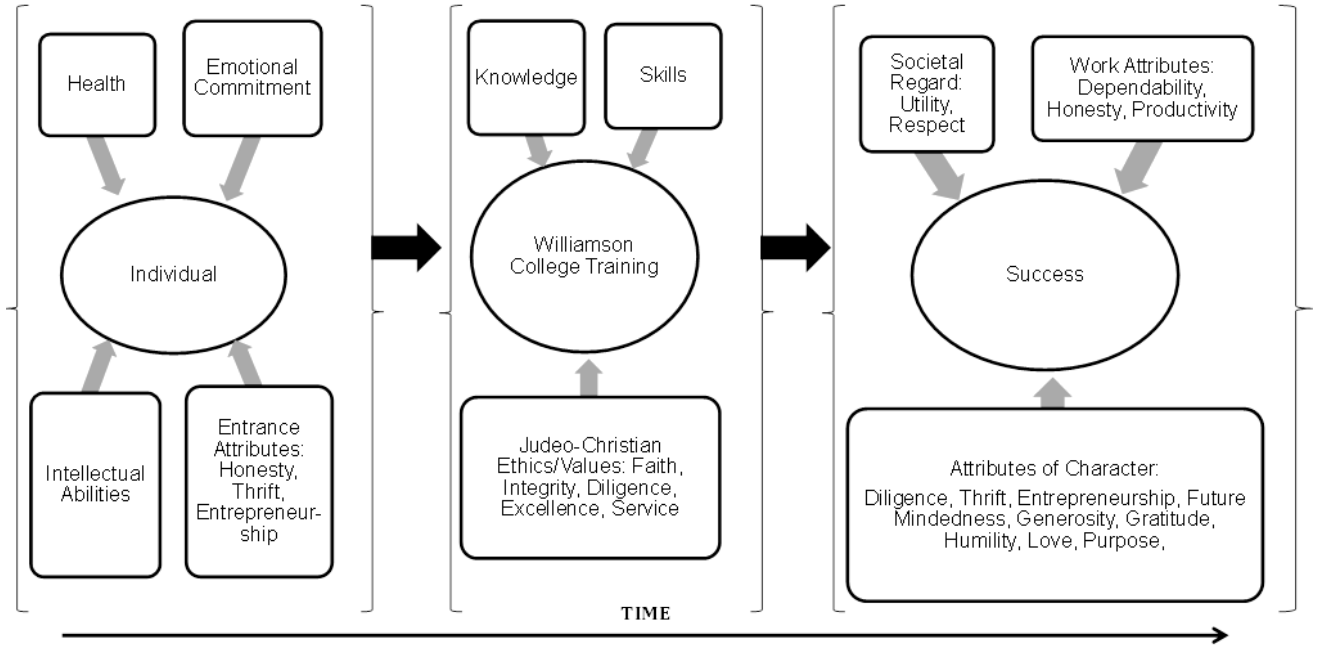
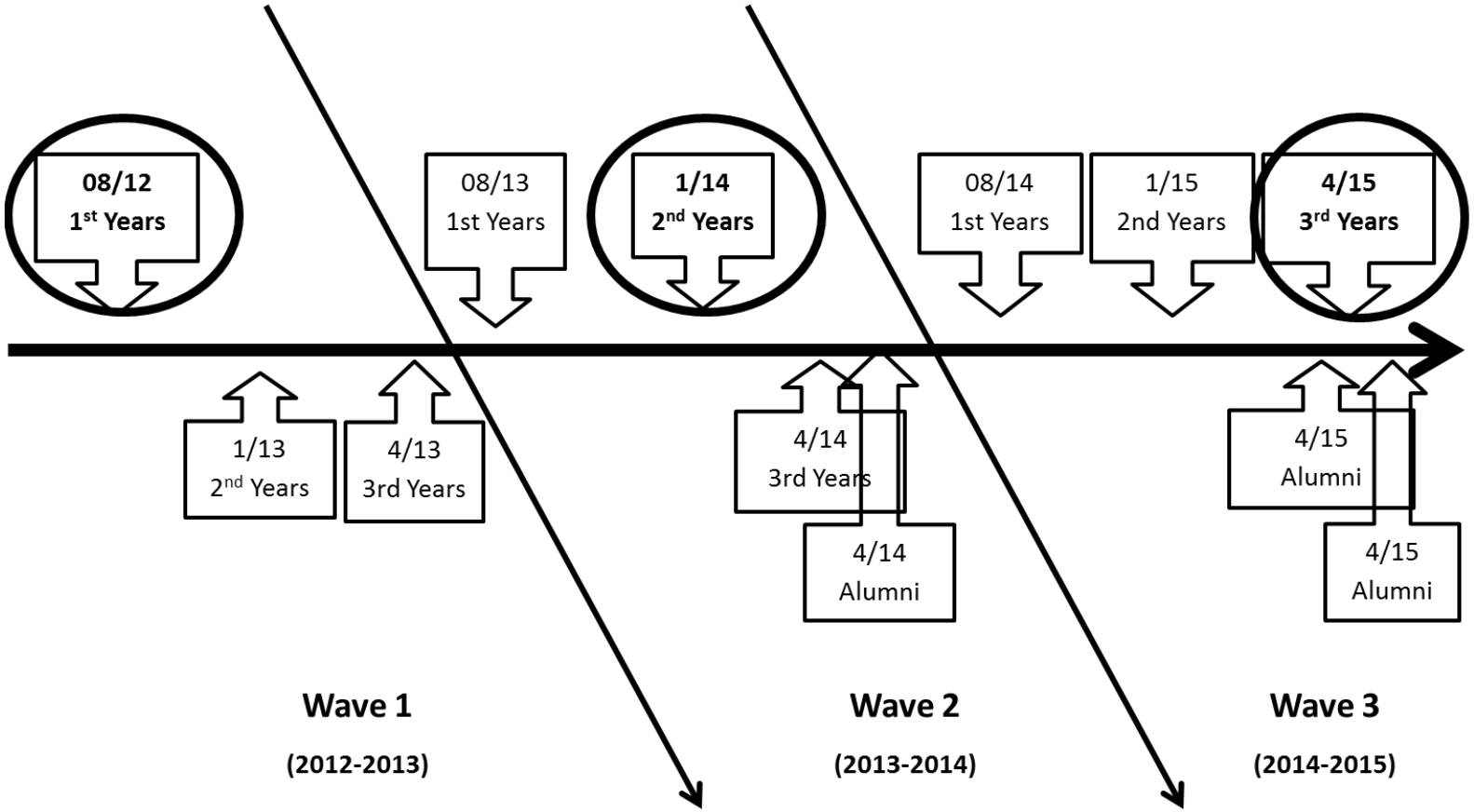


Figure 2.

Cohort Sequential Model of ACT Design



Note: Target cohort is represented in bold and circled