Dissertation

Youth Information Networks and Propensity to Serve in the Military

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This document was submitted as a dissertation in May 2020 in partial fulfillment of the requirements of the doctoral degree in public policy analysis at the Pardee RAND Graduate School. The faculty committee that supervised and approved the dissertation consisted of Dr. Bruce Orvis (Chair), Dr. Charles Goldman, and Dr. Jennifer Li. Dr. Harry Holzer served as the outside reader.

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Abstract

Military recruitment is a perennial challenge. Estimates show just 30 percent of youth are fully qualified to enlist, and many do not consider serving. To meet this challenge, the military must continually assess and adapt its recruiting approaches. This dissertation aids military recruitment planners by providing a more comprehensive understanding of how youth build and access their career and educational information networks in high school, as part of their decision-making process.

This dissertation consists of three papers. The first paper explores the many theories and factors that affect youth career and educational decision-making, integrating several disciplines that have contributed separately to understanding youth in this context. The second paper provides an exploration of two sources of data—a longitudinal survey from the U.S. Department of Education and interviews with high school juniors and newly enlisted U.S. Air Force recruits. I segment youth into seven groups of interest and evaluate how each builds and uses its information networks in high school. The third paper visualizes and describes youth information networks across groups using concepts from social network analysis. I find that youth information networks are dynamic and evolving, with four-year college-bound youth and females having the strongest networks and youth neither enrolling in college nor serving in the military having the weakest. I also find that social-emotional wellbeing, degree of focus, and motivation are important factors in how youth build their networks and make career and educational decisions. I then provide insights and implications for military recruitment planners on how to more effectively engage with youth. This could include marketing strategies designed for the full youth life-course with multiple points of engagement and doing more to distinguish and reach out to youth in a social network context.

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Abbreviations

BIT	Behavioral Insights Team
CI	Confidence Interval
COM-B	Capabilities-Opportunity-Motivation—Behavior
DEP	Delayed Entry Program
DoD	U.S. Department of Defense
HSLS09	High School Longitudinal Survey of 2009
HSPC	Human Subjects Protection Committee
IMBS	Information-Motivation-Behavioral-Skills Model
IRB	Institutional Review Board
JAMRS	Joint Advertising and Marketing Research Studies
SCT	Social Cognitive Theory
SNA	Social Network Analysis
TMC	Transtheoretical Model of Change
TPB	Theory of Planned Behavior

Executive Summary

Issue

It is well-known that military recruiting has long presented challenges, as has the ability to retain members that do eventually serve. Many youth do not consider military service, be it from an unwillingness or lack or interest in service, or that they are not exposed to or aware of service as an option. Moreover, a only a small share of enlistment-aged youth—about 30 percent according to the Department of Defense—are fully-qualified to serve. This is coupled with changes in Congressionally-mandated end-strength over the last decade, which in recent years has risen in some elements of the armed services. Adding to the complexity is a strain in available resources for recruitment – recruiters, enlistment incentives, marketing, scholarships, etc. – which is a resource intensive enterprise. There is a generally accepted reality that recruiters and talent acquisition planners must do more with less.[1]

The looming challenge, and concern for meeting future recruiting requirements, holds particularly for active-duty service members, both enlisted and officers. To meet this challenge, military planners will need to continue to enhance the current approach to recruitment.

Objective and Research Questions

This dissertation focused on helping the military recruitment community by providing a more comprehensive understanding of how youth make the decision to serve and the nature and role of their information networks. It provides a first effort at mapping youth career and educational information networks in high school as they relate to the decision to serve in the military.

The three papers address the identified challenge by exploring the following three questions:

1. Framework: How can existing theories on youth decision-making be integrated to better explain how youth access and consume career and educational information [in high school] when deciding on post-high school plans?
2. Analytic: Who are the major influencers and what are the major sources of information that youth engage with to make decisions about life after high school and joining the military, what is their relative importance, what is the timing of the engagements, and what attributes are associated with differences youths' information networks?
3. Policy: How can military recruitment policy planners leverage this information on how today's youth and their influencers are accessing and consuming educational, career, and military information to be more effective in reaching and recruiting desirable youth populations?

[1] Very recent COVID-19 physical distancing-related effects on military recruiting are outside the scope of this research and are not considered in this dissertation.

Approach

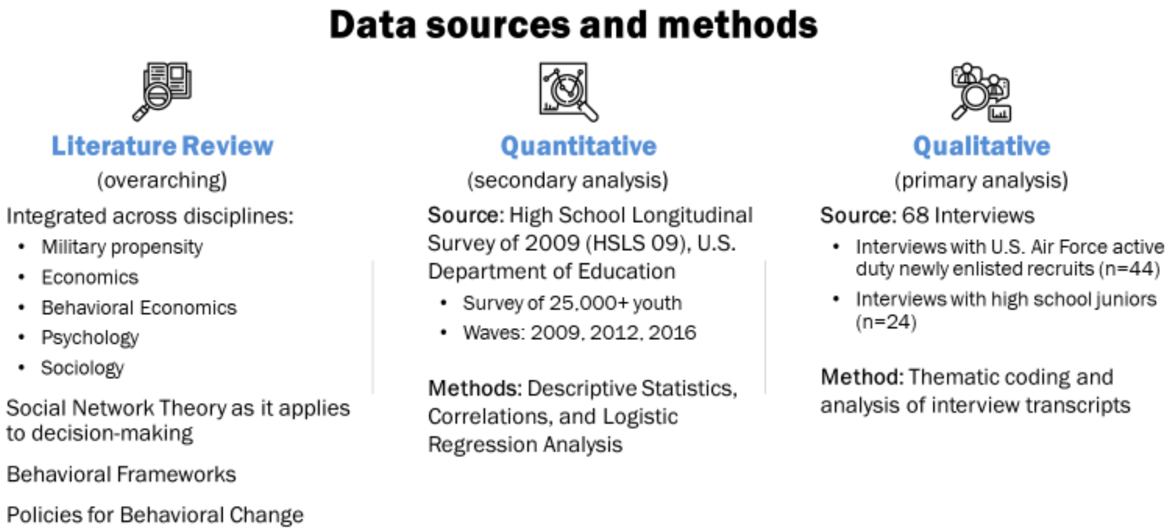
More than 80 percent of military recruiting efforts focus on enlisted service members.[2] (Officers are mainly commissioned through college or university ROTC programs and the military academies; they number far less than the enlisted force.) Therefore, this research study focuses primarily on new enlisted recruits entering military service. Further, the focus of this study will be on active component members, since Reserve and National Guard recruits represent a different set of the population with different demographics, desires, and expectations than active-duty recruits.

This research will also focus on new recruits either joining immediately out of high school or within the first few years after graduation. That puts the target age range of consideration at 17–21 years old, which represents a large share of new enlistees.

This research is a mixed methods study, with quantitative and qualitative data components. The quantitative data consists of a U.S. Department of Education longitudinal survey, the High School Longitudinal Survey of 2009 (HSLS09). The survey is a nationally representative, longitudinal study of over 25,000 ninth graders from 944 U.S. schools who were high school freshmen in the 2009-2010 academic year. There was a first follow-up survey administered during junior year of high school, along with a second follow-up three years after high school graduation. Youths' parents were also surveyed in the base year (2009) and first follow-up (2012), and their responses were linked to their teen. The qualitative data consists of 68 interviews—44 interviews with newly enlisted U.S. Air Force recruits and 24 interviews with high school juniors. Interviews were conducted from January to July of 2019, with one exception in October 2019. A summary of the data sources and research methods used in this dissertation is provided in Figure S.1.

[2] Center for Naval Analyses, "Population Representation in the Military Services: FY2016 Summary Report," 2017.

Figure S.1. Data Sources and Research Methods



This analysis segments youth into seven subgroups of interest and evaluates differences across subgroups in how these youth build and use their information networks in high school. These seven groups are: (1) youth enlisting in the military out of high school, (2) youth enlisting in the military at least a year out of high school, (3) youth who were propensed, or expressed interest in service, in junior year of high school, (4) youth who neither enrolled in college nor enlisted in active duty military, (5) youth who enrolled in two-year college, (6) youth who enrolled in four-year college, and (7) female youth.

Using the quantitative and qualitative analysis, I then visualize and assess youth career and educational information networks across groups using constructs from social network analysis (SNA). This includes evaluating youth networks by their core attributes:

- Density: Small versus large
- Structure: Variation of influencers
- Strength: Strong versus weak ties
- Function: Supportive, informational, influential

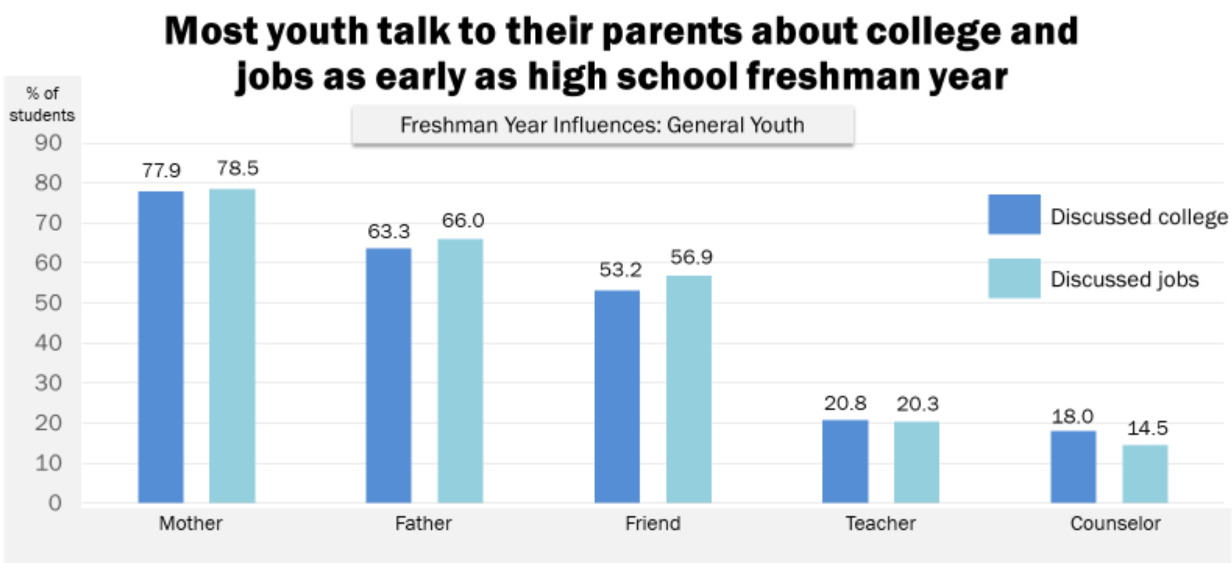
Importantly, social network analysis is inherently non-causal. It relies on rates of actions and associations with groups and outcomes of interest, with an understanding that each person (node) in the network can influence each other in shaping attitudes, behaviors, and decisions.

Youth Information Networks: General Youth

In constructing information networks, we want to know who young people are talking to, what they are talking about, and what sources of information they accessed in their process of planning for life after high school. This analysis starts by looking at the general youth population to assess general trends in influencers and information accessed in high school relating to post-graduation planning.

Figure S.2. shows that the majority of youth were speaking to at least one parent about jobs and college as early as freshman year of high school. In contrast, fewer were speaking to their teachers or guidance counselors. This suggests that youth career and educational network formation was in an early and perhaps informal stage, but actively underway.

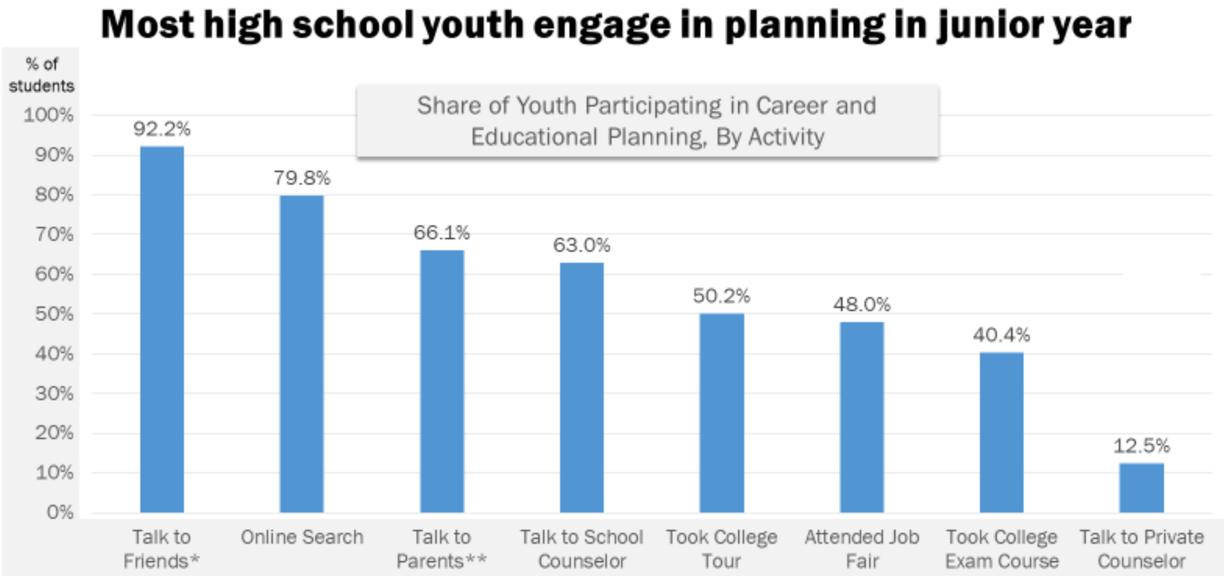
Figure S.2. Youth Information Networks, Selected Conversations, Freshman Year



Source: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16. Base year survey. Tabulations are author calculations. N=24,670.

We also want to understand who youth were speaking to junior year, and what sources of information youth used to build out their information networks. Figure S.3. shows that many youth were actively building their information networks by junior year of high school. The majority of youth engaged in at least one network-building activity, such as speaking with parents and friends. We can see also see the evolution in importance of the high school guidance counselor, and a distinction in less engagement in formal college-planning activities.

Figure S.3. Youth Information Network Activities, Junior Year

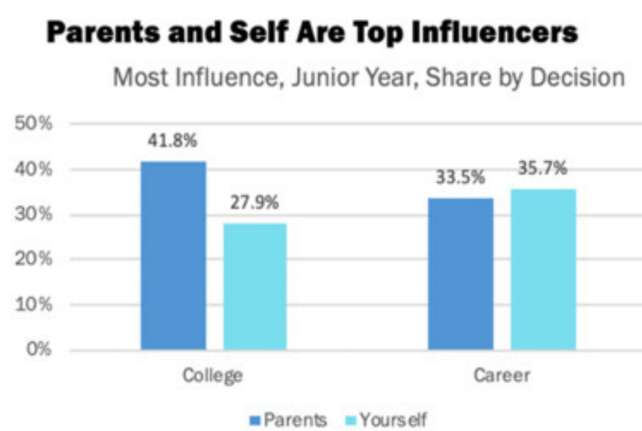


N=24,440; *N=24,670; **N=24,780.

Source: Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, First follow-up survey. Tabulations are author calculations.

Figure S.4. shows who was the "most influential" in terms of career and educational planning junior year. These questions highlight that the most important influencers are different for college versus careers. For college planning, the largest share of youth (42 percent) rated their parents as being most influential. For careers, the importance of parents relative to the importance of oneself reverses. It is possible that financial considerations associated with college played a part in some of the influence parents had in their teen's college decisions, whereas careers may be a more personal decision based on individual preferences.

Figure S.4. Most Influential for College and Career Decisions, Junior Year



Source: Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, First follow-up survey. Tabulations are author calculations. N=20,470.

Youth Information Networks: Sub-Groups

As early as freshman year, the majority of youth across groups spoke to at least one parent about jobs and college. Generally, mothers were the most likely influencer related to those conversations, ranging from 70 to 85 percent across groups, while teachers and guidance counselors were the least influential at that age on average. Interestingly, across groups with the exception of the military enlistees[3], the share of youth speaking with their mothers about jobs was statistically higher than youth speaking with their fathers (although the share for fathers was still larger than half).

By junior year, many youth across outcomes and groups were involved in conversations and activities related to formal career and educational network building. This included conversations with parents and friends about college and life after high school, and it included activities such as searching for college-related information online or taking a college tour. Junior year also saw an evolution in the importance of the high school guidance counselor relative to freshman year, particularly for youth that went on to attend college and for females.

Junior year also demonstrates a clear progression of trends from freshman year in the development and evolution of career and information networks. Youth that went on to four-year college and females had the highest rates of speaking to influencers about college and jobs freshman year, and, continued their lead junior year.

In fact, the networks suggest four-year college-bound students and females had the strongest and most active educational and career information networks in high school across the groups and outcomes studied. Youth that neither enrolled in college nor served in the military had the weakest and least active information networks, and the least likelihood of engaging in life planning activities to build them during high school. While the network for two-year college bound youth appeared to be a cross between four-year college and non-college youth, engaging in some activities over others, the network for propensed youth appeared more similar to non-college youth than other groups. That is, propensed youth had more limited information networks and were less likely to engage in network building activities.

Similar to two-year college bound youth, youth enlisting in the military at least a year after high school engaged in some information network building activities over others, while on average youth enlisting right out of high school had weaker information networks more closely resembling youth that did not attend college. This could be due at least in part to these youth knowing or feeling early on that they were going to enlist, and therefore not engaging in traditional information network building activities.

Parents of youth varied in career and educational planning involvement in ways that resembled the level of involvement of their teen. For example, parents of four-year college bound youth were the most involved, while parents of non-college or military bound youth were

[3] Likely due to a smaller sample in group which led to wider confidence intervals.

the least involved. Generally, parents of two-year college bound youth had more involvement than parents of non-college bound youth, although less than that for four-year college bound youth. Parents of propensed youth were fairly similar to parents of non-college bound youth. On average, a large majority of parents of female youth were involved in their teen's life planning through discussions and online search, as were parents of four-year college youth.

Finally, the networks visualized from the interviews suggest that while HSLS09 derived networks are an average, the actual network structure, density, and composition of youth across groups can vary widely. There are many factors behind this variation that are embedded in youths' networks, including family dynamics, social-emotional well-being, and degree of focus and motivation. Some youth are more able and willing than others to build their networks, linking to strong and weak connections. Some youth are more interested in conversations over online research and other less direct information-gathering. And some youth are more focused than others, and therefore more or less willing to consume information even if it is available.

Youth Decision-Making: Key Findings

This research finds that three main considerations have a sizeable impact and act together on youths' career and educational decisions: (1) the use of and reliance on influencers, (2) engagement in information-seeking activities during high school, and (3) social-emotional wellbeing, degree of focus, and self-motivation. These factors comprise youth career and educational information networks, and they act together on youth decision-making. This research also shows youths' information networks evolve over time.

Moreover, using principles of social network analysis, several key findings emerge specific to youth information networks. First, how youth build and use their career and educational networks in high school varies widely. Some youth have very dense networks while others have few influencers. Some have many strong ties while others have few. Some have good reach outside of immediate family and friends while others do not. The literature shows the importance of social networks in determining behaviors and outcomes, and yet there are a considerable number of youth who hardly build any social or cultural capital during high school.[4]

Second, youth career and educational information networks come in many shapes and sizes. The visualizations show a range of degrees, densities, composition, and functions. Some youth rely on ties for emotional support, others for information, and still others for direct or indirect influencers in their decisions. All are types of influence but they are inherently different in the nature of the relationship and network content.

[4] Lash, Dave and Grace Belfiore, "5 Essentials in Building Social Capital," Next Generation Learning Challenges, 2017. For an explanation of the importance of social capital in building human capital, see Coleman, James S. "Social Capital in the Creation of Human Capital," *American Journal of Sociology*, Vol. 94: S95–S120, 1998.

Third, this research further validates the literature that youth career and information network construction can begin as early as freshman year and continue well after high school graduation,[5] with many youth actively building and using their network during junior year. My interviews also suggest that, at least for some youth, career and educational goals may not come into focus or become firm until junior year of high school. For example, many interviewees reported completely changing their career interests between freshman and junior year. It is when there is a catalyst, such as taking a college exam, applying for college, or realizing graduation is coming, that many interviewees more formally began to create and execute their plans. That said, and also consistent with the literature, many recruits interviewed delayed career and educational decision-making until senior year or later, sometimes spending years in various phases of the career and educational decision-making process.[6]

Fourth, access to online content may be necessary but not sufficient as a stand-alone resource for high school youth to choose to serve. Information has never been more plentiful or easily accessible as it is now. One does not need vast networks of well-connected influencers to consume valuable career and educational information. Indeed, outside of conversations, accessing information online was the college planning activity with the highest shares across outcomes and groups—by a sizeable margin. And yet, many youth interviewed in this study failed to take advantage of this information, even among those planning to attend four-year college. Instead, youth were either interested in accessing information or they were not. Those who were not interested in doing so routinely emphasized the value of personal conversations and experiences over information found online.

The understanding of differences across information networks cannot be fully appreciated without an acknowledgement of the role of family dynamics and social-emotional wellbeing. These factors inherently affect youth information networks in a critical, yet uncontrollable way. Moreover, youth do not appear to be affected in the same way by these factors. Some youth find self-motivation in personal struggle while others lose interest and engagement in making career and educational decisions entirely. Similarly, degree of focus and self-motivation are critical in understanding how willing and able youth are to build and use their information networks.

Implications for Recruitment Planners

Four implications stemming from this research could help military recruitment planners more effectively engage and reach youth across groups:

1. Alternative theoretical frameworks could be more insightful
2. Validation of some existing DoD outreach campaigns and underlying beliefs

[5] Hume, Susannah and Jessica Heal, "Moments of Choice," Behavioural Insights Team, 2016.

[6] Mortimer, J. T., et al., "Tracing the Timing of "Career" Acquisition in a Contemporary Youth Cohort," *Work and Occupations*, 35(1): 44–84, 2008.

3. Extensions to and creation of new campaigns that could be more effective
4. Network segmentation as a new approach to outreach

Alternative Theoretical Frameworks

The Joint Advertising and Marketing Research Studies (JAMRS) within the Department of Defense uses a specific theoretical framework to explain the decision-making process of youth related to serving in the military—the Theory of Planned Behavior (TPB).[7] TPB has three main inputs—attitudes, norms, and self-efficacy. These factors are what determine behavioral intention, which then turns into an action, behavior, or outcome. JAMRS uses TPB as the basis for its policy recommendations and guidance to the services on how to make their recruiting efforts more effective.

The findings of this research suggest that while TPB is useful, it may be an incomplete framework from which to approach framing the decision to serve in the military. TPB is limited in the decision-making factors it considers and does not account for the gap between intention and action, which is key in a military recruiting context.

Alternative theories of behavioral change are more comprehensive than TPB and could provide additional insight into youth career and educational decision-making. For example, the I-Change Model considers psychological, social, and informational factors that inform intention, which informs behavior, along with consideration for three phases of intention that can either end or not end with the behavior being observed.[8] TPB is completely embedded within I-Change, under the motivation construct as just one factor that is part of the decision-making process. I-Change also separates different forms of behavior, which could be insightful particularly in thinking about retention of servicemembers. A depiction of I-Change is provided in Figure S.5.

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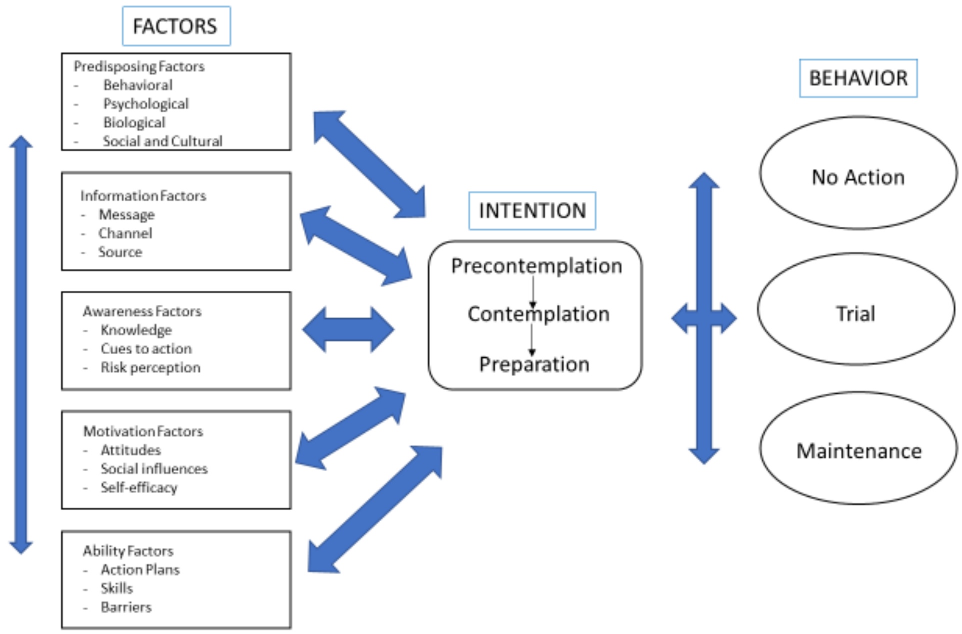
[7] Gibson, Jennifer Lee et al., "Parental influence on youth propensity to join the military," *Journal of Vocational Behavior*, 70: 525-541, 2007.

[8] Ibid.

Figure S.5. An Alternative Decision-Making Framework: I-Change Model



By having a more comprehensive framework, I-Change could facilitate the design of interventions that target one or multiple factors jointly for better accessing the youth market. It gives military recruitment planners more possible options by which to think about interventions, outreach, and marketing campaign design.

Validation of Existing Campaigns

This research validates the importance of emphasizing certain aspects of military service in outreach campaigns that are either not well understood or misunderstood by youth and their influencers. The analysis found that youth and their parents were among the most influential for a large share of youth. However, limited exposure to service, to servicemembers in uniform, and awareness for what service entails has had a notable impact on propensity. Although not generalizable, the high school juniors interviewed generally had a neutral to negative view of the military, and none were seriously considering service.

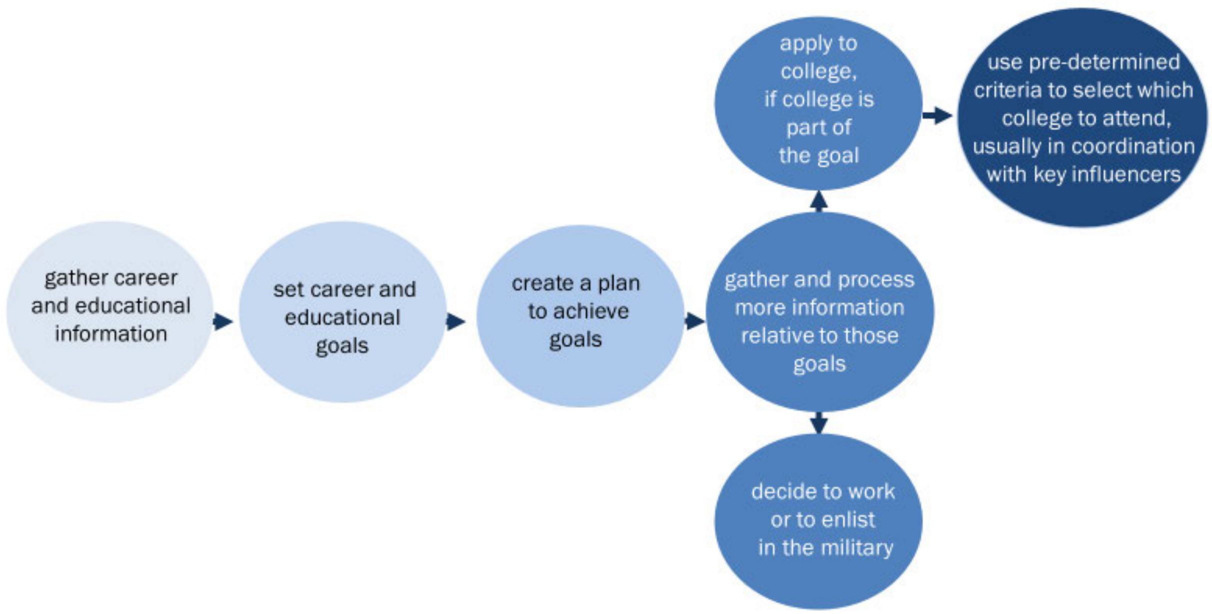
Campaigns that showcase the availability of non-combat roles, positive aspects of daily life in the military, the benefits of service, the relatability of servicemembers to themselves, and address common concerns about self-efficacy ("having what it takes") are likely to have greater effectiveness in reaching the audience. More recent campaign efforts, such as JAMRS' "Today's Military" and the Army's "What's Your Warrior" campaigns are therefore worthwhile and more likely to be effective. These campaigns tackle some of these perceptions and mis-perceptions head-on, as a way to engage youth and their influencers.

Moreover, this research validates that career and educational planning starts early, as early as freshman year in high school. That implies that campaigns and outreach designed to reach youth later in their high school careers could be missing the window for when many youth are embarking on their decision-making process and willing to consider all options.

Extensions to Existing and Future Campaigns

This research suggests that youth decision-making about life immediately after high school generally follows the same process across groups and consists of several stages. These stages are identified in Figure S.6. Although the process is similar for most youth, the length of time they spend in each stage, and how they approach each stage—build and access their information networks—varies considerably.

Figure S.6. Youth Career and Educational Decision-Making Process



Military recruitment planners could most effectively reach youth through outreach strategies that account for youth being in different stages of the process. Campaigns could be designed for the full youth life-course, creating multiple or regular points of engagement throughout. This is supported by my findings that many youth are involved in various aspects, and to varying degrees, of the career and educational planning process throughout high school. This way, outreach can reach youth at critical points in the process, including when they may be more willing and able to consume career information and consider the military as a choice. Enhanced data analytics could enable this, such as data mining and web-tracking when possible.[9]

This translates to outreach and engagement that covers a larger variation of content, variation in depth of content, variation in mediums and modes of delivery, and variation in length and style though continuation and expansion of existing campaigns. All of these levers could target different audiences at different stages in their career and educational decision-making process—meet youth where they are. Content could be intentionally varied at the DoD and service-level to emphasize different aspects of the military and service, from what it is and does, to non-combat careers, to showcasing specific operations and impact. The DoD could grow and expand its "Know Your Military" YouTube channel, for example, that includes short videos for youth and children on what the military is.[10]

Similarly, variation in depth could be ranging from very short or embedded videos to longer explorations of aspects of military life. Such explorations could confront uncertainties about self-efficacy head on, particularly for females. Several female recruits noted watching others "like them" on YouTube detailing their military life gave them a sense of belonging and a confidence that they could be successful in the military. While some were official channels, some were unofficial channels created by servicemembers to share their experiences.

Expanding the variation in digital platforms used to engage youth could also help to meet more youth where they are online. The Army, Navy, and Air Force, for example, all have an e-sports gaming campaign targeting gamers.[11] Analogously targeted efforts on other platforms may prove effective for other target demographics of enlistment age. This is consistent with the variety of mechanisms identified in the I-Change model.

Network Segmentation

In addition to traditional marketing segmentation, military planners could effectively engage more youth by distinguishing and engaging youth in a social network context. For example, military planners could distinguish youth of enlistment age between those with larger or stronger information networks versus youth with smaller or weaker information networks. Youth with larger networks may be easier to reach, through influencers and digitally, but may have varying degrees of focus and willingness to consume career information. (More ties are not necessarily

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[9] The military is already conducting data-enabled outreach and recruiting, such as analyzing youth data at the metro-area and zip code level of data aggregation using internally-collected and publicly available data. However, there are legal limits to what the military is able to do through web-tracking and aggregating or merging data with third party vendors as is common practice in private-sector marketing.

[10] The channel can be accessed here: https://www.youtube.com/user/DODvClips/featured (accessed April 29, 2020). For an example of a video directed at young children, see: https://www.defense.gov/Watch/Video/videoid/629899/ (accessed April 29, 2020). Future videos could similarly promote military exposure in youth without emphasizing combat.

[11] Werner, Ben, "Navy Drops TV Ads: Trades Super Bowl Spots for Esports, YouTube," USNI News, December 2019.

better than less for some youth in making career decisions.) Therefore, general outreach that promotes exposure to military service across as many mediums as possible could heighten awareness and plant a growing seed. Conversely, youth with smaller or less dense networks may be harder to reach, also with varying degrees of career focus. A more targeted message oriented toward a key influencer may be far more effective than a blitz of general advertisements.

Finally, for outreach aimed at eliciting an interaction, especially for propensed youth, military planners should make it easy for people to get the information they need when they want to receive it. The EAST framework—Easy, Attractive, Social, Timely—from the Behavioural Insights Team provides a potentially useful model for designing effective information and outreach campaigns to reach youth.[12] The EAST framework is based on behavioral and decision-making research conducted by the Behavioral Insights Team (BIT). In segmenting youth by their information network attributes, considering differences in youth network density, function, and structure, interventions designed with EAST principles in mind could prove to be effective.

While these are possible implications of this research, additional study to further validate and expand upon these implications would further aid military recruitment planners. The idea of segmenting youth by information network attributes is different from traditional marketing segmentation (at the ZIP Code level or by characteristics such as "Fence Sitters") and should be explored further. For example, collecting data on youth information networks that is more comprehensive than the data presented here would enable greater use of formal social network analytic techniques to identify trends or patterns across groups of youth. As SNA is inherently mixed-methods in nature, this information could be combined with focus groups and interviews to provide qualitative details on how youth build and use their career and educational information network for greater insight.

Conclusion

This dissertation provides a first effort understanding of how youth make career and educational decisions in high school through the lens of building and accessing information networks. The emphasis is on the decision to serve in the military although it applies to all career and educational decisions youth make during high school.

This first effort is accomplished in the following three papers. The first paper explores the many theories and factors that affect youth career and educational decision-making. It integrates several disciplines that have contributed separately to understanding youth in this context, including economics, behavioral economics, sociology, psychology, behavioral science, and social network theory. The research presented suggests youth are susceptible to making life-impacting career and educational decisions with an emphasis on short-termism over maximizing long-term utility, counter to traditional economic theory. It also validates literature that

[12] Behavioural Insights Team, "EAST: Four Simple Ways to Apply Behavioral Insights," 2014.

emphasizes the importance of social-emotional factors in decision-making, as well as family dynamics. Moreover, it validates literature on the importance of social networks. Career and educational decision-making are an iterative and dynamic process where influencers act on youth in conjunction with youths' own preferences and goal setting.

The second paper provides an exploration of two sources of data used to map youth career and information networks—a longitudinal survey from the U.S. Department of Education of high school youth and interviews with high school juniors and newly enlisted U.S. Air Force recruits. The analysis segments youth into seven subgroups of interest and evaluates differences across subgroups in how these youth build and use their information networks in high school. These seven groups are: (1) youth enlisting in the military out of high school, (2) youth enlisting in the military at least a year out of high school, (3) youth who were propensed, or expressed interest in service, in junior year of high school, (4) youth who neither enrolled in college nor enlisted in active duty military, (5) youth who enrolled in two-year college, (6) youth who enrolled in four-year college, and (7) female youth. It finds that youth information networks are dynamic and evolving, and that social-emotional wellbeing, degree of focus, and motivation are important factors in how youth make career and educational decisions.

The third paper visualizes youth career and educational information networks across seven subgroups of interest. It then provides a starting point for how incorporating youth information networks into current military recruitment strategies and marketing campaigns might make them more effective. Specifically, this research finds that designing marketing strategies that are continual, include a wide range of platforms of dissemination, and vary by depth of content could better serve to meet youth where they are in their career and educational decision-making process. Further, given that the majority of youth begin their career and educational planning as early as freshman year in high school, incorporating an age-based dimension in marketing, content, and outreach is essential. Finally, segmenting youth by attributes of their information networks, such as density, structure, and function, in addition to traditional marketing segmentation, may enhance the effectiveness of outreach to youth and engagement.

Dissertation

Youth Information Networks and Propensity to Serve in the Military

A Review of Relevant Literature

Diana Gehlhaus

November 2019

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RAND CORPORATION

Abstract

Understanding how youth make the decision to serve or not serve in the military requires understanding the processes by which youth approach major life decisions. This short report provides an in-depth literature review of youth career and educational decision-making. The review spans multiple disciplines, including economics, sociology, psychology, behavioral science, and social network theory, as many disciplines use their own frameworks, constructs, and mechanisms to explain behavioral change. In particular, as part of a larger study on youth decision-making to serve in the military, this review focuses on the decision-making processes of current and recent high-school students, the primary source of enlisted recruits. Next steps for this research are also discussed.

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Abbreviations

TMC	Transtheoretical Model of Change
TPB	Theory of Planned Behavior
SCT	Social Cognitive Theory
IMBS	Information-Motivation-Behavioral-Skills Model
BIT	Behavioral Insights Team
JAMRS	Joint Advertising and Marketing Research Studies Group

1. Introduction

Policy Problem

It is well-known that military recruiting has long presented challenges, as has the ability to retain members that do eventually serve. Recent trends demonstrate difficulty in youth military recruitment, exacerbated by a very low unemployment rate and a reversal in policy which now increases end-strength in some elements of the armed services. Adding to complexity is a strain in available resources for recruitment–recruiters, enlistment incentives, marketing, scholarships, etc.–which is a resource intensive enterprise. There is a generally accepted reality that recruiters and talent acquisition planners must do more with less.

The looming challenge, and concern for meeting future recruiting requirements, holds particularly for active-duty service members, both enlisted and officers. To meet this challenge, military planners will need to continue to enhance the current approach to recruitment. This report is part of a larger study focused on helping planners more effectively recruit for the future force, by providing a more comprehensive understanding of how youth make the decision to serve and the nature and role of their information networks.

Scope of Research

More than 80 percent of recruitment efforts are focused on enlisted service members.[13] (Officers are mainly commissioned through college or university ROTC programs and the military academies; they number far less than the enlisted force.) Therefore, this research study focuses primarily on new enlisted recruits entering military service. Further, the focus of this study will be on active component members, since Reserve and National Guard recruits represent a different set of the population with different demographics, desires, and expectations than active-duty recruits.

This research will also focus on new recruits either joining immediately out of high school or entering service as an enlisted member within the first few years after graduation. That puts the target age range of consideration at 17–21 years old, which represents about 80 percent of active-duty enlisted recruits.[14] Scoping the main body of research to enlisted active-component recruits will enable further disaggregation. This is valuable because there may be notable variance within sub-populations in terms of their decision-making processes. Those who enlist several years after

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[13] Center for Naval Analyses, "Population Representation in the Military Services: FY2016 Summary Report," 2017.

[14] Ibid.

high school may have a very different influencer and information source network than those who decide to join in high school.

Less than 30 percent of youth aged 17-24 are considered "qualified military eligible."[15] As explained in a recent report from the National Commission on Military, National, and Public Service, "Medical issues, weight, body art, a history of drug use, educational attainment, or a criminal record may disqualify a person from military service."[16] In addition to these criteria, the military also assesses level of qualification based on two aptitude measures: attainment of a high school diploma (not a GED), and score on the Armed Forces Qualification Test (AFQT), which is desired to be at or above the 50th percentile.[17] All prospective recruits must take the test before being accepted into service.[18]

Most people who serve were not initially "propensed," or interested in serving, by traditional measures[19] and instead only became propensed after high-school.[20] For example, these recruits may have experienced unsuccessful attempts to pursue college or work or wanted a major life change. At the same time, of those who did report being propensed in high school, some actually do choose to serve while many others ultimately do not serve. Relative to those who choose to serve, less is understood about the military-decision process of the population of youth who do not serve, whether they were propensed in high school or not.[21]

The larger research study, of which this report is one part, will answer the following three main questions:

4. Framework: How can existing theories on youth decision-making be integrated to better explain how youth access and consume career and educational information [in high school] when deciding on post-high school plans?
5. Analytic: Who are the major influencers and what are the major sources of information that youth engage with to make decisions about joining the military, what is their relative

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[15] Blackstone, Tanja F. et al., "Enlisted Recruit Candidate Market Depth Analysis: Final Report," Naval Air Warfare Center Training Systems Division April 2018.

[16] National Commission on Military, National, and Public Service, "Interim Report," January 2019.

[17] The AFQT is derived from the Armed Services Vocational Aptitude Battery (ASVAB) exam, which is administered in select high schools and military recruiting locations across the country.

[18] U.S. Department of Defense, "Chapter 2: The Recruiting Process," Accessed September 7, 2019: https://prhome.defense.gov/portals/52/Documents/POPREP/poprep99/html/chapter2/c2_recruiting.html.

[19] Such as youth surveys administered by the U.S. Department of Defense, U.S. Department of Education, and other organizations that ask about career and educational goals and interests.

[20] Propensity is an individual's perceived likelihood of joining the military. Someone is "propensed" if they have a perceived interest in serving.

[21] There are two different phenomena underlying this pattern. One is numerical: There simply are so many people in the not propensed group that most enlistees will come from that group, even though their enlistment rates are much lower than for the propensed group. The second involves which market recruiters are most actively working. That market is post-high school, non-student because recruiters often need recruits to ship to training quickly, which is not possible for a high school or college student.

importance, what is the timing of the engagements, and what attributes are associated with differences in their information networks?

6. Policy: How can military recruitment policy planners leverage this information on how today's youth and their influencers are accessing and consuming educational, career, and military information to be more effective and efficient in reaching and recruiting desirable youth populations?

These questions will build on each other to generate policy-relevant research that is embedded in current theory and data analysis. Moreover, these questions were crafted with a careful eye toward the type of questions relevant to a social network research design.

This report provides a literature review of how youth make career and educational decisions. It addresses research question 1 of the larger study.

Policy Implications

At its core, the larger research study aims to provide new insight into the career and educational decision-making actions and processes of youth in high school and of recent graduates. It aims to help military planners better understand youth decision-making processes as they relate to serving in the military. With this perspective, the policy objective is to assist planners in allocating recruitment and outreach resources in a way that effectively and efficiently reaches target youth populations and their influencers. This includes the youth population that would be a good fit for the military but that choose not to serve. Potential policy insights that may be yielded from this research include addressing the following questions:

- To what extent are the services' recruiting and outreach efforts reaching youth and/or their key influencers and/or key sources of information?
    - If so, to what extent is this happening at the age that the literature and this research suggest would have the biggest influence?
    - How can military recruitment planners address information shortfalls, gaps, and timing issues that may be identified?
- How do the desirable timing and content of marketing campaigns change as youth characteristics vary?
- More generally, how might the findings be used to strengthen effectiveness and efficiency of recruiting and marketing outreach? This includes reaching desirable youth populations for recruitment that might be engaged more effectively (for example, those that demonstrate grit/perseverance and meet the physical requirements).
- How might the findings be used to help youth to pursue a military option when it is in their interest/could benefit them (e.g., those not attending college or attending college but needing assistance or youth looking for something more and different)?

2. A Review of Decision-Making Literature

Theoretical Frameworks Surrounding Youth Decision-Making

There is a large body of literature in the defense community exploring military propensity. This research spans the active and reserve components and dissects recruiting issues distinct to the enlisted force and officer corps.[22] Military propensity literature focuses largely on understanding why people choose to serve, who influences them, and how to better engage youth who are qualified military eligible (QME).

Outside of military propensity, but very much relevant, are other bodies of literature related to youth educational and career decision-making. This literature involves separate theoretical frameworks from economics, sociology, psychology, and social network theory, all of which seek to help develop a formal understanding of why and how youth make these decisions. The need to understand decision-making in the youth context is rising in prominence as issues such as student debt, supply of STEM workers, skill mismatches, and the value of a college degree have all caught the attention of researchers and policymakers worried about growing disparities in youth outcomes.

Military Propensity

Youth military propensity—an individual's perceived likelihood of joining the military —along with the factors that affect this propensity, is an evergreen topic of research in military circles. Research spans a range of topics in the youth propensity to enlistment cycle, including surveys of youth attitudes, experiments to measure the depth of parental influence, and modeling the decision-making process for service, among others.

RAND, for example, publishes extensive research related to understanding youth propensity to serve in the military.[23] One recent RAND study looked at the motivations of soldiers in joining the Army, and alignment of those expectations with experiences.[24] Through interviews with 80 privates, of which six were detailed as case studies, the research team found youth decided to enlist from several perspectives that are well-documented in the broader literature. Two of the more common perspectives were the desire to serve from a young age and the lack of other financially viable options. Other RAND research focuses instead on different aspects of

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[22] Civilian employment is another subject of active research, but these are generally older workers not covered in the target population for this dissertation.

[23] Cox, Amy, Gabriella Gonzalez, Christopher Johnson, "Air Force Cadet Career Decision-Making: Barriers and Influencing Factors by Gender and Race-Ethnicity," unpublished RAND Corporation research, 2013.

[24] Helmus, Todd C. et al., "Life as a Private: A Study of the Motivations and Experiences of Junior Enlisted Personnel in the U.S. Army," RAND Corporation, 2018.

enabling more effective recruiting, such as the development of new tools for resource allocation in an effort to optimize the number of enlistees for each dollar spent.[25]

Other research organizations, such as the Army Research Institute (ARI), and federally-funded research and development centers (FFRDCs), the Center for Naval Analyses (CNA) and Institute for Defense Analyses (IDA), have also contributed significant research on the question of enlistment and propensity. CNA, for example, publishes an annual report on the population representation in the military with detailed analyses and statistics. It also publishes special reports on topics related to recruitment, such as more effectively recruiting women and Hispanics in the Marine Corps.

Other literature on propensity explores youth attitudes and how cultural norms impact awareness and willingness to serve. This literature also provides critical context in which to frame the discussion around youth propensity. Propensity is generally low by historical standards, recently hovering around 13 percent for the general youth population aged 16-21, about 20 percent for men and 7 percent for women. Low propensity stems from several factors, although perhaps in part from less exposure to, awareness of, and desirability of military service. The transition to an all-volunteer force in 1973, fewer military installations, misperceptions of service in mass media and pop culture, greater job opportunities for minorities, and cultural norms surrounding the push for college all likely contribute to an information gap and, in some cases, to lower propensity to serve. One analysis of youth attitude data found that millennials had significant information gaps related to what military service was and what it entailed. In addition, while they respected those in uniform, the perceptions they did have were such that they did not feel they themselves aligned with military policies or culture.[26]

Given the shift to an all-volunteer force and the decline since then in the size of the armed forces, there are fewer veterans to enable military awareness and thereby influence America's youth. Currently 7.6 percent of the population are veterans,[27] compared to 13.8 percent in 1970.[28] The decline in the veteran population could also be connected to rising geographic disparities in the military population. In a 2011 survey, just one-third of youth age 18-29 reported having an immediate family member who served compared to about 80 percent of adults age 50-64.[29] There are fewer opportunities for youth to gain exposure to the military through family, and since most military installations are in the southern and western United States, military exposure

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[25] Knapp, David et al., "Resources Required to Meet the U.S. Army's Enlisted Recruiting Requirements Under Alternative Recruiting Goals, Conditions, and Eligibility Policies," RAND Corporation, 2018.

[26] Schake, Kori, and Jim Mattis, *Warriors & Citizens: American Views of Our Military*, Chapter 9.

[27] Schultz, Jennifer, "Veterans by the Numbers," National Conference of State Legislatures, November 2017.

[28] Wellford, Rachel, "By the Numbers: Veterans in Congress," PBS News, November 2014.

[29] Livingston, Gretchen, "Profile of U.S. veterans is changing dramatically as their ranks decline," Pew Research Center, 2016.

may be more concentrated in those regions. One estimate suggests 70 percent of new recruits are now from the south and west.[30]

Additional research explores the role of parents in youths' decisions to serve. One study specific to understanding the parent's role in youth propensity, for example, found parents had a sizeable impact on their child's decision-making through two mechanisms: first, through shaping their child's self-efficacy, and second, by shaping the child's social norms.[31] That said, the strength of parental influence may be more limited in terms of turning intentions into actions, at least in a broader career and education context. In one randomized control trial that was not military-related, text-message outreach to parents about college enrollment deadlines had no significant effect on student enrollment.[32]

Finally, the Department of Defense also produces a wealth of research on military propensity. One of the research offices within the Office of the Secretary of Defense, the Joint Advertising Market Research and Studies (JAMRS) office, regularly collects and disseminates information related to propensity for each service, active component and reserve, and enlisted and officer. For example, JAMRS conducts several surveys of note: a survey of enlisted new recruits, asking them about why they joined; a survey of youth asking about their propensity for military service; a survey of influencers including parents and grandparents of young people, asking about their attitudes toward military service; and an advertisement tracking survey, asking about young people's recall and perception of current radio and television ads.[33] Moreover, JAMRS puts out reports on special topics fairly regularly, including on "fence-sitters,"[34] the college market for officers, and more recently, a report that involved 13 detailed interviews of "probably" or "definitely" propensed youth from their Ad Tracking Survey, asking about their post-high school decision-making journey as it relates to military service.[35]

However, there are some limitations to DoD research. Perhaps most importantly, much of this research is not publicly available. This does not help the general research community interested in youth decision-making, although it is available to military recruitment planners. Moreover, the samples included in some of their analyses, particularly the new recruit survey,

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[30] National Commission on Military, National, and Public Service, "Interim Report," January 2019.

[31] Gibson, Jennifer Lee, Brian K. Griepentrog, and Sean M. Marsh, "Parental influence on youth propensity to join the military," *Journal of Vocational Behavior*, 70: pp. 525-541, 2007.

[32] Castleman, Benjamin L. and Lindsay C. Page, "Parental Influences on Postsecondary Decision Making: Evidence From a Text Messaging Experiment," *Educational Evaluation and Policy Analysis*, Vol. 19, No. 2: pp. 361-377, 2017.

[33] Joint Advertising Market Research & Studies, "Welcome to Joint Advertising, Market Research & Studies," U.S. Department of Defense, Accessed October 25, 2019: https://jamrs.defense.gov/.

[34] "Fence-sitters" is a term used to describe youth who are not necessarily propensed or planning to serve, but could be with a concerted effort, either by influencers, military recruiters, or targeted marketing and advertising.

[35] JAMRS, "The Prospect's Journey Told Through the Experiences of Propensed Youth," U.S. Department of Defense, 2018.

may not accurately reflect the general youth population. There may be reporting bias resulting from respondents knowing that a survey is being funded by the U.S. Government, from feeling the need to socially justify their decision to serve, and/or from the fact that the military population is not geographically or demographically representative of the total youth population.[36]

Much of the existing academic literature on military propensity is limited in publication to military and defense journals. There is less literature on military propensity in mainstream economics, sociology, and psychology journals, particularly those dealing with youth.

Economics

Classical economic theory assumes people are rational and utility-maximizing and make decisions accordingly. Recent economic research, for example, attempts to model the relationship between youths' choice of college major and labor market outcomes. While allowing the choice to be dynamic (e.g., switching majors), these models assume college is the best post-high school choice. They also assume that young people, even those in high school, intentionally make decisions that will maximize expected future discounted earnings subject to individual preferences.[37]

More broadly, several theories have been developed by economists to explain youth workforce outcomes, and therefore, the decision-making process youth should follow to achieve success. Several of the more prominent theories have been used by economists to explain youth workforce outcomes in terms of the school to work transition. As explained in *Beyond College for All*:

> "Human capital theory and structural theory are the two most common ways in which work-entry problems have been viewed. Human capital theory sees students as the primary cause of these problems, and structural theory [segmented labor market theory] sees employers as the cause. Signaling theory points to poor information as a cause…and network theory points to the lack of social contacts as a cause of poor information" (p19-20).

Each of these theories has trade-offs, in that none of them completely explain a reality that is highly nuanced. For example, human capital theory emphasizes investment in education, and the acquisition of knowledge, to compete and succeed in the labor market. Yet it does not consider differences in noncognitive attributes that effect learning, nor does it consider the influence of existing networks and relationships in securing a job.[38] Where these theories agree is that the

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[36] For example, "social desirability bias" occurs when respondents prioritize the socially acceptable response. See Lavrakas, Paul J. "Response Bias," Encyclopedia of Survey Research Methods, Sage Publications, 2008.

[37] Altonji, Joseph G., Peter Arcidiacono, and Arnaud Maurel, "The Analysis of Field Choice in College and Graduate School: Determinants and Wage Effects," *Handbook of the Economics of Education*, 2015.

[38] Rosenbaum, James, *Beyond College For All*, Russell Sage Foundation, 2004, Chapters 2 and 3.

ability to access and consume accurate career and educational information is critical in making utility-maximizing decisions. Still, there is large variation in how youth are able to access and consume information, even as information is more freely available. This makes using one theory to explain how all youth make the school to work transition problematic.

Moreover, making utility-maximizing decisions, regardless of theory, requires something not always available – perfect and complete information. The cost of not having good information can be high. Another study finds large costs associated with imperfect information related to post-high school decisions, limiting "the extent to which individuals can pursue their comparative advantage through schooling choices." Yet much of the economics literature leaves the feasibility of perfect information, the ability to adequately consume and use it, and the social equity implications of efficient "ability sorting" in high school unaddressed.[39]

These theories also assume young people have the ability to consume information in a way that maximizes utility over the long-term. Instead, youth are making decisions under conditions of uncertainty and elevating the short-term value over the longer-term, distorting the underlying cost-benefit decision calculus of going to college and choosing a field of study.[40] If they are in fact maximizing future potential earnings subject to individual preferences, it is heavily discounted due to poor information, immediate environmental conditions that are more salient, emotions, and other unknowns.[41]

Behavioral Economics

Incorporation of behavioral economics is an emerging area related to youth decision-making that works to address this reality, by appreciating people may not be willing or able to efficiently value perfect information. Behavioral economics integrates elements of sociology and psychology. It emphasizes the importance of personality and other non-cognitive attributes, suggesting that these characteristics are more predictive of youth outcomes than parental education and income. A meta-evaluation of the literature on this subject found "being more indecisive about careers is associated with lower emotional intelligence and emotional stability" and that "perceived self-efficacy is a stronger determinant than academic achievement" in setting career expectations. It also found that "personality factors are likely to be key in understanding different responses to information products, openness to learning about alternative careers, and attitude towards options that are perceived as more risky or unknown."[42]

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[39] Arcidiacono, Peter, Esteban Aucejo, Arnaud Maurel, Tyler Ransom, "College Attrition and the Dynamics of Information Revelation," NBER Working Paper, 2016.

[40] Elevating the short-term in decision-making is known as "present bias" and is a widely-cited phenomenon. For example, see *Thinking Fast and Slow* by Daniel Kahneman.

[41] Deck, Cary and Salar Jahedi, "The effect of cognitive load on economic decision making: A survey and new experiments," *European Economic Review*, Vol. 78: 97-119. 2015; Lerner, Jennifer et al., "Emotion and Decision Making," *Annual Review of Psychology*, Vol. 66: 799-823, 2015.

[42] Hume, Susannah and Jessica Heal, "Moments of Choice," Behavioural Insights Team, 2016.

Nobel Prize Winner Daniel Kahneman has made a significant contribution in this area. In his seminal book *Thinking Fast and Slow*, he aggregated decades of experience studying decision-making to show the importance of cognitive bias, burden, and overload in shaping choices.[43] He found that there are two main types of thinking – short-term (automatic, or "experienced self") and long-term (reflective, or "remembered self") – and that these cognitive features factor in differently depending on the type of decision in question. From this he also developed "prospect theory," or the notion that people do not always act rationally. Underlying prospect theory is the idea that people are very loss-averse and dislike losing more than they enjoy gaining and make decisions accordingly.

Arising from Kahneman's perspective is the idea of behavioral segmentation. This idea is that while certain principles guide decision-making processes – for example, reflective versus automatic thinking, loss aversion, cognitive overload, clarity of preferences – the weight given to these principles is not the same for everyone. Instead, decision-making is directly related to psychological mindset at the time of decision.

The study of behavioral segmentation, led by the Behavioural Insights Team (BIT) in the United Kingdom, has particular applicability to youth making career and educational decisions. This is a large decision that carries a high level of cognitive burden. Some youth have a clearer sense of focus, while others are still unsure of what they wish to pursue. Moreover, some youth have a stronger support system, and some have more confidence in their future potential.

Through interviews with youth, teachers, and guidance counselors, BIT found some youth are inherently more willing to access career decision-making information than others.[44] The study revealed youth also can consume the same information very differently. Moreover, BIT found influential "moments of choice" or inspiration could come from anywhere at any time.

BIT categorized youth into four quadrants of "types" along with a fifth category for youth who were neither seeking information nor considering any specific options:

1. Validating
2. Gathering
3. Satisficing
4. Fixed
5. Disengaged

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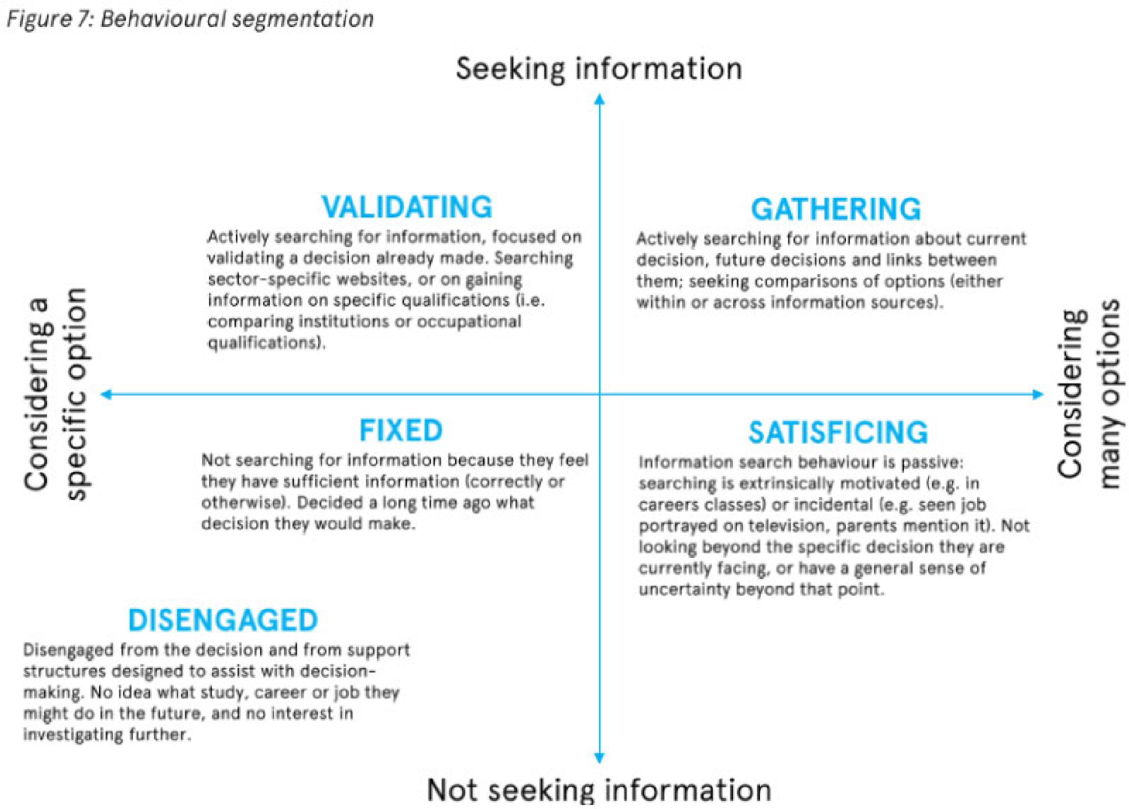
[43] Kahneman, Daniel, *Thinking Fast and Slow*, Farrar, Straus, and Giroux Books, New York, NY: 2011.

[44] Hume, Susannah and Jessica Heal, "Moments of Choice," Behavioural Insights Team, 2016.

Figure 1. Behavioural Segmentation



SOURCE: Behavioural Insights Team, "Moments of Choice."

These quadrants were informed by 35 interviews with British youth in age 11-18 (mode 15) regarding their post-graduation plans. BIT also found differences in the distribution of youth by segment, and patterns of movement between the segments. Twenty-five of the students interviewed fell into the validating and fixed quadrants, with the remaining split between gathering and satisficing. Females were much more likely to be satisficing, while men were more likely to be validators. Youth were less likely to become more open to considering additional options (e.g., move into gathering or satisificing) unless there was an unanticipated "shock" such as a bad class or work experience that caused them to question their original strongly-held preference.

Understanding which segment a youth falls into can enable influencers to assist them in making more informed decisions that will optimize their chances for future success. That is because each segment has different implications for how to best reach youth. For example, satisficers have been shown to have many other more salient cognitive burdens that impede their ability to focus on a long-term (albeit important) decision about career. Helping them focus may not mean providing more information about careers, but instead simplifying the choice. This makes correctly determining which segment a youth falls into essential. BIT found some youth perceived their decision-making status in one quadrant when their detailed responses suggested another.

Sociology and Psychology

Yet another body of sociological and psychological work frames this discussion in the context of the youth life course. It emphasizes that career and educational choices made in high school occur during a time of rapid life change with many transitions happening in a relatively short span. It becomes not just the decision to serve in the military, work, or go to college, but a decision about the direction of one's life and a formal lifestyle choice. It calls into question what it means to be an "adult."

This research argues decision-making is affected by the confluence of several transitions happening all within the span of a few years: into adulthood, into post-secondary education, and into the workforce. Graduation from high school marks not an end but the beginning of many choices about relationships, work, school, and family formation. Moreover, this transition into adulthood is evolving, stretching out in years as young people remain in school for longer and remain financially dependent on their families. Some scholars have even created a new category for the time in life between adolescence and adulthood, calling it "emerging adulthood."[45] Perceptions of what it means to be an adult, self-identification as an adult, and therefore the actions of young adults, are adjusting accordingly.[46]

Research on the evolving transition into adulthood spans the many facets of what it means to be an "adult" and how today's youth measure themselves against these benchmarks. Traditional markers were clearly distinguishable, and included biological, social, psychological, and legal milestones. For example, being financially independent, completing education, and having a family were traditional boundaries of achieving adulthood. Turning 18 has large legal implications as well: in addition to voting and driving, youth are legally emancipated and formally considered an adult by the government.[47]

Although youth still hold themselves to these standards, more recent literature argues that adulthood is no longer lock and step with these traditional measures. For example, the last few decades have seen a reversal in the time youth take to perceive themselves as "grown up." Scholars track the youth life course in the 1800's and 1900's, finding the transition quite linear once a youth reaches 18-20 years old. The graduation of youth from high school led to marriage, work, and starting a family all in rapid succession. This is no longer the case, as youth take much

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[45] Arnett, Jeffrey Jensen, "Emerging Adulthood: What Is It, and What Is It Good For?," Child Development Perspectives, Vol. 1, Number 2: pp 68-73, 2007.

[46] Eliason, SR et al., "The Transition to Adulthood: Life Course Structures and Subjective Perceptions," *Social Psychology Quarterly*, 78(3):205-227, 2015.

[47] Settersten, Richard A., Timothy M. Ottusch and Barbara Schneider, "Becoming Adult: Meanings of Markers to Adulthood," Emerging Trends in the Social and Behavioral Sciences, John Wiley & Sons, Inc., 2015.

longer to pursue education, settle into a career, start a family, and become financially independent.[48] Women now make up the majority of college students. Some "emerging adults" may never check all the "markers" of traditional adulthood. For example, it is increasingly common to remain financially interdependent on family instead of independent.

Today's youth also find themselves in a labor market that looks very different from the one into which their parents and grandparents graduated. The last two decades have seen increased polarization of high-skill and low-skill jobs and relatively stagnant real wages.[49] People often do not stay in one job for the length of their career, as had typically been the case.[50] Moreover, individuals are increasingly going in and out of training or education, both as technical skills become rapidly obsolete and as the rise of college degrees means more education is required to stand out. The transition to adulthood is not only taking longer but is neither linear nor sequential as it had been historically.[51]

The evolution of the transition to "adulthood" has impacted how youth perceive and identify themselves, and therefore, likely how they approach career and educational decisions. Researchers indicate this is strongly related to the resulting impact on youth social-emotional well-being – for example, from the pressure to go to college and to meet high societal expectations, hyperconnectivity to the outside world, and constant self-comparison to others. Well-being is a widely used term, but in the sociological context is defined in three dimensions: (1) subjective, which comprises self-perception and self-acceptance; (2) psychological, which comprises self-confidence and self-efficacy; and (3) eudaimonic, which comprises self-fulfillment and sense of purpose.[52]

More recent research related to emerging adulthood examines the rise in the number of youth facing mental health challenges during this time, along with the increase in number of youth treated for anxiety and depression.[53] It also finds teenage women are twice as likely to be affected by depression than men. The cause for this rise is also a current topic of exploration, with theories that include the rise of social media and cyber bullying, less time going out in lieu of being online, pressure to be academically successful for college, and greater awareness and

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[48] Shanahan, Michael J., "Pathways to Adulthood in Changing Societies: Variability and Mechanisms in Life Course Perspective," Annual Review of Sociology, Vol. 26: pp. 667-692, 2000.

[49] Holzer, Harry, "Job Market Polarization and U.S. Worker Skills: A Tale of Two Middles," Brookings Institution, April 2015.

[50] Long, Heather, "The new normal: 4 job changes by the time you're 32," *CNN Money*, April 2016.

[51] Eliason, Scott R et al., "The Transition to Adulthood: Life Course Structures and Subjective Perceptions," *Social Psychology Quarterly*, Vol. 78,3: 205-227, 2015.

[52] Schwartz, Seth J. et al., "Identity in Emerging Adulthood: Reviewing the Field and Looking Forward," *Emerging Adulthood*, 1(2) 96-113, 2013.

[53] Sugarman, Joe, "The Rise of Teen Depression," Johns Hopkins Health Review, Vol. 4, Issue 2, 2017.

reporting in the medical community.[54] Such changes are related to social-emotional well-being and decision making.

An important implication of the changing nature of the youth life course is in how youth access and consume information of all types – including career and educational information. Access to information has increased enormously over the last two decades. Interestingly, the vast amount of research that seeks to understand disparities in youth outcomes does not focus on information in spite of the fact that the internet has lowered information transaction costs. It focuses instead on factors such as grades and socioeconomic status as indicators of success, because of the compounding implications.[55]

Still, that does not mean youth are better able to consume information. In fact, the existing body of literature suggests the opposite—that more information is not necessarily better than less.

Sociology, Psychology, and Youth Career and Educational Decision-Making

A separate body of sociological and psychological research focuses explicitly on youth decision-making in high school. Studies consider the decision-making process, and the role of noncognitive traits, such as organizational and time management skills, along with social-emotional well-being on the ability to create a plan and execute the plan. The research also ties this in with youths' ability to access and consume career and educational information, with broad agreement that information is critical to creating and executing plans that are feasible. The psychological term for creating and executing such a plan effectively is "planful competence."

Embedded in planful competence is the need to have "aligned ambitions"—setting realistic career or educational expectations. Again aligned ambitions emphasizes the need for accurate information, about the individual's abilities and career preferences, and about what education is needed to reach those ambitions. Schneider discusses the importance of aligned ambitions in effective career and educational decision-making for youth: setting behavioral intentions, committing to those decisions, and actually realizing them. Interestingly, the authors found that background characteristics of students such as socio-economic status were not a predictor of students having aligned ambitions.[56]

The detailed progression from intention to behavior—or choice implementation—is also broken down by tasks in the literature. This process happens in six defined parts:

> "(1) orientation to the choice (i.e., awareness of the need to make a decision and motivation to engage in the career decision-making process), (2) self-exploration (i.e.,

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[54] Twenge, Jean M., "Why Teens Aren't Partying Anymore," Wired.com, December 2017.

[55] Deil-Amen, Regina and Stefanie DeLuca, "The Underserved Third: How Our Educational Structures Populate an Educational Underclass," *Journal of Education for Students Placed at Risk*, 15: 27-50, 2010.

[56] Schneider, Barbara and David Stevenson, *The Ambitious Generation: America's Teenagers, Motivated but Directionless*, Yale University Press, P.O. Box 209040, New Haven, CT, 1999.

gathering information about oneself), (3) broad exploration of the environment (i.e., gathering general information about career alternatives), (4) in-depth exploration of the environment (i.e., gathering detailed information about a reduced set of career alternatives), (5) decisional status (i.e., progress in choosing an alternative), and (6) commitment (i.e., strength of confidence in and attachment to a particular career alternative)."[57]

Few studies that are process-oriented consider the entire process, but instead focus on one or several steps. In one study that did consider choice implementation in this entirety, the authors found a direct relationship with youths' ability to complete these tasks and successful realization. The study focused on choosing a college major during high school, and also found that youths' level of commitment to their decision once made was a key predictor for sticking with that major.[58]

Other studies over time focus instead not on process but on differences in decision-making across youth sub-populations. This includes delineations in decision-making by race, gender, parental educational attainment, and family income. Most of this work emphasizes the importance of access to quality information. However, this work is also focused on explaining differences across groups in their ability to consume this information, and ultimately how socio-economic status affects youth decision-making and outcomes. An exploration of low-income African American youth, for example, found that this group set "modest" ambitions for which they "receive little information or guidance to support" them. These youth also end up underprepared for postsecondary education, and struggle to cope, ultimately "swirling," or staying enrolled without clear focus or steady progression, as opposed to completing.[59] Another study found that differences in accessing college information emerged for higher versus lower-ability students, with higher-ability students considering more criteria.[60]

Notable differences have also been observed by gender. In addition to differentiation by ability, Galotti and Mark also found differences in the nature of information sought and decision criteria used by gender. The Behavioral Insights Team found gender differences "in both information searching behavior and subject/career preferences. Girls are likely to do more

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[57] Germeijs, Veerle and Karine Verschueren, "High school students' career decision-making process: Consequences for choice implementation in higher education," Journal of Vocational Behavior, 70: 223-241, 2007.

[58] Ibid.

[59] Holland, Megan M. and Stefanie DeLuca, "'Why Wait Years to Become Something?' Low-income African American Youth and the Costly Career Search in For-profit Trade Schools," Sociology of Education, Vol. 89(4): 261-278, 2016.

[60] Galotti, Kathleen and Melissa Mark, "How do high school students structure an important life decision? A short-term longitudinal study of the college decision-making process," Research in Higher Education, Vol. 35, Issue 5: p 589-607, 1994.

research and exploration into their career options….[and] are more likely to underestimate their mathematical ability."[61]

Another arm of research on youth decision-making focuses on a small part of the decisional information network. These studies break down the information network into dyads, such as the relationship between high school students and colleges or employers.[62] In one study of 4,400 students attending 14 two-year colleges, for example, it was found that students have "serious [information] deficiencies." Colleges assumed students had planful competence to realize goals. They also assumed students were able to selectively consume available information as needed to formulate their goals. In fact, neither was true, with students relying on "meager, vague, and even incorrect information" without considering college alternatives. Moreover, the solution of colleges providing more information was not always better, as it assumes students have the time and ability to consume it, and that students realize they have information problems. The authors also found that these information deficiencies were strongly correlated with parental education and income.[63]

Other studies along these lines focus instead on the relationship between high school students and their parents. The parental literature argues parents have a strong influence on their children's aspirations, starting at an early age. Research in this area also suggests parents' own self-efficacy, attitudes, and motivation are particularly influential, possibly more than educational attainment or income.[64]

Still other literature focuses on the relationship between students and guidance counselors. One study focusing on the role of high school counselors found while they do have some influence on youth choices, they are hesitant to steer them away from going to college.[65] This biases the nature of their influence considerably.

Importantly, much of the literature on adolescent youth decision-making is couched in the decision to go to college, with researchers acknowledging the rise of a "college for all" societal norm. Research also acknowledges that this norm is not only false, but potentially dangerous, as it exacerbates an already growing divide between those with and without degrees. Although the research does not elaborate specifically on the military population, it does consider that many of these youth struggle with a large gap in their ability to access and consume accurate career and

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[61] Hume, Susannah and Jessica Heal, "Moments of Choice," Behavioural Insights Team, 2016.

[62] The studies exploring the relationship between individuals and employers are prevalent in the economics literature. Also prevalent are studies exploring the relationship between educational institutions and the labor market, but I do not cover this here.

[63] Person, Ann E., James E. Rosenbaum, and Regina Deil-Amen, "Student Planning and Information Problems in Different College Structures," Teachers College Record, Vol. 108, Number 3: pp 374-396, Columbia University, 2006.

[64] Hume, Susannah and Jessica Heal, "Moments of Choice," Behavioural Insights Team, 2016.

[65] Rosenbaum, James, *Beyond College For All*, Ch 4: "Gatekeeping in an Era of More Open Gates: High School Counselors' Views of Their Influence on Students' College Plans," Russell Sage Foundation, 2004.

educational information. This research also argues the "college for all" norm gives students who are not college ready a false sense of security about their future ambitions. By assuming they will go to college, youth do not access and consume information that would enable them to set realistic expectations.

One trade-off of the "college for all" norm is a shift in content and sources of decisional information-gathering. One area of debate in this regard is the changing the relationship between students and high school guidance counselors. Literature on the role of guidance counselors is mixed, although there is general consensus that the value of the relationship may be college-centric. That is, counselors continue to help youth access college information, but they no longer prioritize the provision of useful information that would help youth who are not college ready. Youth scholar James Rosenbaum argues that while counselors once had a large influence on student decisions and outcomes, the rise of college for all has resulted in a complete shift. Starting in the 1990's, Rosenbaum states, their "actions influence students' careers only in minor ways." (p91) Through interviews with guidance counselors, he found that "in regard to the task of dissuading students from making unrealistic college plans, counselors report that they do not want to do it, they cannot make students do it, parents will not let them do it, and they do not have the authority."[66] (p93) Still, other studies note a much more limited influence guidance counselors have altogether on student post-high school decision-making.[67]

Social Network Theory

Although parents and, to some extent, guidance counselors are an important part of the information and influence network for high school youth, the exact role they have in youths' decision-making process is less clear. The literature suggests how and when mothers, fathers, teachers, and high school guidance counselors influence career and educational decisions varies considerably across youth.

This provides a basis for considering a more holistic view of youth influence and information networks as an important part of the post-high school career and educational decision-making process. Social network theory has the potential to extend the existing body of literature, to enable consideration of this more holistic view.

Social network analysis is the study of how people's connections, and the relationships among them, influence attitudes, norms, behaviors, and decisions. Social network research has proliferated over the last decade, especially in the context of understanding influence and behaviors. As a society, we are perhaps more interconnected than at any point in history.

This is particularly relevant for America's youth, who are digital natives. Arguably, as youth have become more connected through mobile devices, apps, and more content online, the context

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[66] Rosenbaum, James, *Beyond College For All*, Ch 4: "Gatekeeping in an Era of More Open Gates: High School Counselors' Views of Their Influence on Students' College Plans," Russell Sage Foundation, 2004.

[67] Hume, Susannah and Jessica Heal, "Moments of Choice," Behavioural Insights Team, 2016.

in which they make decisions has fundamentally changed. It makes the changing nature of how they connect, who they connect to, how they use those connections, and how those connections influence them an interesting area worth studying.

The relatively recent move toward heightened interconnectedness suggests understanding the impact of networks on decision-making may provide meaningful policy insights. A network is a "set of actors and the ties among them."[68] Network analysis, therefore, enables researchers to measure how people's networks are structured, the nature of their relationships, and how those structures and relationships influence individual decisions. Network theory articulates that "the network perspective is, if not unique, distinctive in that it embeds individuals and their decisions, outcomes, and life chances in the larger social context of relationships, group membership, and community"[69] (Perry et al., p. 4).

At the core of social network analysis is an underlying assumption that "social ties and interactions…represent a major 'engine of action' underlying behavior" (Perry et al., p. 4). The underlying theory purports that "social interaction, rather than individual motivation, calculation, or beliefs are the principal bases of behavior" (Perry et al., p. 5). This is a notable departure from mainstream sociology and psychology, which emphasize decisions as being intra-individual. Instead, social network theory postulates that individuals' networks, and their position within them, will provide the foundation for what they experience, how they interact, their ideas and attitudes, and therefore, their options, decisions, and outcomes.

There are two distinct types of social networks that drive the field of network analysis. First, there is the whole, or sociocentric, network. This is a closed network where all members are known, and all connections among members are known. The second is ego networks, also known as egocentric or personal networks. Ego networks are open, with one individual acting as the focal point or node, known as the "ego." The network consists of all known connections of that individual, or "alters," and sometimes also includes the connections between those alters.[70] Alters are typically people, but can also be places, events, organizations, or other connections an individual might have.

Studying networks at the individual level, or ego networks, could provide a better understanding of how young people make post-high school career and educational decisions. Here, the objective is to understand what features of their network impact career and educational decisions for different sub-populations of youth. The emergence of ego networks into

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[68] Wasserman, Stanley and Katherine Faust, Social Network Analysis: Methods and Applications, Cambridge University Press, New York, NY: 1994.

[69] Perry, Brea L., Bernice A. Pescosolido, and Stephen P. Borgatti, *Egocentric Network Analysis: Foundations, Methods, and Models*, Cambridge University Press, New York, NY, 2018.

[70] Hanneman, Robert and Mark Riddle, *Introduction to Social Network Methods*, Chapter 9: Ego Networks: http://faculty.ucr.edu/~hanneman/nettext/C9_Ego_networks.html

mainstream social networks literature is a relatively new phenomenon; in fact, one of the first texts specific to ego networks was published only recently—in 2018.[71]

Origins for the theoretical framework underpinning egocentric network research stem from sociology and social psychology. The key difference, as noted above, is that, while sociology and psychology emphasize the role of the individual in decision-making, network theory views relationships, or ties, and the impact they have on the individual as the main catalyst for behavioral change.

Egocentric network research generally focuses on understanding how individuals' networks influence their behavior and other outcomes, such as relationships or employment. The existing body of research studies these network dynamics under three lines of inquiry – social support, social capital, and social influence.

Social support from network ties enable individuals to navigate effectively through personal events, decisions, and outcomes. Research shows those who provide social support can also be a source of influence, likely associated with attributes like comfort, trust, and dependency that giving and receiving support nurtures. If individuals face events together, that could also create a bond that fosters influence.

Research in this area has focused on how social support affects an individual's network. Perry et al. (p14-15) define four types of social support:

- Instrumental support – Provides practical resources
- Emotional support – Provides caring or nurturing
- Appraisal – Provides evaluation or assistance
- Monitoring – Watches, disciplines, or regulates behavior

Social support is another area where network research differs from traditional sociology and psychology. Network research considers social support as a function of the network – how the ties between people are defined – and approaches measurement from this broader perspective. More traditional disciplines consider the number and type of ties as a measure of social support, and approach measurement in terms of "who" and "how many" (Perry et al., p. 14).

Network research exploring social support has resulted in several relevant findings. For example, researchers "found that larger and more heterogeneous networks contained a higher percentage of supportive ties and provided access to a variety of different types of supporters relative to smaller, homogenous ones." Research also found that more contact involved between ties – strength – and networks that are tightly connected – dense – are associated with greater provision and access to support (Perry et al., p. 15).

Social capital as a second line of inquiry is defined as "resources that accrue to individuals or small groups as a result of network ties" (Perry et al., p. 16). This line of research shows how greater social capital is associated with greater access to job opportunities, new and different

[71] Perry, Brea L., Bernice A. Pescosolido, and Stephen P. Borgatti, *Egocentric Network Analysis: Foundations, Methods, and Models*, Cambridge University Press, New York, NY, 2018.

types of information, and connection to a wider variety of people. It also considers the "costs and benefits of establishing ties, as well as how and why actors construct or maintain ties" (Perry et al., p. 16). Of particular interest, this research covers the impact of family ties, how social capital is passed down to children, and the effect it has on future outcomes.

Here the networks perspective is consistent with the sociology literature on inequality in educational and career outcomes. Youth on the lower end of the socio-economic distribution, or that don't have a stable home, lack familial resources and support from the beginning. They may end up in poorer quality schools, be vulnerable to disciplinary problems, learning disabilities, and fail to see the relevance in school. They may choose to spend their time working instead of in school. Meanwhile, youth from middle- and upper-income families generally have a stable family life and access to financial resources and family support. In turn, they attend better schools, receive supplemental academic counseling, are held accountable for good grades, can afford to participate in extracurricular activities, and have educated parents that pass along valuable advice and networks.[72]

Social capital network research also differentiates between "bonding social capital" and "bridging social capital" as being distinct but each having important network effects. Bonding social capital considers relationships that regulate and integrate the social structure of the individual. Bridging social capital is about relationships that facilitate access to new ideas and information.

Bridging social capital is closely tied to a very important concept in social network theory: structural holes. Structural holes in a network arise when there is limited or no connection to different parts of a network. The people, or actors, who connect separate parts of a network become "brokers" as they are able to access, share and control information with a degree of exclusivity.[73] Structural holes emphasize "important aspects of positional advantage/disadvantage of individuals," since how an individual is connected to others and the nature of those relationships directly affect that individual's option set, and, therefore, behavior.[74]

The third line of inquiry, social influence, is defined in the literature as "the social relations that provide a basis for the alteration of an attitude or behavior by one network actor in response to another" (Perry et al., p. 18). It considers several dimensions of an individual's network, including composition, density, alter attributes, and the nature of relationships. Perry et al. describe influence as a "collection of theories that explain why people's attitudes, emotions, and

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[72] Schneider, Barbara and David Stevenson, *The Ambitious Generation: America's Teenagers, Motivated but Directionless*, Ch 4: "The Importance of Aligned Ambitions," Yale University Press, 2000.

[73] Robbins, Gary Doing Social Network Research: Network-Based Research Design for Social Scientists, Sage Publications Ltd: Thousand Oaks, CA, 2015. There are also five different types of network brokers, which for the purposes of this dissertation, are not necessary to delineate.

[74] Hanneman, Robert and Mark Riddle, *Introduction to Social Network Methods*, Chapter 9: Ego Networks: http://faculty.ucr.edu/~hanneman/nettext/C9_Ego_networks.html.

behaviors tend to converge over time…. conceptualized as an umbrella term for a group of related but distinct social processes, including obedience, conformity, persuasion, peer pressure, and socialization" (Perry et al., p. 18).

In network theory, influence has two dimensions similar to a vector: magnitude and direction. Significant research has been done on the importance of social proximity, for example. Greater proximity can imply more opportunity for interaction and therefore influence, although indirect influence through weak ties also has been shown to happen. "Multiplexity" is also associated with stronger ties, as this implies multiple types of relationships between the individual and alter (e.g., coworker and friend). Similarly, social comparison is a factor that happens through network connections that can result in influence. One study, for example, found influence among a group of students "was strongest when the seed group contained a person identified by a disproportionate number of peers as someone they spent time with" (Perry et al., p. 19).

Of all the literature on influence in networks, the concept of homophily is perhaps the most important. This suggests that "likes attract likes" or that people are most likely to be connected to people like themselves in terms of "demographic variables, behaviors, interests, and attitudes" (Perry et al., p. 166). This can be about reality or perceptions of their alters, as it is "ego's perception of their alters' choices that often influences ego, not the reality" (Perry et al., p. 29).

Network homophily has large implications for how people get information and who influences them. The implications can be positive or negative. On one hand, the tendency for similar people to gravitate toward each other could enable strong ties, fostering a high degree of social support and therefore a positive foundation for good social-emotional wellbeing. On the other hand, it could also limit access to new ideas and information, acting as an "echo chamber" that limits ability and willingness to benefit from opportunities not available within the network.[75]

Homophily can occur not only because individuals may intentionally surround themselves with similar people, but also because an individual's attitudes and preferences may converge over time. This is through influence as the strength and interaction with their connections grows.[76] However, this also limits the ability to make causal inference in social network analysis. If people can both gravitate toward people like themselves and converge to become more similar to their close connections over time, there is simultaneity in behaviors, decisions, and outcomes.

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[75] Robbins, Gary Doing Social Network Research: Network-Based Research Design for Social Scientists, Sage Publications Ltd: Thousand Oaks, CA, 2015.

[76] Ibid.

3. Theories of Behavioral Change and Policy Interventions

Theories of Behavioral Change

Across the many disciplines that study human behavior, including disciplines not covered here, more than 80 theoretical frameworks of decision-making have sprouted. Many of these theories are driven by the type of decision and by the discipline in which they are based. For example, many are based in public health. These vary from disease prevention, to engaging in risky behaviors, to compliance with medications and other treatments. Others are based in promoting sustainability, such as limiting water or electricity consumption. Still others are used to explain the diffusion of information in maximizing effective marketing and communications or adoption of new technologies.

There is a fair amount of overlap across the 80 frameworks. This is driven by the fact that these were developed out of separate disciplines and limited systemic cross-examination has been done to integrate or unify them. As a result, many frameworks use similar constructs to explain the decision-making process, such as attitudes and social norms, although the terminology may be different.

Still, each of these frameworks have at least slight distinctions, more so when examining different types of behaviors. A key implication is that a different weighting, ordering, or combination of these constructs may best explain different behaviors. Another key implication is that different types of behaviors may be best explained by different theories. Designing effective interventions is accordingly dependent on application of the most appropriate theory for the specific decision-making context.

The vast majority of the frameworks focus on intention leading to behavior and what drives intention. Likely this is because they are founded in public health and therefore emphasize the individual as opposed to the individual's social and environmental context. Within this focus on the inter-individual, these frameworks are designed to identify varying factors to explain how those intentions are formed and then what instigates action or change in behavior for a given type of decision.

The book *ABC of Behaviour Change Theories* by Susan Michie et al. catalogues these theories, identifying core constructs, applications, and associated theories each was derived from. The authors find that when looking across citations, four main theories accounted for 63 percent of those cited. These theories were the Transtheoretical Model of Change (TMC), Theory of Planned Behavior (TPB), Social Cognitive Theory (SCT), and the Information-Motivation-Behavioral-Skills Model (IMB).

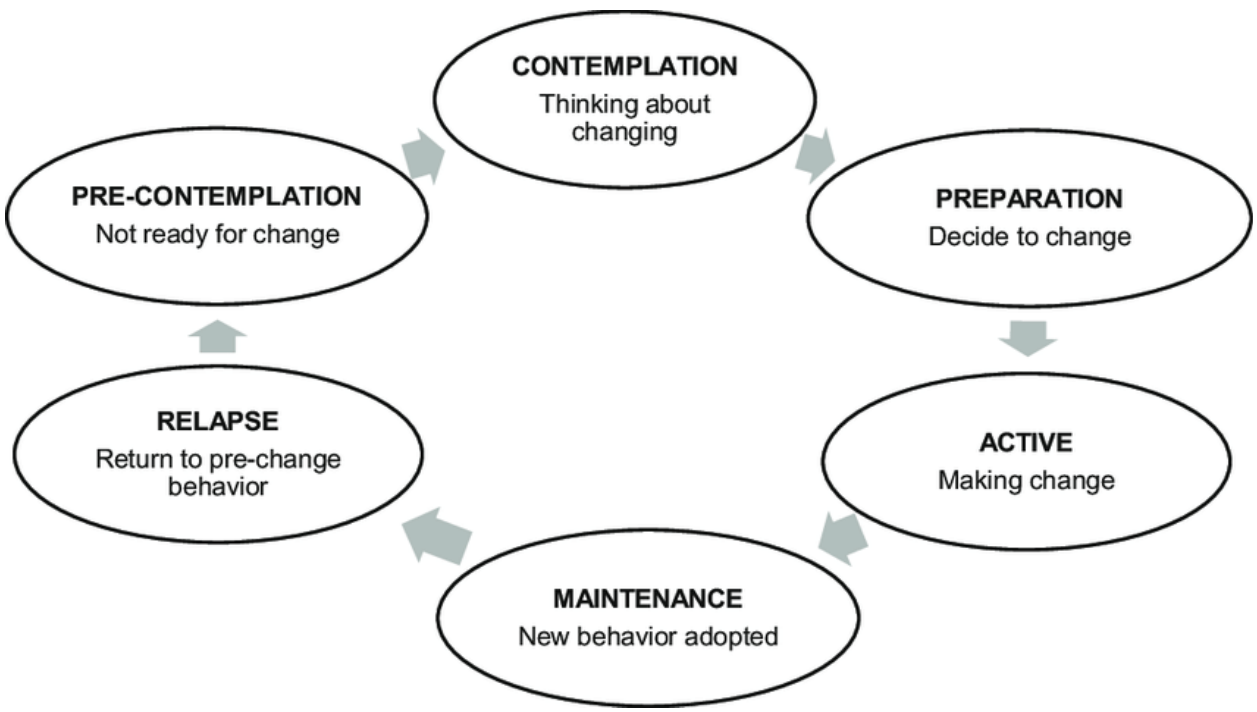
Transtheoretical Model of Change

The Transtheoretical Model of Change (TMC) emphasizes the individual's control over decision-making. It describes six different phases of decision formulation, starting with pre-contemplation through relapse and behavioral maintenance. Each decision under this theoretical framework can be broken down into a cycle of these six phases. A diagram of this model's phases is provided in Figure 2.

TMC has been frequently used to explain health-related behaviors, such as the decision to quit smoking. The model maps how an individual makes the decision, acts on it, and is able to maintain the action or not. The pre-contemplation phase also highlights the individual's willingness to consider the behavior. For example, if an individual enjoys smoking and does not perceive a value to quitting, he/she will unlikely be moved by an anti-smoking campaign.

The pre-contemplation phase – or individual's mindset – is an element of decision-making that could differentiate the target population. In this respect, one implication of TMC is that designing an effective intervention may not be a one-size-fits-all solution. It also does not explicitly consider what factors influence each phase of decision-making, such as attitudes or social environment.

Figure 2. Transtheoretical Model of Change



SOURCE: Shorter, Barbara and Barbara Gordon, "Diet Therapy in the Context of Chronic Pelvic Pain," 2017.

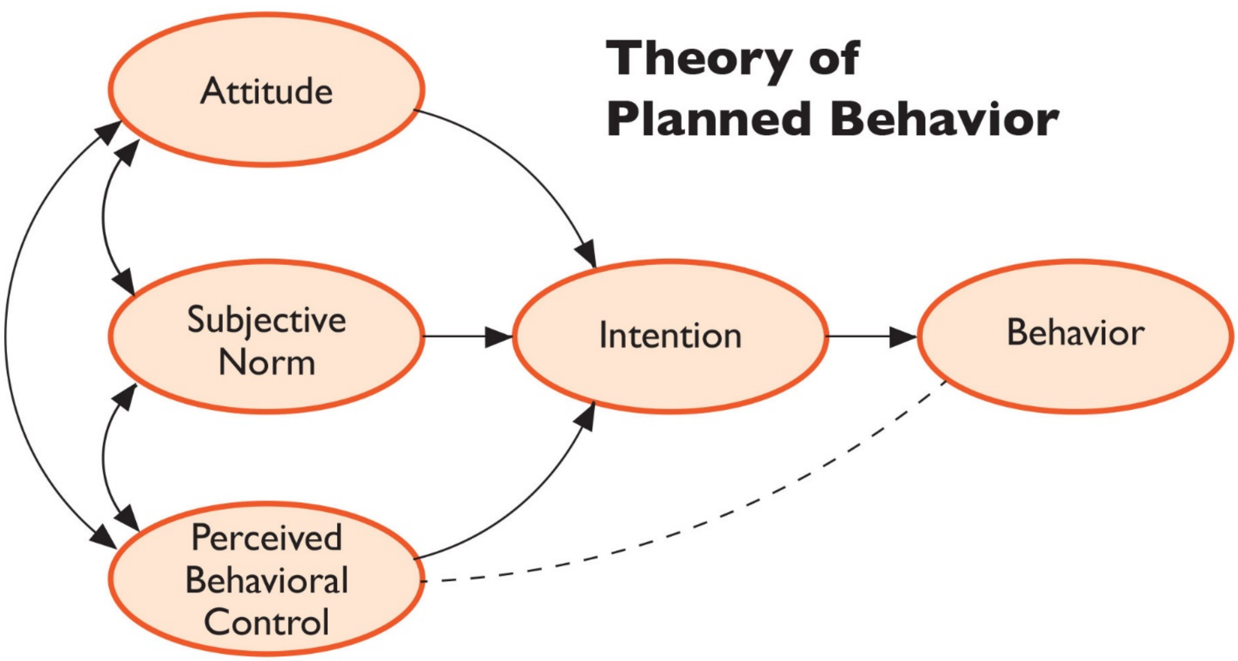
Theory of Planned Behavior

The Theory of Planned Behavior (TPB) is an intra-individual theory based in public health. It is commonly used to explain individual health-related decisions such as smoking, and also used to explain day-to-day actions such as what to eat and whether to purchase a good online. The theory has its roots in the Theory of Rational Action, although itself remains a foundational theory in the literature. Many theories, especially those related to health-related decision making, are based in TPB. Importantly, TPB is also the theoretical framework of choice used by the Department of Defense to explain youth propensity and the decision to serve in the military.

TPB assumes actions – or behaviors – are dependent on first having an intention for that action. Intentions are in turn formed by three key factors: attitudes, subjective norms, and perceived behavioral control. Attitudes are one's opinions and beliefs about a given behavior. Subjective norms are the social context in which the behavior is evaluated. Perceived control is self-efficacy, or the individuals' perception of whether they are able to execute the behavior. The factors influence each other, which in turn determines whether an individual will form an intention to act. It is that intention that leads to a given behavior, or action.

The constructs and assumptions underlying TPB focus extensively on explaining how intentions to act are formed. It is assumed that once the intention is formed, behavior, or action, will follow. A diagram illustrating TPB is provided in Figure 3 below.

Figure 3. Theory of Planned Behavior



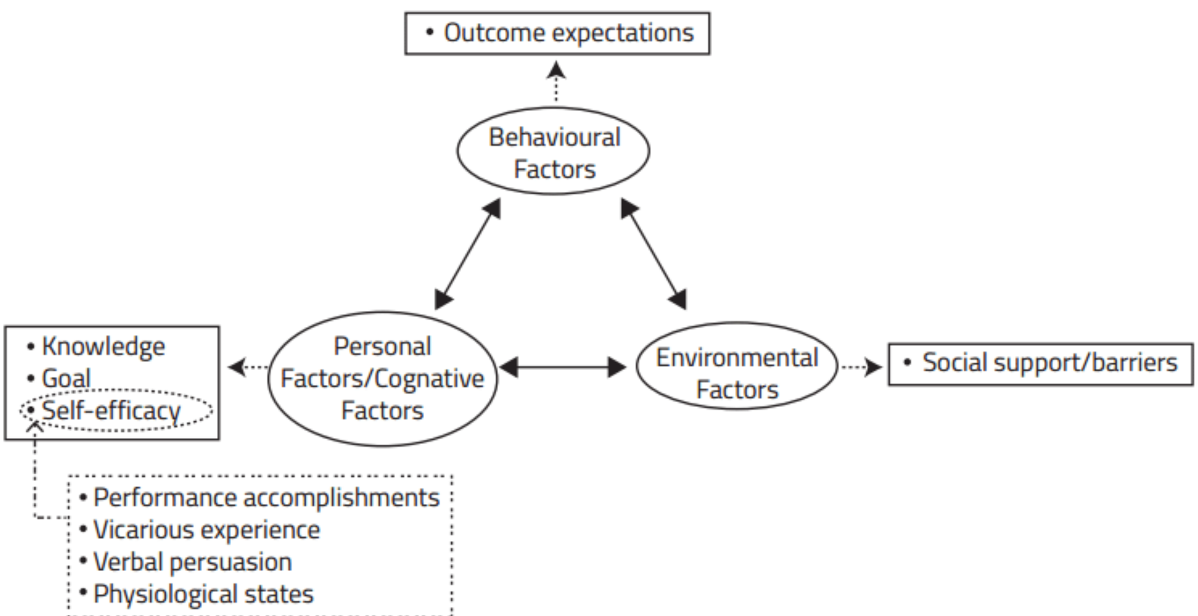
SOURCE: Gooch, Caitlin, "Let the Recycling Games Begin," Hahn Public, December 2015.

Social Cognitive Theory

Social Cognitive Theory (SCT) is used more heavily in education, including by the U.S. Department of Education. For example, SCT is the theoretical framework used by the Department of Education to discuss youth career and educational decision-making, in reporting on their youth longitudinal surveys such as the High School Longitudinal Survey of 2009.

Similar to TPB, SCT considers self-efficacy to be a core construct of decision-making. Different from TPB, however, is the elevation of immediate environmental factors in influencing decisions. It also hypothesizes simultaneous relationships – a triad – between personal and cognitive factors (including self-efficacy), local environment, and behavior. The implication is that they all act on each other as opposed to a linear progression of events. Figure 4 below maps SCT and the core constructs that comprise it.

Figure 4. Social Cognitive Theory



SOURCE: Chin, Jing Huey and Shaheen Mansori, "Social Marketing and Public Health: A Literature Review," 2018.

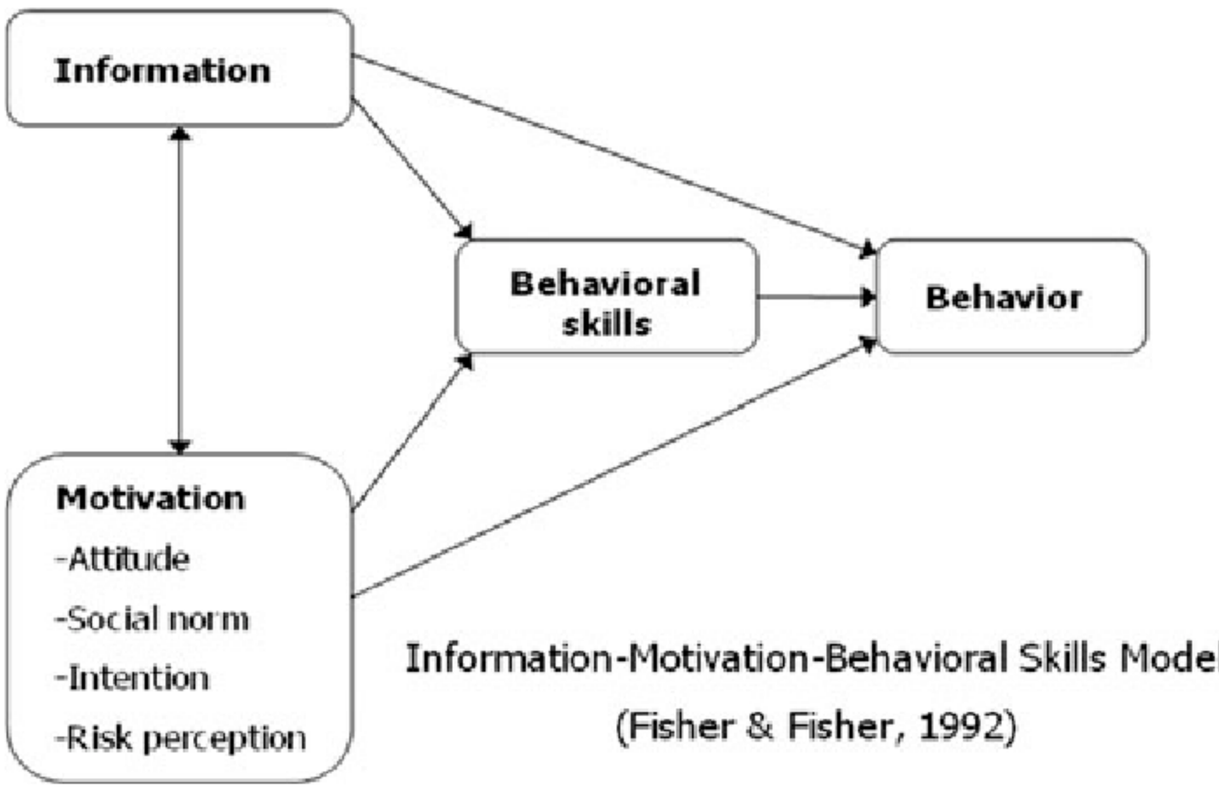
Information-Motivation-Behavioral-Skills Model

The Information-Motivation-Behavioral-Skills Model (IMB) model was derived explicitly by public health in an effort to encourage behaviors that reduced the spread of HIV and AIDS. The theory emphasizes three main constructs, and, as shown in Figure 5 below, they are all self-reinforcing. Two constructs precede behavior: motivation, developed from attitudes and social norms, and information, developed from the knowledge obtained related to the behavior.

Motivation, which combines two constructs in TPB, along with information feed into the third construct, "behavioral skills." Behavioral skills includes self-efficacy but is much broader, also including self-perceptions such as self-acceptance and ability to communicate. It is the idea that people have the skills they need to perform the behavior in question.

This core model is the only one of the four foundational theories that embeds access and consumption of information as a construct that influences behavior. However, in terms of the other constructs there is considerable overlap with TPB.

Figure 5. Information-Motivation-Behavioral-Skills Model



SOURCE: Eggers, Sander et al., "Predicting Condom Use in South Africa: A Test of Two Integrative Models," *AIDS and Behavior*, Vol. 18, 2013.

Additional Theories

Two additional theories of behavioral change, COM-B and I-Change, are worth noting here. Both of these theories are aggregations of core theoretical frameworks in a way that potentially makes them the most comprehensive and inclusive of explaining how individuals make decisions.

The Capabilities-Opportunities-Motivation—Behavior (COM-B) Model identifies capabilities, opportunities, and motivation as the key drivers of behavior. The model takes a systems approach, where capability and opportunity inform motivation, motivation directs behavior, and behavior can in turn influence all three drivers for future decisions. Capability is divided into psychological and physical dimensions, while opportunity is divided into physical and social dimensions. Motivation is divided into reflective (e.g., analytical) and automatic (e.g., emotional and impulsive) processes, and considers both "conscious" and "habitual" decision-making.

The I-Change Model is perhaps the most comprehensive theory of them all, enabling the greatest number of potential levers for behavioral intervention. It considers psychological, social, and informational factors that inform intention, which informs behavior, along with consideration for three phases of intention that can either end or not end with the behavior being observed. Finally, it divides behavior into two phases: trial and maintenance.

The TPB is embedded completely in I-Change, as part of the factors informing intention setting. However, I-Change extends TPB to include factors from other models believed to be influential in decision-making. In addition to TPB, I-Change factors include predisposing factors, such as biological factors, information factors (such as messaging and source), awareness factors (including knowledge and risk perception), ability factors (including skills and planning), and barriers to action.

Theoretical Trade-offs

As the authors identify, each theory has strengths and weaknesses in terms of what is included. The *ABC of Behaviour Change Theories*, for example, explains that:

> "the Theory of Planned Behavior draws attention to some important influences on behavior (intentions, attitudes, perceived control and perceived norms) and in some circumstances can predict behavior quite well, but it does not include important factors that often play [an] important role in behavior such as self-control and momentary environmental reactions." (Michie, p. 29)

Moreover, TPB provides less explanation for how intention translates into behavior or action, or the actual follow-through. Having an intention does not guarantee the behavior will occur – intention is necessary, but not sufficient. There are many factors that could affect the individual actually executing the behavior, even after the intention is established.

Other theories also have shortcomings. For example, in focusing only on the intra-individual, TMC does not account for one's surrounding environment, social norms, or other external influences. This makes TMC useful, but limited, in practical application as a framework to explain youth decision-making in a broader context.

The four core theories are widely cited and are used as foundations for other theories of behavioral change. They focus on the "intra-individual" and many behavioral change interventions have been designed accordingly. Interventions have therefore emphasized "motivation, and to a smaller extent, capability, whereas at least until recently social and environmental variables relating to the opportunity for the behavior to occur have been relatively neglected" (Michie, p. 30).

The benefit of the evolution of theories to more sophisticated versions such as COM-B and I-Change is that as they are adapted for the current societal context and specific types of decisions. They therefore have the potential to be more powerful. The goal of having a more comprehensive, and potentially accurate, framework of decision-making is to be able to appreciate the complexity of intervention design. "One source of complexity is that interventions aimed at changing behavior typically consist of many interrelated components such that it is never possible to identify a single key 'active ingredient'." (Michie, p. 25)

Selecting the Most Appropriate Theoretical Framework

Identifying which framework is the most appropriate to model decision-making in a given context can be quite challenging. Given the difficulties in such a task, for example, collecting sufficient data to validate a model, few attempt it in behavioral research. In fact, very few studies that propose behavioral interventions are actually based in a formal theory. Moreover, there is no one approach for either choosing a theory or for confirming that it is the most appropriate choice. That means that, even when a theoretical framework is applied to intervention design, it may not necessarily be the best theory and therefore guide the most effective interventions.

Ignoring the use of a theoretical framework does not solve this challenge, nor does it make the corresponding policy recommendations any more effective. The use of a best approximation theory, based on the evidence that is available, will at least ground the research and basis for interventions in a rigorous way. This can help policymakers not only design and implement behavioral interventions that may be more effective, but also provide a roadmap for how to modify those interventions if they do not have the anticipated results.

Designing Effective Behavioral Interventions

Decisions are made through a process, which is likely informed by many interconnected factors and iterations of contemplation. The above theoretical frameworks help define that process along with the associated factors. To affect change, or have influence in those decisions, interventions must be designed with the right framework in mind. A final emerging body of literature seeks to map how to operationalize effective or targeted changes in decision-making in a given decision-making theoretical framework.

BIT has done extensive work in this area. They view change agents in decision-making as actions and techniques that nudge behavior. Mindspace, or Messenger-Incentives-Norms-Defaults-Salience-Priming-Affect-Commitments-Ego, is BIT's main contribution to this discussion.[77] It is a "checklist for policymakers" that provides a roadmap for designing interventions targeted toward behavioral change. Mindspace is based on the theoretical framework of behavioral economics, that there are reflective and automatic decisions, that individuals respond to incentives, and that individuals dislike loss more than they like gains. BIT also developed the EAST framework, or Easy-Attractive-Social-Timely, as a more simplified version that defines characteristics of effective decision-changing interventions.[78] A breakdown of Mindspace is provided in Figure 6 below.

Figure 6. Mindspace as a Framework for Behavioral Interventions

Messenger	We are heavily influenced by who communicates information
Incentives	Our responses to incentives are shaped by predictable mental shortcuts such as strongly avoiding losses
Norms	We are strongly influenced by what others do
Defaults	We "go with the flow" of pre-set options
Salience	Our attention is drawn to what is novel and seems relevant to us
Priming	Our acts are often influenced by sub-conscious cues
Affect	Our emotional associations can powerfully shape our actions
Commitments	We seek to be consistent with our public promises, and reciprocate acts
Ego	We act in ways that make us feel better about ourselves

SOURCE: Behavioural Insights Team, "Mindspace: Influencing Behavior through Public Policy."

Other researchers have aggregated behavioral constructs across all 80 theories into partitioned categories. These categories are then matched to various interventions that may be most effective in affecting change for the associated constructs.[79] It is at the discretion of the intervention designer, or policymaker, to determine which constructs should be prioritized and therefore which types of interventions should be targeted.

The aggregation happens in two phases: the Theoretical Domains Framework (TDF) and the Behaviour Change Wheel. The TDF was developed by a collaboration of behavioral science

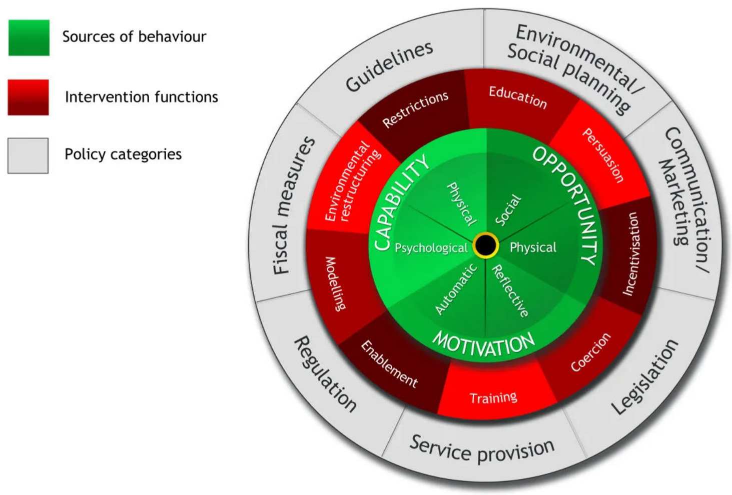
[77] Behavioural Insights Team, "Mindspace: Influencing Behavior through Public Policy," 2010. Accessed August 18, 2019: https://www.bi.team/wp-content/uploads/2015/07/MINDSPACE.pdf.

[78] Behavioural Insights Team, "EAST: Four Simple Ways to Apply Behavioral Insights," 2014. Accessed August 18, 2019: https://www.bi.team/wp-content/uploads/2015/07/BIT-Publication-EAST_FA_WEB.pdf.

[79] This is referred to as "change architecture" in some of the behavioral intervention literature.

researchers, who published a first version in 2005 and a subsequent version in 2012.[80] It is the basis for the COM-B behavioral theory discussed above. The Behaviour Change Wheel is layered on top of the TDF to facilitate targeted policy intervention design based on TDF constructs.[81] A visual depiction of the Behaviour Change Wheel is provided in Figure 7 below.

Figure 7. The Behavioral Change Wheel as a Framework for Behavioral Interventions



SOURCE: "The behaviour change wheel: A new method for characterising and designing behaviour change interventions"

This research study will ultimately consider these frameworks as a possible approach for designing more efficient and effective interventions to reach target youth for the purpose of increasing their likelihood of joining the military. The use of these frameworks will be guided by the quantitative and qualitative findings of this study related to how youth approach career and educational decision-making through their information networks.

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[80] Atkins, Lou et al., "A guide to using the Theoretical Domains Framework of behaviour change to investigate implementation problems," *Implementation Science*, Volume 12, Article number: 77, 2017. Accessed August 19, 2019: https://implementationscience.biomedcentral.com/articles/10.1186/s13012-017-0605-9.

[81] Michie, Susan et. al., "The behaviour change wheel: A new method for characterising and designing behaviour change interventions," Implementation Science, Volume 6, Article number: 42, 2011.

4. Next Steps

This is the first portion of a larger research study. Subsequent research for this study will provide new analysis designed to address the main research questions. This will include quantitative analysis of data from a U.S. Department of Education longitudinal survey, along with qualitative analysis of interviews with U.S. high school juniors and new Air Force recruits in the Delayed Entry Program. These interviews were conducted from January to July 2019 and included different locations across the country. The quantitative and qualitative analysis will be used to construct "youth information networks" for each population of interest (e.g., youth enlisting in high school, after graduation, or with some college, as well as those not enlisting with college, and females). These networks will provide a better understanding how influencer and information networks factor into post-high school planning, with the intention of unlocking new insights for the military to more efficiently and effectively reach these populations.

References

Altonji, Joseph G., Peter Arcidiacono, and Arnaud Maurel, “The Analysis of Field Choice in College and Graduate School: Determinants and Wage Effects,” Handbook of the Economics of Education, 2015.

Arcidiacono, Peter, Esteban Aucejo, Arnaud Maurel, Tyler Ransom, “College Attrition and the Dynamics of Information Revelation,” NBER Working Paper, 2016.

Arnett, Jeffrey Jensen, “Emerging Adulthood: What Is It, and What Is It Good For?,” Child Development Perspectives, Vol. 1, Number 2: pp 68-73, 2007.

Atkins, Lou et al., “A guide to using the Theoretical Domains Framework of behaviour change to investigate implementation problems,” Implementation Science, Volume 12, Article number: 77, 2017.

Behavioural Insights Team, “Mindspace: Influencing Behavior through Public Policy,” 2010.

Behavioural Insights Team, “EAST: Four Simple Ways to Apply Behavioral Insights,” 2014.

Blackstone, Tanja F. et al., “Enlisted Recruit Candidate Market Depth Analysis: Final Report,” Naval Air Warfare Center Training Systems Division April 2018

Castleman, Benjamin L. and Lindsay C. Page, “Parental Influences on Postsecondary Decision Making: Evidence From a Text Messaging Experiment,” Educational Evaluation and Policy Analysis, Vol. 19, No. 2: pp. 361-377, 2017.

Center for Naval Analyses, “Population Representation in the Military Services: FY2016 Summary Report,” 2017.

Cox, Amy, Gabriella Gonzalez, Christopher Johnson, “Air Force Cadet Career Decision-Making: Barriers and Influencing Factors by Gender and Race-Ethnicity,” unpublished RAND Corporation research, 2013.

Deck, Cary and Salar Jahedi, “The effect of cognitive load on economic decision making: A survey and new experiments,” *European Economic Review*, Vol. 78: 97-119. 2015.

Deil-Amen, Regina and Stefanie DeLuca, “The Underserved Third: How Our Educational Structures Populate an Educational Underclass,” Journal of Education for Students Placed at Risk, 15: 27-50, 2010.

Eliason, SR et al., “The Transition to Adulthood: Life Course Structures and Subjective Perceptions,” Social Psychology Quarterly, 78(3):205-227, 2015.

Galotti, Kathleen and Melissa Mark, “How do high school students structure an important life decision? A short-term longitudinal study of the college decision-making process,” Research in Higher Education, Vol. 35, Issue 5: p 589-607, 1994.

Germeijs, Veerle and Karine Verschueren, “High school students’ career decision-making process: Consequences for choice implementation in higher education,” Journal of Vocational Behavior, 70: 223-241, 2007.

Gibson, Jennifer Lee, Brian K. Griepentrog, and Sean M. Marsh, “Parental influence on youth propensity to join the military,” Journal of Vocational Behavior, 70: pp. 525-541, 2007.

Hanneman, Robert and Mark Riddle, Introduction to Social Network Methods, Chapter 9: Ego Networks, Accessed August 2019: http://faculty.ucr.edu/~hanneman/nettext/C9_Ego_networks.html.

Helmus, Todd C. et al., “Life as a Private: A Study of the Motivations and Experiences of Junior Enlisted Personnel in the U.S. Army,” RAND Corporation, 2018.

Holland, Megan M. and Stefanie DeLuca, “’Why Wait Years to Become Something?’ Low-income African American Youth and the Costly Career Search in For-profit Trade Schools,” Sociology of Education, Vol. 89(4): 261-278, 2016.

Holzer, Harry, “Job Market Polarization and U.S. Worker Skills: A Tale of Two Middles,” Brookings Institution, April 2015.

Hume, Susannah and Jessica Heal, “Moments of Choice,” Behavioural Insights Team, 2016.

JAMRS, “The Prospect’s Journey Told Through the Experiences of Propensed Youth,” U.S. Department of Defense, 2018.

Kahneman, Daniel, Thinking Fast and Slow, Farrar, Straus, and Giroux Books, New York, NY: 2011.

Knapp, David et al., “Resources Required to Meet the U.S. Army’s Enlisted Recruiting Requirements Under Alternative Recruiting Goals, Conditions, and Eligibility Policies,” RAND Corporation, 2018.

Lavrakas, Paul J. “Response Bias,” Encyclopedia of Survey Research Methods, Sage Publications, 2008.

Lerner, Jennifer et al., “Emotion and Decision Making,” *Annual Review of Psychology*, Vol. 66: 799-823, 2015.

Livingston, Gretchen, “Profile of U.S. veterans is changing dramatically as their ranks decline,” Pew Research Center, 2016.

Long, Heather, “The new normal: 4 job changes by the time you’re 32,” *CNN Money*, April 2016.

Michie, Susan et al., ABC of Behaviour Change Theories, Silverback Publishing, Great Britain: 2014.

Michie, Susan et. al., "The behaviour change wheel: A new method for characterising and designing behaviour change interventions," Implementation Science, Volume 6, Article number: 42, 2011.

National Commission on Military, National, and Public Service, "Interim Report," January 2019.

Perry, Brea L., Bernice A. Pescosolido, and Stephen P. Borgatti, Egocentric Network Analysis: Foundations, Methods, and Models, Cambridge University Press, New York, NY, 2018.

Person, Ann E., James E. Rosenbaum, and Regina Deil-Amen, "Student Planning and Information Problems in Different College Structures," Teachers College Record, Vol. 108, Number 3: pp 374-396, Columbia University, 2006.

Robbins, Gary Doing Social Network Research: Network-Based Research Design for Social Scientists, Sage Publications Ltd: Thousand Oaks, CA, 2015.

Rosenbaum, James, Beyond College For All, Russell Sage Foundation, 2004.

Schake, Kori, and Jim Mattis, Warriors & Citizens: American Views of Our Military, Chapter 9.

Schneider, Barbara and David Stevenson, The Ambitious Generation: America's Teenagers, Motivated but Directionless, Yale University Press, P.O. Box 209040, New Haven, CT, 1999.

Schwartz, Seth J. et al., "Identity in Emerging Adulthood: Reviewing the Field and Looking Forward," Emerging Adulthood, 1(2) 96-113, 2013.

Schultz, Jennifer, "Veterans by the Numbers," National Conference of State Legislatures, November 2017.

Settersten, Richard A., Timothy M. Ottusch and Barbara Schneider, "Becoming Adult: Meanings of Markers to Adulthood," Emerging Trends in the Social and Behavioral Sciences, John Wiley & Sons, Inc., 2015.

Shanahan, Michael J., "Pathways to Adulthood in Changing Societies: Variability and Mechanisms in Life Course Perspective," Annual Review of Sociology, Vol. 26: pp. 667-692, 2000.

Sugarman, Joe, "The Rise of Teen Depression," Johns Hopkins Health Review, Vol. 4, Issue 2, 2017.

Twenge, Jean M., "Why Teens Aren't Partying Anymore," Wired.com, December 2017, Accessed September 7, 2019: https://www.wired.com/story/why-teens-arent-partying-anymore/.

U.S. Department of Defense, “Chapter 2: The Recruiting Process,” Accessed September 7, 2019: https://prhome.defense.gov/portals/52/Documents/POPREP/poprep99/html/chapter2/c2_recruiting.html.

Wasserman, Stanley and Katherine Faust, Social Network Analysis: Methods and Applications, Cambridge University Press, New York, NY: 1994

Wellford, Rachel, “By the Numbers: Veterans in Congress,” PBS News, November 2014.

Dissertation

Youth Information Networks and Propensity to Serve in the Military

Data Collection, Methods, and Exploratory Analysis

Diana Gehlhaus

April 2020

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Abstract

Understanding how youth make the decision to serve or not serve in the military requires understanding the processes by which youth approach major life decisions. This report provides exploratory analysis and findings related to youths' career and educational planning in high school, using a longitudinal survey from the U.S. Department of Education of youth who were high school freshman in the 2009-2010 academic year. Seven groups are considered for analysis: (1) youth who enlisted in the active duty military out of high school, (2) youth who enlisted in the active duty military one to three years after high school, (3) youth who neither enlisted in the military nor enrolled in college within three years after high school, (4) youth who enrolled in a two-year college within three years after high school, (5) youth who enrolled in a four-year college within three years after high school, (6) youth who were interested in military service during high school, and (7) female youth. Next steps for this research also are discussed, which include mapping prototypical information networks for each of these groups. This report is part of a larger study on youth decision-making to serve in the military.

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Abbreviations

CI	Confidence Interval
DEP	Delayed Entry Program
HSLS09	High School Longitudinal Survey of 2009
JAMRS	Joint Advertising, Marketing Research and Studies
DoD	U.S. Department of Defense
HSPC	Human Subjects Protection Committee
IRB	Institutional Review Board
SNA	Social Network Analysis

1. Introduction

Policy Problem

It is well-known that military recruiting has long presented challenges, as has the ability to retain members that do eventually serve. Recent trends demonstrate difficulty in youth military recruitment, exacerbated by a very low unemployment rate and a reversal in policy which now increases end-strength in some elements of the armed services. Adding to complexity is a strain in available resources for recruitment—recruiters, enlistment incentives, marketing, scholarships, etc.—which is a resource-intensive enterprise. There is a generally accepted reality that recruiters and talent acquisition planners must do more with less.

The looming challenge, and concern for meeting future recruiting requirements, holds particularly for active-duty service members, both enlisted and officers. To meet this challenge, military planners will need to continue to enhance the current approach to recruitment. This report is part of a larger study focused on helping planners more effectively recruit for the future force by providing a more comprehensive understanding of how youth make the decision to serve and the nature and role of their information networks.

Scope of Research

More than 80 percent of military recruiting efforts focus on enlisted service members.[82] (Officers are mainly commissioned through college or university ROTC programs and the military academies; they number far less than the enlisted force.) Therefore, this research study focuses primarily on new enlisted recruits entering military service. Further, the focus of this study will be on active component members, since Reserve and National Guard recruits represent a different set of the population with different demographics, desires, and expectations than active-duty recruits.

This research will also focus on new recruits either joining immediately out of high school or entering service as an enlisted member within the first few years after graduation. That puts the target age range of consideration at 17–21 years old, which represents the vast majority of recruits. For example, from 2016-18, 71 percent of Army enlistments were ages 17-21, 16% were ages 22-24, and the remaining 13 percent were 25 or older.

[82] Center for Naval Analyses, "Population Representation in the Military Services: FY2016 Summary Report," 2017.

Although many factors go in to the decision to serve in the military, some factors are outside of military control.[83] In reality, the majority of youth are not qualified for service; less than 30 percent of youth aged 17-24 are considered "qualified military eligible."[84] As explained in a recent report from the National Commission on Military, National, and Public Service, "Medical issues, weight, body art, a history of drug use, failure to attain a high school degree, or a criminal record may disqualify a person from military service."[85] In addition to these criteria, the military also considers if the youth received a high school diploma (not a GED, limited to a maximum of 10 percent of enlistees) and the youth's score on the Armed Forces Qualification Test (AFQT), which is desired to be at or above the 50th percentile (minimum of 60 percent, with a maximum of 4 percent in percentiles 10-30 and none below 10).[86] All prospective recruits must take the AFQT, and low scores can be grounds for not moving forward with the application.[87]

Youth Groups of Interest

Given the high share of unqualified youth, the goal becomes to more effectively reach the youth within populations of interest who are or might be qualified to serve. The military could be better able to actively engage these youth early in the decision-making process, on the factors where it has some control, with a more comprehensive understanding of these populations.

In this sense, certain groups of youth are more relevant than others. Specifically, there are two categories of youth of potential interest in a military context: (1) those representing populations more likely to serve; and (2) those representing populations of interest the military would like to engage more but have been historically harder to reach.

The first category includes two main types of youth:

- Those who are propensed[88] in high school, enlist, and enter the Army soon after graduation
- Those who are not propensed in high school and enlist later

The first sub-group within this category is relatively straightforward. These youth had a demonstrated interest in the military in high school, if not before high school, and followed through on that interest. Youth in this category generally have a strong awareness of the military,

[83] For example, social-emotional wellbeing, family dynamics, and incompatible career or educational preferences.

[84] Blackstone, Tanja F. et al., "Enlisted Recruit Candidate Market Depth Analysis: Final Report," Naval Air Warfare Center Training Systems Division April 2018.

[85] National Commission on Military, National, and Public Service, "Interim Report," January 2019.

[86] The AFQT is derived from the Armed Services Vocational Aptitude Battery (ASVAB) exam, which is administered in select high schools and military recruiting locations across the country.

[87] U.S. Department of Defense, "Chapter 2: The Recruiting Process," Accessed September 7, 2019: https://prhome.defense.gov/portals/52/Documents/POPREP/poprep99/html/chapter2/c2_recruiting.html.

[88] Propensity is an individual's perceived likelihood of joining the military. Someone is "propensed" if they have a perceived interest in serving.

with some form of exposure in their early life. For example, many of these youth had immediate relatives or influencers who served in the military.[89] The idea of service resonated with their career and educational goals.

However, the majority of youth enlisting in the military fall into the latter group. These youth were not initially sufficiently interested in serving to enlist during high school, and only became so after high-school.[90] Instead, these youth generally take a few years out of high school to pursue other options, such as college, jobs, or both, before enlisting. For example, these recruits may have experienced unsuccessful attempts to pursue college or work or wanted a major life change.

The second category of potential interest also includes:

- Youth who are propensed in high school but do not enlist
- Identified target groups of interest:
    - Females
    - High academic aptitude, preferably athletic as well.

Longitudinal data from the U.S. Department of Education from the high school class of 2013 show that about two-thirds of youth who were propensed[91] in high school attended college within three years of graduating high school. For those pursuing college, a higher share attended two-year institutions. This makes understanding the two-year college market important.

The military has identified certain youth populations of interest as priority markets. First, the military has stated a desire to increase the share of females in uniform.[92] Second, the military has stated a desire to attract more talent with high scholastic and technical aptitudes. It is well-documented that these youth are more likely to attend college, and in particular, a four-year institution.[93] Notably, a higher share of females than males attends a four-year college.[94] Although the data used in this study do not enable analysis of populations by field of study, the

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[89] Phillips, Dave and Tim Arango, "Who Signs Up to Fight? Makeup of U.S. Recruits Shows Glaring Disparity," *New York Times*, January 2020.

[90] There are two different phenomena underlying this pattern. One is numerical: There simply are so many people in the not propensed group that most enlistees will come from that group, even though their enlistment rates are much lower than for the propensed group. The second involves which market recruiters are most actively working. That market is post-high school, non-student because recruiters often need recruits to ship to training quickly, which is not possible for a high school or college student.

[91] Defined as stating "Yes" or "Don't know" on a survey question asking about intention to serve in the military. The options were "Yes," "Don't know," and "No" only, instead of a traditional question wording on official Department of Defense youth surveys.

[92] Werner, Ben, "Military Branches Are Doing More to Recruit Women into Active Duty," USNI News, April 2018.

[93] Wyner, Joshua et al., "Achievement Trap: How America is Failing Millions of High-Achieving Students from Low-Income Families," Jack Kent Cooke Foundation, June 2018.

[94] In the HSLS09 data, 56 percent of the youth surveyed who were enrolled in four-year college in 2016 were women.

implication is that there is value to examining females and the four-year college market separately.

Topics for Future Research

Several areas worthy of exploration are not covered in this dissertation and could be considered as topics for future research. First, it is possible there is an increasing gap between the military's future personnel's skill needs and the skills the services actually recruit today. The implication is that enlisted strength goals by occupational specialty may need to be updated. For example, it is worth considering whether more enlisted positions should emphasize skills such as data coding and analytics over trades such as mechanic, electrician, and general infantryman (which is currently among the largest recruiting assignments in some services). If the future of warfare will be more technologically sophisticated as military leaders suggest, the incoming aptitudes and capabilities of airmen, soldiers, and sailors may also need to change. There are some changes that can be made in terms of military skill training and available retraining, but this consideration is about a more fundamental reorganization of occupational classifications and assignments.[95] It would also include changes to the front-end of the recruiting process, such as modifying the military entrance exam and re-targeting marketing efforts to more technically-minded youth.

Second, it is worth asking what role schools play in the perpetuating a negative stigma for being employed in certain careers such as the trades, especially for those not well-suited for college, and the resulting impact for the military. It is well-documented that schools push youth toward college regardless of academic ability or career ambition, as community colleges are open access institutions.[96] This also ties into the broader college-ready discussion, the limited career pathways discussion, and into the resulting consequences of delayed career and life planning.

Although neither generalizable nor the intended goal of this research study, an interesting byproduct was the conversations with Air Force recruiters that helped coordinate interviews with recruits. Anecdotally, at least from these Air Force recruiters' perspective, one of the larger challenges they face is in terms of "quality" or eligibility of youth, given military requirements and available assignments. The recruiters indicated that many prospective recruits who are interested in serving and approach recruiters – walk-ins or online – are not qualified, not interested in the available assignments, or both.

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[95] Current initiatives targeting the build-up of technical skills are generally more targeted toward officers.

[96] See "Youth Information Networks and Propensity to Serve in the Military: A Review of Relevant Literature" for part one of this study.

Research Questions

This report is the second part of a larger study on how high school youth make career and educational decisions with an emphasis on the decision to serve in the military.[97] It provides a preliminary assessment of research question two of the larger study.

Specifically, the larger research study will answer the following three main questions:

7. Framework: How can existing theories on youth decision-making be integrated to better explain how youth access and consume career and educational information [in high school] when deciding on post-high school plans?
8. Analytic: Who are the major influencers and what are the major sources of information that youth engage with to make decisions about joining the military, what is their relative importance, what is the timing of the engagements, and what attributes are associated with differences in their information networks?
9. Policy: How can military recruitment policy planners leverage this information on how today's youth and their influencers are accessing and consuming educational, career, and military information to be more effective and efficient in reaching and recruiting desirable youth populations?

Policy Implications

At its core, this research study aims to help military planners better understand youth decision-making processes as they relate to serving in the military. With this perspective, the policy objective is to assist planners in allocating recruitment and outreach resources in a way that effectively and efficiently reaches target youth populations and their influencers. Potential policy insights that may be yielded from this research include:

- The extent to which services' recruiting and outreach efforts are reaching youth and/or their key influencers and/or key sources of information
- The extent to which this is happening at the age that the literature and this research suggest would have the biggest influence
- How military recruitment planners can address information shortfalls, gaps, and timing issues that may be identified
- How the desirable timing and content of marketing campaigns change as youth characteristics vary
- How findings might be used to strengthen effectiveness and efficiency of recruiting and marketing outreach, such as reaching desirable youth populations for recruitment that might be engaged more effectively
- How findings might be used to help youth to pursue a military option when it is in their interest/could benefit them (e.g., those not attending college or attending college but needing assistance or youth looking for something more and different).

[97] Part one of this study was a review of the relevant literature. See "Youth Information Networks and Propensity to Serve in the Military: A Review of Relevant Literature."

Outline of this Report

The report is structured as follows: Chapter 2 provides an overview of the data sources and collection used in this study; Chapter 3 discusses the data analysis methods; Chapter 4 provides the quantitative data analysis; Chapter 5 provides the qualitative data analysis; Chapter 6 discusses some findings and hypotheses associated with the quantitative and qualitative analysis; Chapter 7 concludes with next steps.

2. Data Sources and Collection

Data Overview

The data and analysis framework for this study is centered on capturing and understanding youth career and educational information networks. The design consists of both a quantitative and a qualitative component. The quantitative component consists of analysis of data collected by the U.S. Department of Education High School Longitudinal Survey of 2009 (HSLS09). The qualitative component consists of primary data collection in the form of detailed interviews with two populations of interest: (1) high school juniors, and (2) newly enlisted U.S. Air Force recruits.

Quantitative Data

The High School Longitudinal Survey of 2009 is a nationally representative, longitudinal study of over 25,000 ninth graders from 944 U.S. schools who were high school freshmen in the 2009-2010 academic year. There was a first follow-up survey administered during junior year of high school, along with a second follow-up three years after high school graduation.[98] Surveys were administered in the fall of 2009 (base year), in the spring of 2012 (first follow-up), and from March 2016 to January 2017 (second follow-up), respectively. All relevant features and appropriate evaluative applications of HSLS09 are provided in detailed documentation by the U.S. Department of Education.[99]

The initial wave, or base year, surveyed students, their parents, math and science teachers, school administrators, and school counselors. However, my emphasis is on students and their parents. The first follow-up administered in junior year surveyed only students and their parents, while the second follow-up in 2016 surveyed only students. Table 1 below shows the response rates for each survey wave for the identified populations of analysis.

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[98] There was also a short 2013 Update sent out between May-November 2013 to assess immediate post-high school plans. However, it was optional whether parents or students filled it out, and almost half of responses were submitted by parents. Moreover, the survey was limited in scope with only factual questions about post-high school plans. Therefore, to reduce response bias, I do not include this wave in my analysis.

[99] U.S. Department of Education, National Center for Education Statistics, Accessed October 15, 2019: https://nces.ed.gov/surveys/hsls09/.

Table 1. HSLS09 Participation by Wave

Survey	Eligible	Participated	Weighted Percent
2009			
Student	25,206	21,444	85.7
Parent	25,206	16,995	67.5
2012			
Student	25,184	20,594	82.0
Parent	11,592	8,651	72.5
2016			
Student	25,123	17,335	67.9

Note: The 2009 parent survey uses the student base year weight. As such, it has the same number of eligible participants, a parent for each surveyed student. The sample sizes go down for each wave due to attrition in the sample. Source: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09): Base Year to Second Follow-Up Data File Documentation," June 2018.

A key focus of the HSLS09 was to understand students' trajectories from the beginning of high school into postsecondary education, the workforce, and beyond. The survey questions were designed specifically to enhance researchers' understanding of youth career and educational decision-making. Accordingly, HSLS09 asks students and their parents detailed questions about how students made their post high-school graduation decisions, in terms of influencers, sources of information, actions, and other determining factors. All survey instruments (questionnaires) for each survey wave can also be found online through the U.S. Department of Education.[100]

Qualitative Data

The qualitative data collection consisted of detailed interviews in two parts: (1) high school juniors, and (2) newly enlisted U.S. Air Force recruits in the Delayed Entry Program (DEP)[101]. Both sets of interviews were designed to inform the above quantitative analysis and to fill in gaps in knowledge.

The samples were not designed to be representative of the general population, although interviews included a larger female representation among military recruits. Moreover, a variation in geography was intentional to capture potential variety in experiences and attitudes and,

[100] U.S. Department of Education, National Center for Education Statistics, Accessed July 25, 2017: https://nces.ed.gov/surveys/hsls09/.

[101] The Delayed Entry Program (DEP) is a transition program were new recruits have meet all of the conditions and requirements to serve but are waiting to ship to Basic Military Training (BMT). Recruits could be in the DEP for anywhere from a few days to a year, depending on their occupational specialty and training seat availability.

therefore, decision-making processes.[102] Interviews of high school juniors were targeted in central New Jersey, southern California, and the Washington DC metropolitan area. These locations were selected for practical and accessibility reasons for the researcher. Interviews of newly enlisted recruits had a more representative distribution, taking place in the same three areas selected for high school students and in southern Texas, western Illinois, southern Georgia, and central Colorado.

All interviews with both populations took place between January-June 2019, with one exception.[103] All interviews across populations were conducted in person, either in a recruiting office, in a high school conference room, or in a public venue such as a coffee shop of the participant's choice near a high school. Interviews generally lasted 20-40 minutes, with an average time of approximately 30 minutes. The protocols for both populations were designed for interviews to last about 30 minutes. Participant experiences, attitudes, and depth of college and career planning were key contributors to the variation in interview length.

Interviews were recorded anonymously with the participants' verbal consent, and later transcribed for analysis by a transcription service through the use of RAND's formal non-disclosure agreement. Although newly enlisted recruits were not provided compensation, each high school junior participant was provided a $10 cash incentive at the completion of the interview. Signed parental consent forms were obtained for each high school junior, as required by federal law for minor youth.

Multiple methods were employed to recruit high school participants. Initially, the intended recruitment strategy was to work through the high schools or the administration for the high school district. However, that proved lengthy and onerous, with many requirements for the district's Institutional Review Board (IRB) approval that could not be met in a timely and reasonable manner.[104] Moreover, some unified public high school districts, including the District of Columbia, have a ban on graduate student research requests. Lack of formal school approval also meant that flyers could not be posted in schools or at school-sponsored events. It also was not possible to work independently with any employee of schools, including teachers, to help solicit participation.[105] Only for one of the three geographic focus areas, New Jersey, was it possible to secure interviews through a public high school.[106]

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[102] See "Youth Information Networks and Propensity to Serve in the Military: A Review of Relevant Literature" for part one of this study.

[103] One DC-area interview took place in October 2019.

[104] In addition to RAND's Human Subjects Protection Committee approval, a similar approval from the institution's Internal Review Board would be required.

[105] Regardless of if I was introduced to the teacher or employee independently of the school. They could also not help me solicit participation outside of school or hours of work, since they were employed by the school.

[106] It was a small school with less than 400 students. The school board was able to review and approve my application.

Additional approaches to recruit high school juniors were to create and distribute flyers and to work through existing connections. The objective for both of these approaches was to generate a snowball sample.[107] Connections included friends and colleagues, several of which emailed their contacts and posted on social media. Flyers were distributed via email to personal connections and eventually, posted at local area public venues in the DC metropolitan area. Interview participants in the Los Angeles metropolitan area were secured through colleagues sharing my flyer with local parents. Interview participants in the DC metropolitan area were similarly secured through colleagues sharing the flyer to local parents. Although flyers were posted in the DC-metro area to secure participants, no DC area student interviews were actually secured from the physical posting of flyers in public venues.

A sample of newly enlisted U.S. Air Force recruits was obtained with the assistance of the office of the Secretary of the Air Force for Manpower and Reserve Affairs. As part of a RAND study on Air Force recruiting, a list of select recruiters was provided to the team to contact in order to schedule interviews with recruits. Coupled with a desire to include a range of geographic regions, we further refined the list to determine which recruiters to contact. The RAND research team then worked with the recruiters directly to schedule a day and time to visit and interview DEP members. Participants were ultimately selected at the discretion of the recruiter, with the stipulation that we hoped to include a mix of males and females and diversity in age to reflect diversity in experiences and career decision-making.

A total of 44 interviews with newly enlisted Air Force recruits in the DEP and 24 interviews with high school juniors were conducted for a total of 68 interviews. Interviews were intentionally conducted in the spring 2019 timeframe, a time period after students had likely explored post-high-school options but before they had made a final decision that could introduce bias. A breakdown of interviewees for each group is provided in Tables 2 and 3, by location and gender, respectively.

Table 2. Interview Participants by Type and Location

Location	Recruits	High School Juniors
California	6	9
Colorado	8	0
Georgia	6	0
Illinois	6	0
New Jersey	6	11
Texas	6	0

[107] In a snowball sample participants refer or recommend other participants.

Location	Recruits	High School Juniors
Washington DC/ Northern Virginia	6	4
Total	**44**	**24**

Table 3. Interview Participants by Gender

Gender	Recruits	High School Juniors*	Total
Male	28	13	41
Female	16	10	26
Total	**44**	**23**	**67**

*One participant did not wish to identify gender.

The main focus of the interviews was to understand the timing and process of the interviewees' career and educational decision-making, who their influencers were, and what sources of information they accessed. For high school students, interviews focused on post-high school plans, along with whether they ever considered serving in the military. For enlisted recruits more than a year out from their high school graduation, interviews focused both on the decision to serve in the military and their immediate post-high school plans when they were in high school. Specific topics covered in detail included:

- Post-high school plans and decisions made to date
- The timing and the processes by which they had and would continue to formulate and finalize their plans
- Influencers and ranking of those influencers in terms of importance on a scale of 1-5. (All interviewees were asked about the same list of influencers.)
- Sources of information consulted and ranking of those sources in terms of importance on a scale of 1-5
- Other environmental and/or contextual factors involved in their post-high school plans and/or decision to serve in the military
- For high school juniors, whether they had considered military service and why/why not.

Each population had a separate protocol. The interview protocols for the three populations had separate consent forms, as high school juniors required a separate parental consent. The information collected from the interview populations and HSLS09 had a shared data safeguarding plan. The protocols for the newly enlisted recruits and for high school students are provided in Appendices A and B, respectively.

Human Subjects Approval

Formal approval from RAND's Human Subjects Protection Committee (HSPC)[108] was required for both populations and for accessing the HSLS09 microdata. High school juniors are minors, and as such, are classified as a vulnerable population. Newly enlisted recruits were not a vulnerable population, but as active duty servicemembers, required additional levels of review and approval by the U.S. Air Force and by the Office of the Secretary of Defense.

The necessary survey weights for HSLS09 are deemed personally identifiable information by the U.S. Department of Education. Accordingly, use of HSLS09 required a RAND site license from the Department of Education, a data use agreement with the Department of Education, and HSPC approval of the agreements, data safeguarding plan, and intended data use. Per the terms set by the Department of Education, all data analysis was conducted in a secure access room on computers with no external connection on site at RAND.

This study split HSPC approval into two separate applications: (1) HSLS09 and high school student interviews; and (2) newly enlisted recruit interviews. The newly enlisted recruit review and approval was submitted to HSPC, the Air Force, and DoD as part of a formal RAND study on Air Force recruiting.

[108] Known in most organizations as an Institutional Review Board (IRB).

3. Data and Methods

This is a mixed methods research study and, accordingly, will involve multiple analytic methods. The analytic tools used in this report include: (1) STATA for HSLS09 quantitative data analysis, and (2) NVivo for thematic analysis of qualitative data. Ultimately, the results of these analyses will be used to construct youth information networks for the identified populations.

The quantitative data analysis included in this report explores relationships within and between target populations and provides the foundation for working hypotheses on how these youth make the choice whether or not to serve in the military. Based on the hypotheses developed from the longitudinal data analysis, the interviews with newly enlisted recruits and current high school students will then contribute to validation of these ideas. While the sampled population for the qualitative component of this study will not be a random population sampling of the target group studied, it will nonetheless provide meaningful insight. Construction of the youth information networks that will be included in the next part of this study will follow principles of social network analysis (SNA).

Quantitative Methods

Analysis of the quantitative dataset—HSLS09—will allow for development of hypotheses about youth educational and career decision-making. For example, perhaps youth that are known to enter military service have a higher likelihood of being influenced by family. Alternatively, perhaps those that go on to enroll in a four-year college or university are unlikely to serve in the military regardless of what their influencer network looks like.

The quantitative analysis of HSLS 09 consists of three phases: (1) an exploratory analysis that provides descriptive statistics and correlations for the populations and variables of interest, (2) regression analysis that explores statistical relationships between the populations of interest and the variables of interest, and (3) social network analysis that derives from the first two phases and involves additional iterations of those analyses. The third phase will be included in the third paper in this study.

Youth Groups of Interest

Available measures in the survey were used to create the seven youth groups of interest identified in Chapter 1. The descriptions are as follows:

- HSENLIST: Youth who enlisted in the military in the year of or at any time prior to high school graduation, defined as enlisting in 2013 or earlier[109]
- AFTERHS: Youth who enlisted in the military in or after the calendar year following high school graduation, defined as enlisting in 2014 or later[110]
- NOTFOURYR: Youth who attended a sub-baccalaureate degree program at some point between 2013 and 2016
- FOURYRCLG: Youth who were enrolled in a four-year degree program in 2016
- NOCLGORAD: Youth who neither enrolled in any postsecondary institution nor served in the active duty military between 2013 and 2016
- FEMALE: Youth who identified themselves as female
- PROP12: Youth who were propensed during junior year of high school, defined by answering "yes" or "don't know" to the question about intention to serve in the military in the first follow-up survey of 2012.[111]

Each group of interest is a binary variable, having a value of either 0 (not a member of the population of interest) or 1 (a member of the population of interest). Table 4 below provides the total number of observations and share of the sample for each of interest group with a value of 1, along with the share of that group that was female and the share of each group that attended some form of college between 2013 and 2016. To clearly distinguish between HSENLIST and AFTERHS, this report will use "enlisted out of high school" to refer to HSENLIST and "enlisted after high school" to refer to AFTERHS.[112]

Table 4. Groups of Interest

Group	In Group	In Sample	Weighted Share of Sample	Weighted Share Female
HSENLIST	192	15,624	1.2%	20.2%
AFTERHS	166	15,624	1.3%	11.9%
NOTFOURYR	5,347	17,162	34.8%	49.8%
FOURYRCLG	7,532	17,162	35.2%	55.4%
NOCLGORAD	4,065	17,162	28.7%	44.2%
FEMALE	12,292	25,148	49.5%	100.0%
PROP12	4,067	20,544	21.4%	28.3%

109 Recruits can sign contracts before they graduate high school. This group is defined as those who signed a contract either during HS or in the year of graduation.

110 Through 2016 when the second follow-up survey was administered

111 The answer options were "Yes," "No," and "Don't know." In contrast, Department of Defense surveys include "Definitely," "Likely," "Maybe," "Not Likely," and "Definitely Not" as answer options, and count "Maybe" as part of the propensed population. Therefore, I include "Don't know" in this analysis, to capture that option.

112 Available data in HSLS09 concerning enlistment provides the calendar year of enlistment. Therefore, the sample is split into those enlisting in 2013 or earlier and those enlisting in 2014-2016.

Source: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, base year and second follow-up surveys. Tabulations are author calculations.

Variables of Interest

The High School Longitudinal Survey of 2009 was designed in part to understand how high school youth approach career and educational decision-making over time. As such, each survey wave includes questions that could be insightful for the purposes of creating and understanding youth information networks.

Across the survey waves, hundreds of variables were collected. Therefore, the first objective for analysis was to scope the variable set to a core group of variables of interest. The research used two main criteria to explore and select variables for study: First, it used variables directly related to creating youth information networks, as informed by social network analysis theory. Second, it used additional variables related to the creation and structure of networks, as informed by the various schools of literature described in the accompanying report.[113] A full list of variables included in this analysis, including naming convention and definition, is in Appendix C of this report.

Social network analysis is based on connections and the nature of those connections. Here we are interested in the connections between youth and others in their lives as potential sources of influence. The implication is that variables that relate to youths' discussions about career and educational planning are of direct applicability. Questions in both the base year 2009 survey and in the first follow-up survey of 2012 provide this information and are included in this analysis. In the base year survey, youth were asked about a list of influencers with regard to discussing math courses, science courses, other courses, colleges, jobs, and personal problems. In the follow-up survey, we use several questions to measure influence in their career and educational planning: conversations youth had with influencers about which math course to take, whether youth discussed financial aid for college with their parents, whether youth knew what their close friends' post-high school plans were, and whether youth discussed life after high school with their guidance counselor. I use the math course proxy for influence because the survey questions were not the same in the 2009 and 2012 surveys and this was one of the best available. Most students are enrolled in a math course junior year, it covers the same general list of influencers, and analysis of the 2009 survey data suggested that math was a more common subject of discussion than science courses (an analogous science course selection question was also available). I also use the question about financial aid discussions junior year as a proxy for active discussion with parents about life after high school[114], as well a variable generated from a

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[113] See paper one of this study: "Youth Information Networks and Propensity to Serve in the Military: A Review of Relevant Literature."

[114]Originally, I analyzed separate dummy variables for one to three aid discussions versus four or more discussions. The results for the two groups were highly similar. Therefore, I generated a binary variable which depicts whether there was at least one discussion and used it throughout instead.

question about knowing the post-high school plans of close friends as a proxy for discussing life after high school with friends.[115]

A second category of variables related to network analysis includes the sources of information accessed and activities related to planning for life after high school. This includes whether the youth searched online for college information, went on a college tour, prepared for a college entrance exam, attended a job fair, or spoke with a high school or private college counselor about future opportunities. A third category of variables related to network analysis is the extracurricular or other activities that determine how youth spend their time. This is because these activities inform the connections and opportunities for relationship building in a youth's information network. HSLS09 asks about a series of activities in both freshman year and in junior year, and both are included in this analysis.

The behavioral economics, sociology, and psychology literature also suggest that variables related to attitudes and self-efficacy are important factors in decision-making. As an anchoring point to assess relative comparisons, this analysis includes variables that explicitly ask about attitudes and self-efficacy beliefs related to mathematical ability. All variables included in this analysis are listed in Table 5 below.

Table 5. Student Variables of Interest

Freshman Year			
Influencers		**Time Allocation Preferences**	
Mom	Teachers	Homework	Friends
Dad	Counselor	Activities	TV
Friends	No One	Work	Video games
		Family	Online
Junior Year			
Influencers	**College Exploration Resources**	**Extracurricular Activities**	**Attitudes**
Parent	College search	Science club	Math person
Family	College tours	Math club	Can learn math
Friends	College exams	Sports	Born with math ability

[115] The survey question asked how many close friends were planning to attend technical school, two-year college, four-year college, or work full-time after high school, and asked students to rank how many close friends planned to pursue each pathway on a scale ranging from "none" to "all of them." There was also a "Don't know" option for each pathway. I generated a variable that consisted of "0" for students answering "Don't know" to each pathway, and "1" for all other students responding to the question. The implication is that those students with a "1" for at least one of the post-high school options spoke to their friends about it, and therefore about life after high school.

Junior Year			
Influencers	College Exploration Resources	Extracurricular Activities	Attitudes
Teachers	Job fair	Arts	Math is useful for life
Counselor	High school counselor	Music	Math is useful for college
	Private counselor	Drama	Math is useful for job
		Other clubs	

This analysis also considers the parental survey administered at the same time as the first follow-up survey to students in 2012. Specifically, included in the analysis are the variables for parental responses that directly complement or enhance questions related to their child's information networks. This enables a richer analysis, by including the perspective of one of the youths' key influencers. For example, both the first follow-up student and parent survey ask about college search, college tours, and college exam preparation. Matching the parental response provides a better understanding of youths' access to and consumption of college and career planning information and resources. The included variables are listed in Table 6 below.

Table 6. Parent Variables of Interest

Parents, Junior Year	
Topics Discussed	College Exploration Assistance
Courses	College search
College exam	College tours
College application	College exam preparation
Careers	Job fair
Jobs	High school counselor
Current events	Private counselor
Teen's problems	

Notably, many other parent variables were available but not included. This was due to generally low response rates for several populations of interest, particularly for enlisted military populations (HSENLIST and AFTERHS). Therefore, only the most directly relevant and applicable variables were included in this analysis.

Finally, this analysis also considers demographic variables and the potential relationship to the identified populations of interest. After exploring all of the demographic variables provided, including marital status, home ownership, number of household dependents, household income, parental educational attainment, and race/ethnicity, we choose to focus on variables related to socio-economic status. This is consistent with the economics and sociology literature and consists of parental income and educational attainment.

Qualitative Methods

The qualitative data collection consisted of individual in-depth interviews of high school juniors and newly enlisted U.S. Air Force recruits across the country. One-on-one interviews were chosen over focus groups because the quality of data collected is richer and allows for greater detail to get a complete picture of their decision-making process and trajectory.

Interviews were transcribed and coded for thematic analysis along two lines. First, the information needed to understand the participant's decision-making processes and influencers. This is the required information to construct the participants' information networks. The initial coding tree used for analysis therefore follows the broad lines of questioning contained in the protocol and is outlined in Table 7 below. Thematic analysis along this line focuses on elements of the youths' career and educational decision-making network including influencers, sources of information, and timing of the decision-making process.

Table 7. Interview Coding Tree

Code	Name	Description
01	Type	Student or Recruit
02	State	State of Interview
03	Gender	Male or Female
1	Influencers	Discussion of influencers: Mom, Dad, Siblings, Other Family, Friends, Teachers, Counselor, Coaches, Military Recruiters. Includes role in process and associated rating on a scale of 1-5 for importance.
2	Sources of Information	Discussion of sources of information consulted related to career and educational decisions: College websites, Internet search, College tours, YouTube, Social Media, Other online sources, Print Materials. Includes associated rating on a scale of 1-5 for importance.
3	Decision-Making Process	Discussion of timing and process related to making career and educational decisions. Includes events, actions, experiences and other factors that had a direct role in decision-making.
4	Career and Educational Decisions	Choices already made related to careers and educational attainment; for example, the decision to attend or drop out of college.

Code	Name	Description
5	Contextual Factors	Other factors related to decision-making that are not directly network related. Includes comments on social-emotional wellbeing, family dynamics, self-efficacy, and other elements that may be salient to decisions.

Second, as noted in code 5, interviews also provided valuable contextual information related to career and educational decision-making related to but not necessarily part of the information network. This includes factors such as social-emotional wellbeing, previous experiences, hobbies and activities, and attitudes and interests.

4. Quantitative Analysis

Descriptive Statistics

The descriptive statistics discussed here provide information on youth information networks in high school as it applies to the cohort of youth who were freshman in the 2009-2010 academic year. Specifically, in constructing information networks, we want to know who young people are talking to, what they are talking about, and what sources of information they accessed in their process of planning for life after high school.

This analysis deals with the total population to assess general trends in influencers and information accessed in high school relating to post-graduation planning. Statistics for the total youth cohort were generated for sample size, mean, and 95 percent confidence interval (CI). (The sample size, mean, and confidence intervals of these variables for each population of interest are presented in Appendix D.)[116] Means across variables of interest will provide the basis for constructing youth information networks for each outcome or population of interest. It is also possible to conduct statistical testing for differences in means across variables during the network construction. The provided CIs can be used for this purpose by checking for overlapping values. If the values overlap, the proportions are not statistically different.

In the tables that follow, variables that are non-binary (e.g., student time allocation variables, parent discussion variables) are labeled with the appropriate ranges. Given the large sample sizes, even small differences will be statistically significant. Therefore, it is worth differentiating statistical significance from practical significance. The discussion will focus on key observations and cross-comparisons that are *practically* significant (e.g., the difference in means is greater than 0.1).

Table 8 below first provides descriptive statistics for six influencers in freshman year across a range of topics of conversation.[117] The influencers asked about are mothers, fathers, friends, teachers, guidance counselors, and none of the above. The topics of conversation are about which courses to take that year (math, science, and other courses), college, jobs, and personal problems.

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[116] The descriptive statistics presented here, including in Appendix D, were generated using probability weights (pweight). The logistic regression analysis presented later in this chapter also uses pweights. HSLS09 is constructed using pweights since each observation has a different probability of being sampled. Due to p-weight compatibility issues, however, the correlation analysis presented later in this chapter and in Appendix E was generated by assigning the pweight as analytic weights (aweight). See https://parisschoolofeconomics.eu/docs/dupraz-yannick/using-weights-in-stata(1).pdf for more.

[117] The full naming convention and definition of each variable is included in Appendix C. In brief: M=Math course, S=Science course, OTH=Other courses, CLG=College, JOB=Jobs, and PROB=Personal problems.

Table 8. Means, CI, and Sample Sizes, Freshman Year Influencers

Variable	Mean	95% CI		Variable	Mean	95% CI	
Range: 0-1	N=22,898				N=23,205		
S1MOMTALKM	**0.526**	0.512	0.540	S1TCHTALKM	**0.197**	0.186	0.207
S1MOMTALKS	**0.428**	0.413	0.444	S1TCHTALKS	**0.144**	0.137	0.152
S1MOMTALKOTH	**0.549**	0.532	0.566	S1TCHTALKOTH	**0.156**	0.147	0.165
S1MOMTALKCLG	**0.779**	0.771	0.788	S1TCHTALKCLG	**0.208**	0.196	0.220
S1MOMTALKJOB	**0.785**	0.777	0.794	S1TCHTALKJOB	**0.203**	0.193	0.212
MOMTALKPROB	**0.586**	0.575	0.597	TCHTALKPROB	**0.082**	0.076	0.088
	N=21,650				N=23,205		
S1DADTALKM	**0.368**	0.355	0.382	S1CNSLTALKM	**0.202**	0.190	0.215
S1DADTALKS	**0.308**	0.296	0.321	S1CNSLTALKS	**0.172**	0.160	0.184
S1DADTALKOTH	**0.395**	0.381	0.408	S1CNSLTALKOTH	**0.208**	0.195	0.221
S1DADTALKCLG	**0.633**	0.621	0.644	S1CNSLTALKCLG	**0.180**	0.168	0.192
S1DADTALKJOB	**0.660**	0.649	0.672	S1CNSLTALKJOB	**0.145**	0.135	0.154
S1DADTALKPROB	**0.361**	0.348	0.375	S1CNSLTALKPROB	**0.090**	0.083	0.097
	N=23,205				N=23,205		
S1FRNDTALKM	**0.317**	0.306	0.327	S1NOTALKM	**0.273**	0.259	0.287
S1FRNDTALKS	**0.260**	0.250	0.270	S1NOTALKS	**0.381**	0.364	0.398
S1FRNDTALKOTH	**0.399**	0.389	0.409	S1NOTALKOTH	**0.246**	0.232	0.260
S1FRNDTALKCLG	**0.532**	0.522	0.543	S1NOTALKCLG	**0.098**	0.092	0.103
S1FRNDTALKJOB	**0.569**	0.558	0.579	S1NOTALKJOB	**0.074**	0.068	0.081
S1FRNDTALKPROB	**0.614**	0.602	0.627	S1NOTALKPROB	**0.136**	0.129	0.143

Source: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, Base year survey. Tabulations are author calculations.

There is notable range in both the prevalence of influencers and in topics discussed as of the fall of freshman year. Overall, mothers were the highest cited influencer, followed by fathers and friends, although the prevalence of topics was mixed. The smaller sample size for fathers likely reflects that a greater proportion single-parent youth do not have a father in their daily life than those who do not have a mother. This is reflected in the HSLS09 data for the share of youth with a father in the household.

Speaking to mothers about college and jobs had the highest means across all influencers and across all topics. Of the topics asked about, college and jobs were the most popular across mothers and fathers. Speaking to teachers and guidance counselors had relatively low means across all topics, including college and jobs. It is possible the low averages for counselors concerning discussions about college and jobs are related to it being early in the high school experience for many youth to be actively discussing college and careers seriously them.

Still, few youth reported speaking to no one about college and jobs freshman year. This suggests they were likely even freshman year to be thinking about talking about college and jobs but to keep the conversation to friends and family. Conversations may have therefore been more informal or in earlier stages of option exploration.

Table 9 provides descriptive statistics for influencers and sources of information accessed as of the spring of junior year. This includes college planning activities such as online search, college exam prep courses, and college tours; speaking to guidance counselors about life after high school; and speaking to parents about financial aid for college. It also includes the list of influencers relative to discussion about which math course to take that year.

Table 9. Means, CI, and Sample Sizes, Junior Year Influencers and Influences

Variable	Mean	95% CI	
Range: 0-1	N=24,438		
S2FRIENDCLG*	**0.922**	0.916	0.929
S2CLGSEARCH	**0.798**	0.787	0.810
S2AIDTALKPAR1**	**0.661**	0.650	0.671
S2TALKHSCNSL	**0.630**	0.613	0.646
S2CLGTOUR	**0.502**	0.488	0.516
S2JOBFAIR	**0.480**	0.463	0.497
S2CLGEXAMPREP	**0.404**	0.391	0.417
S2CAREERJOB	**0.342**	0.331	0.354
S2CLGCLASS	**0.251**	0.239	0.262
S2INTERN	**0.167**	0.157	0.178
S2TALKCLGCNSL	**0.125**	0.117	0.133
	N=21,466		
S2MCNSLREC	**0.364**	0.349	0.378
S2MTCHRREC	**0.344**	0.331	0.357
S2MPARREC	**0.326**	0.312	0.341
S2MFRIEND	**0.271**	0.261	0.281
S2MFAMREC	**0.166**	0.156	0.176
S2MEMPREC	**0.040**	0.035	0.044

* N=24,671, ** N=24,784

Source: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, First follow-up survey. Tabulations are author calculations.

Of all college and career planning activities asked in the 2012 survey, talking with a friend had the highest mean followed by searching online for college information. Next was speaking with parents about college financial aid at least once, followed by was speaking with a high school guidance counselor about life after high school. Going on a college tour was less common, with just half of youth responding that they had done so. Just under half of youth reported attending a job fair, while just 40 percent of youth reported taking a college exam preparatory course. Speaking to a privately hired college counselor and interning in a position related to career interests ranked as the lowest likely post-high school preparation activities among the youth in HSLS09, with less than 20 percent of youth engaging in either.

Understanding the importance of influencers junior year was limited by the survey questions, although friends, parents, and high school counselors were important for most youth. The vast majority of youth (92 percent) spoke to their friends about life after high school. Just over 60 percent of youth spoke with their high school counselors about life after high school, and about two-thirds to their parents about college[118].

Interestingly, we can also see a rising importance of college as a conversation topic junior year. Nearly twice as many youth reported speaking with their guidance counselor about life after high school than about their math course (63 percent compared to 36 percent), and 2.5 times more youth spoke to their guidance counselor about college junior year over freshman year (63 percent compared to 18 percent). Similarly, far more youth reported speaking with their parents about financial aid for college at least once than about their math course selection.

Table 10 provides descriptive statistics on what extracurricular activities youth participated in junior year and how youth allocated their time freshman year. This gives insights into who youth are exposed to and what their interests are that capture their time and attention.

Table 10. Means, CI, and Sample Sizes, Time Allocation

Variable	Mean	95% CI	
Junior Year			
Range: 0-1	N=23,489		
S2SPORTS	**0.469**	0.453	0.485
S2MUSIC	**0.345**	0.335	0.356
S2CLUB	**0.202**	0.192	0.213
S2ART	**0.198**	0.188	0.207
S2DRAMA	**0.128**	0.120	0.135
S2SCLUB	**0.051**	0.046	0.057
S2MCLUB	**0.037**	0.033	0.041
Freshman Year			
Range: 1-6*	N=22,178		
S1HRFAMILY	**3.544**	3.494	3.594
S1HRFRIENDS	**3.248**	3.202	3.294
S1HRTV	**2.468**	2.427	2.509
S1HRACTIVITY	**2.457**	2.424	2.490
S1HRONLINE	**2.414**	2.377	2.451
S1HRVIDEO	**1.838**	1.807	1.870
S1HRWORK	**1.586**	1.555	1.617

118 This was proxied by talking to parents about financial aid for college. Two-thirds was derived by adding the number of youth who responded with "2" or "3" relative to the total number responding to the question.

* Per day: 1=Less than 1 hour; 2=1-2 hours; 3=2-3 hours; 4=3-4 hours; 5=4-5 hours; 6=More than 5 hours

Source: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, Base year and first follow-up survey. Tabulations are author calculations.

Participating in sports generally had the highest averages of all extracurricular activities, with just under half of youth reporting at least one organized sport. After sports, music, other clubs, and art had the next highest participation among juniors, followed by other clubs and drama. In contrast, math and science clubs had the lowest average participation among youth, with just 3.7 percent and 5.1 percent participation rates, respectively.

There was also notable variation in how youth spent their time freshman year. On average, time spent with family and friends was highest, while time spent working at a job and playing video games ranked as the lowest.[119] Time spent watching TV, participating in extracurricular activities (including sports), and surfing the internet were in the mid-range.

Table 11 provides averages related to respondents' self-perceptions about math abilities and their attitudes toward the importance of math in life success.

Table 11. Means, CI, and Sample Sizes, Attitudes about Mathematics

Variable	Mean	95% CI	
Range: 0-1	N=23,879		
S2MUSECLG	**0.965**	0.961	0.969
S2MUSEJOB	**0.886**	0.879	0.893
S2MUSELIFE	**0.850**	0.843	0.858
S2MLEARN	**0.782**	0.772	0.791
S2SPERSON1	**0.480**	0.468	0.491
S2MPERSON1	**0.437**	0.426	0.448
S2MBORN	**0.277**	0.266	0.287

Source: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, First follow-up survey. Tabulations are author calculations.

Less than half of youth (44 percent) perceived themselves to be a "math person" (S2MPERSON1), though nearly 80 percent believed they could learn it (S2MLEARN). The overwhelming majority of youth believed math was important for college, jobs, and life.

Table 12 considers the parent perspective. It provides means related to parent responses during junior year along two dimensions—discussions they had with their teenager about various topics and college and career planning activities they engaged in for their teenager.

[119] Notably, averages varied considerably across groups of interest in terms of daily hours playing video games. See Appendix D.

Table 12. Means, CI, and Sample Sizes, Parent Discussions and Activities

Variable	Mean	95% CI	
Range: 1-4*	N=24,827		
P2DISCTROUBLE	**3.500**	3.464	3.535
P2DISCCAREER	**3.478**	3.441	3.515
P2DISCJOBS	**3.258**	3.209	3.308
P2DISCCOURSES	**3.141**	3.101	3.180
P2DISCEVENTS	**3.085**	3.031	3.138
P2DISCCLGAPP	**3.043**	2.985	3.102
P2DISCCLGEXAM	**2.934**	2.882	2.986
Range: 0-1	N=24,818		
P2CLGSEARCH	**0.678**	0.657	0.700
P2TALKHSCNSL	**0.501**	0.474	0.528
P2CLGTOUR	**0.478**	0.455	0.501
P2CLGEXAMPREP	**0.450**	0.427	0.474
P2JOBFAIR	**0.259**	0.237	0.281
P2TALKCLGCNSL	**0.150**	0.133	0.167

*Since the 2011-12 school year began: 1=Never; 2=Once or twice;
3=Three or four times; 4=More than four times

Source: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, First follow-up survey. Tabulations are author calculations.

Most parents responding to the survey reported active discussions with their teens across the range of topics. The highest means were reported for discussing personal issues affecting the teens and about the careers they might wish to pursue. However, all of the topics asked about averaged close to or more than three to four times since the school year began.

Consistent with students, the post-high school planning activity most parents engaged in was searching online for college information, at about two-thirds of parents. Other activities that about half of parents reported engaging in included speaking with their teen's high school guidance counselor, organizing college tours, and signing their teen up for a college exam prep course. In contrast, many fewer parents reported attending a job fair or, especially, hiring a private college counselor for their teens.

Finally, Table 13 provides descriptive statistics for selected parental demographics—i.e., whether the responding parent was of Hispanic origin, their highest educational attainment during the child's junior year ("X2") and freshman year ("X1"), and their socio-economic status (SES) quartile.[120] Given that mothers were the majority of parent respondents in both waves (approximately 75 percent of respondents in both parent survey waves), the higher average

[120] SES quartiles were imputed by the U.S. Department of Education based on parental household income responses collected during the first survey wave in 2009 ("X1"). Variables beginning with "X" were imputed for all respondents by the U.S. Department of Education (e.g., filling in missing values).

parental educational attainment as reported junior year suggests some potential response bias in parents electing to continue to participate in the survey over time.

Table 13. Means, CI, and Sample Sizes, Selected Parent Demographics

Variable	Mean	95% CI	
	N=24,765		
P2HISP1	**0.191**	0.169	0.213
X2PAR1EDU*	**3.359**	3.273	3.444
X1PAR1EDU*	**2.846**	2.780	2.912
X1SESQ5**	**3.018**	2.940	3.096

* 1=Less than high school; 2=High school diploma or GED; 3=Associate's degree; 4=Bachelor's degree; 5=Master's degree; 6=Educational specialist diploma; 7=PhD/MD/JD
** 1=1st Quintile; 2=2nd Quintile; 3=3rd Quintile; 4=4th Quintile; 5=5th Quintile

Source: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, Base year and first follow-up survey. Tabulations are author calculations.

Most Influential Junior Year

A final set of questions in HSLS09 asked students junior year who was the most influential in their thinking related to college and careers after high school. For both college and careers, students were provided a list of influencers to select from. The breakout of the importance of each influencer by share, along with the 95 percent confidence interval, is provided in Table 14 and Table 15 below.

These questions highlight that the most important influencers are different for college versus careers. For college planning, the largest share of youth (42 percent) rated their parents as being most influential. The implication is that parents play an outsized role in their child's college-related decision-making. The second most important influencer was "self." This could be that either they were ultimately making the decision about college after consultation with other resources, that they knew what they wanted irrespective of other available resources, or both.

Table 14. Most Influential Influencer for College Decisions, Junior Year

Influencer	Share	95% CI	
Parents	0.418	0.400	0.422
Yourself	0.279	0.265	0.284
No one	0.062	0.056	0.066
Another family member	0.069	0.063	0.072
Teacher	0.046	0.040	0.050
Friends	0.039	0.034	0.042

Influencer	Share	95% CI	
High school counselor	0.030	0.025	0.035
Don't know	0.027	0.022	0.031
Coach or scout	0.015	0.013	0.017
Military recruiter	0.012	0.009	0.014
Counselor hired	0.003	0.001	0.004
Employer	0.002	0.001	0.002

N=20,470.
Note: The 95 percent CI was generated by creating binary variables for each option. It is then possible to obtain descriptive statistics on each variable as with the tables above.
Source: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, First follow-up survey. Tabulations are author calculations.

For careers, the importance of parents relative to the importance of oneself reverses. Table 15 shows that in contrast to college decisions, oneself rated the highest with 36 percent of youth, seven points higher than in Table 14. Parents came in second at 34 percent of youth, losing 8 percentage points of youth from the college decision-making perspective. It is possible that financial considerations associated with college played a part in some of the influence parents had in their teen's college decisions, whereas careers may be a more personal decision based on individual preferences.

Similar to college decisions, the importance of "oneself" should not be interpreted as youth making decisions in a vacuum. It is that they were ultimately the "most influential." While it may be true that some youth knew what they wanted for a career irrespective of other available resources, it is likely that others were affected by consultation with other resources, and still others had a combination of both.

Table 15. Most Influential Influencer for Career Decisions, Junior Year

Influencer	Share	95% CI	
Yourself	0.357	0.339	0.361
Parents	0.335	0.318	0.338
Another family member	0.071	0.064	0.076
Teacher	0.060	0.053	0.065
No one	0.069	0.063	0.072
Friends	0.033	0.029	0.036
High school counselor	0.026	0.021	0.030
Don't know	0.022	0.019	0.025
Military recruiter	0.013	0.011	0.016
Coach or scout	0.011	0.009	0.013

Influencer	Share	95% CI	
Employer	0.003	0.002	0.004

N=20,420.
Note: The 95 percent CI was generated by creating binary variables for each option. It is then possible to obtain descriptive statistics on each variable as with the tables above.
Source: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, First follow-up survey. Tabulations are author calculations.

Summary

High school appears to be an important time in the building of information networks, with many youth speaking to at least one influencer about college and jobs as early as freshman year. Youth surveyed in HSLS09 engaged in various activities related to career and educational planning throughout high school. Parents, and junior year, friends, had the highest average potential influence in terms of college and career planning, with guidance counselors also more influential junior year. Parents were also deemed to be the "most influential" in terms of college planning, while oneself was the "most influential" in terms of career planning. Regarding activities undertaken for college and career planning, the most common across youth and their parents was online search, followed by talking to a high school counselor and taking college tours. Finally, although no single extracurricular activity dominated youth participation junior year, spending time with friends and family had the highest averages across youth freshman year.

Correlation Analysis

The descriptive statistics above provide information about the distribution of values for a given variable for the general youth population surveyed in HSLS09. However, it is also important to understand which variables have significant associations among our seven groups. Correlations and regression analysis give a sense of the magnitude and direction of variable interrelationships and can provide information on statistical significance. Given that this study primarily uses regression analysis to provide information on associations among variables, youth subgroup differences, and their statistical significance, to reduce duplication the full correlation analysis across variables of interest is provided in Appendix E.

In this section, we present two correlation tables containing information not included in the regression analysis: one looking across youth groups, and one looking at demographic factors. Pairwise correlations that were statistically significant at the five percent significance level (or less) are starred in the tables throughout this section.[121] As noted earlier, the discussion will

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[121] The test statistic for whether a correlation differs significantly from zero is: $t = r / \text{sqrt}[(1—r^2)/(n—2)]$. The degrees of freedom are approximated as n-2. This implies that for a sample size of 13,000, a correlation of about .017 in absolute value would differ significantly from zero at a significance level of 0.05 ($p<.05$). Although only the statistical significance of each correlation's difference from zero is discussed here, it is also possible to test whether one correlation is statistically different from another correlation. The test statistic for whether the difference between two correlations is significantly different from zero is calculated as $t = (r_1 – r_2)/(\text{sqrt}\ ((1– r_1^2)/(n_1 – 2) + (1– r_2^2)/(n_2 –$

focus on correlations that also are *practically* significant—where the correlation is statistically significant at $p < .05$ and are at least +/- 0.10 in magnitude.[122] The range in number of pairwise observations for each correlation is provided below the table.[123]

Table 16 first provides correlation results across the populations of interest. Because it is a table exploring relationships across populations, two potential populations of interest were added: those who were propensed in their freshman year (PROP09) and those who were planning to serve in the military upon high school graduation (PROP13). These populations were added to this table to show how propensity changes and interacts with the other factors over sampled youths' high school careers and are not included in subsequent analysis.

Table 16. Correlations Across Populations of Interest

Group	PROP09	PROP12	PROP13	HSENLIST	AFTERHS	FOURYR*	TWOYR*	NOCLG*	FEMALE
PROP09	1								
PROP12	0.269**	1							
PROP13	0.191**	0.259**	1						
HSENLIST	0.111**	0.160**	0.347**	1					
AFTERHS	0.056**	0.099**	0.198**	-0.013	1				
FOURYRCLG	-0.101**	-0.166**	-0.131**	-0.062**	-0.086*	1			
NOTFOURYR	-0.040**	0.003	-0.053**	-0.049**	0.046**	-0.563**	1		
NOCLGORAD	0.124**	0.133**	0.114**	-0.067**	-0.071**	-0.460**	-0.441**	1	
FEMALE	-0.163**	-0.201**	-0.117**	-0.0626*	-0.096**	0.096**	-0.005	-0.077**	1

*FOURYRCLG; NOTFOURYR; NOCLGORAD shortened for formatting.
**$p<0.05$.
Note: N's range from 12,040 - 13,380.
Source: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, Base year, first follow-up and second follow-up survey. Correlations are author calculations.

The first three columns tracking propensed youth show that being propensed during high school was correlated with enlisting right out of high school. However, the magnitude of these correlations ($0.111 \leq r \leq 0.347$) suggests that being propensed is not the only predictor of the post-high school enlistment decision. There are likely other factors that are also associated with the enlistment decision, particularly for those who enlist after high school. Being propensed for

2)). The degrees of freedom are approximated as $(n_1\text{-}2) + (n_2\text{-}2)$. This implies that for a sample size of approximately 13,000 for each correlation, a difference of 0.024 in absolute value would be statistically significant at a $p<.05$. The significance tests applied to the results in this section accounted for the survey sample weights, which minimally increased the magnitudes of the standard errors.

122 I use a threshold of 0.10 because the share of variance in one variable explained by the other variable is r^2. So, at 0.10, one percent of the variance is explained.

123 The sample sizes are large for the HSENLIST and AFTERHS variables even though the number of actual enlistees was small. This is because in the table below, all observations not "1" or "missing" for a given variable were defined as "0." Thus, while there were 361 total active duty enlistees in our sample, the number of related observations for both enlistment variables was much higher.

military service during high school is also negatively correlated with being female. Overall, being propensed in high school is positively correlated with not going to college and negatively correlated with attending a four-year college.

Table 17 provides correlations for selected demographic factors.

Table 17. Selected Correlations, Demographic Variables

Variable	HSENLIST	AFTERHS	PROP12	FOURYR*	TWOYR*	NOCLG*	FEMALE
X1PAR1EDU	0.004	-0.042**	-0.058**	0.370**	-0.126**	-0.274**	0.003
P1HISP1	-0.025	0.108**	-0.002	-0.183**	0.113**	0.082**	0.013
X1SESQ5	0.021	-0.058**	-0.062**	0.426**	-0.142**	-0.324**	-0.006

*FOURYRCLG; NOTFOURYR; NOCLGORAD shortened for formatting.
Note: N ranges from 4,820 – 5,460. The smaller Ns than in the preceding tables are due to the smaller parent survey response and pairwise matches with the associated youth categories.
Source: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, Base year survey. Correlations are author calculations.

There are some notable demographic trends across populations. First, as documented in the literature, household income and parental education are strongly correlated with going on to enroll in a four-year college. There is an opposite, weaker relationship for youth attending two-year colleges, and a stronger negative correlation for youth who do not enroll in college.

Second, military service is not strongly correlated with parental income or educational attainment.[124] This suggests that parental income may not be a driving factor in the decision to enlist, and that other factors may be more salient. For example, more recruits may come from the southern U.S. because they have greater exposure and awareness about the military from the larger number of military establishments located there. The larger share of southern youth could also could be related to income more indirectly, through less access to colleges—particularly four-year colleges—based on geographic proximity.[125] It is also possible that the "college for all"

[124] See Goldberg, Matthew, et al., "Geographic Diversity in the Military," Institute for Defense Analysis, 2019. The report finds that while income is not a key predictor of enlistment, college enrollment is. The implication is an indirect association with income that is confounded with issues such as social norms about college. Also, according to the *New York Times*, "The main predictors [of enlistment] are not based on class or race. Army data show service spread mostly evenly through middle-class and "downscale" groups…Instead, the best predictor is a person's familiarity with the military." See Phillips, Dave and Tim Arango, "Who Signs Up to Fight? Makeup of U.S. Recruits Shows Glaring Disparity," *New York Times*, January 2020.

[125] There is a growing body of literature on the presence of college "education deserts" in the United States—areas with limited college options—and the potential impact on college enrollment. A 2018 Stanford study found lower enrollment in these "deserts," concentrated in the South and Mid-west, could be due to more limited social networks and access to information about college. See Klasik, Daniel et al., "Out of the Education Desert: How Limited Local College Options are Associated with Inequity in Postsecondary Opportunities," Center for Education Policy Analysis (CEPA), Stanford University, Working Paper No. 18-15, 2018.

social norm is more prevalent in some parts of the country where there are many highly ranked colleges and universities, such as in the Northeast.[126]

Regression Analysis

In constructing youth information networks, a third piece of useful information is to understand which statistical associations are the most important for youth within populations, all else equal. Regression analysis can measure the relative importance of the variables of interest and the outcomes. It answers the question of what are the main drivers of youth decision-making concerning post-high school plans among the available variables of interest. For example, regression analysis can unpack the relative importance of talking to one's mother about jobs freshman year or going on college tours junior year on the decision to enlist in the military or attend a four-year college.

This analysis only reports results that are statistically significant at the five percent significance level or less; it notes whether the result was significant at the five, one, or one-tenth percent significance level. The results reported are relative risk ratios (RRR), which indicate how likely an identified member of that outcome group or population is to engage in that discussion or activity relative to a non-member of that outcome group or population.[127] For example, a risk ratio of 0.78 for a predictor variable in a regression related to high school enlistees means that those enlisting out of high school are 22 percent less likely to engage in the action represented by the variable than those who do not enlist out of high school.

The 95 percent confidence interval (CI) for each RRR is also reported.[128] With the confidence interval, it is possible to compare intervals for a given variable within or across outcome groups or populations for overlap. If there is overlap, it can be concluded that the RRRs are not statistically different.

Having a low participation rate—low underlying rate of behavior or prevalence rate—even with a large sample could bias regression results. This is known in statistics as the "rare events" problem,[129] here, the number of respondents enlisting in the active duty military within three years of high school graduation. The question becomes whether the number of positive observations in the given sample size is too small to conduct meaningful statistical analysis.

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[126] For example, Forbes found the Northeast had the highest concentration of top-ranked colleges and universities, with the South having the least. See Pristic, Max, "Regional Differences In Higher Education: Where Is The Best Place To Go To College?," Forbes, 2016.

[127] A RRR of "1" means that the predictor variable is not associated with membership in the outcome group or population.

[128] Confidence intervals that include "1" imply the RRR is not statistically significant.

[129] See ResearchGate Q&A Forum, Accessed February 17, 2020: https://www.researchgate.net/post/What_sample_size_is_needed_to_detect_a_low-prevalence_disease_in_a_population.

Fortunately, a simple calculation shows the sample is sufficiently large, using the smallest group (AFTERHS).[130]

Importantly, this study does not attempt comprehensive predictive modeling for the identified outcomes of interest. As suggested by the literature, there are many factors that contribute to youth decision-making, not all of them easily measurable.[131] The objective of this analysis is to understand the statistical association of the variables of interest with a given outcome or population.[132] Accordingly, there is not extensive use of covariates; only gender included as a control. For the purposes of this analysis it is accepted that each population inherently has associated attributes that may influence their behaviors and actions. The analysis accepts groups as they are, knowing that a statistical association may also be related to omitted variables.

Logistic Regressions

Logistic regressions have outcomes of interest—usually binary outcomes—as dependent variables. The regressions run for this analysis consider groupings of variables of interest as the covariates or independent variables. For example, a grouping would be whether the youth talked to his or her mother during freshman year about the various topics asked about in the survey or the respondent's gender. This model takes the functional form of:

<u>Logit Model</u>:

$$[\text{OUTCOME}]_{i,4} = \beta_0 + \beta_1{*}\text{MOMTALKM}_{i,1} + \beta_2{*}\text{MOMTALKS}_{i,1} + \beta_3{*}\text{MOMTALKOTH}_{i,1} + \beta_4{*}\text{MOMTALKCLG}_{i,1} + \beta_5{*}\text{MOMTALKJOB}_{i,1} + \beta_6{*}\text{MOMTALKPROB}_{i,1} + \beta_7{*}\text{FEMALE}_{i,1} + \varepsilon_{i,4}$$

For example, this model can test whether youths talking to their moms about various topics in freshman year of high school is associated with whether or not they enlisted in the military after high school. Table 18 provides the results of the logistic regression, including RRR and 95 percent confidence interval. Significance level is indicated with asterisks for $p<.05$ or lower. The regression models include all topics for each influencer for completeness.

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[130] The probability of AFTERHS in our sample is P=166/25,200=.00659. Therefore, the probability of a respondent to not be in AFTERHS is 1-0.00659=0.99341. Given that we have a sample of 25,200, the probability of not observing AFTERHS in 25,200 independent individuals is $(0.99341)^{25,200}=4.35\text{x}10^{-73}$, very low.

[131] This means it is accepted that each population inherently has associated attributes that may influence its behaviors and actions, and that there are inevitably omitted variables and a risk of omitted variable bias.

[132] This means that effects of omitted variables such as income can be embedded in the RRR. Regardless of the cause of the variable's effect, the RRR is the statistical relationship.

Table 18. Logistic Regression Results, Military Outcomes

Variable	HSENLIST			AFTERHS			PROP12		
	RRR	95% CI		RRR	95% CI		RRR	95% CI	
	N=22,447			N=22,447			N=23,275		
S1MOMTALKM	**0.626**	0.326	1.199	**1.214**	0.570	2.585	**1.012**	0.830	1.233
S1MOMTALKS	**1.181**	0.643	2.169	**1.262**	0.534	2.981	**0.813****	0.673	0.982
S1MOMTALKOTH	**1.179**	0.580	2.397	**0.599**	0.267	1.346	**0.876**	0.703	1.092
S1MOMTALKCLG	**0.743**	0.453	1.220	**0.724**	0.363	1.443	**0.841**	0.694	1.019
S1MOMTALKJOB	**1.831****	1.026	3.267	**1.316**	0.604	2.866	**1.252****	1.049	1.494
S1MOMTALKPROB	**0.760**	0.484	1.193	**0.830**	0.520	1.324	**0.725********	0.631	0.833
	N=21,646			N=21,646			N=22,284		
S1DADTALKM	**0.604**	0.288	1.265	**0.833**	0.413	1.680	**0.980**	0.789	1.217
S1DADTALKS	**1.655**	0.782	3.500	**1.357**	0.684	2.693	**0.831**	0.643	1.073
S1DADTALKOTH	**0.918**	0.517	1.629	**1.183**	0.565	2.477	**0.944**	0.808	1.104
S1DADTALKCLG	**1.061**	0.579	1.947	**0.699**	0.372	1.311	**0.891**	0.766	1.037
S1DADTALKJOB	**1.166**	0.675	2.015	**1.495**	0.697	3.203	**1.107**	0.930	1.318
S1DADTALKPROB	**0.869**	0.464	1.627	**0.530****	0.319	0.883	**0.752******	0.633	0.894
	N=22,611			N=22,611			N=23,511		
S1FRNDTALKM	**0.836**	0.509	1.373	**0.653**	0.329	1.298	**0.901**	0.717	1.041
S1FRNDTALKS	**1.177**	0.722	1.919	**0.686**	0.362	1.301	**0.844**	0.584	1.138
S1FRNDTALKOTH	**0.934**	0.548	1.589	**1.432**	0.823	2.490	**1.038**	0.859	1.429
S1FRNDTALKCLG	**1.029**	0.630	1.680	**0.958**	0.487	1.886	**0.863**	0.669	0.973
S1FRNDTALKJOB	**1.293**	0.762	2.195	**1.116**	0.621	2.005	**1.187****	0.978	1.392
S1FRNDTALKPROB	**0.959**	0.613	1.501	**1.268**	0.717	2.243	**0.869****	0.752	1.004
	N=22,611			N=22,611			N=23,511		
S1TCHTALKM	**0.620**	0.340	1.130	**0.656**	0.248	1.765	**0.722******	0.579	0.902
S1TCHTALKS	**0.645**	0.298	1.394	**0.879**	0.244	3.309	**1.078**	0.816	1.425
S1TCHTALKOTH	**1.286**	0.649	2.549	**0.936**	0.378	2.099	**1.116**	0.884	1.410
S1TCHTALKCLG	**1.810**	0.751	4.362	**0.566**	0.276	1.145	**0.913**	0.737	1.131
S1TCHTALKJOB	**0.930**	0.442	1.961	**1.924**	0.929	4.033	**1.123**	0.927	1.360
S1TCHTALKPROB	**0.452**	0.164	1.244	**1.340**	0.419	4.493	**1.102**	0.792	1.533
	N=22,611			N=22,611			N=23,511		
S1CNSLTALKM	**0.922**	0.421	2.020	**0.927**	0.506	1.659	**0.851**	0.686	1.056
S1CNSLTALKS	**0.789**	0.297	2.097	**1.386**	0.804	2.617	**0.978**	0.771	1.240
S1CNSLTALKOTH	**1.005**	0.561	1.800	**0.683**	0.402	1.151	**1.056**	0.841	1.327
S1CNSLTALKCLG	**1.185**	0.677	2.075	**0.588**	0.235	1.352	**0.935**	0.768	1.137
S1CNSLTALKJOB	**0.778**	0.372	1.624	**1.729**	0.785	3.812	**1.214**	0.969	1.523
S1CNSLTALKPROB	**0.906**	0.418	1.966	**1.556**	0.760	3.186	**1.011**	0.813	1.257
	N=23,924			N=23,924			N=24,612		
S2CLGTOUR	**0.709**	0.455	1.104	**1.061**	0.546	2.102	**0.866****	0.772	0.972
S2CLGSEARCH	**1.297**	0.757	2.222	**1.193**	0.692	2.016	**0.745********	0.628	0.884
S2JOBFAIR	**0.780**	0.475	1.281	**1.304**	0.773	2.148	**1.078**	0.957	1.215

Variable	HSENLIST			AFTERHS			PROP12		
	RRR	95% CI		RRR	95% CI		RRR	95% CI	
S2CLGEXAMPREP	**0.743**	0.462	1.193	**1.207**	0.673	2.209	**0.777******	0.680	0.887
S2TALKCLGCNSL	**0.863**	0.443	1.682	**0.200****	0.045	0.829	**0.988**	0.817	1.194
	N=24,005			**N=24,005**			**N=24,744**		
S2TALKHSCNSL	**0.612****	0.393	0.952	**1.174**	0.571	2.411	**0.854**	0.715	1.020
	N=24,024			**N=24,024**			**N=24,799**		
S2AIDTALKPAR1	**0.602****	0.388	0.935	**1.539**	0.707	3.350	**0.780******	0.695	0.876
	N=23,964			**N=23,964**			**N=24,691**		
S2FRIENDCLG	**1.652**	0.784	3.483	**1.052**	0.498	2.222	**0.792****	0.640	0.980
	N=22,237			**N=22,237**			**N=21,811**		
S2MCNSLREC	**1.161**	0.728	1.850	**2.260**	0.875	5.837	**1.131**	0.981	1.304
S2MTCHRREC	**0.704**	0.406	1.220	**1.634**	0.530	5.036	**0.790*****	0.663	0.940
S2MPARREC	**0.614**	0.351	1.072	**0.583**	0.156	2.182	**0.761*****	0.639	0.906
S2MFAMREC	**1.109**	0.556	2.212	**0.589**	0.147	2.363	**0.920**	0.732	1.157
S2MEMPREC	**2.360**	0.841	6.625	**0.286**	0.027	3.085	**2.601******	1.878	3.601
S2MFRIEND	**0.850**	0.437	1.655	**0.581**	0.249	1.355	**0.950**	0.819	1.102
	N=23,339			**N=23,339**			**N=23,649**		
S2MCLUB	**1.462**	0.507	4.217	**0.067******	0.013	0.329	**0.794**	0.546	1.156
S2SCLUB	**0.251****	0.076	0.822	**1.354**	0.667	3.157	**0.760****	0.588	0.983
S2SPORTS	**1.802****	1.084	2.995	**1.399**	0.652	2.958	**0.969**	0.852	1.102
S2ART	**0.772**	0.424	1.403	**0.482**	0.190	1.144	**1.190****	1.017	1.393
S2MUSIC	**0.892**	0.501	1.587	**1.988**	0.620	6.072	**0.797******	0.697	0.913
S2CLUB	**0.707**	0.397	1.259	**0.698**	0.423	1.214	**1.024**	0.888	1.180
S2DRAMA	**1.193**	0.609	2.336	**0.905**	0.326	2.614	**0.919**	0.726	1.162
	N=23,654			**N=23,654**			**N=24,142**		
S2MPERSON1	**1.059**	0.722	1.600	**0.578****	0.345	0.966	**0.940**	0.823	1.074
S2MLEARN	**1.189**	0.571	2.497	**2.171**	0.979	4.814	**0.993**	0.816	1.210
S2MBORN	**1.410**	0.872	2.317	**0.858**	0.405	1.816	**1.140**	0.961	1.351
S2MUSELIFE	**0.490****	0.251	0.928	**0.277****	0.077	0.995	**1.028**	0.858	1.232
S2MUSECLG	**2.784**	0.799	10.261	**0.434**	0.146	1.294	**0.834**	0.631	1.103
S2MUSEJOB	**0.865**	0.375	1.997	**1.726**	0.470	6.334	**1.089**	0.898	1.320

**p<0.05; ***p<0.01; ****p<0.001

Source: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, Base year and first follow-up survey. Regression outputs are author calculations.

A few points stand out for the military-bound and military-propensed populations that suggest a more limited building of career and educational information networks. For example, youth enlisting out of high school were almost 40 percent less likely to speak with their guidance counselor about life after high school junior year. They were also 40 percent less likely to have at least one discussion with their parents about college financial aid junior year. In terms of information access and consumption, youth who were propensed junior year were about 25 percent less likely to engage both in searching for college information online and in taking a college exam prep course. Notably, however, they were over 2.5 times more likely to speak with employers about math courses junior year, potentially suggesting a stronger likelihood of working in high school. Propensed youth were 20 or more percent less likely to participate in a science club or in music extracurricular activities; they were about 20 percent more likely to participate in art activities. Finally, youth enlisting in the active duty military directly out of high school were 80 percent more likely to play an organized sport junior year, but 75 percent less likely to participate in a science club.

Several results also point to more targeted information network construction as early as freshman year. Enlisting in the military out of high school and having positive propensity junior year were substantially positively associated with talking to mothers about jobs freshman year. Propensed youth were also more likely to speak to friends about jobs freshman year. However, propensed youth were about 25 percent less likely to speak with their parents about personal problems freshman year, and about 13 percent less likely to speak with their friends about personal problems freshman year.

In terms of attitudes, youth who enlisted were much less likely to think math was useful for life, and youth enlisting after high school were much less likely to believe in their mathematical abilities.

Table 19 presents the results from the same regressions for the non-military populations.

Table 19. Logistic Regression Results, Non-military Populations

Variable	NOCLGORAD			NOTFOURYR			FOURYRCLG			FEMALE		
	RRR	95% CI		RRR	95% CI		RRR	95% CI		RRR	95% CI	
	N=23,706			N=23,706			N=23,706			N=22,898		
S1MOMTALKM	**0.799****	0.639	0.999	**0.989**	0.832	1.174	**1.283*****	1.093	1.506	**1.032**	0.917	1.162
S1MOMTALKS	**0.716*****	0.579	0.886	**0.836****	0.708	0.988	**1.490******	1.282	1.732	**0.826*****	0.733	0.931
S1MOMTALKOTH	**0.712******	0.587	0.864	**0.978**	0.817	1.172	**1.368******	1.176	1.592	**1.323******	1.151	1.522
S1MOMTALKCLG	**0.556******	0.467	0.662	**1.174**	0.980	1.407	**1.687******	1.389	2.050	**1.360******	1.163	1.591
S1MOMTALKJOB	**1.065**	0.859	1.319	**0.992**	0.827	1.190	**0.924**	0.804	1.061	**1.388******	1.229	1.569
S1MOMTALKPROB	**1.060**	0.920	1.220	**0.942**	0.831	1.067	**1.045**	0.938	1.164	**1.259******	1.126	1.407
	N=22,840			N=22,840			N=22,840			N=21,650		
S1DADTALKM	**0.737****	0.584	0.931	**0.834**	0.695	1.001	**1.503******	1.263	1.791	**0.934**	0.810	1.078
S1DADTALKS	**0.814**	0.646	1.026	**0.817****	0.681	0.979	**1.329******	1.123	1.574	**1.184****	1.031	1.359
S1DADTALKOTH	**0.685******	0.559	0.838	**0.997**	0.852	1.168	**1.344******	1.161	1.557	**1.129**	0.985	1.293
S1DADTALKCLG	**0.556******	0.453	0.683	**1.078**	0.922	1.261	**1.654******	1.407	1.945	**1.365******	1.208	1.544
S1DADTALKJOB	**1.014**	0.857	1.199	**0.961**	0.828	1.115	**1.022**	0.875	1.193	**0.776******	0.688	0.876
S1DADTALKPROB	**1.082**	0.923	1.269	**1.031**	0.904	1.176	**0.946**	0.838	1.068	**0.460******	0.412	0.513
	N=23,897			N=23,897			N=23,897			N=23,205		
S1FRNDTALKM	**1.078**	0.859	1.284	**0.822****	0.685	0.988	**1.187****	1.011	1.395	**1.031**	0.907	1.172
S1FRNDTALKS	**0.921**	0.736	1.103	**1.005**	0.861	1.174	**1.036**	0.875	1.227	**0.829*****	0.726	0.948

Variable	NOCLGORAD			NOTFOURYR			FOURYRCLG			FEMALE		
	RRR	**95% CI**		**RRR**	**95% CI**		**RRR**	**95% CI**		**RRR**	**95% CI**	
S1FRNDTALKOTH	**0.733******	0.657	0.906	**0.932**	0.808	1.074	**1.379******	1.203	1.582	**1.208******	1.080	1.351
S1FRNDTALKCLG	**0.729******	0.628	0.860	**1.128**	0.963	1.321	**1.186**	0.997	1.412	**1.265******	1.120	1.430
S1FRNDTALKJOB	**1.122**	0.967	1.303	**0.935**	0.823	1.063	**0.951**	0.834	1.086	**1.063**	0.955	1.184
S1FRNDTALKPROB	**0.717******	0.633	0.844	**1.087**	0.941	1.254	**1.250******	1.102	1.419	**2.723******	2.490	2.977
	N=23,897			**N=23,897**			**N=23,897**			**N=23,205**		
S1TCHTALKM	**0.759*****	0.622	0.925	**0.842****	0.726	0.977	**1.511******	1.313	1.739	**1.025**	0.906	1.159
S1TCHTALKS	**0.803**	0.635	1.014	**0.791****	0.656	0.955	**1.474******	1.191	1.825	**0.983**	0.861	1.123
S1TCHTALKOTH	**0.895**	0.736	1.088	**1.030**	0.853	1.244	**1.059**	0.900	1.246	**1.075**	0.926	1.247
S1TCHTALKCLG	**1.075**	0.884	1.306	**1.055**	0.887	1.255	**0.901**	0.768	1.058	**1.104**	0.964	1.263
S1TCHTALKJOB	**0.914**	0.765	1.092	**1.025**	0.867	1.212	**1.017**	0.875	1.182	**1.267*****	1.087	1.477
S1TCHTALKPROB	**1.236**	0.968	1.578	**1.155**	0.925	1.443	**0.743*****	0.604	0.914	**1.429******	1.197	1.707
	N=23,897			**N=23,897**			**N=23,897**			**N=23,205**		
S1CNSLTALKM	**0.846**	0.654	1.091	**1.009**	0.835	1.232	**1.165**	0.967	1.403	**1.081**	0.940	1.244
S1CNSLTALKS	**0.997**	0.739	1.257	**0.881**	0.719	1.108	**1.126**	0.915	1.385	**1.079**	0.900	1.293
S1CNSLTALKOTH	**0.800****	0.662	1.002	**0.883**	0.723	1.075	**1.375******	1.162	1.627	**1.124**	0.976	1.295
S1CNSLTALKCLG	**1.011**	0.867	1.262	**1.086**	0.847	1.349	**0.919**	0.748	1.129	**1.137**	0.966	1.339
S1CNSLTALKJOB	**1.006**	0.807	1.351	**1.068**	0.840	1.308	**0.922**	0.768	1.107	**1.028**	0.879	1.203
S1CNSLTALKPROB	**1.597******	1.260	1.903	**1.161**	0.981	1.404	**0.540******	0.443	0.660	**1.114**	0.956	1.298
	N=24,885			**N=24,885**			**N=24,885**			**N=24,639**		
S2CLGTOUR	**0.628******	0.552	0.759	**0.782******	0.684	0.889	**1.922******	1.687	2.190	**1.000**	0.909	1.100
S2CLGSEARCH	**0.291******	0.251	0.355	**1.365******	1.147	1.624	**3.142******	2.663	3.707	**2.456******	2.130	2.831
S2JOBFAIR	**1.189*****	1.017	1.332	**1.103**	0.989	1.237	**0.774******	0.684	0.875	**0.939**	0.846	1.043
S2CLGEXAMPREP	**0.613******	0.516	0.730	**0.828*****	0.727	0.954	**1.802******	1.608	2.020	**1.040**	0.952	1.135
S2TALKCLGCNSL	**1.298****	0.998	1.631	**1.281****	1.047	1.571	**0.644******	0.535	0.776	**0.966**	0.830	1.124
	N=24,973			**N=24,973**			**N=24,973**			**N=24,771**		
S2TALKHSCNSL	**0.799******	0.702	0.908	**0.954**	0.847	1.075	**1.313******	1.157	1.489	**1.151****	1.029	1.288
	N=24,996			**N=24,996**			**N=24,996**			**N=24,812**		
S2AIDTALKPAR1	**0.551******	0.485	0.626	**1.097**	0.973	1.236	**1.627******	1.454	1.820	**1.581******	1.437	1.742
	N=24,926			**N=24,926**			**N=24,926**			**N=24,712**		
S2FRIENDCLG	**0.681******	0.543	0.854	**0.943**	0.748	1.188	**1.508******	1.237	1.837	**1.473******	1.256	1.728
	N=23,057			**N=23,057**			**N=23,057**			**N=21,819**		
S2MCNSLREC	**1.300*****	1.076	1.570	**1.283******	1.104	1.475	**0.634******	0.546	0.738	**1.058**	0.943	1.187
S2MTCHRREC	**0.825**	0.650	1.048	**0.749*****	0.623	0.899	**1.556******	1.311	1.847	**1.202*****	1.051	1.374
S2MPARREC	**0.379******	0.294	0.488	**0.670******	0.556	0.807	**2.713******	2.333	3.156	**1.133**	0.986	1.303
S2MFAMREC	**0.943**	0.672	1.322	**1.197**	0.938	1.526	**0.890**	0.735	1.078	**0.897**	0.751	1.072
S2MEMPREC	**3.127******	2.035	4.804	**1.731*****	1.138	2.634	**0.243******	0.166	0.356	**0.497******	0.358	0.688
S2MFRIEND	**0.822**	0.672	1.006	**0.840**	0.705	1.000	**1.346******	1.166	1.553	**0.936**	0.837	1.047
	N=24,258			**N=24,258**			**N=24,258**			**N=23,658**		
S2MCLUB	**0.772**	0.455	1.308	**0.669****	0.468	0.940	**1.752*****	1.218	2.520	**0.876**	0.673	1.142
S2SCLUB	**0.676****	0.463	0.987	**0.890**	0.692	1.159	**1.480*****	1.155	1.897	**0.988**	0.795	1.227

Variable	NOCLGORAD			NOTFOURYR			FOURYRCLG			FEMALE		
	RRR	**95% CI**		**RRR**	**95% CI**		**RRR**	**95% CI**		**RRR**	**95% CI**	
S2SPORTS	**0.410******	0.346	0.485	**0.837*****	0.741	0.938	**2.479******	2.162	2.842	**0.604******	0.550	0.662
S2ART	**1.567******	1.325	1.855	**1.075**	0.917	1.244	**0.639******	0.553	0.738	**1.271******	1.125	1.436
S2MUSIC	**0.864**	0.741	1.006	**0.919**	0.793	1.077	**1.233*****	1.071	1.418	**1.971******	1.746	2.225
S2CLUB	**0.557******	0.445	0.696	**0.952**	0.820	1.127	**1.591******	1.367	1.852	**1.262******	1.113	1.431
S2DRAMA	**0.692*****	0.549	0.872	**1.114**	0.887	1.311	**1.139**	0.929	1.395	**1.299******	1.113	1.516
	N=24,571			**N=24,571**			**N=24,571**			**N=24,150**		
S2MPERSON1	**0.540******	0.471	0.620	**0.871****	0.764	0.994	**1.928******	1.720	2.161	**0.716******	0.655	0.784
S2MLEARN	**0.866**	0.712	1.054	**1.131**	0.972	1.317	**0.977**	0.853	1.119	**0.778******	0.680	0.891
S2MBORN	**0.792*****	0.668	0.940	**0.959**	0.844	1.090	**1.241******	1.089	1.415	**0.978**	0.851	1.125
S2MUSELIFE	**1.385*****	1.126	1.702	**0.863**	0.720	1.035	**0.949**	0.811	1.110	**1.141**	0.974	1.335
S2MUSECLG	**0.490******	0.346	0.694	**1.241**	0.914	1.683	**1.652******	1.215	2.247	**0.915**	0.707	1.184
S2MUSEJOB	**1.359****	1.073	1.722	**1.031**	0.849	1.253	**0.754*****	0.612	0.928	**1.195****	1.017	1.404

**p<0.05; ***p<0.01; ****p<0.001

Source: U.S. Department of Education, National Center for Education Statistics, “High School Longitudinal Study of 2009 (HSLS:09),” 2009-16, Base year and first follow-up survey. Regression outputs are author calculations.

Youth that went on to attend a four-college had the most active information network freshman and junior year of high school. They were 30 percent more likely to speak with a guidance counselor about life after high school junior year, and 50 percent more likely to talk about life after high school with their close friends in junior year. They were also more than 60 percent more likely to have at least one conversation with their parents about financial aid. This strongly suggests these youth were actively discussing life after high school with influencers junior year. As early as freshman year, they were 65 percent more likely to have a conversation with either of their parents about college.

Youth who went on to attend a four-year college were the most active in terms of accessing and consuming career and educational information. These youth were more than three times more likely to engage in online search and almost two times as likely to go on a college tour. They were 80 percent more likely to take a college exam prep course.

The opposite is true for youth that neither enrolled in college nor enlisted in the military as of three years after high school. These youth were more than 20 percent less likely to speak with their guidance counselor about life after high school and over 30 percent less likely to speak with their close friends about life after high school junior year. They were 45 percent less likely to have at least one discussion with their parents about financial aid for college.

Even freshman year, these youth were generally 20 percent or more less likely to have conversations with parents or friends across a range of topics including college freshman year. Moreover, they were generally much less engaged in building out their information network through other sources. As of junior year, they were more than 35 less likely to go on a college tour or take a college prep exam course, and 70 percent less likely to conduct an online search for college. The exception was that they were nearly 20 percent more likely to go to a job fair and 30 percent more likely to talk to a private college counselor. Youth who attended a non-four-year college showed a similar pattern, with the exception that they were 35 percent more likely to search online for college information.

In terms of extracurricular activities, with the exception of two-year college youth, youth were more likely to engage in at least one outside activity. However, the activities youth were most likely to be engaged in varied across groups. For example, youth that went on to enroll in a four-year college were almost 2.5 times more likely to play an organized sport than other youth. Females were almost twice as likely to be involved in music, and youth not attending college were almost 60 percent more likely to be involved in art.

Interestingly, these results indicate a notable difference between females and males in terms of information network construction. During freshman year, females appear to be considerably more likely to speak to people across their network than males. Females also were likely to be involved in different extracurricular activities than males. Equally important, females were also far less likely to believe they were good at math or that math could be learned with enough effort. These differences provide context for military recruiting planners interested in attracting more female youth.

Alternative Model Specifications

The model specifications presented here were selected for two reasons: The first reason was to consider groups of variables separately or together as sensible. For example, to consider influencers freshman year as one entity, as influencers are typically considered in social network analysis. This approach also provides a sense of importance of the relative topics. Second, given the large number of observations for each dependent variable, general conclusions are unlikely to drastically change from alternate specifications given the small number of independent variables.

To check for consistency, I ran three alternative specifications: (1) same specification as above including socio-economic status quintile as a control; (2) all independent variables separately as stand-alone regressions using only gender as a control; and (3) all independent variables separately as stand-alone regressions using gender and socio-economic status quintile as controls. All three models were consistent with the results and conclusions presented here. The most notable difference was that separately evaluating all variables produced more significantly positive RRRs for four-year college and females freshman year, while more influencer variables had significantly negative RRRs for propensed youth, non-college youth, and two-year college youth freshman year.[133]

[133] The majority of those RRRs did not differ statistically from those reported here, having overlapping confidence intervals. Several variables were statistically different in terms of magnitude, and some of those reached significance in some models but not others: This includes freshman-year conversations with mothers, fathers, and friends for the four-year college, no college or active duty, and female groups. The vast majority of junior year variables had overlapping CIs across all four specifications.

Summary

The range of positive and negative associations across populations reveals differences across information networks. There are significant differences related to engagement in college and career planning conversations and activities, how youth spend their time, and in perceived abilities. Generally, youth that went on to a four-year college had virtually the opposite statistical associations across variables as youth that did not go on to attend college. They were far more likely to engage in conversations related to careers and educational planning across influencers, having strong networks. As early as freshman year, deficits can be seen in the building of information networks for non-college bound youth relative to their peers.

That only females and the four-year college group showed a positive association with speaking to guidance counselors about life after high school suggests that guidance counselors may play a more prominent role for youth likely to attend college. There are several reasons why this might be the case. For example, in cases where meetings with counselors are not mandatory, college-bound students may be more likely to self-select into meetings. Even where meetings are mandatory, they could be mandatory for college-bound, or youth less certain about what they are planning to do after high school (e.g., those not enrolling in college) may not be utilizing guidance counselors as a resource outside of course scheduling.

Table 20 provides a summary of the magnitude of statistically significant regression results for the RRRs across outcomes, indicating direction of the RRR. The table uses the following indicators when the difference between the RRR and 1.0 is between +/– .10 < RRR difference ≤ +/– .20 (“+”/”–“), +/– .20 < RRR difference ≤+/– .30 (“++”/”– –“), or RRR difference > +/– 0.30 (“+++”/”– – –“).

Table 20. Summary of Logistic Regression Results, All Outcomes

Variable	HSENLIST	AFTERHS	PROP12	NOCLGORAD	NOTFOURYR	FOURYRCLG	FEMALE
S1MOMTALKM				– –		+ +	
S1MOMTALKS			–	– –	–	+ + +	–
S1MOMTALKOTH				– –		+ + +	+ + +
S1MOMTALKCLG				– – –		+ + +	+ +
S1MOMTALKJOB	+ + +		+ +				+ + +
S1MOMTALKPROB			– –				+ +
S1DADTALKM				– –		+ + +	
S1DADTALKS					–	+ + +	+
S1DADTALKOTH				– – –		+ + +	
S1DADTALKCLG				– – –		+ + +	+ + +
S1DADTALKJOB							– –
S1DADTALKPROB		– – –	– –				– – –
S1FRNDTALKM					–	+	
S1FRNDTALKS							–

Variable	HSENLIST	AFTERHS	PROP12	NOCLGORAD	NOTFOURYR	FOURYRCLG	FEMALE
S1FRNDTALKOTH				− −		+ + +	+ +
S1FRNDTALKCLG				− −			+ +
S1FRNDTALKJOB			+				
S1FRNDTALKPROB			−	− −		+ +	+ + +
S1TCHTALKM			− −	− −	−	+ + +	
S1TCHTALKS					− −	+ + +	
S1TCHTALKOTH							
S1TCHTALKCLG							
S1TCHTALKJOB							+ +
S1TCHTALKPROB						− −	+ + +
S1CNSLTALKM							
S1CNSLTALKS							
S1CNSLTALKOTH				−		+ + +	
S1CNSLTALKCLG							
S1CNSLTALKJOB							
S1CNSLTALKPROB				+ + +		− − −	
S2CLGTOUR			−	− − −	− −	+ + +	
S2CLGSEARCH			− −	− − −	+ + +	+ + +	+ + +
S2JOBFAIR				+		− −	
S2CLGEXAMPREP			− −	− − −	−	+ + +	
S2TALKCLGCNSL		− − −		+ +	+ +	− − −	
S2TALKHSCNSL	− − −			− −		+ + +	+
S2AIDTALKPAR1	− − −		− −	− − −		+ + +	+ + +
S2FRIENDCLG			− −	− − −		+ + +	+ + +
S2MCNSLREC				+ +	+ +	− − −	
S2MTCHRREC			− −		− −	+ + +	+ +
S2MPARREC			− −	− − −	− − −	+ + +	
S2MFAMREC							
S2MEMPREC			+ + +	+ + +	+ + +	− − −	− − −
S2MFRIEND						+ + +	
S2MCLUB		− − −			− − −	+ + +	
S2SCLUB	− − −		− −	− − −		+ + +	
S2SPORTS	+ + +			− − −	−	+ + +	− − −
S2ART			+	+ + +		− − −	+ +
S2MUSIC			− −			+ +	+ + +
S2CLUB				− − −		+ + +	+ +
S2DRAMA				− − −			+ +
S2MPERSON1		− − −		− − −	−	+ + +	− −
S2MLEARN							− −
S2MBORN				− −		+ +	
S2MUSELIFE	− − −	− − −		+ + +			

Variable	HSENLIST	AFTERHS	PROP12	NOCLGORAD	NOTFOURYR	FOURYRCLG	FEMALE
S2MUSECLG				— — —		+ + +	
S2MUSEJOB				+ + +		— —	+

Note: See Tables 24 and 25 for N’s.

5. Qualitative Analysis

Interview Themes and Insights

The interviews with high school juniors and recent Air Force recruits provided additional context and detail into career and educational decision-making processes. One key theme emerged from participant discussions: there was large variation in decision-making timing, process, networks, and network usage. In fact, the experiences and perspectives of these interviewees reinforces the theory of behavioral segmentation as proposed by the Behavioral Insights Team discussed in the first report from this study.[134]

Another notable observation is that, although this was not a generalizable sample, there was not much evidence of regional differences in how youth approached career and educational decision-making. Instead, interviewees generally approached career and educational decision-making in high school based on several factors. These were directly related to the composition and dynamics of their influencer network and to their state of mind on ability and willingness to access and consume career and educational information. Traditional factors associated with going to college, such as income and family educational attainment, were generally embedded in the structure and dynamics of their information networks. For example, having a perception that "college was the only acceptable option" or that "I don't want to take on debt for college" was largely driven by their information networks. Interestingly, not having a clear career or educational focus was not always a function of their information networks. Some youth, even with strong network influencers, were not in a social-emotional state that enabled them to critically approach these decisions.

Finally, it was difficult for interviewees to disentangle "influence" from "support." Many participants stated they were influenced by a person in their network, but when pressed for details, it was more about the support for a decision or potential decision. In other words, different people in their network had varying roles related to influence that were not all the same, but all factored into the decision-making process. The interaction and relationship among influence, information, and providing support is therefore quite nuanced. All are forms of "influence" but some more direct than others (e.g., providing college information or being a role model for an occupation versus affirming a choice made without their involvement).

This differentiation is important in a military context, particularly the notion of support. Several youth noted that they did not make the choice to serve earlier, or that they would never consider military service, because key influencers did not or were assumed to not support such a

[134] See "Youth Information Networks and Propensity to Serve in the Military: A Review of Relevant Literature" for part one of this study. See also Hume, Susannah and Jessica Heal, "Moments of Choice," Behavioural Insights Team, 2016.

choice. Recruits enlisting after high school noted the importance of influencer support as an influence appeared to evolve, being more of a factor in high school. A non-trivial number of recruits described how they made the choice to serve on their own, after high school, irrespective of what their influencers thought. That said, after listening to interviewees discuss the military, it is also possible some youth may actually use a perceived lack of "support" as a justification for not enlisting. For example, youth saying they would not enlist because it would upset their parents, even though they admitted to never having a discussion with "supporters" about it.

Decision-Making Timing and Process

Youth decision-making during high school about life after high school generally followed a process: (1) gathering career and educational information; (2) setting career and educational goals; (3) creating a plan to achieve those goals; (4) gathering and processing more information relative to those goals; (5) applying to college, if college is part of the goal; and (6) using pre-determined criteria to select which college to attend upon receiving acceptance letters, such as program offerings, location, and financial aid packages, usually in coordination with key influencers. Accessing and consuming information generally included speaking with influencers or people in their influencer network, visiting college campuses, attending a career or college camp or other career-oriented programming, and conducting research online. These steps were not always completed in a linear order, and for some interviewees, steps were omitted entirely.

The execution of the above decision-making process among all interviewees varied widely, based on several factors. First, and probably most important, was self-initiative and motivation. Engagement in the college and career planning process varied across interviewees according to how motivated, willing, and able they were to set goals and create a plan. Some interviewees had a clear focus on what they wanted (e.g., be a nurse, attend a four-year college) so they could put a plan together and put it into action. The more specific they were about their goals and personal preferences, the more focused and targeted they could be with their plans. Those who did not have a clear career focus, or who had perceptions that they should go to college without a clearly articulated desire for why *they* wanted to go to college, were generally less engaged with life planning. High school juniors interviewed in this group were generally willing to procrastinate planning, with many believing plans would fall into place.

For example, some interviewees noted that while they knew they were interested in a certain career or knew they "should" go to a four-year college, they had done little research or planning to achieve these goals. This was true both for interviewees in the spring of junior year and for military recruits joining at least a year after high school when recalling their high school experience. In contrast, interviewees who were focused on their future were actively willing to engage in planning. They were far more likely to seek out information and use that information as inputs into their decision-making.

Self-initiative was also connected to the second factor, social-emotional well-being. That is, youths' state of mind in terms of willingness and ability to focus on career and college planning.

This could be affected by external factors, such as family dynamics, or internal factors, such as low self-esteem and low self-efficacy. Some interviewees also appeared to struggle with cognitive overload and had the mental capacity only to handle more immediate challenges. For interviewees who reported having personal or family challenges, among both high school juniors and recruits, the majority stated college planning was not a top priority.

Third was the interviewees' network of influencers. This related to how much pressure their influencers placed on them to put together a plan for college, particularly parents. However, depending on the above factors, while support or encouragement from influencers was an important ingredient in creating and executing a plan, it was not necessarily sufficient. In some cases, particularly where interviewees lacked motivation or focus, they perceived their key influencers, usually parents, to be driving the planning process and were following along. For both high school juniors and recruits enlisting at least a year after high school, in cases where interviewees lacked motivation and where parents were uninvolved, career and educational plans were generally not made. In the case of recruits for which I could ask about their post-high school experience, they generally attempted some unfocused combination of college and work before signing up to enlist.

Take-up of career and educational resources appeared to heavily depend on the above factors. When asked about the availability of counseling, college and career planning courses, and other resources, most interviewees reported that their schools offered planning services. Some reported that their schools offered extensive services, having multiple counselors, college and career planning courses, organized college visits, and even a weekly newsletter with college news, summer opportunities, and visiting information. Many high school juniors across all three regions also mentioned having access to an online college planning platform that allowed them to search schools by preferences and rankings. This resource also allowed them to find out admissions and application information.

However, even for interviewees within the same high school, students' take-up of these resources and services varied considerably. For example, some interviewees opted to take full advantage of their guidance counselor while others did not have a single meeting. The same held for other services provided by the school, including use of the online platform, reading newsletters, and attending college information sessions.

Interestingly, there was no obvious pattern for how students decided to access and consume information once they were willing and motivated to gather such information.[135] However, there was generally a much higher weight placed on people and first-hand experiences over online or print content. Some high school juniors who were focused on four-year colleges, for example, chose not to research extensively online and relied mostly on their network for forming opinions and accessing college information. They valued more what they heard from people, even heresay from people they did not know, than information gathered from official sources, such as college

[135] Students who were not willing or motivated simply did not participate in active information gathering.

websites. Interviewees were especially skeptical of social media for information and were split on the value of online content platforms such as YouTube.

The timing of college and career decision-making also varied across interviewees. Generally, interviewees began to seriously consider options during high school, although interviewees stated a range of when. For some interviewees, their planning process began as early as middle school, while for others, they did not seriously begin to think about college until junior or senior year. For several recruits enlisting at least a year after high school, they did not seriously begin to think about post-high school plans until spring of senior year or after graduation. That said, a notable amount of actual college planning happened during high school, picking up during the spring of sophomore year.

High School Juniors' Experience

Although not a nationally representative sample, virtually every high school junior interviewed stated an intention to attend college upon graduation. A few were planning to attend a two-year institution, while the majority were planning to apply to four-year colleges. High school interviewees noted a strong social expectation, from the school community, their families, friends, and themselves, to attend college. They generally stated that they knew it to be true that college was the pathway to success, specifically four-year college, but they could not pinpoint where they got that perception from. Many stated it was something ingrained in them from an early age.

High school interviewees that reported considering two-year colleges almost always saw it as a stepping stone to a four-year institution. They generally reported having less guidance and pressure about college planning from their parents, who in many cases did not attend four-year colleges themselves. These interviewees also tended to report less clarity about their career path and educational goals. They emphasized several reasons for considering a two-year institution: to help them sort out their goals, to boost their grades for four-year college, to get a bachelor's degree more cheaply than attending a four-year college right away. Still, few reported being committed to two-year institutions, and most noted they were still considering four-year colleges.

In contrast, high school juniors considering four-year institutions generally reported having parents who had at least a bachelor's degree. They also stated strong and active parental involvement in college and career planning. This ranged from parents organizing college visits, to conducting online research about colleges, signing up for college or career-centric summer camps, and using their personal networks to introduce people of potential interest for job shadowing or informal interviews. A few interviewees reported taking college exam preparatory courses and speaking to college application advisors at the encouragement of their parents, particularly mothers.

None of the high school juniors interviewed were seriously considering military service, although a few cited knowing people who were. Several had family members who served or were in service, but this did not translate into a motivation to seriously consider service.

Military Recruits' Experience

Recruits who enlisted right out of high school generally knew for some time that they wanted to serve. Many of these interviewees had immediate family who also served and reported feeling motivation for service because of their lifelong affiliation with the military. They also cited the financial benefits associated with enlisting in the military, including college aid. Many of these interviewees did not consider college while in high school or engage in any serious college planning activities, although most planned to attend college during their time in service or afterward.

Still, not all high school enlistees stated family history as the deciding factor. Several interviewees, even with family who served, stated their family encouraged them to consider going to college first. It was after they considered college that they still decided to enlist, whether it was due to a lack of career focus, lack of appetite to take on student loans, or perception that they did not have the necessary academic record to get accepted into an institution of choice.

Recruits enlisting at least a year after high school either attempted college first or spent time working various jobs.[136] Most of the recruits that attended college went to two-year institutions, although a few attended four-year institutions first. Many of these recruits did not complete a degree, and several reported switching institutions before dropping out. These recruits also had varied timing regarding enrollment, with some enrolling in the fall after high school graduation and others with delayed enrollment. The reasons for dropping out also varied, from lack of focus and motivation to family and monetary challenges. Several of these recruits also reported moving across states due to family circumstances.

All of the recruits enlisting at least a year after high school reported a sense of frustration about their current life circumstance. Many of these recruits tried unsuccessfully to complete college and were working part-time jobs. They did not feel this was the direction they wanted for their life and did not feel they could build a family or a life for themselves on their current income. Several recruits noted serious relationships and the prospect of marriage and family prompted the choice to serve, although the majority of recruits reported a self-realization about the direction they were heading in and what they wanted to achieve in life.

Moreover, many of these recruits reported being interested in military service in high school, but did not enlist for various reasons. This included not being ready to make the commitment, a desire to try college first, and lack of support from their parents. Several noted a sense of losing years of their life and wished they had made the decision sooner to enlist.

A non-trivial amount of recruits enlisting at least a year out of high school also reported a challenging family dynamic, in general contrast to those enlisting right out of high school. These recruits who enlisted later noted tension between family members, non-relationships with parents, or having to instead prioritize getting a job to help make ends meet at home. These

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[136] These recruits ranged in age from 19-31.

recruits also noted that their personal challenges negatively impacted their social-emotional wellbeing, and that having to deal with those challenges delayed college and other life decision-making. Many of these recruits also reported certain characteristics in high school that are known to be risk factors that threaten success in college.[137] That is, given their post-high school planning experience, they were potentially at greater risk to not succeed in college, making them more likely to look to the military as the next best option. These include:

- Less ability to plan for the future or interest in doing so
- Little to no life focus or career goals
- Fewer extracurricular activities (more time working and playing video games)
- Weaker social networks, whether intentionally anti-social or through family dynamics that did not facilitate network building
- Bad information about colleges with no serious validation or research[138].

Perceptions of Military Service

In terms of the decision to serve, there was a generally a neutral to negative view of military service across high school juniors. Many disagreed with current U.S. military operations and posturing, felt it was incompatible with their physical abilities and career goals, and bought into existing negative stereotypes about service. For example, several high school juniors viewed enlisted members as "the ones who can't get into college," "need[ing] structure or discipline," or "[not] need[ing] control over their future." Several interviewees also made comments related to "I don't want to die" and "I couldn't kill people," implying the belief that everyone who serves will be on a combat tour.

Many high school juniors interviewed stated media, video games, and movies formed the basis of their perceptions about the military. Several stated that their fellow classmates were likely to have negative perceptions about military service, saying that while they "know" the military is "fine"—just not for them—others in their class were plagued by misperceptions. Surprisingly, a non-trivial number of high school juniors in the interview sample had immediate family in military service. Yet they were still unwilling to consider it, and, in at least several of these cases, were dissuaded by their family members who served to consider it.

Interestingly, many new recruits interviewed also expressed a knowledge of existing stereotypes about military service, even continuing to perpetuate them. For example, many recruits stated that the Air Force was the "smart, technologically advanced" branch. They also reported that they would not consider serving in the Marines because those service members were "war-happy" and wanted to fight. Some of the recruits enlisting after high school also

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[137] Horton, Joann, "Identifying At-Risk Factors That Affect College Student Success," *International Journal of Process Education*, Vol 7, Issue 1, June 2015.

[138] Ibid.

stated that while in high school, they did not think service was a good option for them; they reported that life events changed their minds.

Key Influencers

Influencers and their roles varied considerably across high school and recruit interviewees. Interviewees noted the distinction between supportive, informative, and influential in their networks. However, even if not directly influential, the majority of interviewees strongly valued having people in their network that were supportive and informational. Although these forms of influence are more indirect, they are nonetheless important in youth career and educational decision-making.

Among the high school juniors and military recruits interviewed, parents and themselves were cited among the top influencers in high school. Even in cases where youth cited themselves as the key influencer, or had a clear career or educational focus, they noted the value of having supporters in their network. For high school juniors in particular, those with clearly defined career or educational goals noted the value of having parents, teachers, or others in their network to talk to about these goals and use as an informational resource. This is consistent with the HSLS 09 data presented in Table 14 on top influencers for post-high school planning.

Military recruits enlisting out of high school cited both themselves and their parents as the key influencers, while those enlisting at least a year out of high school were more likely to cite only themselves. Those enlisting directly after high school generally had parental support. In fact, many cited parents who served in the military in some capacity or siblings who served as their key influencers. Many of these interviewees made the decision to serve during high school in consultation with their parents and military recruiter.

Notably, recruits enlisting after high school reported varied experiences that led them to the local recruiting office. Many stated that it took several additional years of personal growth to come to the realization of choosing to serve. Of the recruits in this group who considered enlisting in high school, many stated that they came back around to joining the military after trying other options and having a moment of "self-realization." In cases where they cited lack of parental support in high school, they were less concerned with having it later. Some reported that their parents changed their level of support for a military career after the individual had tried other options, while others said their parents were no longer a consideration. In one case, the recruit was shipping to basic military training the following day and had yet to tell an unsupportive mother.

Moreover, while mothers and fathers were both widely cited as key influencers, mothers were cited with greater frequency. Fathers were more likely to be seen as either supporters or less involved in the college planning process. A minority of interviewees relied heavily on their father for career and educational advice and saw their mother simply as a support. In some cases, interviewees did not live with their father, or their father was not an active part of their life. Such a family dynamic inherently factored into the construction of their information networks, since connections with or through their father were not an option. Still, for interviewees in high school and recruits reflecting on high school, mothers were generally engaged.

Other relatives such as grandparents, aunts, uncles, siblings and cousins played a prominent role in many youth information networks. In cases where parents were less involved, generally another relative was. In many cases, relatives were consulted as sources of information regarding their careers, and when relevant, military service experience.

Friends were often cited as people interviewees talked to, but few considered them very influential related to careers and college. The few interviewees who noted friends to be extremely influential had friends who provided information that was aligned with the interviewee's preferences and information needs. For example, one high school junior planning to study biology noted a friend who FaceTimed from a campus to share the laboratory amenities, while one military recruit applied and enrolled in a college where a friend informed him about an ROTC opportunity he also was pursuing. Generally, military recruits enlisting at least a year after high school were more likely to note the influence of friends in their decision to serve. In contrast, high school juniors were less likely to say friends were influential, outside of a pressure to go to college if that was what their friends were planning.

Teachers also had a mixed influence, with many stating their teachers were not influential. Those interviewees that were influenced by teachers were generally high school juniors, and this ultimately varied by student. Teachers that were influential provided career-related education or information, and for some interviewees, valuable career and educational planning support. There were no patterns in subjects of favored teachers. Few military recruits noted a particularly influential teacher, although some noted the informational or support element a teacher may have provided.

The importance of guidance counselors varied widely, as did the amount of interaction with guidance counselors in high school. Interviewees were mostly split on how they used their guidance counselors in terms of planning for life after high school. Most interviewees that considered their guidance counselors to be influential stated their influence was related to providing educational information. Interestingly, no interviewees, including military recruits, stated their high school guidance counselor encouraged military service without prompting or provided information about military service.

In high school, both high school juniors and military recruits stated that coaches or club leaders and visiting military recruiters had limited influence. Coaches and club leaders were generally not seen as sources of career and education information, and few reported having substantive conversations with them about college. A few interviewees noted they had mentors they saw as both supporters and influencers, generally leaders of local community groups they were members of. They were introduced to these mentors either through existing family connections or through taking initiative to join the group.

Many interviewees stated military recruiters visited high school during the lunch hour when there was little time for discussion. In cases where there was a mandatory assembly, few reported being influenced by it. Even military recruits stated that these recruiters were not overly influential. Those enlisting out of high school already knew they were going to serve, and those enlisting at least a year after high school were not in a mental place to seriously consider military service during high school. Still, some recruits stated that military recruiters in high school did help plant a seed that would later grow. At least one recruit was directly influenced by a visiting recruiter to enlist through an interactive classroom demonstration.

Overall, one of the larger concerns recruits raised about recruiters coming to high schools was the prevalence of some branches of the military over others. The recruits interviewed did not believe unequal representation necessarily depicted the experience they would have or were looking for. Another general concern was related to the accuracy of information presented, with skepticism about promises of "free college" and no combat.

Several interviewees also noted the role of indirect influencers. These are people who were not perceived to be key influencers or in the interviewee's immediate social network, were people the interviewee either knew or just met as an acquaintance through other connections or life events. Although not in their immediate network, these people introduced the interviewees to something that was later determined to be very important in their decision-making process. For example, one shadowed a fellow student and was exposed to a robotics club that sparked an interest in pursuing electrical engineering; another was introduced to his (or her?) top choice college by speaking with a friend of a relative who was an alum. The importance of weaker connections is analogous to the concept of "the strength of weak ties," a concept with roots in social network analysis.[139]

Importantly, an implication of the experience of recruits enlisting at least a year after high school is that their influencer networks, and the weight they place on specific individuals within their networks, changed over time. While parents may have been extremely important in high school, after high school, coworkers, friends, and oneself were driving influencers. Parents and family were more likely to be credited for the origination of the idea of service, and military recruiters were perceived as "last-mile" influencers that brought them over the finish line to sign the enlistment contracts. Most recruits joining at least a year after high school stated being 90 to 100 percent certain they were going to enlist before they walked into the recruiting office.

Key Sources of Information

In addition to first-hand conversations, many interviewees noted information gathered through personal experiences to have a large influence. For example, one recruit recalled the impact of visiting an Air Force base. Other interviewees credited their career focus to having an interest, discussing that interest, and then shadowing someone in their network on the job. Other interviewees stated that they believed the deciding factor on colleges would be the feeling they got when visiting the college campus. While not all high school students had gone on a college

[139] Granovetter, Mark, "The Strength of Weak Ties," *American Journal of Sociology*, 78:1360-80, 1973.

tour at the time of the interview, those that did were generally influenced by their visit experience. Even for those that had not as of the time of the interview, many planned to at some point, and believed it would be an important deciding factor.

The majority of interviewees engaged in online search as part of their information gathering process. However, while important for accessing information, few noted it as very influential. The amount and timing of their search varied, as did the nature of the search, ranging from accessing a few targeted websites, to looking for rankings and conducting a general careers and average earnings search. Several interviewees did not engage in any online search related to career and educational information, including high school juniors seriously considering college.

Most interviewees seriously considering college did look at college websites. However, as with online search, the influence of college sites in decision-making was limited. Only a few stated the websites had serious influence in determining which college to attend. Several interviewees commented that official sites showcased what the institution wanted you to see and were not a reliable source of information for what it would actually be like to attend there.

Other sources of information routinely mentioned were YouTube and Naviance. YouTube is an online video content platform, and Naviance is a subscription-based college information platform many high schools provide. However, use of both varied. For YouTube, interviewees were generally split on going to the site. While a few interviewees stated that they went on YouTube and did not watch career or educational videos, many of those that did watched some videos related to what it was like to be in a certain careers or colleges. They mentioned both official videos and unofficial videos or specific channels. Some were more methodical than others about how they engaged content. Similarly, the majority of high school juniors interviewed knew of Naviance but were split on whether they used it. Several actively used it to narrow down colleges while others tangentially used it and others had not used it but potentially had plans to.

Very few interviewees noted print materials as an important source of information, military or colleges. Only a handful noted that it prompted them to search for a college online, even interviewees who admitted to getting a confidence boost by seeing their marketability come in the mail. Similarly, few new recruits noted advertisements or national events as a factor in their decision. Conversely, almost every recruit noted the importance of the official Air Force website, although use was mostly related to reading about careers and finding contact information.

Social media, blogs, online forums, and reddit were cited with less frequency. A few interviewees noted each of these as being sources of information, particularly military recruits enlisting at least a year after high school. Most interviewees did not perceive social media to be a trustworthy source of information, and a non-trivial number stated they were not active on social media. Those that did use social media for career or educational information generally were already focused on a college or on a military branch and used it to follow pages of affiliated sports teams or people.

For military recruits, virtually all reported visiting the official service website. Most recruits visited the military website before going to the recruiting office, particularly the careers and recruiting office location pages. Several recruits reported not visiting the website until after they spoke with the recruiter and made the decision to serve. The majority of recruits believed the website was valuable and provided important information in their decision to serve.

Finally, the overwhelming majority of military recruits reported they were not influenced by official military advertisements or events. When prompted, a few recruits noted seeing an ad but stated they were not influenced by it. Instead, most recruits recalling ads stated seeing the ads only after they visited an official military website or had already made the decision to serve. Only one saw the ad as a "sign" to validate his (or her?) leaning toward enlistment.

Summary

As demonstrated by the interviews, youth career and educational information networks come in all shapes and sizes. Both high school juniors and recruits had a range of information network composition and relative strength of influencers, suggesting it is not a one-size-fits-all and there are many ways to effectively reach them. Consistent with HSLS09, parents were often cited as key influencers, with teachers and guidance counselors having a more limited footprint.

Moreover, the timing of interviewees' decision-making process for life after high school was consistent with the literature in that most began to take the process seriously between sophomore and junior year of high school. However, there was also considerable variation here as well, and the experiences of recruits enlisting at least a year after high school demonstrates the potential for delayed planning.

In contrast to HSLS09 data, the detailed discussions afforded by the interviews reveal the importance of social-emotional wellbeing, degree of focus, and motivation in setting and achieving post-high school goals. This greatly affected interviewees' willingness and ability to build and use their information networks, similar to the difference between those who did not enroll in college and those going on to attend four-year colleges in HSLS09.

The prevalence of the "college for all" social norm was apparent across the juniors in high school interviewed. The pressure of getting accepted and going to college was noted even by high school youth who were unsure of what they wanted to do professionally and by youth that admitted to struggling academically and disliking school. They did not feel there were other options, but perhaps most interestingly, they generally were not searching for them.

Finally, high school juniors generally had a neutral to negative view of the military. None of the 24 high school juniors interviewed were seriously considering service. For those not opposed to the military as an institution and the idea of combat operations, they did not feel service was a good fit for them. For many, college was the preferred and expected route. However, the majority cited having perceptions of the military and/or life in service that were based on media, movies, video games, and general unattributed hear-say.

6. Conclusion and Hypotheses

The overarching goal of this research study is to better understand youth career and educational decision-making with a focus on the decision to enlist in the military. As explored in part one of this research study, traditional behavioral frameworks as described in the literature assert differences in influencing factors, but ultimately view decision-making through a one-size-fits-all lens. More recent literature in behavioral economics, however, is beginning to question this assertion. There is some evidence that youth build their information networks differently, particularly given the added social and psychological dimensions of this period in their lifecourse while making choices about life after high school. This evidence suggests that not only do youth build their information networks differently from adults, but perhaps more importantly, that youth do so differently from each other.

One possible implication of the social and emotional factors affecting youth during high school is that there may be a range in the willingness and ability of youth to access and consume educational and career planning information. Some youth may be more able and willing to access information, for example, while some youth may have less focus and direction. Indeed, as observed in interviews, there was large variation in how focused youth were in high school on career and educational planning, with some youth knowing from an early age what they wanted to do, others still searching and exploring, and still others who had not given their long-term career goals extensive thought. There also was a notable variation in perceived stress levels and family dynamics across interviewees. To bring in another non-cognitive dimension, differences were also observed in HSLS09 related to perceived self-confidence and self-efficacy about mathematical ability, particularly for females.

Analysis of HSLS09 suggests youth begin to build their information networks early, at least as early as freshman year of high school. During freshman year, on average, youth spoke most with their parents and least with teachers and guidance counselors. However, there were notable variations across groups in terms of how youth build and use their career and educational information networks. The regression analysis showed four-year college bound youth and females to be more actively engaged in conversations with influencers across topics surveyed freshman and junior year.

In contrast, youth that go on to enlist in the active duty military, youth who were propensed to serve junior year, and youth that neither enrolled in college nor enlisted had more limited information networks on average. They were also less likely than four-year college bound youth to engage in career and educational planning activities or discussions that could build their information networks in a way that would enable them to access them later. In other words, their social capital accumulation was less during high school. Similarly, youth that went on to enroll in two-year colleges had associations among variables more in line with youth that did not attend college than with youth that enrolled in four-year colleges, albeit with weaker magnitude.

Correlations provided in Appendix D show the use of information networks freshman year is consistent with how youth reported they allocated their time. During freshman year, on average, youth across populations spent the most time with friends and family, followed by watching TV, browsing online, and participating in extracurricular activities. On average, youth across populations spent less time playing video games and working; however, there was a positive correlation with average daily time spent playing video games for youth who ultimately enlisted and for youth that did not attend college.

There is also some evidence that youths' information networks may evolve over time. For example, by junior year, more youth on average reported speaking with their guidance counselor about life after high school than freshman year (0.630 versus 0.180). This evolution was particularly apparent in the interviews with high school juniors and military recruits. Many high school juniors discussed an evolution of accessing career and college information over time, accessing and building their influencer networks to engage in conversations about college.

Junior year is also when differences across populations become more apparent in terms of career and educational planning. This is particularly prevalent for activities related to accessing and consuming information, such as searching for college information online, going on college tours, and preparing for a college exam. For example, across all populations, the highest average across information-seeking activities was for online search, which was also the case for parents in the parent survey. However, the regression analysis showcased large variation between youth that did not attend college and youth who went on to attend four-year colleges. Although specific websites were not discussed in HSLS09, interviewees routinely cited Google search and YouTube as top sources of information. Less cited in terms of information-seeking was social media, blogs or other online forums.

Together, this analysis demonstrates a range of youth information networks across populations, on average, with youth who ultimately did not attend college on one end and youth who went to four-year college on the other. Youth who did not attend college generally had the lowest averages, most negative correlations, and most negative statistical associations across speaking with influencers, engaging in information-seeking activities, and participating in extracurricular activities. The opposite was true for youth who went on to a four-year college, who had the strongest network of influencers, engaged in the most career and college planning activities, and participated in the most extracurricular activities.

Interviews with high school juniors and new recruits further validate these preliminary observations. Those discussions suggested all of the above factors act together in terms of how youth make career and educational decisions. No interviewees made career and educational decisions by considering only one dimension of their lives. Yet, the degree to which youth are willing to access and consume career and education information is also the degree to which they have the best available information and can make the best choice for themselves.

Moreover, interviews with recruits enlisting at least a year after high school demonstrated that there could be considerable evolution of information and influencer networks over time. Many who decide to serve later do not have the same information or influencer network they did back in high school, which impacts willingness and ability to consider service. Many serve on their own volition after (unsuccessfully) trying other options. Some of these recruits reported having information networks in high school that completely transitioned over time, grew over time, or both.

A central hypothesis of this study going forward is that three main considerations have a sizeable impact on youths' ultimate career and educational decisions: (1) social-emotional wellbeing, (2) the use of and reliance on influencers, and (3) engagement in information-seeking activities during high school. Moreover, these factors act together on youth decision-making. For example, youth who are chronically overwhelmed cognitively may be more likely to make career and educational decisions based on short-term ease or gains than on long-term outcomes. Depending on the nature of their stress, they likely build and access their information networks differently than youth not cognitively overburdened. They may also be less willing to access and consume career and educational information and therefore make post high school plans based on relatively incomplete information.

A second hypothesis is that these factors evolve over time, as youth information networks evolve over time. The career and educational decision-making process starts early, and for many, continues after high school. Youth also appear to build and utilize their information networks at different rates, depending on the above factors. The result is that as youth graduate high school and continue on to new experiences, new exposure to people and information, and develop socially and emotionally, their information networks change accordingly. This is also related to the third hypothesis.

A third hypothesis is that youth career and educational decision-making in high school is "behaviorally segmented."[140] Given the three main factors above, not all youth are in a state of mind in high school that enables them to think critically, or with finality, about their post-high school career and educational plans. These factors indicate the degree of youths' behavioral segmentation, or their state of mind about making career and educational decisions. This in turn affects their willingness to access and consume related information across sources. This hypothesis cannot be directly tested given the available data for this study, but it is supported by the available data and in the corresponding literature.

Although this study does not attempt causal inference, the implication is that there is a clear association with information networks in high school and with outcomes later. This is relevant to military planners who are interested in engaging youth across groups. Each population will be explored in more detail in the next part of this research study.

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[140] Hume, Susannah and Jessica Heal, "Moments of Choice," Behavioural Insights Team, 2016.

Finally, it should be acknowledged that the Great Recession (2007-2009) could be yet another confounding factor on decision-making for this youth cohort. A growing body of research suggests the Great Recession had a lasting adverse impact on the self-esteem and mental well-being of youth aged 16-24 during that time, along with a reduction in future earnings potential. Interestingly, the result has been for youth to place more value on their social networks, especially as trust in government declined.[141] However, this phenomenon was found to be more limited for adolescent youth, those less than 18 years old during the Great Recession, which is the population in HSLS09 (youth were in their freshman year of high school in 2009, the base year of the survey). Moreover, isolating those effects would be extremely difficult to do with confidence. Therefore, the issue is not studied in detail here.

As discussed, this study shows that there are clear differences across youth in how they build and use their educational and career information networks in high school. The analysis presented here suggests several factors playing into this, some of which are difficult to measure, such as social-emotional wellbeing, degree of focus, and motivation. These findings also suggest that one size will not fit all in terms of effectively engaging youth across groups to encourage enlistment in the military. Further development of these implications for military recruitment planners is explored in paper 3 of this study.

[141] Schoon, Ingrid and Jeylan Mortimer, *Youth and the Great Recession: Are values, achievement orientation and outlook to the future affected?*, International Journal of Psychology, Vol. 52, No. 1, 1-8, 2017.

7. Next Steps

This report is the second part of a larger research study.[142] Subsequent research for this study will visualize youth career and educational information networks for each identified group using the analysis presented and discussed here. It will also include analysis of those networks using concepts from social network analysis, along with additional context for statistical testing of differences in means across groups and influencers.

Additional context on how youth build and use their information networks in high school will provide a better understanding for how influencers and sources of information factor into post-high school planning, with the intention of unlocking new insights for the military. The final part of this research study will conclude with implications for military recruitment planners on how to more efficiently and effectively reach target youth.

[142] See "Youth Information Networks and Propensity to Serve in the Military: A Review of Relevant Literature" for part 1 of this study.

Appendix A. New Enlisted Recruit Interview Protocol

No information that you provide will be connected with you personally or used in a way that you could be identified as its source or a study participant. I would like to record this interview solely for transcription purposes, and have an approved data safeguarding plan to securely destroy the files upon completion of the study. Is it okay if I record the session?

PART I. GENERAL POST-HIGH SCHOOL PLANS

1. How old are you?

2. When/In what year of school did you start thinking about your post-high school plans (approximately)?

3. I'm going to ask a series of questions as it relates to several groups of people in your life. We will go through one first and then the same questions will apply for each.
    a. Parents
    - How often (once, monthly, weekly) did you speak with them about your post-HS plans?
        - When did the discussions begin?
    - Decision to serve in the military? Air Force?
        - When did the discussions begin?
    - Who initiated the discussion(s) (you, them, both)?
    - How influential were they on a scale of 1 to 5 (1=Not at all influential, 2=Slightly influential, 3=Moderately influential, 4=Significantly influential, 5=Extremely influential)?

    b. Counselor
    c. Friends
    d. Teacher
    e. Coach
    f. Military recruiter
    g. Other mentor or connection?

4. Who was the most influential and why?

PART II. MILITARY SERVICE

I am very interested in understanding the process by which you joined the military.

5. When did you first think about serving in the military? What motivated that thought?

6. Do you have relatives/friends in the military? Which relatives/friends and in which branches? Do you have relatives/friends who previously served in the military? When? In which branches?

7. How seriously did you consider military service during high school? When?

8. If you didn't consider service until after high school, what were you going to do/were you doing before service? What changed your mind about serving?

9. Which of the following sources of information did you consult for:
   - Military service
   - Other post high school plans, especially if did something else post-high school

   And how influential were they in your decision to serve on a scale of 1 to 5 ((1=Not at all influential, 2=Slightly influential, 3=Moderately influential, 4=Significantly influential, 5=Extremely influential)?
   a. College websites
      i. Who/what referred you to the school sites you visited?
   b. Government websites (Dept. of Ed, BLS, Military)
   c. YouTube (videos)
   d. Other websites (All non-college including employers)
   e. Rankings
   f. Social media
      i. Facebook
      ii. Instagram
      iii. Snapchat

10. Can you clarify what your primary sources of information were, and for what type of information you relied on them for? (e.g., benefits, terms of service, quality of life, career opportunities, etc.)

11. Can you recall if any military outreach left an impression on your decision to serve, or influenced your likelihood of serving?
    a. Advertisements (TV, Radio, Internet, Emails, Publications, Direct Mailing)
    b. Social Media
    c. College/Career Fairs
    d. Other events (NASCAR, NHRA, All American Bowl, Strength in Action tour, etc.)

12. Why did you choose the AF over other services?

Appendix B. High School Student Interview Protocol

This study is evaluating the processes by which High School youth make career and educational decisions. No information that you provide will be connected with you personally or used in a way that you could be identified as its source or a study participant. I would like to record this interview solely for transcription purposes, and have an approved data safeguarding plan to securely destroy the files upon completion of the study. Is it okay if I record the session?

<u>GENERAL POST-HIGH SCHOOL PLANS</u>

2. How old are you and what grade are you in?

3. What is the current status of your post-high school plans?
    a. How many/Which options are you considering?

4. When/In what school year did you start thinking about your post-high school plans (approximately)?

5. I'm going to ask a series of questions as it relates to several groups of people in your life. We will go through one first and then the same questions will apply for each.
    a. Parents
    - How often (once, monthly, weekly) did you speak with them about your post-HS plans?
    - Who initiated the discussion(s) (you, them, both)?
    - How influential were they on a scale of 1 to 5 (1=Not at all influential, 2=Slightly influential, 3=Moderately influential, 4=Significantly influential, 5=Extremely influential)?

    b. Counselor
    c. Friends
    d. Teacher
    e. Coach
    f. Military recruiter
    g. Other mentor or connection?

6. Who was the most influential and why?

7. Which of the following sources of information did you consult, and how influential was it in your process (1=Not at all influential, 2=Slightly influential, 3=Moderately influential, 4=Significantly influential, 5=Extremely influential)?

    a. College websites
        i. Who/what referred you to the school sites you visited?
    b. Government websites (Dept. of Ed, BLS, Military)
    c. YouTube (videos)
    d. Other websites (All non-college including employers)
    e. Rankings
    f. Social media
        i. Facebook
        ii. Instagram
        iii. Snapchat

8. What other factors will/have influenced your post-high school plans?

9. How will you ultimately decide what you are going to do after HS?

<u>MILITARY SERVICE</u>

10. Have you ever thought about serving in the military?
    a. If so, when?
    b. How likely is it that you will be serving in the military in the next few years?
        i. Definitely
        ii. Probably
        iii. Probably Not
        iv. Definitely Not
    c. Who have you spoken with about serving in the military, and who initiated contact? Who was the most influential?
        i. Parents
        ii. Guidance Counselor
        iii. Friends
        iv. Other relative/Connection
        v. Military Recruiter
    d. If you have considered serving in the military, what other sources of information have you consulted? Which was the most influential?
    e. If you are likely to join, which service(s) are you considering and why?
    f. If not, why not?

11. Has any military outreach made you think about this as an option or influenced your likelihood of serving?
    a. Advertisements (TV, Radio, Internet, Emails, Publications, Direct Mailings)
    b. Social Media
    c. College/Career Fairs
    d. Other events (NASCAR, NHRA, All American Bowl, Strength in Action tour, etc.)

Appendix C. Variable Names and Meanings

The variable names used in this report follow the naming convention as designated by the U.S. Department of Education. Each variable begins with a letter, “S”, “P”, or “X”, which stands for “Student”, “Parent”, or “Composite”. Student means the variable came from the student survey (e.g., the student answered the question), while Parent means the variable came from the parent survey. Composite variables are generated by the Department of Education and are designed for use in research and analysis of data. They are commonly used variables such as socio-economic status, gender, and educational attainment of parents, and impute missing values to enable a complete representation of the sample. The next position is filled by a number, “1” or “2”, to designate survey wave. For example, “1” reflects the first wave, or 2009 wave, while “2” reflects the second wave, or 2012 follow-up survey. The remainder of the name is a brief description of the variable.

All variables included in the analysis are defined as follows:

Table C.1. Variable Names and Definitions

Student Variables	
S1MOMTALKM	Student talked to mother about which math course to take
S1MOMTALKS	Student talked to mother about which science course to take
S1MOMTALKOTH	Student talked to mother about other courses to take
S1MOMTALKCLG	Student talked to mother about going to college
S1MOMTALKJOB	Student talked to mother about possible jobs or careers
S1MOMTALKPROB	Student talked to mother about personal problems
S1DADTALKM	Student talked to father about which math course to take
S1DADTALKS	Student talked to father about which science course to take
S1DADTALKOTH	Student talked to father about other courses to take
S1DADTALKCLG	Student talked to father about going to college
S1DADTALKJOB	Student talked to father about possible jobs or careers
S1DADTALKPROB	Student talked to father about personal problems
S1FRNDTALKM	Student talked to friends about which math course to take
S1FRNDTALKS	Student talked to friends about which science course to take
S1FRNDTALKOTH	Student talked to friends about other courses to take
S1FRNDTALKCLG	Student talked to friends about going to college
S1FRNDTALKJOB	Student talked to friends about possible jobs or careers
S1FRNDTALKPROB	Student talked to friends about personal problems
S1TCHTALKM	Student talked to a teacher about which math course to take
S1TCHTALKS	Student talked to a teacher about which science course to take
S1TCHTALKOTH	Student talked to a teacher about other courses to take

Student Variables	
S1TCHTALKCLG	Student talked to a teacher about going to college
S1TCHTALKJOB	Student talked to a teacher about possible jobs or careers
S1TCHTALKPROB	Student talked to a teacher about personal problems
S1CNSLTALKM	Student talked to school counselor about which math course to take
S1CNSLTALKS	Student talked to school counselor about which science course to take
S1CNSLTALKOTH	Student talked to school counselor about other courses to take
S1CNSLTALKCLG	Student talked to school counselor about going to college
S1CNSLTALKJOB	Student talked to school counselor about possible jobs or careers
S1CNSLTALKPROB	Student talked to school counselor about personal problems
S1NOTALKM	Student talked to no one about which math course to take
S1NOTALKS	Student talked to no one about which science course to take
S1NOTALKOTH	Student talked to no one about other courses to take
S1NOTALKCLG	Student talked to no one about going to college
S1NOTALKJOB	Student talked to no one about possible jobs or careers
S1NOTALKPROB	Student talked to no one about personal problems
S2AIDTALKPAR1	Student talked with parents about financial aid for college *(author derived)*
S2TALKHSCNSL	Student talked with a high school counselor about options for life after high school
S2FRIENDCLG	Student talked to friends about life after high school *(author derived)*
S2TALKCLGCNSL	Student talked about options with a counselor hired by family to help prepare for college admission
S2MCNSLREC	Student took junior year math course because his/her counselor recommended it
S2MTCHRREC	Student took junior year math course because his/her teacher recommended it
S2MPARREC	Student took junior year math course because his/her parents recommended it
S2MFAMREC	Student took junior year math course because another family member recommended it
S2MEMPREC	Student took junior year math course because his/her employer recommended it
S2MFRIEND	Student took junior year math course because his/her friend recommended it
S2CLGTOUR	Student has attended a program at or taken a tour of a college campus
S2CLGSEARCH	Student has searched the Internet for college options or read college guides
S2JOBFAIR	Student attended a career day or job fair
S2CLGCLASS	Student sat in on or has taken a college class
S2INTERN	Student participated in an internship or apprenticeship related to career goals
S2CAREERJOB	Student worked or volunteered in a job related to career goals

Student Variables	
S2CLGEXAMPREP	Student took a course to prepare for a college admission exam such as SAT or ACT
S2MCLUB	Student participated in math club since the fall of 2009
S2SCLUB	Student participated in science club since the fall of 2009
S2SPORTS	Student participated in organized sports since the fall of 2009
S2ART	Student participated in art since the fall of 2009
S2MUSIC	Student participated in music or dance since the fall of 2009
S2CLUB	Student participated in other groups or club activities since the fall of 2009
S2DRAMA	Student participated in theater or drama since the fall of 2009
S1HRACTIVITY	Time student spent participating in extracurricular activities such as sports teams, clubs, band, student government
S1HRWORK	Time student spent working for pay not including chores or house jobs
S1HRFAMILY	Time student spends with family
S1HRFRIENDS	Time student spends hanging out or socializing with friends
S1HRTV	Time student spends watching television or movies
S1HRVIDEO	Time student spends playing video games
S1HRONLINE	Time student spends chatting or surfing online
S2MPERSON1	Student sees self as a math person *(author derived)*
S2SPERSON1	Student sees self as a science person *(author derived)*
S2MLEARN	Student agrees that most people can learn to be good at math
S2MBORN	Student agrees that you have to be born with the ability to be good at math
S2MUSELIFE	Student agrees that math is useful for everyday life
S2MUSECLG	Student agrees that math is useful for college
S2MUSEJOB	Student agrees that math is useful for a future career
Parent Variables	
P2DISCCOURSES	Number of times parent discussed selecting courses or programs at school with teen
P2DISCCLGEXAM	Number of times parent discussed preparing for college entrance exams such as ACT, SAT, or ASVAB with teen
P2DISCCLGAPP	Number of times parent discussed applying to college or other schools after high school with teen
P2DISCCAREER	Number of times parent discussed possible careers with teen
P2DISCJOBS	Number of times parent discussed jobs child might want after high school
P2DISCEVENTS	Number of times parent discussed community, national, and world events with teen
P2DISCTROUBLE	Number of times parent discussed things that are troubling teen with teen
P2JOBFAIR	Parent attended a career day or job fair with teen

Student Variables	
P2CLGTOUR	Parent arranged for teen to attend a program at or take a tour of a college campus
P2CLGSEARCH	Parent searched the Internet for college options or read college guides
P2TALKHSCNSL	Parent talked with a high school counselor about teen's options for life after high school
P2TALKCLGCNSL	Parent talked about teen's options with a counselor hired by family to help teen prepare for college admission
P2CLGEXAMPREP	Parent arranged for teen to take a course to prepare for a college admission exam such as SAT or ACT
P2HISP1	Responding parent is of Hispanic origin
X2PAR1EDU	Responding parent's highest level of educational attainment, 2012 survey wave
X1PAR1EDU	Responding parent's highest level of educational attainment, 2009 survey wave
X1SESQ5	Household income quintile

Source: U.S. Department of Education, National Center for Education Statistics, “High School Longitudinal Study of 2009 (HSLS:09),” 2009-16, Base year, first follow-up, and second follow-up survey. Tabulations are author calculations.

Appendix D. Additional Descriptive Statistics

Tables D.1–D.10 in this appendix provides detailed descriptive statistics for the outcomes of interest studied in this report: mean (proportion for binary variables), 95 percent confidence interval (CI), and response totals (N). The response totals provided are the number of responses for that survey question with a value of one (e.g., 162 respondents enlisted immediately out of high school) for each group provided in Table 1 of this report.

Table D.1. Means, CI, and Sample Size Across Military Groups, Freshman Year

	HSENLIST			AFTERHS			PROP12		
Variable	Mean	95% CI		Mean	95% CI		Mean	95% CI	
Range: 0-1	N=162			N=146			N=3,290		
S1MOMTALKM	**0.442**	0.335	0.549	**0.483**	0.358	0.607	**0.456**	0.430	0.481
S1MOMTALKS	**0.391**	0.285	0.497	**0.403**	0.287	0.519	**0.351**	0.324	0.378
S1MOMTALKOTH	**0.510**	0.402	0.618	**0.438**	0.314	0.562	**0.465**	0.434	0.496
S1MOMTALKCLG	**0.732**	0.636	0.828	**0.692**	0.567	0.818	**0.720**	0.693	0.748
S1MOMTALKJOB	**0.806**	0.721	0.891	**0.744**	0.623	0.864	**0.745**	0.721	0.770
S1MOMTALKPROB	**0.497**	0.387	0.607	**0.488**	0.367	0.608	**0.493**	0.471	0.516
	N=148			N=136			N=3,052		
S1DADTALKM	**0.346**	0.247	0.444	**0.368**	0.250	0.486	**0.322**	0.301	0.344
S1DADTALKS	**0.335**	0.235	0.435	**0.331**	0.218	0.444	**0.253**	0.229	0.277
S1DADTALKOTH	**0.395**	0.293	0.497	**0.414**	0.295	0.534	**0.346**	0.322	0.370
S1DADTALKCLG	**0.661**	0.561	0.761	**0.596**	0.465	0.728	**0.589**	0.563	0.615
S1DADTALKJOB	**0.700**	0.606	0.795	**0.696**	0.563	0.828	**0.641**	0.615	0.666
S1DADTALKPROB	**0.389**	0.277	0.501	**0.308**	0.193	0.422	**0.328**	0.300	0.357
	N=162			N=148			N=3,355		
S1FRNDTALKM	**0.290**	0.190	0.390	**0.222**	0.137	0.307	**0.267**	0.247	0.288
S1FRNDTALKS	**0.260**	0.163	0.358	**0.181**	0.108	0.254	**0.213**	0.190	0.235
S1FRNDTALKOTH	**0.371**	0.266	0.477	**0.376**	0.261	0.491	**0.352**	0.326	0.379
S1FRNDTALKCLG	**0.520**	0.416	0.624	**0.481**	0.350	0.612	**0.468**	0.442	0.493
S1FRNDTALKJOB	**0.591**	0.488	0.694	**0.556**	0.436	0.676	**0.537**	0.511	0.563
S1FRNDTALKPROB	**0.548**	0.441	0.654	**0.568**	0.442	0.694	**0.526**	0.499	0.552
	N=162			N=148			N=3,355		
S1TCHTALKM	**0.124**	0.065	0.183	**0.122**	0.044	0.200	**0.166**	0.147	0.186
S1TCHTALKS	**0.087**	0.036	0.139	**0.094**	0.035	0.153	**0.135**	0.117	0.154
S1TCHTALKOTH	**0.134**	0.067	0.200	**0.108**	0.029	0.188	**0.148**	0.129	0.167
S1TCHTALKCLG	**0.243**	0.133	0.352	**0.141**	0.056	0.227	**0.190**	0.167	0.213
S1TCHTALKJOB	**0.184**	0.107	0.261	**0.230**	0.124	0.337	**0.195**	0.174	0.216
S1TCHTALKPROB	**0.034**	0.004	0.064	**0.080**	0.000	0.164	**0.078**	0.061	0.094

	HSENLIST			AFTERHS			PROP12		
Variable	Mean	95% CI		Mean	95% CI		Mean	95% CI	
	N=162			N=148			N=3,355		
S1CNSLTALKM	**0.152**	0.078	0.227	**0.180**	0.091	0.268	**0.180**	0.158	0.201
S1CNSLTALKS	**0.122**	0.053	0.191	**0.163**	0.076	0.249	**0.154**	0.133	0.175
S1CNSLTALKOTH	**0.164**	0.088	0.241	**0.170**	0.082	0.258	**0.196**	0.171	0.221
S1CNSLTALKCLG	**0.154**	0.084	0.224	**0.139**	0.052	0.225	**0.171**	0.149	0.192
S1CNSLTALKJOB	**0.109**	0.055	0.162	**0.165**	0.072	0.258	**0.150**	0.131	0.169
S1CNSLTALKPROB	**0.072**	0.018	0.125	**0.116**	0.032	0.201	**0.086**	0.073	0.100
	N=162			N=148			N=3,355		
S1NOTALKM	**0.334**	0.226	0.441	**0.389**	0.251	0.527	**0.328**	0.303	0.354
S1NOTALKS	**0.398**	0.287	0.509	**0.445**	0.315	0.575	**0.440**	0.416	0.464
S1NOTALKOTH	**0.247**	0.163	0.331	**0.336**	0.203	0.469	**0.303**	0.279	0.327
S1NOTALKCLG	**0.162**	0.092	0.232	**0.160**	0.034	0.285	**0.119**	0.102	0.136
S1NOTALKJOB	**0.040**	0.011	0.070	**0.095**	0.000	0.209	**0.083**	0.068	0.099
S1NOTALKPROB	**0.203**	0.126	0.281	**0.187**	0.069	0.305	**0.215**	0.192	0.237

Source: U.S. Department of Education, National Center for Education Statistics, “High School Longitudinal Study of 2009 (HSLS:09),” 2009-16, Base year survey. Tabulations are author calculations.

Table D.2. Means, CI, and Sample Sizes Across Non-Military Groups, Freshman Year

	NOCLGORAD			NOTFOURYR			FOURYRCLG			FEMALE		
Variable	Mean	95% CI		Mean	95% CI		Mean	95% CI		Mean	95% CI	
Range: 0-1	N=3,218			N=4,580			N=6,626			N=9,866		
S1MOMTALKM	**0.377**	0.350	0.404	**0.504**	0.477	0.530	**0.660**	0.640	0.679	**0.564**	0.544	0.584
S1MOMTALKS	**0.286**	0.261	0.310	**0.397**	0.370	0.424	**0.561**	0.539	0.584	**0.454**	0.432	0.477
S1MOMTALKOTH	**0.401**	0.374	0.428	**0.534**	0.508	0.559	**0.685**	0.663	0.708	**0.602**	0.576	0.628
S1MOMTALKCLG	**0.658**	0.635	0.682	**0.784**	0.763	0.805	**0.867**	0.852	0.883	**0.833**	0.821	0.846
S1MOMTALKJOB	**0.707**	0.685	0.729	**0.783**	0.765	0.801	**0.847**	0.831	0.863	**0.839**	0.829	0.850
S1MOMTALKPROB	**0.519**	0.495	0.543	**0.573**	0.548	0.598	**0.655**	0.638	0.673	**0.640**	0.622	0.657
	N=2,917			N=4,258			N=6,399			N=9,219		
S1DADTALKM	**0.223**	0.198	0.248	**0.324**	0.303	0.345	**0.512**	0.490	0.534	**0.355**	0.337	0.372
S1DADTALKS	**0.182**	0.158	0.205	**0.266**	0.245	0.288	**0.440**	0.421	0.459	**0.302**	0.285	0.319
S1DADTALKOTH	**0.244**	0.216	0.271	**0.361**	0.338	0.383	**0.534**	0.514	0.555	**0.385**	0.368	0.401
S1DADTALKCLG	**0.481**	0.449	0.512	**0.623**	0.601	0.644	**0.757**	0.739	0.774	**0.625**	0.610	0.641
S1DADTALKJOB	**0.547**	0.517	0.576	**0.638**	0.614	0.663	**0.746**	0.729	0.762	**0.630**	0.615	0.644
S1DADTALKPROB	**0.293**	0.263	0.323	**0.353**	0.331	0.375	**0.428**	0.410	0.446	**0.286**	0.269	0.303
	N=3,305			N=4,642			N=6,667			N=9,985		
S1FRNDTALKM	**0.272**	0.250	0.295	**0.296**	0.275	0.317	**0.395**	0.377	0.413	**0.357**	0.341	0.373
S1FRNDTALKS	**0.216**	0.193	0.239	**0.251**	0.234	0.267	**0.327**	0.310	0.344	**0.287**	0.271	0.303
S1FRNDTALKOTH	**0.318**	0.296	0.341	**0.384**	0.359	0.408	**0.492**	0.475	0.509	**0.460**	0.445	0.475
S1FRNDTALKCLG	**0.444**	0.418	0.470	**0.539**	0.513	0.564	**0.603**	0.581	0.626	**0.611**	0.594	0.628
S1FRNDTALKJOB	**0.513**	0.488	0.538	**0.563**	0.541	0.584	**0.622**	0.605	0.638	**0.640**	0.625	0.656

	NOCLGORAD			NOTFOURYR			FOURYRCLG			FEMALE		
Variable	**Mean**	**95% CI**		**Mean**	**95% CI**		**Mean**	**95% CI**		**Mean**	**95% CI**	
S1FRNDTALKPROB	**0.517**	0.491	0.543	**0.614**	0.586	0.641	**0.679**	0.662	0.697	**0.744**	0.731	0.757
	N=3,305			N=4,642			N=6,667			N=9,985		
S1TCHTALKM	**0.149**	0.132	0.165	**0.170**	0.157	0.184	**0.251**	0.234	0.268	**0.213**	0.199	0.227
S1TCHTALKS	**0.106**	0.092	0.120	**0.120**	0.108	0.133	**0.192**	0.176	0.208	**0.156**	0.146	0.166
S1TCHTALKOTH	**0.122**	0.107	0.137	**0.143**	0.129	0.157	**0.188**	0.173	0.204	**0.174**	0.160	0.188
S1TCHTALKCLG	**0.194**	0.173	0.216	**0.209**	0.190	0.227	**0.227**	0.208	0.246	**0.234**	0.216	0.251
S1TCHTALKJOB	**0.180**	0.161	0.200	**0.201**	0.182	0.219	**0.220**	0.205	0.236	**0.233**	0.219	0.247
S1TCHTALKPROB	**0.077**	0.064	0.091	**0.081**	0.069	0.092	**0.076**	0.064	0.087	**0.101**	0.091	0.111
	N=3,305			N=4,642			N=6,667			N=9,985		
S1CNSLTALKM	**0.170**	0.146	0.195	**0.191**	0.171	0.211	**0.237**	0.216	0.258	**0.224**	0.206	0.242
S1CNSLTALKS	**0.145**	0.121	0.170	**0.157**	0.140	0.175	**0.204**	0.186	0.222	**0.193**	0.175	0.211
S1CNSLTALKOTH	**0.175**	0.151	0.199	**0.194**	0.172	0.215	**0.248**	0.228	0.268	**0.231**	0.212	0.250
S1CNSLTALKCLG	**0.171**	0.151	0.192	**0.183**	0.159	0.208	**0.180**	0.163	0.198	**0.200**	0.184	0.216
S1CNSLTALKJOB	**0.139**	0.123	0.156	**0.149**	0.131	0.166	**0.145**	0.198	0.160	**0.159**	0.147	0.172
S1CNSLTALKPROB	**0.112**	0.095	0.129	**0.097**	0.084	0.111	**0.065**	0.055	0.074	**0.099**	0.088	0.109
	N=3,305			N=4,642			N=6,667			N=9,985		
S1NOTALKM	**0.366**	0.342	0.391	**0.292**	0.268	0.315	**0.186**	0.170	0.203	**0.241**	0.220	0.262
S1NOTALKS	**0.487**	0.460	0.513	**0.408**	0.383	0.432	**0.275**	0.256	0.293	**0.351**	0.325	0.377
S1NOTALKOTH	**0.347**	0.320	0.373	**0.263**	0.239	0.286	**0.152**	0.137	0.168	**0.200**	0.181	0.218
S1NOTALKCLG	**0.154**	0.135	0.173	**0.085**	0.073	0.098	**0.066**	0.051	0.080	**0.062**	0.055	0.069
S1NOTALKJOB	**0.099**	0.084	0.113	**0.081**	0.065	0.097	**0.058**	0.045	0.072	**0.053**	0.046	0.061
S1NOTALKPROB	**0.185**	0.163	0.208	**0.137**	0.122	0.152	**0.108**	0.095	0.121	**0.072**	0.064	0.080

Source: U.S. Department of Education, National Center for Education Statistics, “High School Longitudinal Study of 2009 (HSLS:09),” 2009-16, Base year survey. Tabulations are author calculations.

Table D.3. Means, CI, and Sample Sizes Across Military Groups, Junior Year

	HSENLIST			AFTERHS			PROP12		
Variable	**Mean**	**95% CI**		**Mean**	**95% CI**		**Mean**	**95% CI**	
Range: 0-1	N=154			N=137			N=3,990		
S2CLGSEARCH	**0.793**	0.714	0.871	**0.816**	0.706	0.925	**0.718**	0.693	0.743
S2TALKHSCNSL	**0.508**	0.399	0.617	**0.654**	0.492	0.817	**0.597**	0.560	0.634
S2CLGTOUR	**0.407**	0.302	0.512	**0.534**	0.326	0.742	**0.450**	0.426	0.474
S2JOBFAIR	**0.394**	0.285	0.504	**0.549**	0.384	0.713	**0.477**	0.451	0.503
S2CLGEXAMPREP	**0.317**	0.221	0.414	**0.455**	0.273	0.636	**0.336**	0.310	0.362
S2TALKCLGCNSL	**0.094**	0.037	0.151	**0.028**	0.000	0.067	**0.117**	0.100	0.134
	N=156			N=138			N=4,030		
S2AIDTALKPAR1	**0.537**	0.431	0.643	**0.735**	0.593	0.877	**0.599**	0.576	0.621
	N=154			N=139			N=4,014		
S2FRIENDCLG	**0.948**	0.911	0.984	**0.918**	0.860	0.976	**0.905**	0.888	0.922
	N=135			N=124			N=3,255		

	HSENLIST			AFTERHS			PROP12		
Variable	Mean	95% CI		Mean	95% CI		Mean	95% CI	
S2MCNSLREC	**0.323**	0.223	0.423	**0.488**	0.241	0.736	**0.352**	0.328	0.376
S2MTCHRREC	**0.246**	0.156	0.336	**0.395**	0.172	0.619	**0.295**	0.272	0.318
S2MPARREC	**0.222**	0.135	0.310	**0.241**	0.092	0.390	**0.272**	0.248	0.297
S2MFAMREC	**0.134**	0.064	0.204	**0.096**	0.000	0.205	**0.152**	0.133	0.171
S2MEMPREC	**0.059**	0.009	0.109	**0.009**	0.000	0.027	**0.066**	0.051	0.081
S2MFRIEND	**0.217**	0.128	0.305	**0.173**	0.058	0.287	**0.254**	0.232	0.276

Source: U.S. Department of Education, National Center for Education Statistics, “High School Longitudinal Study of 2009 (HSLS:09),” 2009-16, First follow-up survey. Tabulations are author calculations.

Table D.4. Means, CI, and Sample Sizes Across Non-Military Groups, Junior Year

	NOCLGORAD			NOTFOURYR			FOURYRCLG			FEMALE		
Variable	Mean	95% CI		Mean	95% CI		Mean	95% CI		Mean	95% CI	
Range: 0-1	N=2,642			N=4,035			N=6,234			N=9,203		
S2CLGSEARCH	**0.644**	0.617	0.671	**0.840**	0.821	0.859	**0.924**	0.913	0.935	**0.866**	0.854	0.879
S2TALKHSCNSL	**0.591**	0.561	0.622	**0.623**	0.593	0.653	**0.671**	0.650	0.693	**0.645**	0.622	0.669
S2CLGTOUR	**0.391**	0.359	0.423	**0.484**	0.458	0.509	**0.635**	0.615	0.655	**0.519**	0.500	0.538
S2JOBFAIR	**0.457**	0.429	0.485	**0.498**	0.469	0.527	**0.498**	0.474	0.523	**0.487**	0.463	0.510
S2CLGEXAMPREP	**0.298**	0.265	0.331	**0.388**	0.363	0.412	**0.524**	0.501	0.547	**0.422**	0.404	0.440
S2TALKCLGCNSL	**0.124**	0.105	0.143	**0.138**	0.116	0.160	**0.110**	0.098	0.121	**0.127**	0.115	0.138
	N=2,675			N=4,092			N=6,281			N=9,318		
S2AIDTALKPAR1	**0.574**	0.546	0.602	**0.690**	0.667	0.714	**0.747**	0.730	0.764	**0.710**	0.695	0.725
	N=2,658			N=4,067			N=6,253			N=9,274		
S2FRIENDCLG	**0.903**	0.888	0.919	**0.923**	0.908	0.937	**0.943**	0.935	0.952	**0.936**	0.928	0.944
	N=1,947			N=3,453			N=5,728			N=7,833		
S2MCNSLREC	**0.335**	0.300	0.369	**0.358**	0.333	0.384	**0.370**	0.350	0.390	**0.376**	0.359	0.394
S2MTCHRREC	**0.260**	0.230	0.290	**0.299**	0.275	0.323	**0.439**	0.417	0.461	**0.363**	0.345	0.380
S2MPARREC	**0.188**	0.165	0.211	**0.274**	0.249	0.299	**0.459**	0.436	0.482	**0.336**	0.316	0.356
S2MFAMREC	**0.113**	0.090	0.136	**0.153**	0.131	0.176	**0.204**	0.188	0.221	**0.162**	0.149	0.174
S2MEMPREC	**0.050**	0.038	0.061	**0.043**	0.028	0.058	**0.022**	0.016	0.028	**0.028**	0.022	0.035
S2MFRIEND	**0.205**	0.179	0.231	**0.232**	0.207	0.257	**0.327**	0.309	0.346	**0.265**	0.252	0.279

Source: U.S. Department of Education, National Center for Education Statistics, “High School Longitudinal Study of 2009 (HSLS:09),” 2009-16, First follow-up survey. Tabulations are author calculations.

Table D.5. Means, CI, and Sample Sizes Across Military Groups, Time Allocation

	HSENLIST			AFTERHS			PROP12		
Variable	Mean	95% CI		Mean	95% CI		Mean	95% CI	
	Junior Year								
Range: 0-1	N=146			N=133			N=3,741		
S2MCLUB	**0.041**	0.001	0.081	**0.003**	0.000	0.008	**0.029**	0.021	0.038

	HSENLIST			AFTERHS			PROP12		
Variable	Mean	95% CI		Mean	95% CI		Mean	95% CI	
S2SCLUB	**0.016**	0.000	0.033	**0.058**	0.013	0.102	**0.038**	0.030	0.045
S2SPORTS	**0.635**	0.529	0.742	**0.595**	0.398	0.793	**0.489**	0.460	0.517
S2ART	**0.135**	0.064	0.207	**0.101**	0.032	0.170	**0.189**	0.168	0.210
S2MUSIC	**0.270**	0.176	0.364	**0.389**	0.172	0.606	**0.285**	0.262	0.307
S2CLUB	**0.161**	0.090	0.232	**0.163**	0.099	0.227	**0.195**	0.176	0.213
S2DRAMA	**0.123**	0.060	0.186	**0.112**	0.032	0.192	**0.104**	0.086	0.122
	Freshman Year								
Range: 1-6*	N=163			N=140			N=3,242		
S1HRACTIVITY	**2.640**	2.337	2.942	**2.588**	2.274	2.901	**2.428**	2.349	2.507
S1HRWORK	**1.639**	1.395	1.882	**1.819**	1.528	2.111	**1.726**	1.649	1.803
S1HRFAMILY	**3.142**	2.783	3.502	**3.904**	3.437	4.372	**3.547**	3.412	3.683
S1HRFRIENDS	**3.224**	2.882	3.566	**3.311**	2.903	3.719	**3.321**	3.192	3.450
S1HRTV	**2.577**	2.257	2.898	**2.412**	2.096	2.728	**2.554**	2.448	2.660
S1HRVIDEO	**2.266**	1.920	2.613	**2.662**	2.183	3.141	**2.175**	2.080	2.271
S1HRONLINE	**2.288**	1.973	2.603	**2.095**	1.547	2.643	**2.388**	2.265	2.511

*Per day: 1=Less than 1 hour; 2=1-2 hours; 3=2-3 hours; 4=3-4 hours; 5=4-5 hours; 6=More than 5 hours
Source: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, Base year and first follow-up survey. Tabulations are author calculations.

Table D.6. Means, CI, and Sample Sizes Across Non-Military Groups, Time Allocation

	NOCLGORAD			NOTFOURYR			FOURYRCLG			FEMALE		
Variable	Mean	95% CI		Mean	95% CI		Mean	95% CI		Mean	95% CI	
	Junior Year											
Range: 0-1	N=2,486			N=3,866			N=5,969			N=8,773		
S2MCLUB	**0.028**	0.016	0.040	**0.031**	0.021	0.041	**0.063**	0.053	0.072	**0.037**	0.031	0.044
S2SCLUB	**0.034**	0.023	0.045	**0.047**	0.037	0.058	**0.078**	0.068	0.088	**0.054**	0.047	0.061
S2SPORTS	**0.315**	0.286	0.344	**0.444**	0.421	0.468	**0.610**	0.581	0.638	**0.417**	0.398	0.436
S2ART	**0.228**	0.203	0.253	**0.203**	0.183	0.223	**0.180**	0.165	0.195	**0.238**	0.224	0.253
S2MUSIC	**0.308**	0.283	0.334	**0.339**	0.314	0.364	**0.396**	0.376	0.417	**0.433**	0.416	0.450
S2CLUB	**0.125**	0.104	0.147	**0.200**	0.182	0.219	**0.285**	0.265	0.305	**0.220**	0.204	0.236
S2DRAMA	**0.101**	0.081	0.120	**0.141**	0.124	0.159	**0.161**	0.147	0.176	**0.162**	0.151	0.173
	Freshman Year											
Range: 1-6*	N=3,125			N=4,383			N=6,373			N=9,365		
S1HRACTIVITY	**2.107**	2.028	2.186	**2.359**	2.292	2.426	**2.770**	2.718	2.823	**2.415**	2.369	2.460
S1HRWORK	**1.863**	1.768	1.957	**1.565**	1.516	1.615	**1.328**	1.293	1.363	**1.498**	1.461	1.535
S1HRFAMILY	**3.634**	3.530	3.738	**3.621**	3.522	3.719	**3.315**	3.243	3.386	**3.584**	3.514	3.654
S1HRFRIENDS	**3.601**	3.500	3.702	**3.253**	3.170	3.336	**2.828**	2.764	2.893	**3.320**	3.246	3.393
S1HRTV	**2.702**	2.610	2.794	**2.563**	2.486	2.640	**2.205**	2.149	2.260	**2.394**	2.335	2.453
S1HRVIDEO	**2.107**	2.024	2.190	**1.910**	1.833	1.987	**1.590**	1.545	1.635	**1.303**	1.274	1.332
S1HRONLINE	**2.654**	2.555	2.752	**2.472**	2.393	2.551	**2.253**	2.197	2.309	**2.572**	2.519	2.624

*Per day: 1=Less than 1 hour; 2=1-2 hours; 3=2-3 hours; 4=3-4 hours; 5=4-5 hours; 6=More than 5 hours
Source: U.S. Department of Education, National Center for Education Statistics, “High School Longitudinal Study of 2009 (HSLS:09),” 2009-16, Base year and first follow-up survey. Tabulations are author calculations.

Table D.7. Means, CI, and Sample Sizes Across Military Groups, Attitudes About Mathematics

	HSENLIST			AFTERHS			PROP12		
Variable	**Mean**	**95% CI**		**Mean**	**95% CI**		**Mean**	**95% CI**	
Range: 0-1	N=150			N=133			N=3,808		
S2MPERSON1	**0.483**	0.372	0.593	**0.322**	0.198	0.445	**0.447**	0.422	0.472
S2SPERSON1	**0.549**	0.441	0.658	**0.626**	0.444	0.809	**0.482**	0.450	0.513
S2MLEARN	**0.799**	0.687	0.911	**0.856**	0.763	0.950	**0.786**	0.765	0.807
S2MBORN	**0.351**	0.253	0.449	**0.230**	0.092	0.368	**0.294**	0.269	0.320
S2MUSELIFE	**0.757**	0.636	0.878	**0.636**	0.416	0.857	**0.849**	0.831	0.866
S2MUSECLG	**0.983**	0.962	1.004	**0.915**	0.842	0.989	**0.960**	0.952	0.968
S2MUSEJOB	**0.863**	0.781	0.945	**0.863**	0.760	0.966	**0.883**	0.868	0.899

Source: U.S. Department of Education, National Center for Education Statistics, “High School Longitudinal Study of 2009 (HSLS:09),” 2009-16, First follow-up survey. Tabulations are author calculations.

Table D.8. Means, CI, and Sample Sizes Across Non-Military Groups, Attitudes About Mathematics

	NOCLGORAD			NOTFOURYR			FOURYRCLG			FEMALE		
Variable	**Mean**	**95% CI**		**Mean**	**95% CI**		**Mean**	**95% CI**		**Mean**	**95% CI**	
Range: 0-1	N=2,539			N=3,925			N=6,076			N=8,923		
S2MPERSON1	**0.351**	0.323	0.379	**0.428**	0.402	0.454	**0.542**	0.524	0.560	**0.395**	0.380	0.410
S2SPERSON1	**0.406**	0.376	0.437	**0.482**	0.455	0.509	**0.567**	0.546	0.588	**0.457**	0.440	0.474
S2MLEARN	**0.772**	0.745	0.798	**0.797**	0.779	0.815	**0.789**	0.774	0.804	**0.758**	0.744	0.772
S2MBORN	**0.236**	0.212	0.260	**0.262**	0.242	0.283	**0.310**	0.293	0.327	**0.273**	0.255	0.292
S2MUSELIFE	**0.864**	0.847	0.882	**0.842**	0.824	0.860	**0.857**	0.843	0.871	**0.852**	0.839	0.865
S2MUSECLG	**0.952**	0.941	0.963	**0.969**	0.962	0.977	**0.975**	0.969	0.981	**0.963**	0.956	0.969
S2MUSEJOB	**0.895**	0.878	0.911	**0.890**	0.876	0.903	**0.887**	0.873	0.901	**0.888**	0.878	0.899

Source: U.S. Department of Education, National Center for Education Statistics, “High School Longitudinal Study of 2009 (HSLS:09),” 2009-16, First follow-up survey. Tabulations are author calculations.

Table D.9. Means, CI, and Sample Sizes Across Military Groups, Parental Indicators

	HSENLIST			AFTERHS			PROP12		
Variable	**Mean**	**95% CI**		**Mean**	**95% CI**		**Mean**	**95% CI**	
Range: 1-4*	N=68			N=44			N=843		
P2DISCCOURSES	**2.830**	2.543	3.116	**2.630**	2.048	3.212	**3.105**	3.006	3.204
P2DISCCLGEXAM	**2.800**	2.525	3.075	**2.253**	1.856	2.650	**2.737**	2.626	2.849
P2DISCCLGAPP	**2.647**	2.287	3.006	**2.449**	2.044	2.853	**2.819**	2.685	2.953
P2DISCCAREER	**3.474**	3.262	3.686	**2.878**	2.160	3.596	**3.462**	3.374	3.550
P2DISCJOBS	**3.303**	3.096	3.509	**2.653**	2.103	3.204	**3.331**	3.242	3.421

	HSENLIST			AFTERHS			PROP12		
Variable	Mean	95% CI		Mean	95% CI		Mean	95% CI	
P2DISCEVENTS	**3.277**	3.016	3.538	**2.366**	1.263	3.469	**3.059**	2.946	3.172
P2DISCTROUBLE	**3.557**	3.334	3.779	**2.756**	2.137	3.374	**3.568**	3.499	3.636
Range: 0-1	N=69			N=46			N=848		
P2JOBFAIR	**0.249**	0.119	0.379	**0.121**	0.000	0.245	**0.224**	0.185	0.264
P2CLGTOUR	**0.407**	0.264	0.551	**0.226**	0.027	0.424	**0.377**	0.327	0.426
P2CLGSEARCH	**0.605**	0.462	0.748	**0.445**	0.091	0.800	**0.624**	0.580	0.668
P2TALKHSCNSL	**0.464**	0.314	0.615	**0.616**	0.294	0.938	**0.510**	0.461	0.558
P2TALKCLGCNSL	**0.193**	0.057	0.329	**0.074**	0.000	0.160	**0.122**	0.093	0.150
P2CLGEXAMPREP	**0.302**	0.170	0.434	**0.267**	0.040	0.493	**0.385**	0.331	0.440
Ranges: Vary	N=72			N=46			N=890		
P2HISP1	**0.121**	0.010	0.232	**0.571**	0.231	0.911	**0.187**	0.146	0.228
X2PAR1EDU**	**3.550**	3.075	4.026	**2.536**	1.954	3.119	**3.153**	2.980	3.327
X1PAR1EDU**	**2.872**	2.501	3.243	**2.349**	2.012	2.686	**2.663**	2.533	2.792
X1SESQ5***	**3.249**	2.843	3.655	**2.257**	1.294	3.221	**2.790**	2.653	2.926

* Since the 2012-11 school year began: 1=Never; 2=Once or twice; 3=Three or four times; 4=More than four times
** 1=Less than high school; 2=High school diploma or GED; 3=Associate's degree; 4=Bachelor's degree; 5=Master's degree; 6=Educational specialist diploma; 7=PhD/MD/JD
*** 1=1st Quintile; 2=2nd Quintile; 3=3rd Quintile; 4=4th Quintile; 5=5th Quintile
Source: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, Base year and first follow-up survey. Tabulations are author calculations.

Table D.10. Means, CI, and Sample Sizes Across Non-Military Groups, Parental Indicators

	NOCLGORAD			NOTFOURYR			FOURYRCLG			FEMALE		
Variable	Mean	95% CI		Mean	95% CI		Mean	95% CI		Mean	95% CI	
Range: 1-4*	N=907			N=1,534			N=2,524			N=2,589		
P2DISCCOURSES	**2.960**	2.859	3.061	**3.101**	3.023	3.179	**3.299**	3.250	3.348	**3.172**	3.117	3.227
P2DISCCLGEXAM	**2.351**	2.247	2.455	**2.844**	2.759	2.930	**3.396**	3.339	3.453	**3.005**	2.937	3.073
P2DISCCLGAPP	**2.517**	2.387	2.647	**3.018**	2.905	3.130	**3.418**	3.355	3.482	**3.161**	3.078	3.244
P2DISCCAREER	**3.296**	3.197	3.394	**3.431**	3.374	3.488	**3.637**	3.593	3.682	**3.528**	3.479	3.577
P2DISCJOBS	**3.254**	3.172	3.337	**3.251**	3.139	3.362	**3.269**	3.209	3.330	**3.278**	3.212	3.345
P2DISCEVENTS	**2.685**	2.573	2.797	**3.030**	2.935	3.126	**3.375**	3.312	3.437	**3.073**	2.999	3.146
P2DISCTROUBLE	**3.395**	3.307	3.483	**3.464**	3.403	3.524	**3.601**	3.556	3.645	**3.571**	3.522	3.620
Range: 0-1	N=909			N=1,544			N=2,543			N=2,612		
P2JOBFAIR	**0.222**	0.179	0.265	**0.248**	0.202	0.294	**0.294**	0.267	0.321	**0.284**	0.258	0.310
P2CLGTOUR	**0.308**	0.266	0.349	**0.462**	0.415	0.509	**0.604**	0.573	0.636	**0.522**	0.494	0.551
P2CLGSEARCH	**0.515**	0.464	0.565	**0.619**	0.576	0.661	**0.838**	0.816	0.859	**0.740**	0.712	0.769
P2TALKHSCNSL	**0.487**	0.436	0.538	**0.472**	0.415	0.528	**0.538**	0.507	0.569	**0.506**	0.473	0.540
P2TALKCLGCNSL	**0.141**	0.100	0.182	**0.140**	0.113	0.168	**0.161**	0.138	0.184	**0.159**	0.136	0.181
P2CLGEXAMPREP	**0.247**	0.203	0.292	**0.410**	0.373	0.448	**0.616**	0.584	0.648	**0.478**	0.448	0.509
Ranges: Vary	N=975			N=1,628			N=2,642			N=2,742		
P2HISP1	**0.242**	0.201	0.284	**0.260**	0.209	0.295	**0.108**	0.084	0.132	**0.205**	0.177	0.233

	NOCLGORAD			NOTFOURYR			FOURYRCLG			FEMALE		
X2PAR1EDU**	**2.530**	2.398	2.663	**3.025**	2.908	3.142	**4.084**	3.968	4.200	**3.328**	3.224	3.432
X1PAR1EDU**	**2.181**	2.089	2.273	**2.585**	2.499	2.671	**3.422**	3.332	3.511	**2.813**	2.733	2.893
X1SESQ5***	**2.150**	2.050	2.250	**2.687**	2.569	2.806	**3.763**	3.673	3.854	**2.960**	2.870	3.051

* Since the 2012-11 school year began: 1=Never; 2=Once or twice; 3=Three or four times; 4=More than four times
** 1=Less than high school; 2=High school diploma or GED; 3=Associate's degree; 4=Bachelor's degree; 5=Master's degree; 6=Educational specialist diploma; 7=PhD/MD/JD
*** 1=1st Quintile; 2=2nd Quintile; 3=3rd Quintile; 4=4th Quintile; 5=5th Quintile
Source: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, Base year and first follow-up survey. Tabulations are author calculations.

Appendix E. Correlation Analysis

The descriptive statistics above provide information about the distribution of values for a given variable for the general youth population surveyed in HSLS09. However, it is also important to understand which variables have significant associations among our seven groups. Correlations give a sense of the magnitude and direction of variable interrelationships and can be tested for statistical significance. Pairwise correlations that were statistically significant at the five percent significance level (or less) are starred in the tables throughout this section.[143] However, similar to the earlier discussion, this section will focus on correlations that also are *practically* significant—where the correlation is statistically significant at $p < .05$ and are at least +/- 0.10 in magnitude.[144] The range in number of pairwise observations for each correlation is provided below the table.[145]

The goal of these correlations is to get an understanding of which influencers and sources of information are relevant for each population. The tables correspondingly cover the variables of interest on influencers, topics of conversation, and engagement in activities related to planning for life after high school. Additional variables in this analysis provide further context for youths' information networks, to shed insight into which attributes are associated with each population, for example, whether military enlistees are positively correlated with certain high school activities, or whether females are associated with certain attitudes about self-efficacy that could impact their decision-making process.

Table E.1 shows the correlations for two influencers emphasized in the literature, mothers and fathers—parents. For junior year, included are whether parents were influential in math course selection and whether the student discussed financial aid for college with parents (mothers and fathers were not broken out separately).

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143 The test statistic for whether a correlation differs significantly from zero is: $t = r / \text{sqrt}[(1—r^2)/(n—2)]$. The degrees of freedom are approximated as n-2. This implies that for a sample size of 13,000, a correlation of about .017 in absolute value would differ significantly from zero at a significance level of 0.05 ($p<.05$). Although only the statistical significance of each correlation's difference from zero is discussed here, it is also possible to test whether one correlation is statistically different from another correlation. The test statistic for whether the difference between two correlations is significantly different from zero is calculated as $t = (r_1 – r_2)/(\text{sqrt}((1– r_1^2)/(n_1 – 2) + (1– r_2^2)/(n_2 – 2))$. The degrees of freedom are approximated as $(n_1\text{-}2) + (n_2\text{-}2)$. This implies that for a sample size of approximately 13,000 for each correlation, a difference of 0.024 in absolute value would be statistically significant at a 0.05 confidence level ($p<.05$). The significance tests applied to the results in this section accounted for the survey sample weights, which minimally increased the magnitudes of the standard errors.

144 I use a threshold of 0.10 because the share of variance in one variable explained by the other variable is r^2. So, at 0.10, one percent of the variance is explained.

145 The sample sizes are large for the HSENLIST and AFTERHS variables even though the number of actual enlistees was small. This is because in the table below, all observations not "1" or "missing" for a given variable were defined as "0," Thus, while there were 361 total active duty enlistees in our sample, the number of related observations for both enlistment variables was much higher.

Table E.1. Selected Influencer Correlations, Parents

Variable	HSENLIST	AFTERHS	PROP12	FOURYR*	TWOYR*	NOCLG*	FEMALE
Freshman Year							
S1MOMTALKM	-0.025**	-0.026**	-0.063**	0.204**	-0.055**	-0.159**	0.077**
S1MOMTALKOTH	-0.006	-0.042**	-0.078**	0.194**	-0.046**	-0.163**	0.098**
S1MOMTALKCLG	-0.019**	-0.005	-0.064**	0.159**	0.000	-0.169**	0.117**
S1MOMTALKJOB	0.000	0.015	-0.025**	0.111**	-0.014	-0.108**	0.124**
S1DADTALKM	-0.005	-0.012	-0.046*	0.227**	-0.092**	-0.154**	-0.029**
S1DADTALKOTH	-0.002	-0.013	-0.039**	0.205**	-0.064**	-0.159**	-0.031**
S1DADTALKCLG	-0.006	0.01	-0.040*	0.188**	-0.024**	-0.184**	-0.029**
S1DADTALKJOB	-0.003	-0.016	-0.015	0.151**	-0.035**	-0.134**	-0.074**
Junior Year							
S2MPARREC	-0.025**	-0.024**	-0.042**	0.228**	-0.085**	-0.160**	0.034**
S2AIDTALKPAR1	-0.034**	0.015	-0.048**	0.114**	0.020**	-0.133**	0.088**

*FOURYRCLG; NOTFOURYR; NOCLGORAD shortened for formatting.
Note: N's range from 11,150 – 12,890 freshman year and 10,570 – 13,330 junior year.
Source: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, Base year and first follow-up survey. Correlations are author calculations.

Although several correlations for the military outcomes are statistically significant, none are practically significant. The same is true for youth who were propensed during junior year and for youth who went on to attend a two-year college. While being female was modestly correlated with speaking to mothers about courses, college, and jobs freshman year, the same was not true of speaking with their fathers across topics. Thus, females were a bit more likely to speak with their mothers than fathers about these topics freshman year. And, they were slightly more likely to discuss financial aid for college with their parents than were their male counterparts.

The strongest correlations for parental influence were across two groups—youth who did not enroll in college and youth who went on to attend a four-year college. Interestingly, they show the opposite in terms of influence. Youth who neither enrolled in the college nor enlisted showed negative correlations with speaking to their parents across topics freshman year. They also showed negative correlations with speaking to their parents junior year about their math course and about financial aid for college.

In contrast, four-year college bound youth showed positive correlations with speaking to both of their parents across topics freshman and junior year. Speaking with parents about courses had the strongest correlation freshman and junior year, followed by speaking to parents about college.

Table E.2 provides selected correlations for speaking with friends about selected topics freshman and junior year of high school.

Table E.2. Selected Influencer Correlations, Friends

Variable	HSENLIST	AFTERHS	PROP12	FOURYR*	TWOYR*	NOCLG*	FEMALE
Freshman Year							
S1FRNDTALKM	-0.016	-0.034**	-0.068**	0.120**	-0.052**	-0.067**	0.100***
S1FRNDTLKOTH	-0.005	0.014	-0.056**	0.121**	-0.035**	-0.090**	0.124**
S1FRNDTLKCLG	-0.003	-0.034**	-0.087**	0.104**	-0.005	-0.104**	0.173***
S1FRNDTLKJOB	0.012	-0.031**	-0.044**	0.079**	-0.019**	-0.068**	0.146**
Junior Year							
S2MFRIEND	-0.013	-0.025**	-0.016	0.117**	-0.052**	-0.073**	-0.012
S2FRIENDCLG	0.010	-0.003	-0.015	0.053**	-0.008	-0.051**	0.043**

*FOURYRCLG; NOTFOURYR; NOCLGORAD shortened for formatting.
Note: N ranges from 11,930 – 13,030 freshman year and 10,570 – 13,260 junior year.
Source: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, Base year and first follow-up survey. Correlations are author calculations.

Talking to friends about courses and college freshman year was positively correlated with being a four-year college bound youth and being female. Being female also was correlated with speaking to friends about future jobs freshman year. In contrast, youth that did not go on to attend college or enlist in the military showed a modest negative correlation with speaking to friends about courses freshman year.

In junior year, youth who subsequently attended a four-year college were more likely to speak to their friends about their math course (S2MFRIEND). Although many youth spoke with their friends about life after high school junior year, there were no practically significant correlations during junior year for such discussions for the groups shown in Table E.2.

Table E.3 looks at the influence of teachers and guidance counselors during freshman year and junior year. As true for parents and friends, only included are topics of discussion relevant to youth career and educational information networks.

Table E.3. Selected Influencer Correlations, Teachers and Counselors

Variable	HSENLIST	AFTERHS	PROP12	FOURYR*	TWOYR*	NOCLG*	FEMALE
Freshman Year							
S1TCHTALKM	-0.023**	0.026**	-0.050**	0.091**	-0.027**	-0.062**	0.050**
S1TCHTALKOTH	-0.001	0.036**	-0.018**	0.053**	-0.008	-0.045**	0.049**
S1TCHTALKCLG	0.008	0.022**	-0.024**	0.009	0.005	-0.012	0.072**
S1TCHTALKJOB	-0.005	-0.006	-0.008	0.029**	-0.012	-0.019**	0.079**
S1CNSLTALKM	-0.011	-0.008	-0.022**	0.072**	-0.027*	-0.045**	0.047**
S1CNSLTLKOTH	-0.009	-0.015	-0.017	0.071**	-0.026**	-0.045**	0.050**
S1CNSLTLKCLG	-0.007	-0.011	-0.001	0.009	-0.002	-0.005	0.063**
S1CNSLTLKJOB	-0.003	0.005	0.017	0.000	-0.002	0.003	0.039**
Junior Year							

Variable	HSENLIST	AFTERHS	PROP12	FOURYR*	TWOYR*	NOCLG*	FEMALE
S2MTCHRREC	-0.025**	0.013	-0.044**	0.162**	-0.074**	-0.095**	0.034**
S2MCNSLREC	-0.009	0.034**	0.004	0.022**	0.001	-0.024**	0.027**
S2TALKHSCNSL	-0.029**	0.006	-0.049**	0.065**	-0.011	-0.050**	0.026**

*FOURYRCLG; NOTFOURYR; NOCLGORAD shortened for formatting.
Note: N ranges from 11,990 – 13,060 freshman year and from 10,570 – 13,300 junior year.
Source: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, Base year and first follow-up survey. Correlations are author calculations.

Although there are statistically significant correlations, only one is practically significant—four-year college bound youth talking to their teachers junior year about math course selection. Other correlations follow similar positive and negative trends as with parents and friends, although they are not large in magnitude. Regression analysis, as is done in the next section, can shed additional perspective on the guidance counselor's footprint. However, the lack of strength in these correlations for guidance counselors could suggest that their impact is relatively limited.

Table E.4 addresses some life and college planning activities youth may engage in during high school. Not included are activities few youth participated in as seen in the descriptive statistics, such as taking a college course and completing an internship.

Table E.4. Selected Correlations, College and Career Planning Activities Junior Year

Variable	HSENLIST	AFTERHS	PROP12	FOURYR*	TWOYR*	NOCLG*	FEMALE
S2CLGTOUR	-0.025**	0.003	-0.035**	0.188**	-0.046**	-0.148**	0.042**
S2CLGSEARCH	-0.006	-0.002	-0.087**	0.210**	0.041**	-0.267**	0.149**
S2JOBFAIR	-0.019**	0.014	0.000	0.018**	0.019**	-0.038**	0.007
S2CLGEXAMPREP	-0.020**	0.009	-0.069**	0.172**	-0.038**	-0.139**	0.024**
S2TALKCLGCNSL	-0.009	-0.034**	-0.003	-0.029**	0.035**	0.002	0.015

*FOURYRCLG; NOTFOURYR; NOCLGORAD shortened for formatting.
Note: N ranges from 12,220 – 13,330.
Source: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, Base year survey. Correlations are author calculations.

As with influencers, there is a clear contrast in career and educational information seeking activities between youth who go on to a four-year college and those that do not attend college. Attending a four-year college was correlated with searching for information online, going on college tours, and participating in some form of college exam preparation. Being female was also positively correlated with searching for information online. Youth who did not go on to attend college were less likely to undertake these actions.

Table E.5 provides correlations related to time allocation and extracurricular activities in freshman and junior year.

Table E.5. Selected Correlations, Time Allocation and Activities

Variable	HSENLIST	AFTERHS	PROP12	FOURYR*	TWOYR*	NOCLG*	FEMALE
Junior Year							
S2SPORTS	0.035**	0.031**	0.033**	0.217**	-0.053**	-0.184**	-0.134**
S2ART	-0.0152	-0.029**	-0.006	-0.037**	0.003	0.044**	0.089**
S2MUSIC	-0.018	0.007	-0.062**	0.073**	-0.020**	-0.052**	0.167**
S2CLUB	-0.011	-0.017	-0.006	0.140**	-0.022**	-0.126**	0.040***
S2DRAMA	-0.004	-0.011	-0.037**	0.050**	0.003	-0.058**	0.093**
Freshman Year							
S1HRACTIVITY	0.018	0.013	-0.008	0.153**	-0.054**	-0.113**	-0.028**
S1HRWORK	0.007	0.040**	0.076**	-0.148**	-0.012	0.170**	-0.052**
S1HRFAMILY	-0.025**	0.022**	0.013	-0.076**	0.026**	0.060**	0.050**
S1HRFRIENDS	0.006	-0.003	0.043**	-0.145**	0.021**	0.134**	0.053**
S1HRTV	0.016	-0.007	0.055**	-0.110**	0.031**	0.081**	-0.045**
S1HRVIDEO	0.040**	0.071**	0.118**	-0.149**	0.041**	0.109**	-0.352**
S1HRONLINE	-0.001	-0.033**	0.003	-0.083**	0.010	0.082**	0.096**

*FOURYRCLG; NOTFOURYR; NOCLGORAD shortened for formatting.
Note: N ranges from 12,020 – 13,170 junior year and from 11,610 – 12,900 freshman year.
Source: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, Base year and first follow-up survey. Correlations are author calculations.

How youth across groups chose to spend their time freshman and junior year is consistent with previous trends. In junior year, youth who went on to attend a four-year college showed the strongest positive correlations with participating in extracurricular activities, particularly sports and clubs. In contrast, not attending college was negatively associated with sports and clubs. Being female also was negatively associated with sports. Instead, it was positively correlated with other activities, particularly music.

As early as freshman year, youth who went on to attend a four-year college were more likely to engage in extracurricular activities (S1HRACTIVITY). They were less likely to engage in non-extracurricular activities such as spending time with friends, watching TV, and playing video games. Females also were less likely to play video games. In contrast, youth who were propensed in high school and youth who did not go on to attend college were modestly more likely to spend time playing video games freshman year. Being non-college bound was also negatively correlated with extracurricular activities and positively correlated with having a job and spending time with friends.

Finally, Table E.6 considers youth perceptions about their mathematical abilities junior year.

Table E.6. Youth Self-Perception About Mathematical Ability

Variable	HSENLIST	AFTERHS	PROP12	FOURYR*	TWOYR*	NOCLG*	FEMALE
S2MPERSON1	0.009	-0.031**	0.024**	0.143**	-0.028**	-0.122**	-0.092**

*FOURYRCLG; NOTFOURYR; NOCLGORAD shortened for formatting.
Note: N ranges from 12,130 – 13,180.
Source: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, First follow-up survey. Correlations are author calculations.

Being non-college bound or female was modestly negatively correlated with considering oneself as a "math person." In contrast, youth who went on to attend four-year colleges had the strongest positive correlation with believing in their mathematical abilities.

Summary

Across variables, correlations are strongest for youth who went to a four-year college and youth who neither went to college nor served in active duty military. Youth who did not go on to attend college had solidly negative correlations across all influencers, suggesting these youth were generally less engaged in thinking about and planning for life after high school during high school. In contrast, youth who went on to attend four year college had solidly positive correlations across influencers. One implication is that youth who do not attend college or enlist have more limited information networks, while those attending four-year college have larger networks. Regarding females, mothers and friends have the strongest correlation regarding potential influence concerning career and educational planning.

Youth who went on to enroll in two-year college were somewhere in between no college and four-year college youth, generally looking more like youth that did not enroll in college but with correlations of smaller magnitude that were not practically significant. One possible hypothesis for why youth in this group look more like youth who did not attend college could be that many of these youth may be unsure of what to do after high school and were therefore not as actively engaged in college planning or information network building during high school. Community colleges are open access institutions and as such, must accept anyone who wants to matriculate.

References

Blackstone, Tanja F. et al., “Enlisted Recruit Candidate Market Depth Analysis: Final Report,” Naval Air Warfare Center Training Systems Division April 2018.

Center for Naval Analyses, “Population Representation in the Military Services: FY2016 Summary Report,” 2017.

Goldberg, Matthew, et al., “Geographic Diversity in the Military,” Institute for Defense Analysis, 2019.

Granovetter, Mark, “The Strength of Weak Ties,” *American Journal of Sociology*, 78:1360-80, 1973.

Horton, Joann, “Identifying At-Risk Factors That Affect College Student Success,” *International Journal of Process Education*, Vol 7, Issue 1, June 2015.

Hume, Susannah and Jessica Heal, “Moments of Choice,” Behavioural Insights Team, 2016.

JAMRS, “The Prospect’s Journey Told Through the Experiences of Propensed Youth,” U.S. Department of Defense, 2018.

Kahneman, Daniel, *Thinking Fast and Slow*, Farrar, Straus, and Giroux Books, New York, NY: 2011.

Klasik, Daniel et al., “Out of the Education Desert: How Limited Local College Options are Associated with Inequity in Postsecondary Opportunities,” Center for Education Policy Analysis (CEPA), Stanford University, Working Paper No. 18-15, 2018.

Michie, Susan et al., ABC of Behaviour Change Theories, Silverback Publishing, Great Britain: 2014.

National Commission on Military, National, and Public Service, “Interim Report,” January 2019.

Perry, Brea L., Bernice A. Pescosolido, and Stephen P. Borgatti, *Egocentric Network Analysis: Foundations, Methods, and Models*, Cambridge University Press, New York, NY, 2018.

Phillips, Dave and Tim Arango, “Who Signs Up to Fight? Makeup of U.S. Recruits Shows Glaring Disparity,” *New York Times*, January 2020.

Pristic, Max, “Regional Differences In Higher Education: Where Is The Best Place To Go To College?,” Forbes, 2016.

Robbins, Gary, *Doing Social Network Research: Network-Based Research Design for Social Scientists*, Sage Publications Ltd: Thousand Oaks, CA, 2015.

Schoon, Ingrid and Jeylan Mortimer, Youth and the Great Recession: Are values, achievement orientation and outlook to the future affected?, International Journal of Psychology, Vol. 52, No. 1, 1-8, 2017.

U.S. Department of Defense, "Chapter 2: The Recruiting Process," Accessed September 7, 2019: https://prhome.defense.gov/portals/52/Documents/POPREP/poprep99/html/chapter2/c2_recruiting.html.

U.S. Department of Education, High School Longitudinal Survey of 2009 (HSLS09), survey questionnaires and complete documentation available online: https://nces.ed.gov/surveys/hsls09/hsls09_data.asp.

Werner, Ben, "Military Branches Are Doing More to Recruit Women into Active Duty," USNI News, April 2018.

Wyner, Joshua et al., "Achievement Trap: How America is Failing Millions of High-Achieving Students from Low-Income Families," Jack Kent Cooke Foundation, June 2018.

Dissertation

Youth Information Networks and Propensity to Serve in the Military

Network Analysis and Policy Implications

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Abstract

Understanding how youth make the decision to serve or not serve in the military requires understanding the processes by which youth approach major life decisions. This report uses concepts from social network analysis to visualize and describe how young Americans are building and using career and educational information networks as part of their decision-making process for life after high school. It then provides insights and implications for military recruitment planners about how to more effectively engage target youth. It is the third and final part of a larger study on youth decision-making to serve in the military. The insights and implications for military planners are drawn in part from that earlier work.

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Abbreviations

COM-B	Capabilities-Opportunity-Motivation—Behavior
DEP	Delayed Entry Program
HSLS09	High School Longitudinal Survey of 2009
JAMRS	Joint Advertising and Marketing Research Studies
DoD	U.S. Department of Defense
HSPC	Human Subjects Protection Committee
IRB	Institutional Review Board
SNA	Social Network Analysis
TPB	Theory of Planned Behavior

1. Introduction

This report is the third and final report of a study on how youth make the decision of whether or not to serve in the military. The first part was a review of the relevant literature, the second provided quantitative and qualitative data methods and exploratory analysis. This final portion of the research provides: (1) social network visualizations of youth information networks by category of youth, (2) some analysis of those networks and differences between them, and (3) implications for military recruitment planners to more effectively engage and attract youth.

Policy Problem

It is well-known that military recruiting has long presented challenges, as has the ability to retain members that do eventually serve. Recent trends demonstrate difficulty in youth military recruitment, exacerbated by a very low unemployment rate and a reversal in policy which now increases end-strength in some elements of the armed services. Adding to complexity is a strain in available resources for recruitment – recruiters, enlistment incentives, marketing, scholarships, etc. – which is a resource intensive enterprise. There is a generally accepted reality that recruiters and talent acquisition planners must do more with less.[146]

The looming challenge, and concern for meeting future recruiting requirements, holds particularly for active-duty service members, both enlisted and officers. To meet this challenge, military planners will need to continue to enhance the current approach to recruitment. This study focused on helping planners by providing a more comprehensive understanding of how youth make the decision to serve and the nature and role of their information networks.

Scope of Research

More than 80 percent of military recruiting efforts focus on enlisted service members.[147] (Officers are mainly commissioned through college or university ROTC programs and the military academies; they number far less than the enlisted force.) Therefore, this research study focuses primarily on new enlisted recruits entering military service. Further, the focus of this study will be on active component members, since Reserve and National Guard recruits represent a different set of the population with different demographics, desires, and expectations than active-duty recruits.

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[146] Very recent COVID-19 physical distancing-related effects on military recruiting are outside the scope of this research and are not considered in this paper.

[147] Center for Naval Analyses, "Population Representation in the Military Services: FY2016 Summary Report," 2017.

This research will also focus on new recruits either joining immediately out of high school or entering service as an enlisted member within the first few years after graduation. That puts the target age range of consideration at 17–21 years old, which represents the lion's share of new enlistees.

Although many factors go in to the decision to serve in the military, some factors are outside of military control.[148] In reality, the majority of youth are not qualified for service; less than 30 percent of youth aged 17-24 are considered "qualified military eligible."[149] As explained in a recent report from the National Commission on Military, National, and Public Service, "Medical issues, weight, body art, a history of drug use, failure to attain a high school degree, or a criminal record may disqualify a person from military service."[150] In addition to these criteria, the military also considers if the youth received a high school diploma (not a GED) and the youth's score on the Armed Forces Qualification Test (AFQT), which is desired to be at or above the 50th percentile.[151] All prospective recruits must take the AFQT, and low scores could be grounds for not moving forward with the application.[152]

Data Sources

This research is a mixed methods study, with quantitative and qualitative data components. The quantitative data consists of a U.S. Department of Education longitudinal survey, the High School Longitudinal Survey of 2009 (HSLS09). The survey is a nationally representative, longitudinal study of over 25,000 ninth graders from 944 U.S. schools who were high school freshmen in the 2009-2010 academic year. There was a first follow-up survey administered during junior year of high school, along with a second follow-up three years after high school graduation. The qualitative data consists of 68 interviews—44 interviews with newly enlisted U.S. Air Force recruits and 24 interviews with high school juniors. Interviews were conducted from January to July of 2019, with one exception in October 2019. For more information on the data and analytic methods used in the exploratory analysis, see Paper Two of this research study.

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148 For example, social-emotional wellbeing, family dynamics, and incompatible career or educational preferences.

149 Blackstone, Tanja F. et al., "Enlisted Recruit Candidate Market Depth Analysis: Final Report," Naval Air Warfare Center Training Systems Division April 2018.

150 National Commission on Military, National, and Public Service, "Interim Report," January 2019.

151 The AFQT is derived from the Armed Services Vocational Aptitude Battery (ASVAB) exam, which is administered in select high schools and military recruiting locations across the country.

152 U.S. Department of Defense, "Chapter 2: The Recruiting Process," Accessed September 7, 2019: https://prhome.defense.gov/portals/52/Documents/POPREP/poprep99/html/chapter2/c2_recruiting.html.

Research Questions

As noted, this report is the third and final part of a larger study on how high school youth make career and educational decisions with an emphasis on the decision to serve in the military.[153] It provides a preliminary assessment of research question three of the larger study.

Specifically, the larger research study addressed the following three main questions:

10. Framework: How can existing theories on youth decision-making be integrated to better explain how youth access and consume career and educational information [in high school] when deciding on post-high school plans?
11. Analytic: Who are the major influencers and what are the major sources of information that youth engage with to make decisions about life after high school and joining the military, what is their relative importance, what is the timing of the engagements, and what attributes are associated with differences youths' information networks?
12. Policy: How can military recruitment policy planners leverage this information on how today's youth and their influencers are accessing and consuming educational, career, and military information to be more effective in reaching and recruiting desirable youth populations?

Policy Implications

At its core, the policy objective of this research is to assist planners in allocating outreach and recruitment resources in a way that effectively reaches target youth populations and their influencers. Potential policy insights that may be yielded from this research include:

- The extent to which services' outreach and recruiting efforts are reaching youth and/or their key influencers and/or key sources of information
- The extent to which this is happening at the age that the literature and this research suggest would have the biggest influence
- How military recruitment planners can address information shortfalls, gaps, and timing issues that may be identified
- How the desirable timing and content of marketing campaigns change as youth characteristics vary
- How findings might be used to strengthen effectiveness and efficiency of marketing outreach and recruiting, such as reaching desirable youth populations for recruitment that might be engaged more effectively
- How findings might be used to help youth to pursue a military option when it is in their interest/could benefit them (e.g., those not attending college or attending college but needing assistance or youth looking for something more or different)

[153] Paper One of this study, "Youth Information Networks and Propensity to Serve in the Military: A Review of Relevant Literature," was a review of the relevant literature.

Outline of this Report

The report is structured as follows: Chapter 2 provides some background on social network analysis and the methods used in this research. Chapter 3 provides an overview of youth information network visualizations along with factors embedded in the design. Chapter 4 visualizes youth information networks across outcomes of interest. Chapter 5 explores policy implications for military recruitment planners. Chapter 6 provides conclusions.

2. Social Network Analysis

Social Network Analysis

Social Network Analysis (SNA) is the study of how people's connections, and the relationships among them, influence attitudes, norms, behaviors, and decisions. Social network research, particularly from the individual's perspective, has proliferated over the last decade as a way of understanding influence and behaviors. This is because the relatively recent move toward heightened interconnectedness in society suggests understanding the impact of networks on decision-making may provide meaningful policy insights.[154]

There are two distinct types of social networks. First, there is the whole, or sociocentric, network. This is a closed network where all members are known, and all connections among members are known. The second is ego networks, also known as egocentric or personal networks. Ego networks are open, with one individual acting as the focal point or node, known as the "ego." The network consists of all known connections of that individual, or "alters," and sometimes also includes the connections between those alters.[155] Alters are typically people, but can also be places, events, organizations, or other connections an individual might have.

This research studies networks at the individual level, or ego networks, with the goal of providing a better understanding of how young people make post-high school career and educational decisions.[156] This requires data collection from the individual's perspective, through detailed interviews, surveys, or both. The analysis presented here is mixed methods and employs elements of both, although the populations are different.

Social Network Analysis Principles

In the book *Egocentric Network Analysis*, the authors posit eight "basic principles" that should be considered in any egocentric network analysis. These principles provide a theoretical underpinning for ego-centric network research design. They are:

1. "Connections are a key mechanism of social action (p. 7)."

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[154] For more, see "Youth Information Networks and Propensity to Serve in the Military: A Review of Relevant Literature" for Paper One of this study.

[155] Hanneman, Robert and Mark Riddle, *Introduction to Social Network Methods*, Chapter 9: Ego Networks.

[156] For example, a 2018 study of 13,000 children aged 7-11 on setting career aspirations shows the importance of understanding the role of key influencers and the availability of information in their networks. The study, "Drawing the Future," found that "Children overwhelmingly learned about their chosen job through a family member or teacher; fewer than 1 percent of children had learned about a job from someone in the career coming to their school." See https://www.edweek.org/ew/articles/2020/01/22/students-dream-jobs-out-of-sync-with.html?cmp=eml-enl-eu-news1&M=59026218&U=2931416&UUID=af3d1ac8ef3376838013ad464399f16c.

Decisions can be passive or active – shaped by habits of one's status in the network or shaped by purposeful intentions to act independently of those habits.

2. "Human networks are fundamental building blocks of non-human entities such as institutions, cultures, communities, and social systems (p. 8)."

Although this study considers the micro perspective—ego networks—it is important to contextualize this perspective. Individual networks form the basis of surrounding culture, which "affects what people do, how they feel, and what happens to them (p. 8)."[157]

3. "Four dimensions of social networks are distinct – structure, function, strength, and content (p. 9)."

The four dimensions of networks provide different levels of understanding about the individual and his/her decision-making process. According to the authors:

> "Structure reflects the architectural aspect of networks, including the presence and patterns of linkages between actors…function [is about] the types of exchanges, services, or supports accessible through ties to alters…strength [is about] the intensity and duration of bonds between an ego and alters…[and] content [is about the] attitudes, opinions, and beliefs [within the network and] provides information about actors' active or potential access to economic or cultural capital and other resources (p. 9)."

4. "Networks are a function of interactions among these four dimensions (p. 10)."

The four dimensions of a network define an individual's interactions and "influence individual outcomes and behaviors (p. 10)."

5. "Network ties are not always beneficial (p. 10)."

Networks can be beneficial, enabling positive outcomes such as "employment advantages, reduced stress, transfer [of] key information, and shaping of identity (p. 10)." However, network ties can be damaging if they reinforce a lack of opportunity and/or negative behaviors. An individual's network could reinforce inequity, for example, if the individual starts in a disadvantaged position and does not have others to provide access to advancement.[158]

6. "'More' is not necessarily better with regard to social ties (p. 11)."

There is a trade-off concerning the number of ties an individual can have and the associated range of influence. This is particularly relevant to the content and function of the network.

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[157] The text gives the example of whether soldiers stayed or deserted their posts during the Paris Commune of 1871. Those who were in units with people they grew up with were more likely to stay and fight than those who did not have any previous connections to their unit.

[158] The text gives the example of the high likelihood of adolescents being delinquent or in trouble with the law if their peers also are delinquents.

Having too many people, especially if they have strong opinions and influence, can overwhelm individual thought on important decisions. In contrast, having too few ties to people providing emotional support can be a negative for an individual when dealing with important decisions.

7. "Networks across all levels are dynamic, not static, structures and processes (p. 11)."

Networks evolve over time. As the authors explain, "the ability to form and maintain social ties may be just as important as their state at one point in time…membership turnover rates hover between 25% and 50%...the underlying reasons for change mark important dynamics in the operation of social networks (p. 11)."

8. "A network perspective allows for, and even calls for, multi-method approaches."

This is key for social network analysis, particularly when comprehensive and accurate data collection is challenging. The authors state "any notion that there is only one way to approach understanding the nature, functioning, and effects of network ties is outdated and inefficient…only by tapping into qualitative research can we describe the 'on the ground' mechanisms of network process and functioning (p. 12)."

Social Network Analysis Design and Measures

The general consensus on conducting an ego network analysis is that "there isn't a single 'right' way to define an ego neighborhood for every research question."[159] As such, there is no standardized approach to research design. Ego network analysis is often described as both art and science, dependent on the network data and research question being addressed.[160] It becomes a function of the research question, the available data, and the researcher's ability to design a network that meets the objective.[161]

For this research study, there are two network designs to consider. The first is unipartite, or the one-level network between the individual (ego) and his/her influencers (alters). The second is bipartite, or a two-level network between the individual (ego), his/her influencers (alters), and sources of information (events).

This research essentially encompasses both network designs given the available data: unipartite for freshman year influencers and bipartite for junior year influencers and sources of information. However, due to data limitations the visualizations include all bipartite connections (e.g., people and activities) in the same network with labeling for differentiation.

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[159] Robert Hanneman and Mark Riddle, *Introduction to Social Network Methods*, Chapter 9: Ego Networks.

[160] Perry, Brea L., Bernice A. Pescosolido, and Stephen P. Borgatti, *Egocentric Network Analysis: Foundations, Methods, and Models*, Cambridge University Press: New York, NY, 2018.

[161] Gary Robbins, *Doing Social Network Research: Network-Based Research Design for Social Scientists*, Chapter 3.

This analysis will use both the quantitative analysis and qualitative analysis discussed in paper two of this research study to develop networks for outcomes of interest. Generally, most ego network analyses use "simple graphs (i.e., graphs that are symmetric and show only connection/not, not direction)" and "use binary data."[162] This is consistent with the majority of included variables of interest. However, for more depth, it is also possible to apply weights to each tie to assess strength of ties. This study has data to measure tie strength and employs a weighted tie approach to assess differences in influencer importance within and across networks.

Analyzing ego networks begins with several standard measures and concepts of general social network analysis. These measures can provide insights for how youth in the target populations access and consume career and educational information.[163] They include:

- Degree: Number of connections to other nodes
- Density: Number of connections to other nodes relative to the number of total possible connections
- Strong and weak ties: Strong ties reflect the extent to which there is network closure, while weak ties allow for connectivity across the network
- Structural holes: Gaps in the network ("how and why the ways that an actor is connected affect their constraints and opportunities, and hence their behavior").

Notably, additional standard SNA measures exist, such as those related to centrality, or relative importance of individuals in the network. However, these measures are more targeted toward whole network analysis, and require more data about the network than applicable here. Instead, this study uses tie weighting to distinguish relative importance.

Degree is one of the most basic measures of a network, the number of connections from an individual to others. Those with higher degree networks simply have more influencers or avenues by which the individual can be potentially reached. Density considers the number of connections in the network relative to the total number of possible connections. Although this is also more appropriate for whole network analysis, in some cases of ego networks it is possible to collect data on alter connections to each other. For the networks derived using quantitative data, there is information on the actions of parents related to some of the same sources of information as asked of their teens. These averages (by outcome of interest) can be mapped onto the prototypical youths' information networks for that outcome of interest. This gives a sense of how involved, and therefore, how potentially influential parents were during junior year of high school.

Density gives some understanding of the tightness or cohesiveness of the network, which has implications for the nature and strength of influence. As the authors explain, it is "related to the availability of social support…[is a] component of bonding social capital….[is an] indicator of

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162 Robert Hanneman and Mark Riddle, *Introduction to Social Network Methods*, Chapter 9: Ego Networks.

163 Definitions of measures as discussed in Gary Robbins, *Doing Social Network Research: Network-Based Research Design for Social Scientists*, Chapter 2.

normative pressure to conform and the capacity of alters to collectively influence egos (p. 174).”[164]

Getting a sense of the strength of ties in youth information networks is important because it provides context on how youth approach decision-making and how their decisions or attitudes could be influenced. This includes understanding strong and weak ties. For some youth, weak ties may ultimately be as influential as strong ties. In *Egocentric Network Analysis*, the authors note “tie strength captures the intensity and duration of bonds…as well as the frequency of interaction…often seen as an indicator of social integration and regulation, while weak ties provide access to information (p. 163).”

The relevance of weak ties related to career and educational decisions can be traced back to Granovetter’s 1973 study on job-seeking. Perhaps the most widely cited research on individual networks, Granovetter showed that when looking at employment prospects, those with only strong ties were at a disadvantage when it came to finding work. He found that “weak ties, those that are infrequent and not of central importance to an individual, are critical because they allow individuals access to other social networks and, as a result, to new and different information.” This can also be the case for select youth looking into career and educational options, especially when their strong ties do not have access to the information that could be of greatest value given their individual goals and preferences.[165]

Density of networks also has a close relationship to structural holes. These are gaps in networks (here, youth information networks) that highlight where youth are missing access to people or information.[166] These gaps could be seen as having no access to a completely isolated group within the network (“component”) or could be seen as having a single person (“broker”) that bridges the gap between two groups or networks. In this study, I consider structural holes in the sense of differences in access to types of actors or information sources across groups of interest. The question raised concerns the value of filling that role within a network when it is not there as a way to reach and engage that type of youth.

When complete data on the network and interconnections are available, analysis of ego networks can also employ typical statistical methods including descriptive statistics and regression analysis, such as the exploratory analyses conducted in paper two of this study.[167,168]

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164 Perry, Brea L., Bernice A. Pescosolido, and Stephen P. Borgatti, *Egocentric Network Analysis: Foundations, Methods, and Models*, Cambridge University Press: New York, NY, 2018.

165 Granovetter, Mark, “The Strength of Weak Ties,” *American Journal of Sociology*, 78:1360-80, 1973.

166 Burt, Ronald, “Structural Holes and Good Ideas,” *American Journal of Sociology*, Vol 110, No 2: 349-99, 2004.

167 I would observe that the underlying assumptions of connectedness challenge the assumption of statistical independence between dependent and independent variables.

168 Stock, James, and Mark Watson, *Introduction to Econometrics*, Pearson Education, Inc.: Boston, MA, 2003. See page 105.

Social Network Analysis Limitations

There are several documented limitations of social network analysis worth noting here. First, by design, ego networks do not show the entire social network of that individual, including connections of connections. We only observe the immediate connections as the ego perceives them. This means we cannot make inferences about the broader community or institutional context they are embedded in. This also means it is not possible to obtain many of the traditional measures of social network analysis, including measures of density, centrality, and power.

The second concerns the social network theory that actors shape attitudes, intentions, and behaviors of each other, as a symbiotic, dynamic, and evolving system. This concept, known as "homophily" in networks, refers to the idea of reverse causality. One's attitudes, behaviors and decisions could be influenced by their network and one's network composition could be influenced by one's attitudes, behaviors, and decisions. This also means there could be endogeneity in networks, in the cases where youth are including people or sources into their networks to reinforce their decisions or behaviors. That makes attempts at casual inference in isolating individual decisions or behaviors complex, since people influence each other in a dynamic way. Therefore, it is challenging to make statements that are causal, in that "X was the reason for behavior Y."   Social Network Theory recognizes this and does not rely on causality in developing networks or in drawing implications from them.

Third is the limitation in both methods of data collection. According to *Egocentric Network Analysis*, "face to face administration continues to be the gold standard for ego network research (p. 46)". Still, even here there is potential bias, since much of the underlying data is self-reported. The authors outline the following forms of bias (pp. 44-45)[169]:

- Social Desirability Bias—where "respondents [seek] to maintain or achieve a favorable impression of themselves"
- Satisficing—where respondents have a heavy cognitive burden from answering many questions, "executing all the cognitive steps required [to complete] but with less effort" to provide "answers [that] are inaccurate but defensible"
- Interviewer Effects—where the interviewer's question phrasing and intonation may affect responses. This could include leading an interviewee or not providing enough time and space for a participant to fully respond.

This study acknowledges these limitations exist. For example, social desirability bias could be an issue for recruits seeking to reinforce/justify their decision to serve and for high school youth feeling pressure to attend college. However, interviews were structured to make it clear there were no wrong answers and with guarantees of confidentiality.

[169] Perry, Brea L., Bernice A. Pescosolido, and Stephen P. Borgatti, *Egocentric Network Analysis: Foundations, Methods, and Models*, Cambridge University Press: New York, NY, 2018.

3. Youth Information Network Overview

Applying concepts of social network analysis to the youth decision-making process can provide additional validation of these ideas or contradict them. This chapter visualizes youth information networks as it depicts career and educational decision-making in high school.[170]

The exploratory analysis in the second report of this study explored relationships within and between target populations. It also provided the foundation for the main hypotheses concerning how these youth make the choice whether or not to serve in the military. Specifically, I hypothesize that three main considerations have a sizeable impact on youths' ultimate career and educational decisions: (1) social-emotional wellbeing, (2) use of and reliance on influencers, and (3) engagement in information-seeking activities during high school. Moreover, insights from the exploratory analysis suggest these factors act together in youth decision-making, and that information networks evolve over time.

The results presented here are intended to be a first cut at understanding and mapping youth information networks. They provide a descriptive snapshot of the networks associated with a given group, on average, in freshman and junior year of high school, as they relate to career and educational planning. They are not intended to be a comprehensive picture of youth decision-making, and, as noted earlier, this is a not causal research design. Instead, this analysis should be interpreted as providing insights relevant to youth social networks, their implications for marketing outreach policy for the Department of Defense and colleges, and as a starting point for future research on this topic. Moreover, while the sampled population for the qualitative component of my dissertation is not a random population sampling of the target group studied, it nonetheless provides meaningful insight. It is incorporated into the analysis with that caveat in mind.

Populations and Related Social Networks of Interest

As outlined in the analysis in paper two of this study, there are seven populations and related networks of interest: (1) those representing populations more likely to serve; and (2) those representing populations of interest the military would like to engage more but have been historically harder to reach. The descriptions are as follows:

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[170] All visualizations were created using the UCINet software package. See Borgatti, S. P., *Netdraw Network Visualization*, Analytic Technologies: Harvard, MA, 2002.

- HSENLIST: Youth who enlisted in the military in the year of or at any time prior to high school graduation, defined as enlisting in 2013 or earlier[171]
- AFTERHS: Youth who enlisted in the military in or after the calendar year following high school graduation, defined as enlisting in 2014 or later[172]
- NOTFOURYR: Youth who attended a sub-baccalaureate degree program at some point between 2013 and 2016
- FOURYRCLG: Youth who were enrolled in a four-year degree program in 2016
- NOCLGORAD: Youth who neither enrolled in any postsecondary institution nor served in the active duty military between 2013 and 2016
- FEMALE: Youth who identified themselves as female
- PROP12: Youth who were propensed during junior year of high school, defined by answering "yes" or "don't know" to the question about intention to serve in the military in the first follow-up survey of 2012.[173]

Building Information Networks

Network Data and Construction

The first set of visualizations provided for each outcome of interest use the descriptive statistics (variable proportions) from HSLS09. The HSLS09 survey data allows for building partial information networks for youth in freshman year and again in junior year. The visualizations presented here are for select influencers related to jobs freshman year, and for select influencers and influences junior year regarding the life after high school planning process. (Visualizations of select influencers related to college freshman year look similar to those for jobs and are provided in Appendix A.) The ability to include more sources of influence for junior year networks relates to the time relevancy in the decision-making process and the greater richness of the data. Moreover, for all but the two military service outcomes, it is possible to also include responses from the parent survey regarding their preparation activities.[174]

Whether or not a youth consulted with an influencer or with a source of information is binary, with values of 0 or 1. The mean for a given variable therefore reflects the average amount (proportion) of youth in that group that spoke to a given influencer or consulted that source of information. The means thus provide a proxy for the relative weighting—importance through

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[171] Recruits can sign contracts before they graduate high school. This group is defined as those who signed a contract either during HS or in the year of graduation.

[172] Through 2016 when the second follow-up survey was administered.

[173] The answer options were "Yes," "No," and "Don't know." In contrast, the JAMRS Department of Defense survey includes "Definitely," "Probably," "Probably Not," and "Definitely Not" as answer options. Definitely and Probably are counted as positive propensity. Because the NLS version does not include "probably" which is a much larger category than "definitely" and many HSLS09 respondents say "don't' know," I count "don't know" as part of the propensed population.

[174] The number of "in group" observations for parents is too low (N<70) to include for analysis.

relevance—for that influencer or information source for the average youth in that group. All descriptive statistics used in network construction, including for the freshman year networks in Appendix A, are provided in Appendix B. All variable names and definitions are provided in Appendix C.

Each tie in the HSLS09 visualizations is labeled with the mean (proportion) for that influencer or source of information. Tie length and width were also visualized to correspond to the strength of the tie. The strongest ties had the shortest lengths, and were closest to ego, while the weakest ties were the furthest away. Similarly, tie width was greatest for strongest ties and narrowed as the proportions decreased. This depiction is provided in Table 1.

Moreover, nodes are differentiated by shape and color, to represent different influencers and sources of information. The shape and color scheme are consistent across tables. A legend is provided in Table 2 below.

Table 1. Social Network Visualization Line Chart

Influence Level	Line Style	Description
Greater Influence		Thicker, shorter
Less Influence		Thinner, longer

Table 2. Social Network Visualization Node Chart

Family	
Teachers & GCs	
Friends	
Other influencers	
Military	
Internet	
Tours & Fairs	
College Exam Prep	
Ego (Outcome)	

The more limited depth and comprehensiveness in HSLS09-derived networks are due to data availability. However, these networks do include the most important influencers as identified in the second report of this study. Moreover, in looking across freshman year and junior year, it is possible to see the evolution over time in importance of these "most important" influencers.

The second set of visualizations come from the interview data. For all but two groups of interest—neither attending college nor serving in the military and propensed youth—it is possible to supplement the HSLS09 visualizations with a sample of the qualitative data. The value of doing this in understanding youth career and educational information networks is two-fold. First, for the two military sub-populations, HSLS09 parent response rates were too low for those populations to include data on parental interconnections. Second, the experiences of interviewees provide valuable context for understanding the career and educational decision-making process along with its evolution. The interviews are comprehensive whereas HSLS09 is not. They demonstrate that there are a range of network compositions that youth might have, as noted in the embedded factors above. They also show some evidence for Granovetter's "strength of weak ties" hypothesis, that in some cases, for some youth, weaker ties were among the most valuable (as evidenced by the higher weighting).

To visualize the relative importance of an influencer or source of information, the numbers on each line reflect how influential that person or source of information was on a scale of 1 to 5 (with one being minimally influential and five being extremely influential). All interviewees were asked about the same influencers and sources of information; however, for various categories, interviewees opted to say zero for no influence.[175] For categories not reported in a given visualization, it is because that interviewee rated them as "not at all influential." Differences in network composition provide a clear method of comparison across networks, to see who and what is included in one network over another.

For network visualizations derived from the qualitative data, the line width and length, and node coloring scheme, are the same as in Table 4 and Table 5. However, an additional feature for the two military groups is the color of the lines to reflect granularity in their decision-set: pink and blue. The pink lines reflect influencers related to the decision to serve in the military, while blue lines represent influencers related to the career aspirations. Unlike for high school juniors, for many of these interviewees the decision to serve and their career ambitions were orthogonal.

The categories of neither attending college nor enlisting in the military and propensed in high school are not included in qualitative visualizations due to limitations in interviewee career and educational expectations. None of the high school junior interviewees were seriously considering military service. Moreover, none of the high school junior interviewees believed they were not going to college, and all the of the military recruits were enlisted.

As discussed in Paper Two of this study, information networks are in part determined by several key factors that are outside of measurement but embedded within the structure and strength of relations. Three are: (1) family structure, (2) social-emotional wellbeing, and (3) degree of focus and motivation. The potential effect on network composition of each is considered in turn.

Family Structure and Dynamics

Family structure and dynamics play an important role in youths' accumulation of social and cultural capital—in other words, in the building, composition, and use of information networks. As suggested in the qualitative interviews, family dynamics directly impacted the composition of

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[175] Also not visualized is how influential interviewees rated themselves on a scale of 1 to 5; most interviewees put themselves at a 4 or 5.

information networks and the use of networks. For example, some youth do not have both parents in their life, and therefore, their information network may be inherently different from a youth's that does. HSLS09 data show that youth are more likely to not have fathers in their life than mothers. Of course, even youth that do have both parents in their life may not utilize both as part of their network, or they may not influence them equally. Previous analysis of HLS09 data also showed that on average, across sub-populations, fathers generally were less engaged in discussions about life after high school during freshman year.[176]

Family dynamics are a factor for every individual, and in some sense, every family is unique and the effect on the individual is unique. In my interviews with military recruits and high school juniors, a variety of stable and unstable family dynamics were observed across and within sub-populations. There is an argument that some family dynamics are correlated with certain outcomes, such as the absence of a parent being correlated with not going to college. In this analysis, such potentially associated factors are embedded in differences between youth information networks across sub-populations. It is perfectly conceivable that family dynamics could partially explain some of the statistically significant differences. That said, having a stable family dynamic is not a guarantee of a certain, perhaps more socially desired, outcome, just as having an unstable family dynamic does not guarantee a less socially desirable outcome. Many of the youth I interviewed showed exceptional resilience, even if it took more time to get there.

This study also does not attempt casual inference concerning the role of family dynamics just as it does not with demographic or social-economic status. Some questions that may be relevant—such as, does the absence of one parent, being in a socio-economic income quartile, in a certain race/ethnicity, or some combination of these make X outcome more likely—are not addressed here. However, Paper Two of this study did show that while household income is highly correlated with attending college, there is not a statistically significant correlation with enlisting in the military out of high school, and only a small statistically significant correlation with serving after high school.

Social-Emotional Wellbeing

Related but separate from family dynamics, the literature suggests that social-emotional wellbeing is an important component in youth decision-making.[177] In addition to family dynamics, social-emotional wellbeing can be influenced by multiple factors, including social environment, attitudes and beliefs, and other biological circumstances or conditions. The literature also shows a rise in youth anxiety and depression in teenage youth, particularly for females, with several hypotheses attempting to explain recent trends. Females are also vulnerable

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[176] This result was found even after accounting for differences in the presence of fathers in youths' lives, as evidenced by the lower response rates for that question. See Paper Two of this study.

[177] See "Youth Information Networks and Propensity to Serve in the Military: A Review of Relevant Literature" for Paper One of this study.

to having lower self-efficacy and self-confidence in their mathematics abilities, which could significantly impact educational and career decisions by discouraging technical fields.[178]

Unfortunately, it is difficult to measure or clearly observe social-emotional wellbeing in networks because it is intangible. Instead, similar to family dynamics, it is embedded in the design. Likely, it would impact the density and reach of the network, in addition to the strength of ties. Youth in an impaired social-emotional state may not be actively building their network, instead relying on more core influencers such as family and friends. They may lack the cognitive bandwidth or self-confidence to reach out to weaker connections to build a larger network. They may not be in a position to build their information network or consume career and educational information that could be valuable to them, regardless of how easily accessible it is.

Several interviews with youth showed that youth having personal and/or emotional challenges were less likely to build or use their information networks in high school. These youth either did not have a clear plan, in the case of current high school juniors, or they delayed planning until after high school when they were in a better mental state, in the case of recruits. Alternatively, several interviewees also demonstrated the power of self-motivation and willingness to seek out counseling support (from influencers or non-influencers). They sought out support from others to help work through challenges (reflecting the strength and multi-faceted nature of relationships). They also noted their own motivation, wanting to move forward with their life planning and therefore, network building, because of how important it was to them.

Degree of Focus and Motivation

Strongly related to social-emotional wellbeing is the degree of focus and motivation youth have about their educational and career goals. This is also difficult to measure or distinguish in network composition but is embedded. For example, individuals who know what they want to accomplish, and who are able to create and execute a plan to achieve it, may have a different network composition than those without a clear focus or plan. Their connections to needed resources could be stronger, or ties could be fewer or more strategically oriented. Depending on their goal relative to the resources of immediate influencers, they may rely more heavily on a few stronger or weaker ties (e.g., connections of influencers or other sources) for information.

Youth may be considered stable in the traditional social-emotional context, but simply lack focus or certainty.[179] They may not know what they want to do after high school, may have limited direction on how to tackle related decisions, or both. Some youth in this category may perceive themselves as academically uninclined or uninterested in college. In this context, how

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[178] See “Youth Information Networks and Propensity to Serve in the Military: Data Collection, Methods, and Exploratory Analysis” for Paper Two of this study.

[179] This could arguably be another form of social-emotional impairment because that may underpin this type of uncertainty, but I do not discuss that area here.

that effects their network may be more related to level of self-motivation. That is, youth in this category could go either way in terms of network density and strength. This was observed in the interviews. Some youth who were motivated but lacked focus had a large network, seeking out a lot of information and believing everyone was a major influencer. In one interview, for example, every person and resource mentioned was a "major" influencer, including celebrities the youth admired. Other youth had a smaller network of influencers, based on people and resources immediately available. These youth either did not know where to start for gathering information or were overwhelmed by the amount of information available online and could not rely on their immediate influencers (e.g., parents) for help. In either case, these youth will have to eventually narrow down their area of focus or risk missing out on opportunities or making no decisions before college or other deadlines.[180]

Alternatively, youth who are both unfocused and unmotivated, even under the pressure of influencers providing direction and support, are at high risk for having a less developed network to carry them forward. They may be more likely to have a smaller network, consisting of a few strong ties, similar to those who are in a vulnerable social-emotional state or cognitively overwhelmed. They may be more likely to experience a delay in building their information network, potentially at a disadvantage to their peers. Several military recruits, for example, acknowledged seeing military recruiters in their high school, but stated they were not in a mind space that was open to hearing that information or considering the military seriously as an option. In fact, they were not in a mind space to conduct any career or educational planning.

Note on Parents

Although HSLS09 data does differentiate between mothers and fathers in the freshman year questionnaire, it does not in the junior year survey wave. Instead, questions regarding parental involvement are phrased as "parents."

Similarly, the accompanying parent survey is asking from the perspective of the responding parents, although in the HSLS09 visualizations ties are represented from the individual parent node. Respondent data from the 2012 HSLS09 Parent Survey shows approximately 75 percent of respondents were the teen's mother.

Note on Teachers

The social network visualizations for junior year of high school using HSLS09 do not include teachers due to data limitations. There was no question in the 2012 student survey that asked youth about discussions or potential influence of teachers related to life after high school. For this reason, the descriptive statistics provided in Appendix B do include a freshman and junior year comparison as it relates to speaking with one's teacher about math course selection. This is

[180] Indeed, several decided to enlist in the military after missing or opting out of college admission deadlines.

the best question available. Data on the general youth population shows that, on average, about twice as many youth spoke with their teachers junior year over freshman year, increasing from 0.192 to 0.344.[181] This is consistent across the sub-populations, as can be seen by comparing means for S2MTCHRREC (junior year) and S1TCHTALKM (freshman) as provided in Appendix B.[182]

The implication is that teachers, although still limited in absolute influence, do become more influential over the course of high school. This is consistent with the interview data, which suggested that teachers were influential for some students in some cases, similar to high school guidance counselors. That said, the nature of influence was much more likely to be that of support or related to careers. For example, only a few interviewees noted a push toward college, while others noted becoming interested in a career field because of a course or teacher discussion, and still others noted a general sense of support and encouragement. The majority of interviews, however, were generally not influenced by their teachers in terms of decision-making for life after high school.

Statistical Testing for Differences

Using the confidence intervals provided in Appendix A, it is possible to evaluate statistical differences in means (here, the mean is the proportion of youth who engaged in that conversation or action). If there is overlap in CIs, the differences are not statistically significant. Evaluating statistical differences can be done across influencers and across outcomes of interest for given variables. More information on the use of confidence intervals, given the complex survey design and weighting scheme employed in HSLS09, can be found in Paper Two of this study.

Given the large number of observations associated with each outcome of interest, it is worth noting that even small differences are likely to be statistically significant. Therefore, as in Paper Two, it is appropriate to distinguish between practical and statistical significance. Differences in proportions that are greater than 0.1, for example, are notable from a practical perspective and, together with being statistically different, suggest a true underlying difference between groups.

Perhaps the starkest differences in network strength are between youth who went on to attend four-year college and youth who neither enrolled in college nor enlisted in the military. Females were also more likely to have strong network connections than other groups of interest aside from four-year college bound youth.

[181] See Paper Two of this research study, "Youth Information Networks and Propensity to Serve in the Military: Data Collection, Methods, and Exploratory Analysis," for means of the general youth population.

[182] Full descriptions of the survey variables used, including naming convention and definition, is provided in Appendix C.

4. Youth Information Networks

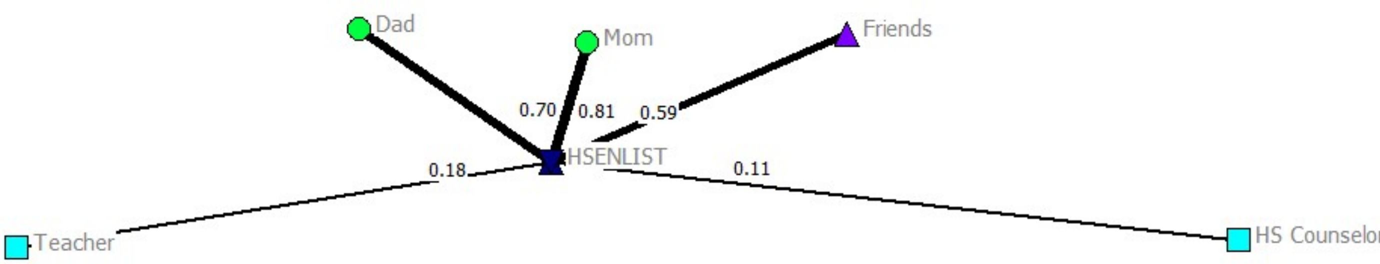
For each outcome of interest, it is valuable to understand three points of information: (1) who a majority in this group were talking to related to college and jobs freshman year, (2) what actions a majority in this group were doing related to college and jobs and junior year, and (3) how this group differs from other groups of interest.[183] For each group, networks in freshman and junior year are visualized from the student perspective, junior year from the parent perspective,[184] and networks from a sample of interviews to supplement with a more individualized mapping.[185]

Since, for each outcome or group, the proportion of youth talking to their network about jobs freshman year were very similar for to the proportion discussing college, only the network visualizations for jobs are presented here. Network visualizations for discussions about college freshman year are provided in Appendix A, and all underlying data are provided in Appendix B.

Enlisted Out of High School

As early as freshman year, a large majority of youth that would go on to enlist out of high school spoke to their parents about jobs. As shown in Figure 1, about 80 percent of this group spoke with their mothers about jobs freshman year, 70 percent with their fathers, and 60 percent with their friends.

Figure 1. HS Enlist Information Network, Student, Freshman Year



Source Data: U.S. Department of Education, National Center for Education Statistics, “High School Longitudinal Study of 2009 (HSLS:09),” 2009-16, Base year survey. Tabulations are author calculations.

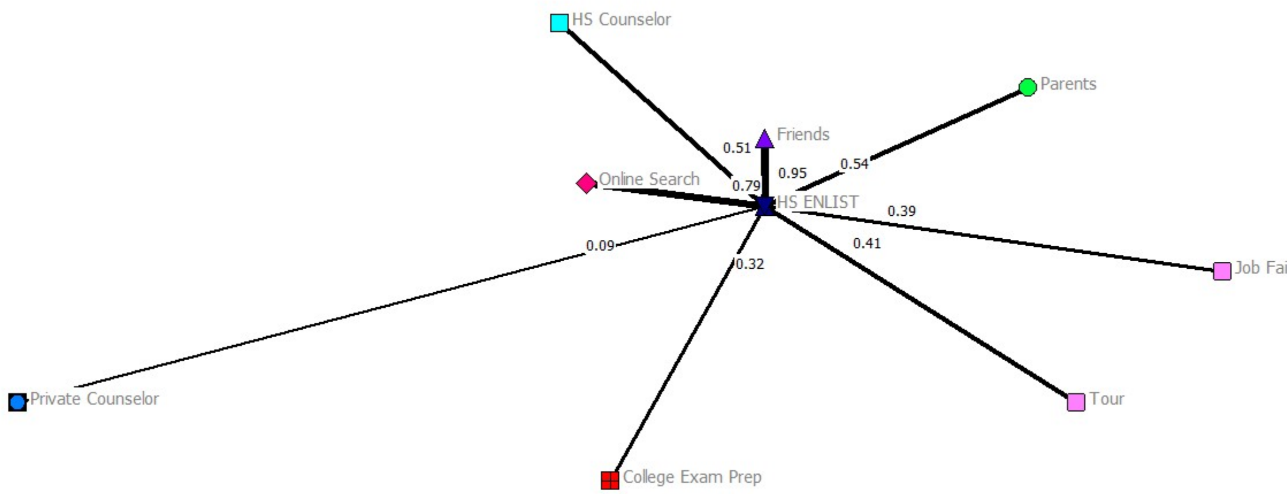
[183] I use the proportions (means) and results of the logistic regressions conducted in Paper Two of this study, along with supplemental information from interviews with high school juniors and newly enlisted recruits.

[184] Parent networks were not possible for the HSENLIST and AFTERHS groups due to the limited number of “in-group” responses from parents.

[185] There were no interviews conducted that fell into the PROPENSED or NOCLGORAD groups.

As shown in Figure 2, youth enlisting out of high school were not especially inclined to participate in college planning activities. In junior year, only half of youth who enlisted in the military out of high school reported speaking to their parents about college.[186] This is likely because many of these youth already decided to serve in the military or were in the process of doing so, and thus may have been less inclined to pursue serious discussions about college. Only about one-third of these youth participated in a college exam preparatory course, and only about 40 percent went on a college tour or job fair. In contrast, almost all of these youth spoke to their friends about life after high school.

Figure 2. HS Enlist Information Network, Student, Junior Year



Source Data: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, First follow-up survey. Tabulations are author calculations.

The more limited footprint of guidance counselors also can be seen in the interviews with Air Force recruits. Below are two additional information networks of high school youth who enlisted in the Air Force out of high school. (Two are provided to show that there was a range in the composition of networks.) Many of the interviewed youth in this population either came from a long family tradition of service or had a long-standing interest in law-enforcement careers or explicitly serving in the military, regardless of history of family service.

Figure 3 provides the network of a youth enlisting out of high school with a long-standing family tradition of service. The interview revealed two categories of decisions (decision set) that were orthogonal to the interviewee—career and military service.[187] To visually differentiate this,

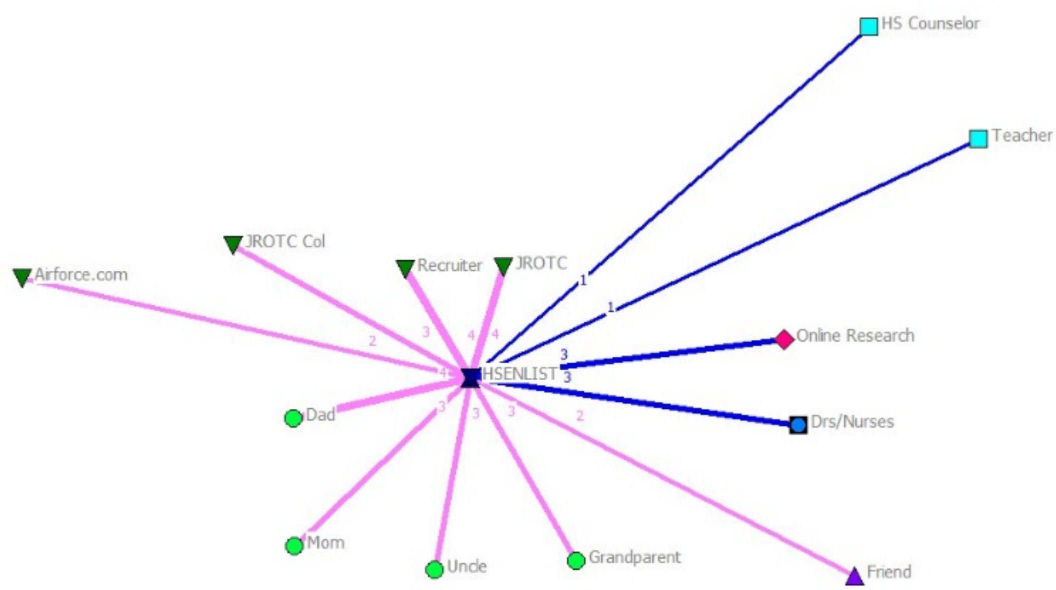
[186] As proxied by conversations about college financial aid.

[187] In fact, differentiating careers from college was common for interviewees.

the pink lines reflect influence related to the decision to serve and the blue lines represent the decisions related to careers and college.

Although this youth came to the decision to serve, the youth's family was very enthusiastic and encouraging about this choice. This youth also was well-versed in the financial benefits of serving and intended to use those benefits for college. However, in terms of career, the youth was very set on a becoming a nurse-midwife (regardless of assigned military occupation) and even used the network to shadow doctors in a local hospital during high school. The interviewee cited all of these people and sources of information as influential in getting to the chosen current path, but in different ways and for different reasons.

Figure 3. HS Enlist Information Network, Interview Sample 1

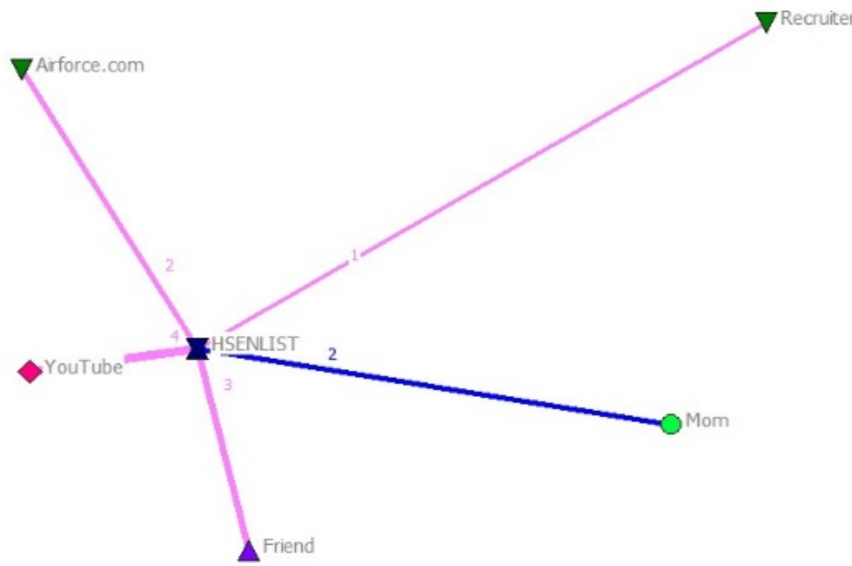


Note: JROTC Col is the colonel running the JROTC program the interviewee participated in during high school.
Source: interview.

For this youth, school staff and friends were not seen as very influential. Instead, the youth's experience in JROTC (Air Force), military recruiter, and family were among the most influential. Likely this is related to the longstanding exposure to military service through the youth's parents.

Figure 4 shows the network of a high school enlistee that decided to serve because of a long-standing desire to be in the military or law-enforcement. The interviewee's bedroom was painted in a battlefield scene at the age of 10 because of enthusiasm for service, even though the youth did not have family in service. This interviewee applied to college solely because of influence from the youth's mother (blue line), but never wanted to go. The interviewee cited "themself" as the largest influencer to enlist and not enroll in college. In fact, the youth's parents were not told about the intention to serve until after the decision was made.

Figure 4. HS Enlist Information Network, Interview Sample 2



Source: interview.

Interestingly, this youth's network is markedly less dense with far fewer degrees (connections) than the youth depicted in Figure 3. The implication is that this interviewee was influenced through fewer avenues. The youth did not seek out many sources of information in life planning in high school. Moreover, only YouTube rated at least a 4 on the scale of importance, suggesting this youth was not very open to building or using cultural and social capital. This youth actively chose not to consider other available avenues for information (e.g., family, high school counselor, teachers, online research).

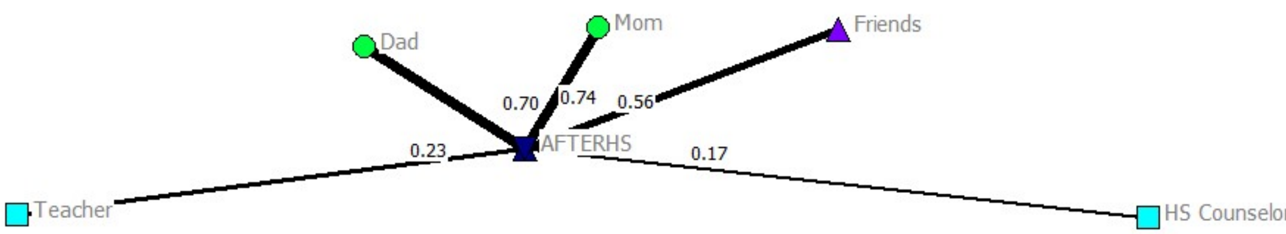
Group Differences

As shown in the regression analysis in Paper Two, youth enlisting out of high school were over 80 percent more likely to speak with their parents about jobs freshman year than youth that did not enlist out of high school (and about 80 percent of these youth had those discussions). Moreover, by junior year, traditional conversations about college were less likely. These youth were 40 percent less likely to speak with their guidance counselor about life after high school junior year or to have at least one discussion with their parents about college financial aid (only half did so in each case). Although not visualized, but still relevant in an information context, these youth were 80 percent more likely to play an organized sport junior year (nearly two-thirds did so).

Enlisted After High School

Youth enlisting at least a year after graduating from high school are particularly important to understand because the majority of military enlistees fall in this group. At least as early as freshman year, 70 percent of these youth were speaking to their parents about jobs and more than half were speaking to their friends about jobs. The information network of these youth related to discussion about jobs freshman year is provided in Figure 5.

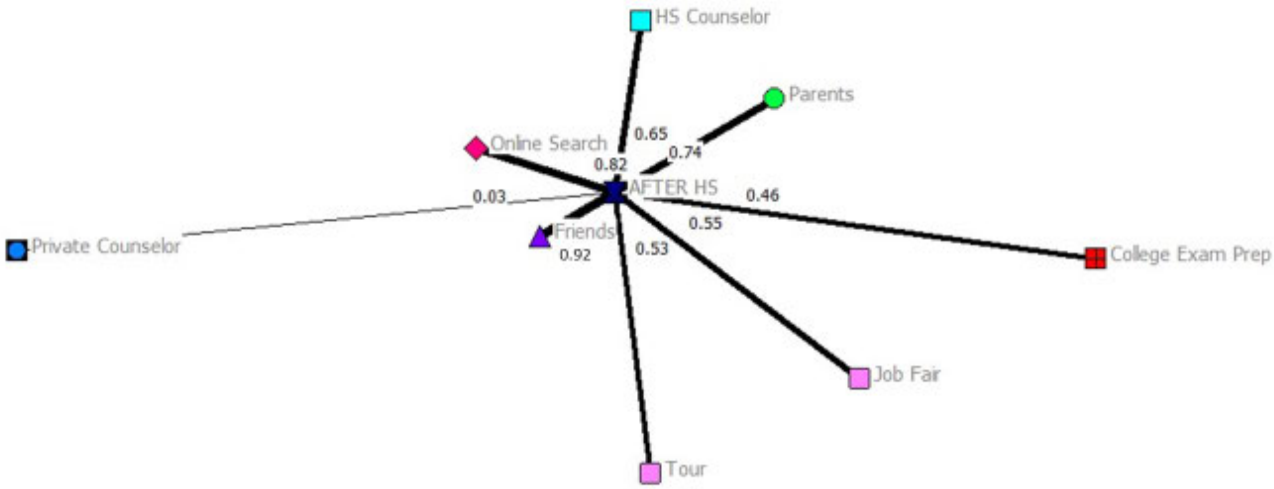
Figure 5. Enlist After HS Information Network, Student, Freshman Year



Source Data: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, Base year survey. Tabulations are author calculations.

Junior year provides a more detailed snapshot of these youth. Figure 6 shows over half of youth enlisting at least a year after high school went on a college tour or attended a job fair, and just over 80 percent conducted online research about colleges. Moreover, almost three-quarters of these youth spoke to their parents about college, while about two-thirds spoke to a high school counselor about life after high school. One implication is that these youth are more open to sources of career and educational information than youth enlisting out of high school, meaning that there may be more opportunities to reach them and to do so sooner.

Figure 6. Enlist After HS Information Network, Student, Junior Year



Source Data: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, First follow-up survey. Tabulations are author calculations.

With regard to interviews of Air Force recruits enlisting at least a year after high school, the evolution of their information networks over time was evident. For these recruits, it was this evolved network, not their high school information network, that they used to inform their decision to serve in the military.[188] Many of these recruits relied on different friends, coworkers, or themselves in making the decision. In fact, a large share of these recruits reported they were the most influential in their decision, seeing the function and content of their career and educational information network as more strictly a source of information and/or inspiration.[189]

As true for recruits enlisting right out of high school, Figures 7 and 8 demonstrate a range of information networks seen across interviews for this group. Figure 7 visualizes the information network of an interviewee enlisting in the Air Force several years after high school. This recruit's network was extremely limited, as this youth was not actively building or using a network during or after high school. The youth admitted to lacking motivation and focus, stating "I don't know my heart; what I [should] do for [a] career." The youth conceded to having this perspective in high school as well, as denoted by the presence of only the pink lines in this interviewee's network (implying no one influenced the youth in high school since the youth was not looking for information or influence). Ultimately, it was the youth's father that made the decision, making an appointment with the local recruiter.

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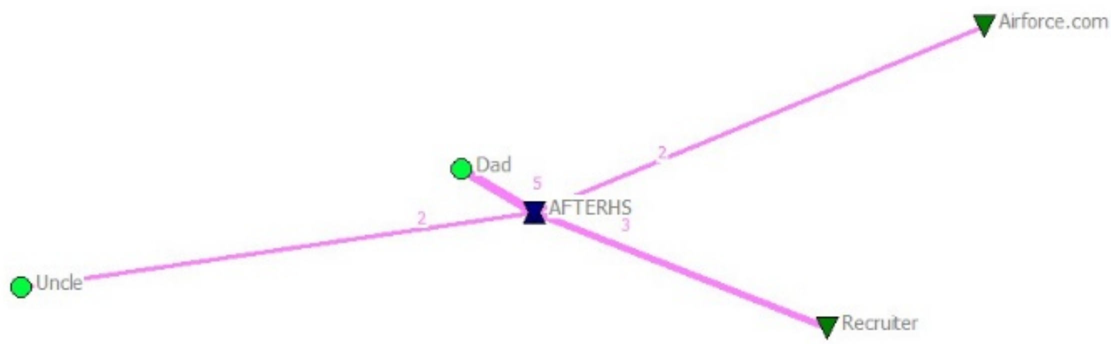
[188] Many interviewees noted having an interest in service in high school that they did not pursue at the time for a variety of reasons.

[189] See "Youth Information Networks and Propensity to Serve in the Military: Data Collection, Methods, and Exploratory Analysis" for Paper Two of this study.

Figure 7. Enlist After HS Information Network, Interview Sample 1



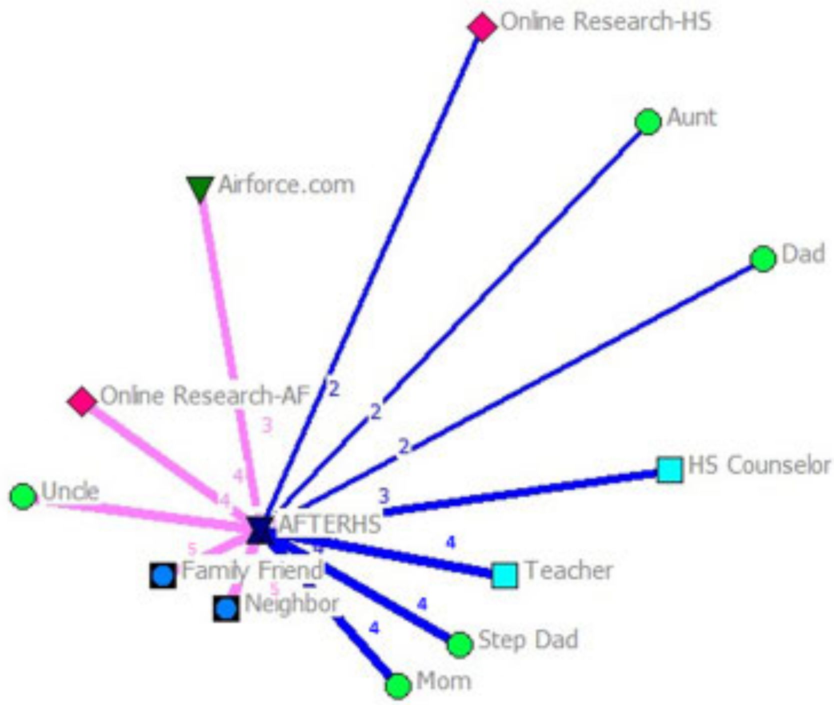
Source: interview.

Figure 8 depicts the information network of a second recruit in this group. This recruit enrolled in college out of high school, then subsequently decided to enlist. As such, the youth's network for making the decision to enroll in college is highlighted with blue lines, while the decision to serve in the military is highlighted with pink lines. This recruit clearly shows the influence of teachers and guidance counselors in high school. Parents (mother and step-father, much less so for biological father) were also noted as being particularly influential in the decision to go to college after high school.

In contrast, others in the network were far more influential regarding the decision to serve, specifically an uncle and family friend who had also served. Moreover, it was a neighbor's decision to enlist that was the tipping point for this youth, who was already highly propensed. At the time of the interaction with the neighbor, the youth was open to that conversation and topic of discussion. In fact, this youth's network is an example of the strength of weak ties—how non-traditional influencers can sometimes be the most influential. This youth also demonstrates the evolution of information networks after high school.

Also noteworthy about this youth is the increase in importance of accessing other sources of information about life planning online for to the decision to serve over going to college. Likely this is because the youth was in a different mindset, one that was more willing to seek out and consume career information. The was suggested in the interview: the youth needed a few years to mature and focus.

Figure 8. Enlist After HS Information Network, Interview Sample 2



Source: interview.

As true for the high school enlistees, the networks of these recruits suggest differences in how these youth can be better engaged. These differences stem less from ability to access people and information than a willingness to do so. Moreover, there also are questions raised about the perceived reliability of information sources. These recruits, for example, did not cite social media or online blog forums as being particularly impactful for career and educational information.

Group Differences

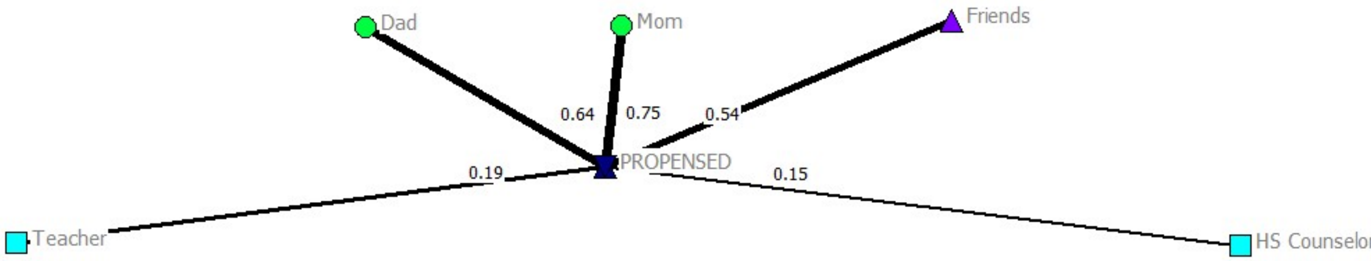
Many youth enlisting at least a year out of high school were involved in college planning activities during their junior year.

Propensed in High School

These network visualizations consider the group of youth who were propensed during junior year of high school. As noted in the second paper in this research study, HSLS09 data showed these youth were split between enrolling in college and not enrolling in college after high school (with more enrolling in college).

Figure 9 shows many of these youth were engaged in conversations about jobs freshman year. However, there was variation across influencers. While three-quarters of these youth spoke to their mothers about jobs freshman year, only two-thirds reported having those conversations with their fathers. Just over half reported speaking to their friends about jobs, while less than 20 percent spoke with their teachers or guidance counselors about jobs.

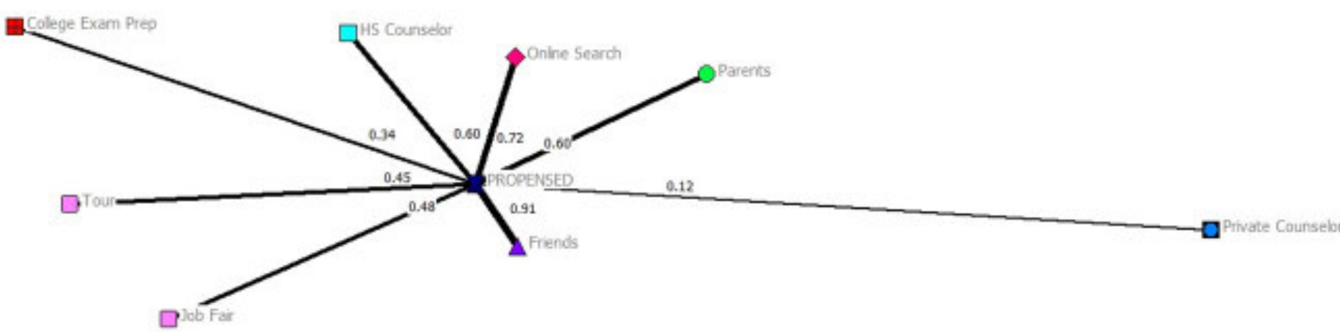
Figure 9. Propensed Information Network, Student, Freshman Year



Source Data: U.S. Department of Education, National Center for Education Statistics, “High School Longitudinal Study of 2009 (HSLS:09),” 2009-16, Base year survey. Tabulations are author calculations.

As shown in Figure 10, over 70 percent conducted online research, the activity with the greatest share on average. About 60 percent, spoke with their parents about financial aid for college or spoke with their high school counselor about life after high school. Just under half reported going on a college tour and to a job fair.

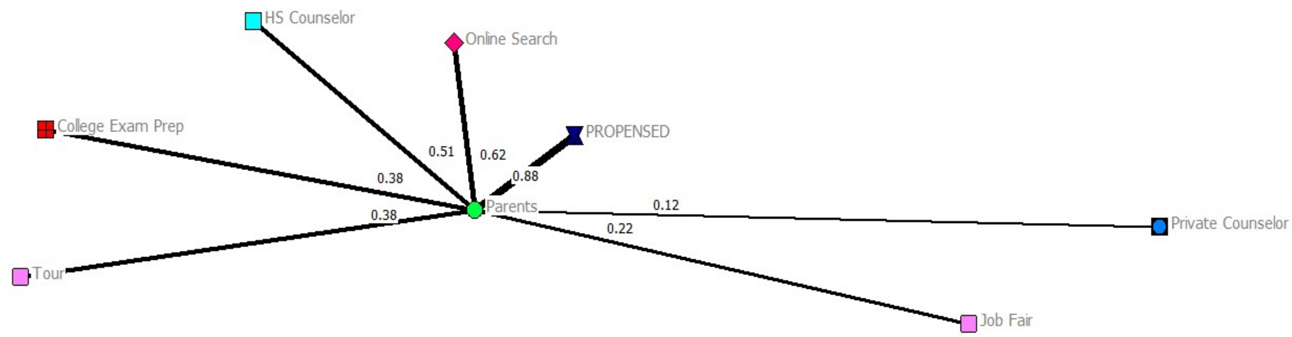
Figure 10. Propensed Information Network, Student, Junior Year



Source Data: U.S. Department of Education, National Center for Education Statistics, “High School Longitudinal Study of 2009 (HSLS:09),” 2009-16, First follow-up survey. Tabulations are author calculations.

Figure 11 shows the college planning networks of parents of youth propensed junior year. Parents reported the most involvement with conducting online searches on behalf of their teen and in speaking with their teen about college. About half spoke with their teen’s high school guidance counselor, and less than 40 percent of propensed youths’ parents organized a college tour or registered their teen in a college exam prep course.

Figure 11. Propensed Information Network, Parent Junior Year



Source Data: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, First follow-up parent survey. Tabulations are author calculations.

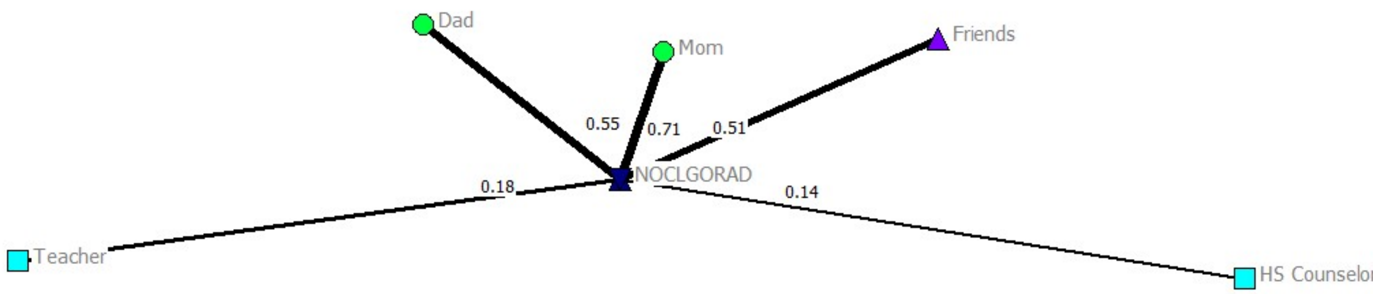
Group Differences

Propensed youth were more likely to speak with mothers and friends about jobs freshman year than non-propensed youth. However, they were less likely to engage in some career and educational planning activities junior year. Specifically, they were less likely to speak with their parents about financial aid for college and less likely to speak with their friends about life after high school. They were also less likely to search for college information online and to take a college exam prep course. Notably, although not visualized here, they were far more likely to speak with employers about math courses junior year. This could suggest a stronger likelihood of working in high school.

Did Not Attend College or Enlist in Active Duty Military

Descriptive statistics from HSLS09 showed that youth who neither enrolled in college nor enlisted in the military within three years of high school graduation had the most limited network of any group. Figure 12 shows the information network freshman year for select influencers as it relates to conversations about jobs. While about 70 percent spoke with their mother about jobs, just 55 percent reported speaking with their father, and about half reported speaking with their friends about jobs. Only a minority of non-college bound youth (less than 20 percent) spoke with teachers or their guidance counselor.

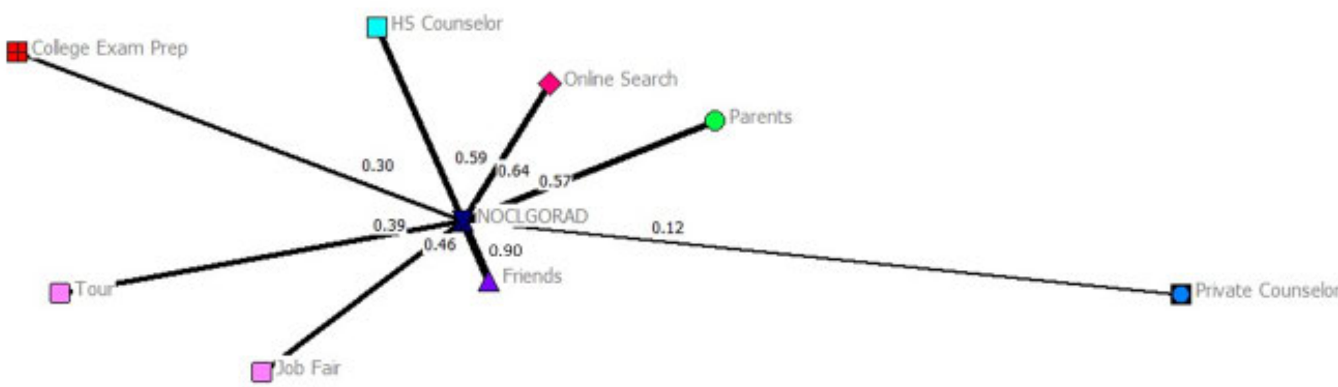
Figure 12. No College or Military Information Network, Student, Freshman Year



Source Data: U.S. Department of Education, National Center for Education Statistics, “High School Longitudinal Study of 2009 (HSLS:09),” 2009-16, Base year survey. Tabulations are author calculations.

The more limited network of non-college bound youth is also apparent junior year, as visualized in Figure 13. About two-thirds of youth engaged in college-related online search and about three-fifths spoke with their guidance counselor. Similarly, just 57 percent reported having a conversation with their parents about college financial aid. Other planning activities, such as going on a college tour or taking a college exam prep course, were engaged in by only a minority of non-college youth, at less than 40 percent.

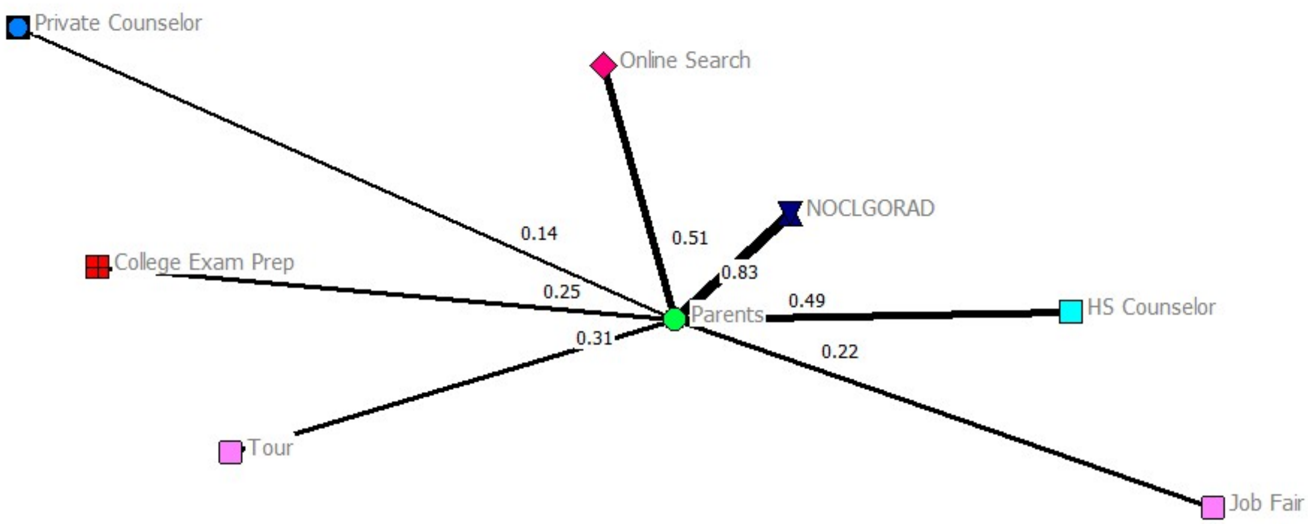
Figure 13. No College or Military Information Network, Student, Junior Year



Source Data: U.S. Department of Education, National Center for Education Statistics, “High School Longitudinal Study of 2009 (HSLS:09),” 2009-16, First follow-up survey. Tabulations are author calculations.

As shown in Figure 14, these youths’ parents were also somewhat limited in terms of their involvement with their youth. Over 80 percent did report speaking to their youth about college, however only about half conducted an online search or met with a high school counselor on behalf of their teen. Less than one-third reported taking their teen on a college tour, and just a quarter signed their teen up for a college exam prep course.

Figure 14. No College or Military Information Network, Parent, Junior Year



Source Data: U.S. Department of Education, National Center for Education Statistics, “High School Longitudinal Study of 2009 (HSLS:09),” 2009-16, First follow-up parent survey. Tabulations are author calculations.

Group Differences

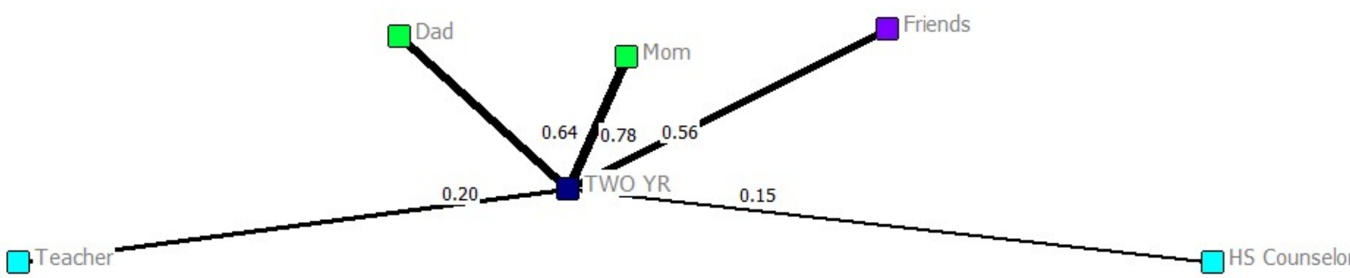
Even in freshman year, non-college bound youth were much less likely than military and college-bound youth to speak to either parent or friends about a range of topics, including college. By junior year, the divergence continued. These youth were less likely to speak to their guidance counselors and friends about life after high school, and to their parents about financial aid for college. They were also less likely to go on a college tour, search for information online, or take a college exam prep course. They were less likely to participate in a range of extracurricular activities, including sports, with the exception of art. As true for propensed youth, although not visualized here, they were far more likely to speak with employers about math courses junior year, also suggesting a stronger likelihood of working in high school.

Attended Two-Year College

Nationally, about one-third of youth enrolling in college out of high school enroll in a two-year institution. These institutions are typically community colleges—open-access publicly-funded institutions. By design, all students who want to attend are generally able to do so. This means that limited focus or planful intent on the process of applying to college is required. The result is that while some youth attend a two-year postsecondary institution for strategic and intentional purposes, others do so without having done any particular life planning and have no firm career focus. In other words, they have limited need to build and use their information network.

Figures 15 and 16 show, however, that these youth engaged in some life planning activities more than others, even as early as freshman year. In freshman year, over three-quarters of youth spoke with their mothers about jobs, almost two-thirds spoke with their fathers, and over half (56 percent) spoke with their friends. Similar to other groups, a (small) minority spoke to teachers and guidance counselors about jobs.

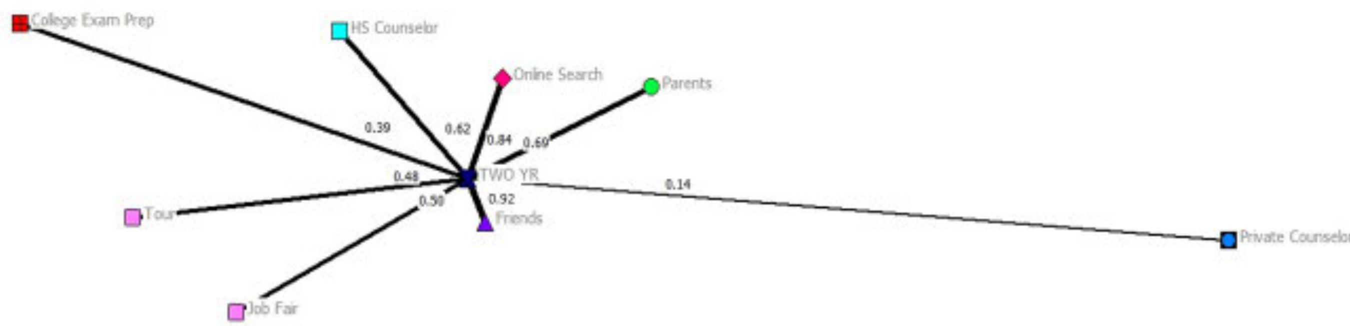
Figure 15. Two-Year College Information Network, Student, Freshman Year



Source Data: U.S. Department of Education, National Center for Education Statistics, “High School Longitudinal Study of 2009 (HSLS:09),” 2009-16, Base year survey. Tabulations are author calculations.

Figure 16 shows the information network during junior year. The prevalence of online research—which 84 percent of the Two-Year College group engaged in—is quite notable for these youth relative to the proportion of other college-planning activities. Almost 70 percent reported speaking to their parents about college, and just over 60 percent spoke with their high school counselor about life after high school. However, only half reported going on a college tour or attending a job fair, and only about 40 percent took a college exam prep course. A possible implication is that these youth could be more open to influence from targeted sources such as their parents and the internet.

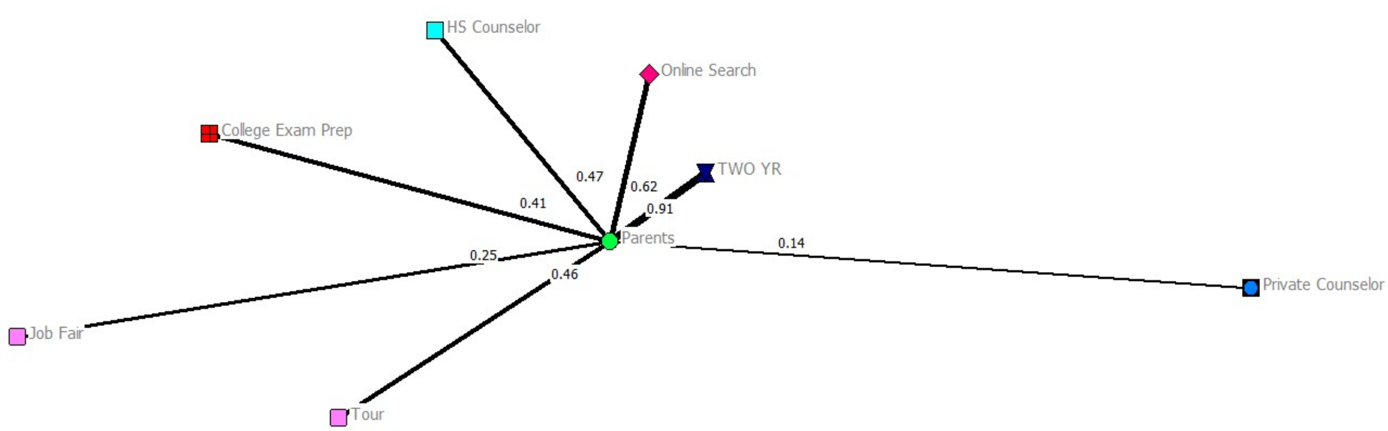
Figure 16. Two-Year College Information Network, Student, Junior Year



Source Data: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, First follow-up survey. Tabulations are author calculations.

As true for their teens, Figure 17 shows parents had mixed involvement in career and educational planning. About 62 percent conducted online research on behalf of their teen, and over 90 percent spoke with their teen about college. However, less than half of parents reported planning a college tour or enrolling their teen in a college exam prep course. Very few (about a quarter) attended a job fair with their teen, and roughly the same share as the other college and non-college groups (half) met with their teen's high school counselor.

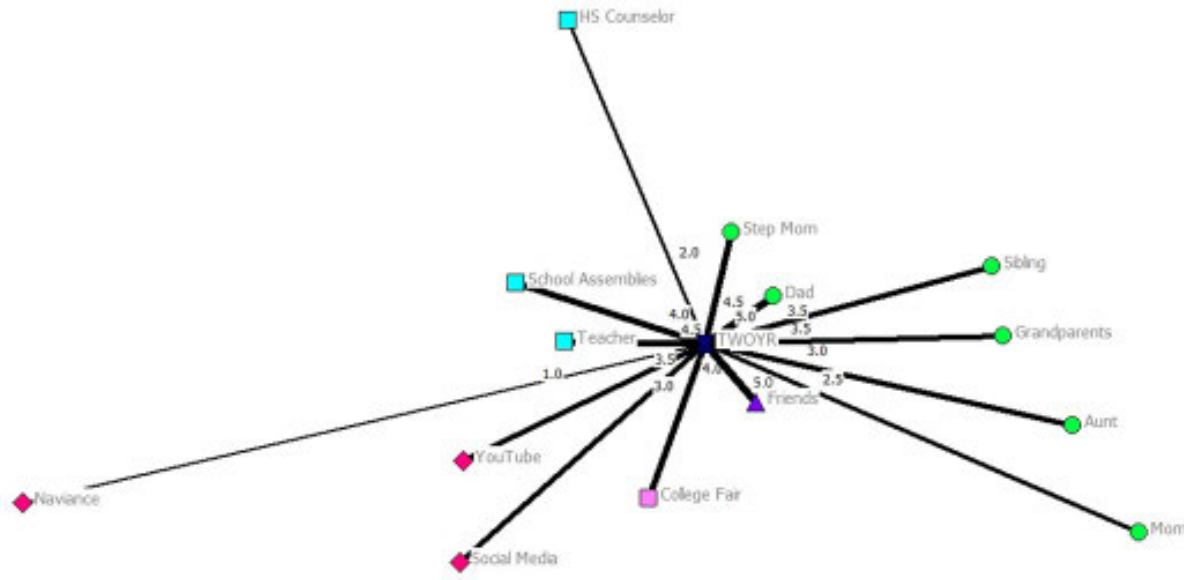
Figure 17. Two-Year College Information Network, Parent, Junior Year



Source Data: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, First follow-up parent survey. Tabulations are author calculations.

Interviews with high school juniors provide additional insight. A few interviewees knew they were going to enroll in a local community college out of high school, generally with the goal of enrolling in a four-year institution afterwards. One such youth's network is depicted in Figure 18 below.

Figure 18. Two-Year College Information Network, Interview Sample



Source: interview.

This interviewee did not have a clear focus on a desired career to pursue. As a result, the youth's network was quite dense with a high degree of connections. The interviewee relied on many sources of information to try to make career and educational decisions. Moreover, many of the connections were rated as being highly influential, so there were many strong ties. This could be a positive in terms of having access to information, or it could be a negative in creating cognitive overload for an already unfocused youth.

In the HSLS09 sample, the two-year college group includes about half of the youth that went on to enlist in the military after high school. The networks depicted here suggest at least some youth in this group are actively searching online for career and educational information. They may also be willing to consider a wider variety of sources for influence, including social media and YouTube.

Group Differences

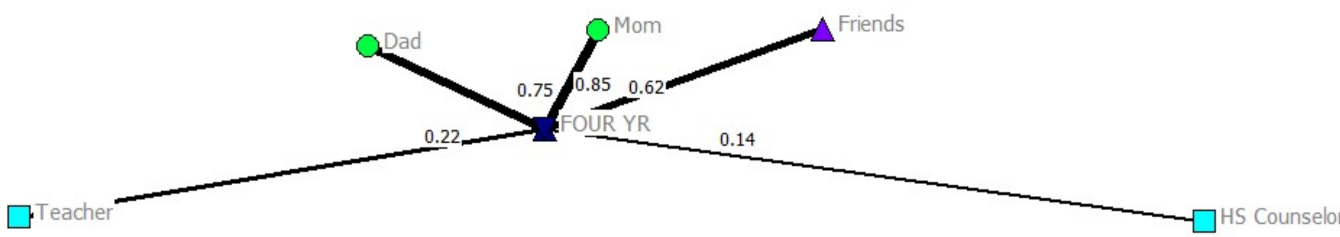
Youth that went on to attend two-year college demonstrated mixed information-seeking behaviors junior year. They were more likely than youth that did not attend two-year college (composed of youth that went to four-year college and youth that did not attend college) to search online for college-related information and work with a family-hired private college counselor. They were less likely, however, to go on a college tour or take a college exam prep course. Interestingly, whether intentional or not, those actions may be more reflective of youth intending to attend four-year college.

Attended Four-Year College

Youth attending four-year college had among the strongest and widest information networks as described in Paper Two of this study. Their parents were also the most actively involved in college and career planning activities on behalf of their teen. Visualizations that directly compare four-year college bound networks to those that neither enrolled in college nor served in the military are provided in Appendix D.

Even in freshman year of high school, a large majority of youth were speaking to at least one of their parents about jobs. About 85 percent were speaking with their mothers, and three-quarters were speaking to their fathers. Over 60 percent spoke to their friends. As true for other groups, a small minority spoke to teachers or guidance counselors about jobs freshman year.

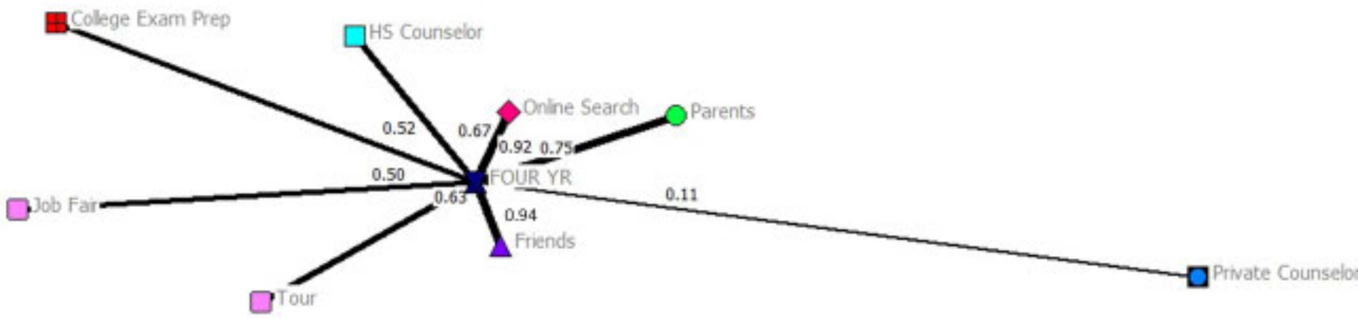
Figure 19. Four-Year College Information Network, Student, Freshman Year



Source Data: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, Base year survey. Tabulations are author calculations.

Figure 20 visualizes the junior year descriptive statistics from HSLS09 of four-year college bound youth. It shows the overwhelming majority of youth—over 90 percent—conducted online searches about college. Two-thirds spoke with their high school counselors about life after high school. Moreover, three-quarters spoke with their parents about college financial aid. This is in contrast with 54 percent of youth enlisting out of high school and 57 percent of non-college bound youth. These youth also were far more likely to report going on a college tour than other groups, at almost two-thirds compared to 48 percent of two-year college bound youth and 39 percent of non-college bound youth.

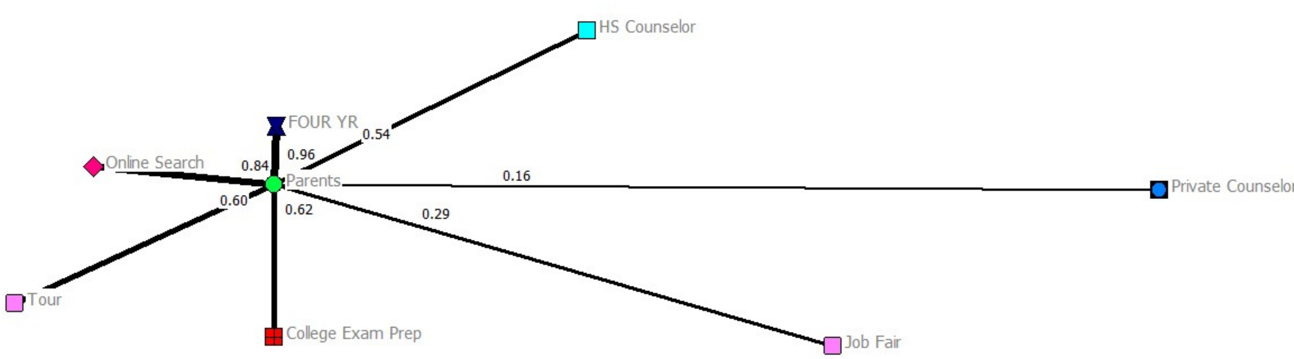
Figure 20. Four-Year College Information Network, Student, Junior Year



Source Data: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, First follow-up survey. Tabulations are author calculations.

Parents of these youth conducted a large amount of college planning on behalf of their teen, as shown in Figure 21. Over 80 percent conducted college-related online search and 60 percent reported organizing a college tour. Moreover, 96 percent reported speaking with their teen about college. Surprisingly, just over half of parents spoke with their teen's high school counselor, which, in practical terms, is one influencer that was not so different in terms of importance for parents of teens in other groups. In contrast, parents of four-year college bound youth were between 15 and 30 percentage points more likely to engage in online research, college tour organizing, and enrollment of their teen in a college exam prep course than parents of youth who did not go to college or two-year college bound youth.

Figure 21. Four-Year College Information Network, Parent, Junior Year

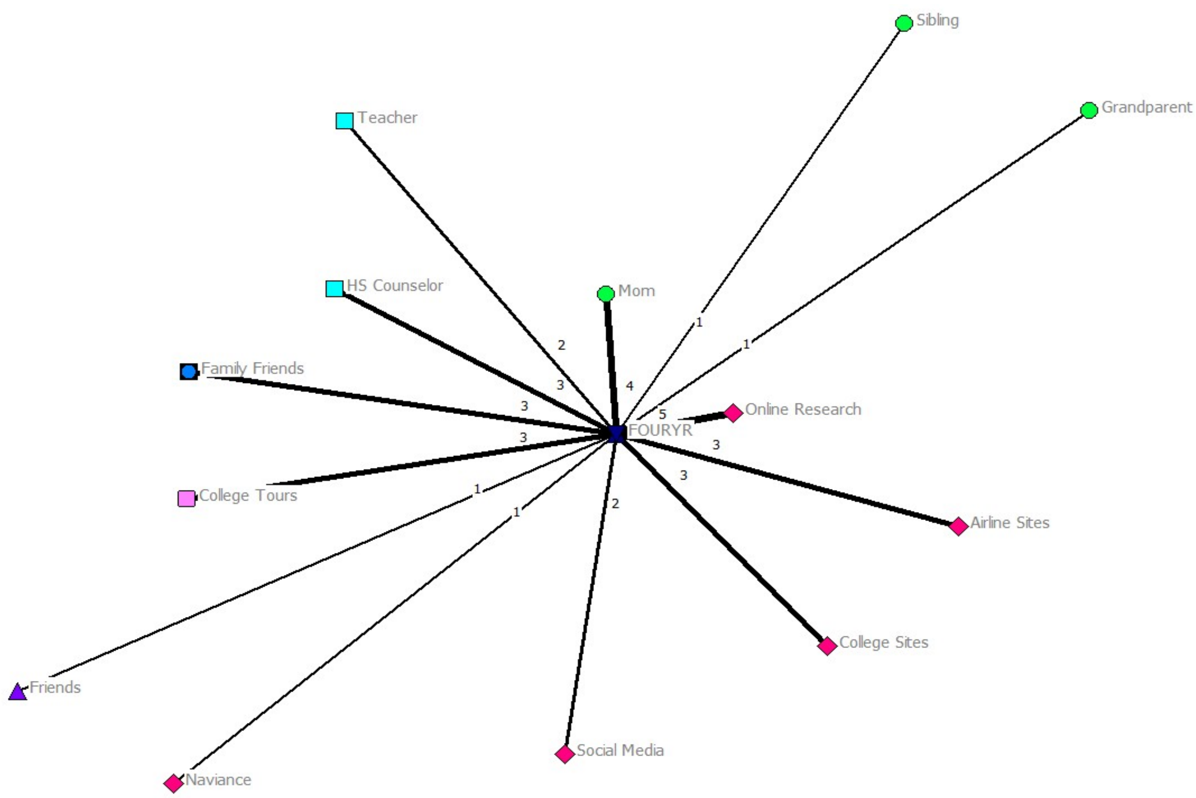


Source Data: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, First follow-up parent survey. Tabulations are author calculations.

Notably, as Paper Two of this research study showed, there is a relationship between parental educational attainment and household income and youth attending four-year college. Although the nature of that relationship is not studied here, it is likely embedded in the strength of the parental portion of the network.

A more comprehensive look is possible with the interview data. Most high school youths interviewed anticipated attending four-year college, whether they had conducted any planning or not. One high school junior interviewed was very set on four-year college, with the eventual goal of becoming a commercial airline pilot. This interviewee's network is depicted in Figure 22.

Figure 22. Four-Year College Information Network, Interview Sample



Source: interview.

This youth demonstrates the importance of weak ties. After the interviewee had a realization about wanting to be a pilot the summer before junior year, the youth got to work building an information network.[190] The interviewee did not immediately know anyone who was a pilot but was able to meet new connections through his mother (e.g., family friends). The youth was very focused and motivated and searched for information online, from licensure requirements to

[190] Interestingly, a fair number of youths interviewed changed their career intention between sophomore and junior year. In this case, the realization was entirely the youth's own after taking a flight.

college degree programs and job postings on airline sites for other credentialing and flight hours needed. The youth spoke with family friends and the high school guidance counselor about summer program opportunities. Through a family friend, the youth signed up for a flight school to get started on lessons and accruing flight time hours.

Another network dimension worth noting for this youth is function. Although this youth's network is dense, the youth really was only interested in a specific type of information—information related to becoming an airline pilot. Unlike the two-year college interviewee depicted in Figure 18, this youth was not open to general career and educational information. It was more about validation and creating a plan to realize the youth's career goal. Youths in this category are therefore able to be reached because they are accessing information, but it could be difficult to reach them effectively if it means changing their focus.

Group Differences

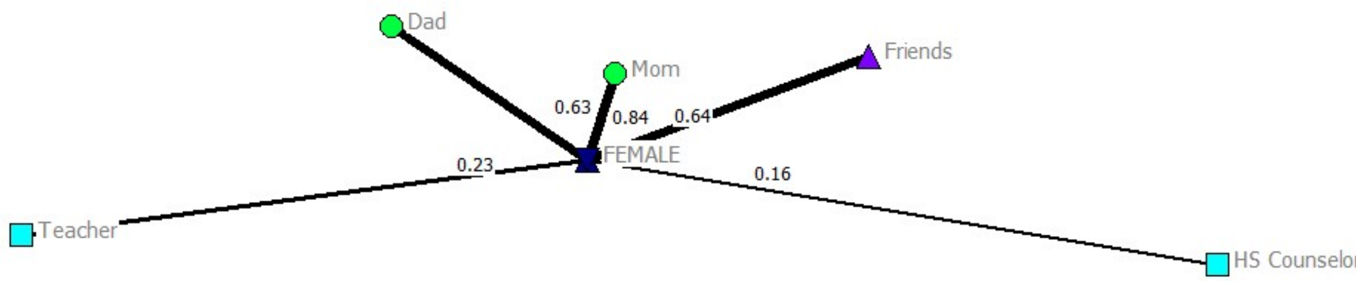
Youth that went on to attend four-year college were far more likely to build out their career and information networks, even as early as freshman year. These youth were far more likely than youth that did not go on to attend four-year college to speak with their parents and friends across a range of topics, including college. By junior year, they were far more likely to speak with their parents about financial aid for college, and with their friends and guidance counselors about life after high school. They were also more likely to engage in college planning activities, such as going on a college tour, searching for information online, or taking a college exam prep course. They were also more likely to be active across extracurricular activities, including sports, with the exception of art.

Female

The regression analysis in Paper Two of this research study showed that females had much stronger information networks than males. In short, they talked to more people about more topics. Moreover, Paper Two showed more females than males in this sample went on to attend college. The strength of females' information network can be seen freshman year and junior year, in Figures 23 and 24 respectively.

Interestingly, although females were more active in building their networks, freshman year numbers suggest that, at least at that age, fewer females spoke with their fathers across topics than with their mothers. Across all topics of discussion, these differences were statistically significant. In freshman year, for example, while almost 85 percent spoke to their mothers about jobs, just under two-thirds spoke to their fathers about jobs. This is about the same share of females that spoke to their friends freshman year about jobs. As true for other groups, only a small minority spoke to teachers and guidance counselors about jobs freshman year.

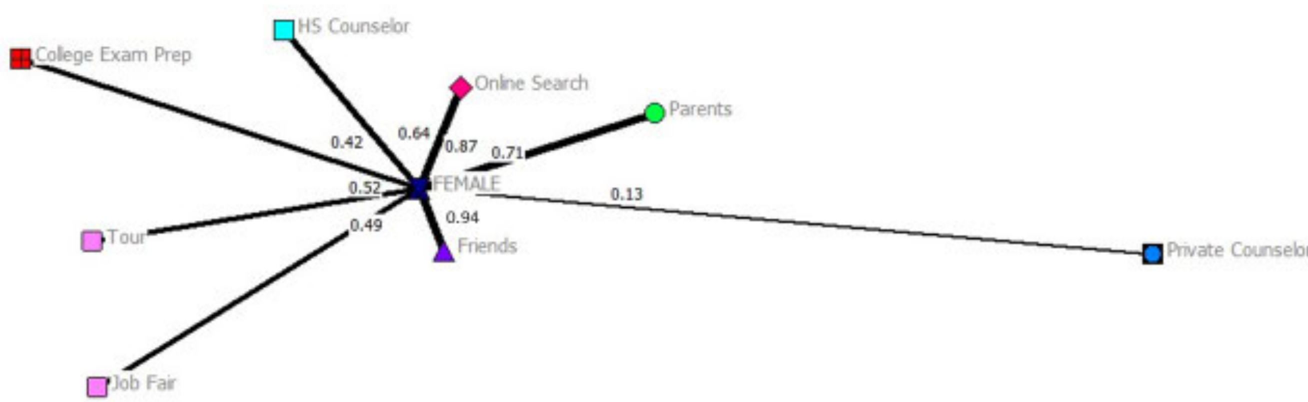
Figure 23. Female Information Network, Student, Freshman Year



Source Data: U.S. Department of Education, National Center for Education Statistics, “High School Longitudinal Study of 2009 (HSLS:09),” 2009-16, Base year survey. Tabulations are author calculations.

Similar to four-year college bound youth, Figure 24 shows that the overwhelming majority of females junior year conducted online research—almost 90 percent. About two-thirds spoke with their guidance counselor about life after high school and over 70 percent spoke to their parents about financial aid for college. Just over half also went on a college tour, while nearly half attended a job fair.

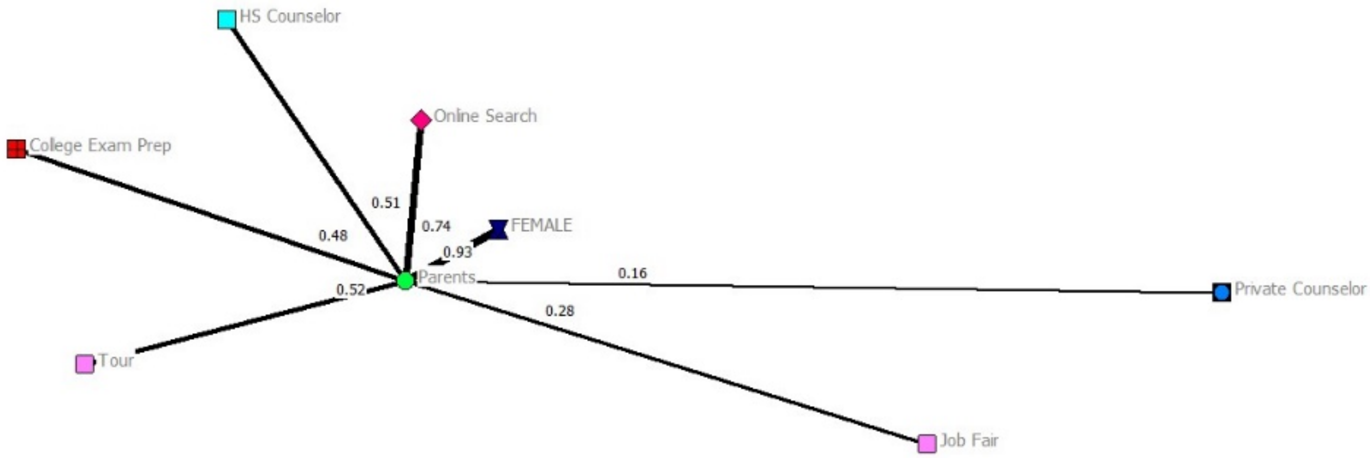
Figure 24. Female Information Network, Student, Junior Year



Source Data: U.S. Department of Education, National Center for Education Statistics, “High School Longitudinal Study of 2009 (HSLS:09),” 2009-16, First follow-up survey. Tabulations are author calculations.

Figure 25 shows that parents also were generally involved with planning on behalf of their female teen. Almost three-quarters conducted online searches on behalf of their teen and about 93 percent reported speaking with their teen about college. Just over half organized a college tour and spoke with their teen’s high school counselor, similar to parents in other groups.

Figure 25. Female Information Network, Parent, Junior Year

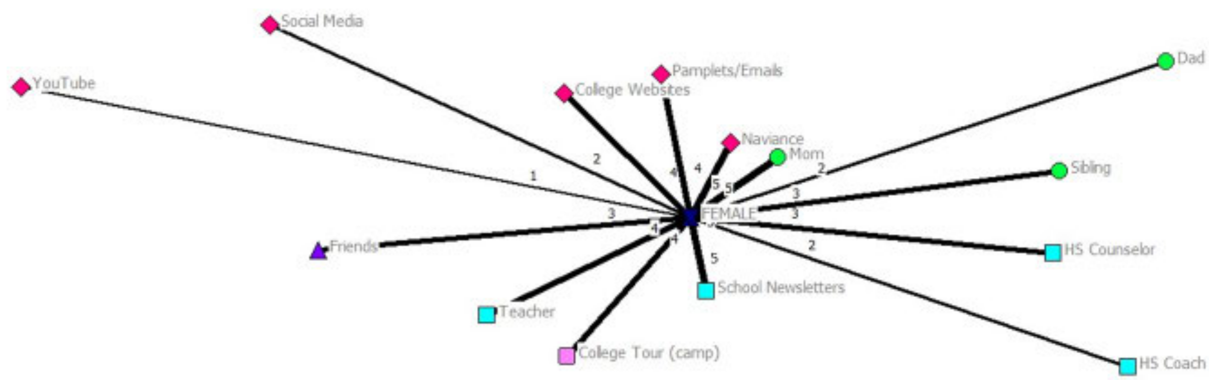


Source Data: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, First follow-up parent survey. Tabulations are author calculations.

In line with the above discussion on social-emotional wellbeing, the interviews allow for some appreciation of differentiation in circumstances among female youth. Figure 26 depicts a female high school junior who struggled with an unstable family situation that ultimately resulted in self-described depression. However, she addressed this with counseling. Moreover, she described herself as extremely motivated to be the first female in her family to attend four-year college and would not let anything derail her planning. She was very active in building her network through school-provided opportunities and with the encouragement of her mother.[191]

[191] This youth won a lottery to attend a high school outside of her home district to have access to school-provided opportunities, which were quite notable. That said, not everyone at this high school, including others interviewed, took advantage of these opportunities.

Figure 26. Female Information Network, Interview Sample 1



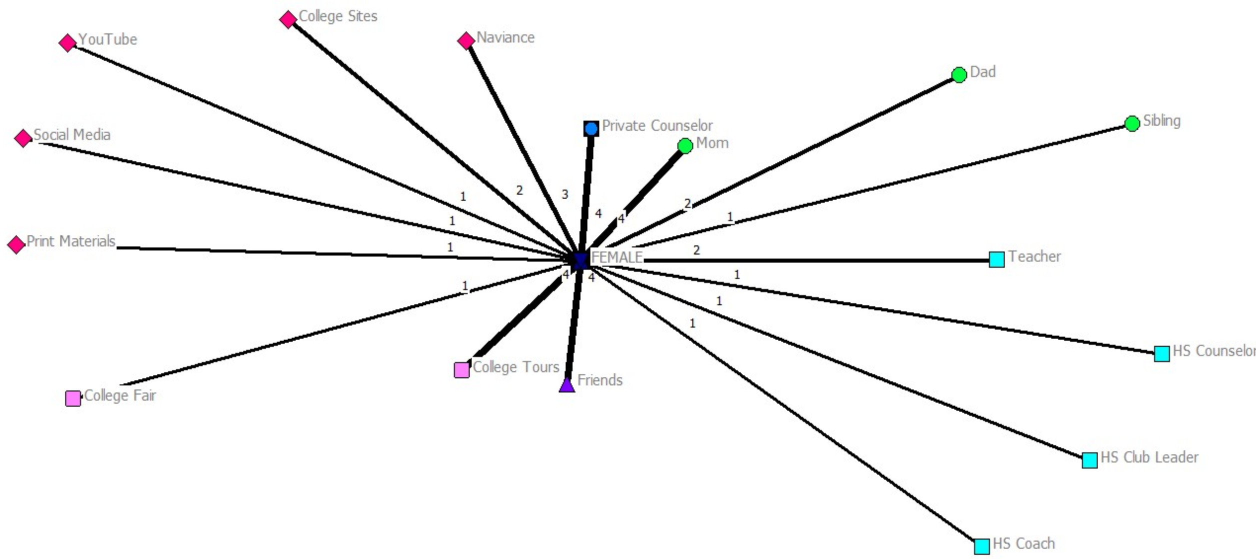
Source: interview.

The high degree and density of this youth's network suggests this youth is fairly reachable as it relates to career and educational information. This youth took advantage of available resources and used them to build her social and cultural capital through network strength and composition.

A second network derived is provided in Figure 27. In contrast to the interviewee depicted in Figure 26, this interviewee was extremely self-assured and confident in her plan to attend a prestigious four-year college. She came from a stable family background and had a very actively involved mother in terms of college planning. However, this youth insisted that her college decisions were solely her own, that she had a strong will, and that no one could influence her decision. Accordingly, although her network also was fairly dense, including many sources of influence and information, few were regarded as strong influencers.

The implication is that while this youth is reachable, this youth could be difficult to effectively influence. Many females interviewed also were vocal about the importance of people over other resources, some acknowledging a limited interest in conducting research outside of discussions. This youth admitted to being more influenced by hear-say and anecdotes from trusted influencers than online sources. Moreover, this youth admitted similar influence in forming general perceptions about college and the military that could not be tied to any particular node, person or source.

Figure 27. Female Information Network, Interview Sample 2



Source: interview.

Group Differences

Females were more likely than males to build out their career and educational information networks, particularly across influencers through conversation, even as early as freshman year. They were more likely to speak with their mothers and friends across a range of topics freshman year, including college, although fewer spoke with their fathers across the same range. By junior year, they were more likely to speak with their parents about financial aid for college, and with their guidance counselors and friends about life after high school. They were more likely to search for information about college online, although not necessarily more likely to engage in other non-conversational information-seeking activities. Females were also far more likely than males to participate across a range of extracurricular activities, with the exception of sports, where females were far less likely to participate.

Summary

As early as freshman year, the majority of youth across groups spoke to at least one parent about jobs (and college as shown in Appendix A). Generally, mothers were the most likely influencer related to those conversations, ranging from 70 to 85 percent across groups, while teachers and guidance counselors were the least influential at that age on average. Interestingly, across groups with the exception of the military enlistees[192], the share of youth speaking with their mothers about jobs was statistically higher than youth speaking with their fathers (although the share for fathers was still larger than half).

[192] Likely due to a smaller sample in group which led to wider confidence intervals.

By junior year, many youth across outcomes and groups were involved in conversations and activities related to formal career and educational network building. This included conversations with parents and friends about college and life after high school, and it included activities such as searching for college-related information online or taking a college tour. Junior year also saw an evolution in the importance of the high school guidance counselor relative to freshman year, particularly for youth that went on to attend college and for females.

The network visualizations of junior year also demonstrate a clear progression of trends from freshman year in the development and evolution of career and information networks. Youth that went on to four-year college and females had the highest rates of speaking to influencers about college and jobs freshman year, and, continued their lead junior year.

In fact, the networks visualized in this chapter suggest four-year college-bound students and females had the strongest and most active educational and career information networks in high school across the groups and outcomes studied. Youth that neither enrolled in college nor served in the military had the weakest and least active information networks, and the least likelihood of engaging in life planning activities to build them during high school. While the network for two-year college bound youth appeared to be a cross between four-year college and non-college youth, engaging in some activities over others, the network for propensed youth appeared more similar to non-college youth than other groups. That is, propensed youth had more limited information networks and were less likely to engage in network building activities.

Similar to two-year college bound youth, youth enlisting in the military at least a year after high school engaged in some information network building activities over others, while on average youth enlisting right out of high school had weaker information networks more closely resembling youth that did not attend college. This could be due at least in part to these youth knowing or feeling early on that they were going to enlist, and therefore not engaging in traditional information network building activities.

Parents of youth varied in career and educational planning involvement in ways that resembled the level of involvement of their teen. For example, parents of four-year college bound youth were the most involved, while parents of non-college or military bound youth were the least involved. Generally, parents of two-year college bound youth had more involvement than parents of non-college bound youth, although less than that for four-year college bound youth. Parents of propensed youth were fairly similar to parents of non-college bound youth. On average, a large majority of parents of female youth were involved in their teen's life planning through discussions and online search, as were parents of four-year college youth.

Finally, the networks visualized from the interviews suggest that while HSLS09 derived networks are an average, the actual network structure, density, and composition of youth across groups can vary widely. There are many factors behind this variation that are embedded in youths' networks, including family dynamics, social-emotional well-being, and degree of focus and motivation. Some youth are more able and willing than others to build their networks, linking to strong and weak connections. Some youth are more interested in conversations over online research and other less direct information-gathering. And some youth are more focused than others, and therefore more or less willing to consume information even if it is available.

5. Policy Implications

> "A widening military-civilian divide increasingly impacts our ability to effectively recruit and sustain the force. This disconnect is characterized by misperceptions, a lack of knowledge and an inability to identify with those who serve. It threatens our ability to recruit the number of quality youth with the needed skill sets to maintain our advantage." – Anthony M. Kurta, acting Under Secretary of Defense for Personnel and Readiness, testimony to the National Commission on Military, National and Public Service, 2019

Having adequate manpower and personnel is essential for an effective U.S. military. But current trends pose challenges. Most youth are not fully-qualified to serve, and youth unemployment has been at a record low.[193] Research shows that "the main predictors [of service] are not based on class or race…instead the best predictor is a person's familiarity with the military."[194] As noted above, the military-civilian divide has widened over the past decades. My interviews and other national youth population research support the notion that many youth do not consider the military as an option.[195] They have limited exposure to or information about service and its benefits and many did not see themselves as a good fit. Instead, all of the high school juniors I interviewed believed they should enroll in college after high school and were planning accordingly.

As unemployment decreased to near-historical lows and, in some cases, military recruiting requirements increased over the last few years, the military services recognized that they needed to improve recruiting effectiveness. They struggled to meet Congressionally-mandated end-strengths and announced measures to improve youth targeting and outreach. For example, this includes a new advertising campaign and outreach to 22 underrepresented cities for the Army, total force integration in recruiting and female-friendly advertising campaigns from the Air Force, and commercials targeting concerned parents funded through the Office of the Secretary of Defense.

This research aims to better understand why youth choose to enlist in the military—or why they do not. It builds and visualizes career and educational information networks across seven segments of youth using two sources of data: (1) HSLS09, a longitudinal survey of youth from the U.S. Department of Education, and (2) interviews with high school juniors and newly

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[193] See "Youth Information Networks and Propensity to Serve in the Military: A Review of Relevant Literature" for part one of this study. These results precede the recent effects of COVID-19 and physical distancing on military recruiting.

[194] Phillips, Dave and Tim Arango, "Who Signs Up to Fight? Makeup of U.S. Recruits Shows Glaring Disparity," *New York Times*, January 2020.

[195] National Commission on Military, National, and Public Service, "Inspired to Serve: Executive Summary," 2020.

enlisted military recruits in the U.S. Air Force. The evolution in information network composition, and variation in degree of focus, motivation, and social-emotional wellbeing all suggest that youth career and educational decision-making is neither a one-size-fits-all process nor a one-time or static decision.

The findings presented in this paper suggest a more nuanced lens from which to address the issue of limited youth familiarity with the military. This chapter provides insights and implications for military recruitment planners on how youth make career and educational decisions with an emphasis on serving in the military. It also explores what these findings suggest related to theories of behavioral change and what that means for designing more effective marketing and advertising campaigns to reach the intended youth audience and their influencers. These insights and implications are based on the average rates of engaging in the specific activities and differences across the youth subgroups I identified, provided, and discussed in Paper Two and above in Paper Three, in combination with the literature and supplemented by my interviews. They are intentionally robust to non-causal evidence. It is not possible to state with certainty that making these changes will lead to a specific, desired outcome; however, based on my analyses, better youth engagement is a possible, even likely, outcome given the outreach deficiencies identified.

Insights from Youth Information Networks

Key Findings

The career and educational information networks presented here provide a prototypical network and range for each identified youth group of interest. They provide validation of the hypotheses presented in Paper Two of this research study:

- **Three main considerations have a sizeable impact on youths' ultimate career and educational decisions: (1) social-emotional wellbeing, (2) the use of and reliance on influencers, and (3) engagement in information-seeking activities during high school**.
- **These factors act together on youth decision-making**.
- **Youths' information networks evolve over time**.

Moreover, using principles of social network analysis, several key findings emerge specific to youth information networks. First, **how youth build and use their career and educational networks in high school varies widely**. Some youth have very dense networks while others have few influencers. Some have many strong ties while others have few. Some have good reach outside of immediate family and friends while others do not. The literature shows the importance of social networks in determining behaviors and outcomes, and yet there are a considerable number of youth who hardly build any social or cultural capital during high school.[196]

Second, **youth career and educational information networks come in many shapes and sizes**. The visualizations show a range of degrees, densities, composition, and functions. Some youth rely on ties for emotional support, others for information, and still others for direct or indirect influencers in their decisions. All are types of influence but they are inherently different in the nature of the relationship and network content.

Third, this research further validates the literature that **youth career and information network construction can begin as early as freshman year and continue well after high school graduation**,[197] with many youth actively building and using their network during junior year. My interviews also suggest that, at least for some youth, career and educational goals may not come into focus or become firm until junior year of high school. For example, many interviewees reported completely changing their career interests between freshman and junior year. It is when there is a catalyst, such as taking a college exam, applying for college, or realizing graduation is coming, that many interviewees more formally began to create and execute their plans. That said, and also consistent with the literature, many recruits interviewed delayed career and educational decision-making until senior year or later, sometimes spending years in various phases of the career and educational decision-making process.[198]

Fourth, **access to online content may be necessary but not sufficient as a stand-alone resource for high school youth to choose to serve**. Information has never been more plentiful or easily accessible as it is now. One does not need vast networks of well-connected influencers to consume valuable career and educational information. Indeed, outside of conversations, accessing information online was the college planning activity with the highest shares across outcomes and groups—by a sizeable margin. And yet, many youth interviewed in this study failed to take advantage of this information, even among those planning to attend four-year college. Instead, youth were either interested in accessing information or they were not. Those who were not interested in doing so routinely emphasized the value of personal conversations and experiences over information found online.

Group and Factor Distinctions

Virtually everyone interviewed mentioned at least one of their parents as influencers, although the scope and duration of that influence varied. Although some interviewees were

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[196] Lash, Dave and Grace Belfiore, “5 Essentials in Building Social Capital,” Next Generation Learning Challenges, 2017. For an explanation of the importance of social capital in building human capital, see Coleman, James S. “Social Capital in the Creation of Human Capital,” *American Journal of Sociology*, Vol. 94: S95–S120, 1998.

[197] Hume, Susannah and Jessica Heal, “Moments of Choice,” Behavioural Insights Team, 2016.

[198] Mortimer, J. T., et al., “Tracing the Timing of “Career” Acquisition in a Contemporary Youth Cohort,” *Work and Occupations*, 35(1): 44–84, 2008.

directly influenced by their parents, a large number of youth interviewed generally relied on their parents for support and reinforcement for their current thinking and decisions.

Outside of parents, those who were important sources of information, support, and influence for youth varied widely.[199] While many cited themselves or their parents as key influencers, others cited more indirect connections such as career professionals they met or family friends. In fact, the networks presented here validate social network literature emphasizing the "strength of weak ties" particularly for career outcomes.

Youth that went on to attend four-year college, females, non-college youth, and propensed youth were more extreme in their information network strength and composition. This suggests these youth may be among the easiest or hardest to effectively reach across different platforms and forms of engagement.

However, other groups studied here fell somewhere in between. For example, two-year college youth and youth enlisting at least a year after high school look similar in some ways to non-college bound youth with a more limited network, but a few features suggest they could be more open to influence through targeted means. A large share of these youth searched for college-related information online and engaged in conversations with parents about college. Similarly, a large share of youth enlisting right out of high school searched for college-related information online.

Moreover, high school juniors planning to attend four-year college were very likely to have active parental involvement in their college planning, which was evidenced in the strength of descriptive statistics in HSLS09. Parents were active participants in the planning process, from information gathering to scheduling tours and using their networks as a resource for their youth. The implication here is that in reaching four-year college bound youth, for example, in recruiting future officers, directly targeting their parents is a good strategy.

The understanding of differences across information networks cannot be fully appreciated without an acknowledgement of the role of family dynamics and social-emotional wellbeing. These factors inherently affect youth information networks in a critical, yet uncontrollable way. Moreover, youth do not appear to be affected in the same way by these factors. Some youth find self-motivation in personal struggle while others lose interest and engagement in making career and educational decisions entirely.

Similarly, degree of focus and self-motivation are critical in understanding how willing and able youth are to build and use their information networks. One commonality across all youth interviewed was the importance of social-emotional wellbeing, degree of focus, and motivation in terms of how they were able and willing to access and consume information. Any interventions aimed at engaging youth effectively would benefit from understanding it is as

[199] See Youth Information Networks and Propensity to Serve in the Military: Data Sources, Methods, and Exploratory Analysis" for Paper Two of this study.

much about state of mind—where youth are in the decision-making process—as anything else, regardless of youth race, gender, income, preferences, and family dynamics.

Moreover, the importance of state of mind in willingness to use and build information networks is evident even with access to people. Many interviewees, including recruits, recalled having recruiters visit their high schools but never interacting with them. They acknowledged opportunity to learn more about the military but actively chose not to. They were not in a position of interest in learning more or considering the military as a serious option. That suggests more must be done to open their minds to the option of service as a pathway worthy of consideration, both for those actively making career and educational plans and those that are not in that mindset but who will get to it eventually.

Although not explored in depth in this dissertation, it must be acknowledged that other non-military factors could be a confounding factor in decision-making for today's youth. For example, a growing body of research suggests the Great Recession had a lasting adverse impact on youth self-esteem and mental well-being, along with a reduction in future earnings potential.[200] We also live in a culture where college is strongly emphasized in getting tomorrow's well-paying jobs.

Insights Related to the Theory of Planned Behavior

A first line of insight from this research relates to the theoretical framework DoD uses to explain the decision-making process of youth regarding the decision to serve in the military, and to design outreach strategies accordingly. As discussed in Paper One of this study, the Joint Advertising and Marketing Research Studies (JAMRS) within the Department of Defense uses a specific theoretical framework—the Theory of Planned Behavior (TPB).[201] TPB has three main inputs—attitudes, norms, and self-efficacy. These factors are what determine behavioral intention, which then turns into an action, behavior, or outcome. TBP is visualized in Figure 28.

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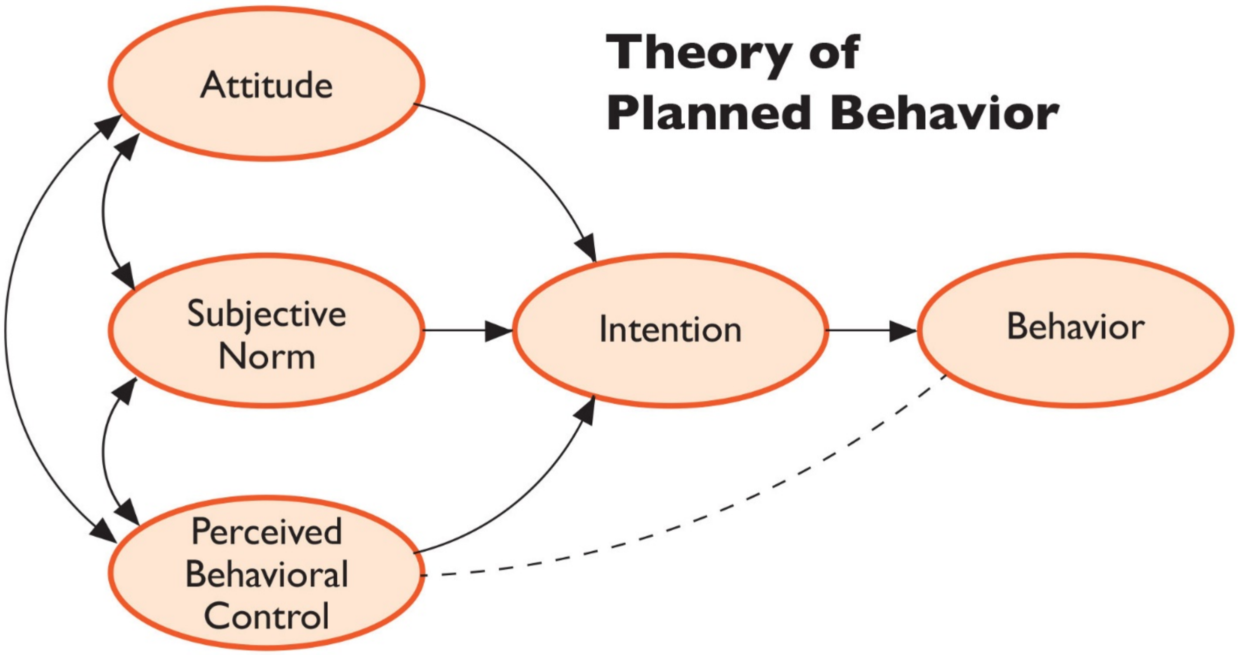
[200] Bell, David and David Blanchflower, "Young People and the Great Recession," *Oxford Review of Economic Policy*, Vol 27, No. 2: 241-267, 2011.

[201] Gibson, Jennifer Lee et al., "Parental influence on youth propensity to join the military," *Journal of Vocational Behavior*, 70: 525-541, 2007.

Figure 28. Theory of Planned Behavior



Source: Gooch, Caitlin, "Let the Recycling Games Begin," Hahn Public, December 2015.

The findings of this research suggest that **while TPB is useful, it may be an incomplete framework from which to approach framing the decision to serve in the military**. First, there is no weighting of each of the three inputs, which likely vary across youth and would affect how best to reach and engage them. Second, there is a lack of consideration for social environment, which is important for youth. In addition to a social norm of college, many high schools offer extensive college planning services that factor into youth exposure and awareness. At home, family dynamics can play a large role for youth in how willing and able they are to build and use their information networks—to set an intention for what to do after high school. Third, social-emotional wellbeing factors into self-efficacy and possibly attitudes but is still broader. Similarly, degree of focus and motivation are not well represented in this framework. Yet this research suggests these are important factors to consider in the career and educational decision-making process.

Moreover, TBP fails to account for what happens between intention and action or behavior. Many youth (and adults) believe they will do something, or state they want to do something, but fail to follow through on it. Stated propensity to enlist is an example, wherein most youth who state that they are likely to enlist do not do so in the end, and where in the end half the enlistees come from youth indicating they were not likely to do so.[202] Simply, in life, things change over

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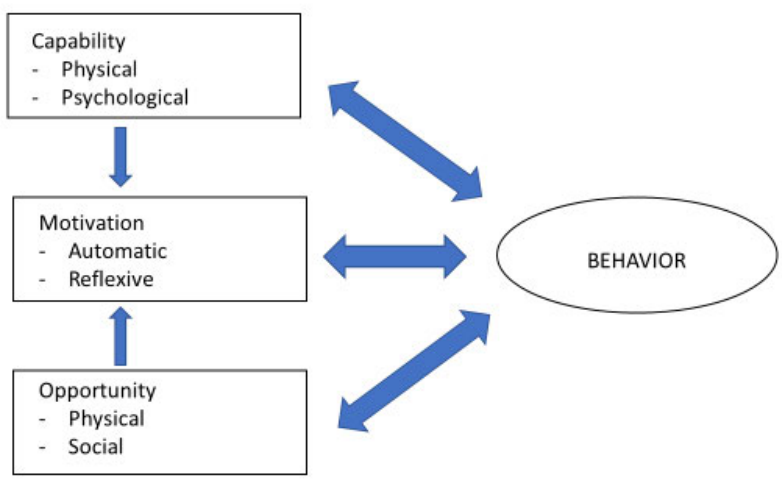
[202] Orvis, Bruce et al., "Validity and Usefulness of Enlistment Intention Information," RAND Corporation, 1992. See Tables 5 and 11. Propensity today is lower than it was in 1992; this means that the proportion of youth who

time. Similarly, many recruits enrolled in college first with the intention of completing a degree, but for various reasons did not do so. This is again where social-emotional wellbeing, focus, and motivation are important, as is understanding the composition, strength, density, and function of youths' information networks.

Validity of Other Behavioral Change Theories

Also as discussed in Paper One of this study, **two theories of behavioral change are more comprehensive than TPB and could provide additional insight into youth career and educational decision-making**. The Capabilities-Opportunities-Motivation—Behavior (COM-B) Model identifies these factors as the key drivers of behavior.[203] Capability and opportunity inform motivation, motivation directs behavior, and behavior can in turn influence all three drivers for future decisions. Capability is divided into psychological and physical dimensions, while opportunity is divided into physical and social dimensions. Motivation is divided into reflective (e.g., analytical) and automatic (e.g., emotional and impulsive) processes, and considers both "conscious" and "habitual" decision-making. A depiction of COM-B is provided in Figure 29.

Figure 29. COM-B Model



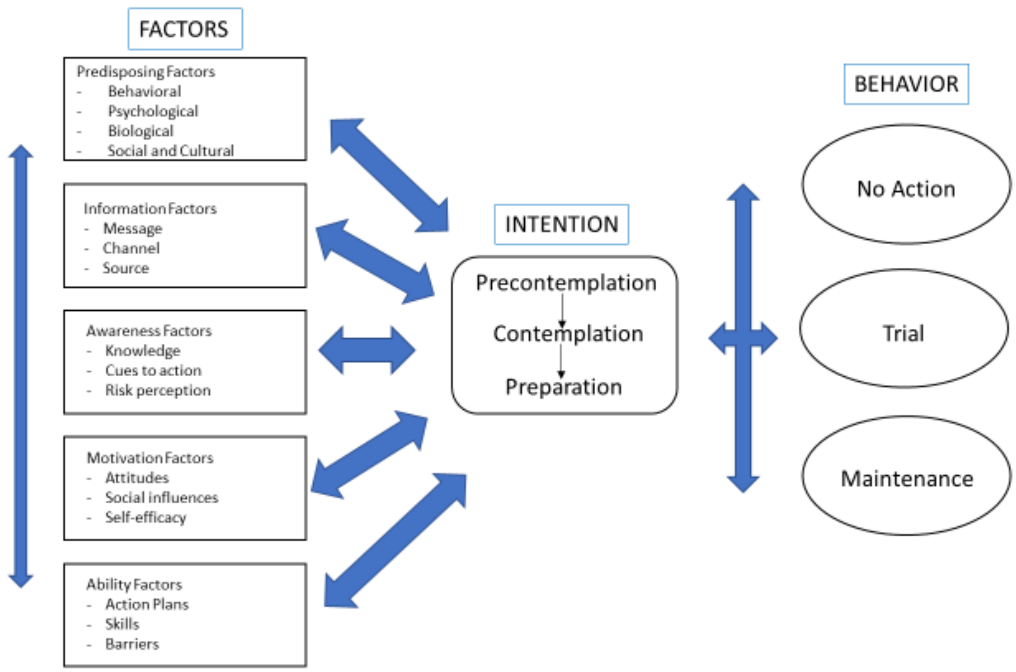
The I-Change Model is the most comprehensive and considers psychological, social, and informational factors that inform intention, which informs behavior, along with consideration for

eventually enlist that would have indicated they did not intend to do so if surveyed up to several years beforehand has increased.

[203] Michie, Susan et al., *ABC of Behaviour Change Theories*, Silverback Publishing: Great Britain, 2014.

three phases of intention that can either end or not end with the behavior being observed.[204] It also separates different forms of behavior, which could be insightful particularly in thinking about retention of servicemembers. A depiction of I-Change is provided in Figure 30.

Figure 30. I-Change Model



TPB is embedded completely in I-Change under motivation. However, I-Change extends TPB to include factors from other models believed to be influential in decision-making that are supported by this research. These factors include predisposing factors, such as biological factors, information factors (such as messaging and source), awareness factors (including knowledge and risk perception), ability factors (including skills and planning), and barriers to action.

The research presented here suggests **COM-B and I-Change could provide an enhanced perspective by which military recruitment planners could frame youths' decision to serve in the military**. The benefit of COM-B is that there is a growing body of research surrounding it, and it explicitly recognizes the importance of motivation in follow-through of intention to behavior. The benefit of I-Change is that it is the most comprehensive, embeds TBP, and considers TBP as a driver of motivation. Application of either theory could facilitate interventions that target one or multiple factors jointly for better accessing the youth market.

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[204] Ibid.

Insights for Military Marketing and Event Campaigns

A second line of insights from this research relates to current and future outreach strategies to engage youth about the possibility of serving in the military.

The majority of youth across all groups and outcomes of interest spoke with at least one of their parents about college and jobs as early as freshman year of high school. The implication is that **military marketing suffers from a timing mismatch**. This mismatch is independent of who initiated the conversation or why. It does, however, suggest that marketing campaigns are not reaching youth at the right time in their career and educational decision-making processes to have the most effectiveness. Not reaching youth with appropriate content until after they are well into their post-high-school planning means marketing campaigns are failing to reach these youth in a way that could have gotten them to consider military service sooner.

Although not generalizable, it is notable that several high school students and recruits interviewed who discussed military perception-setting noted the military ads they did see—including in movies and video games—could potentially have had a counter-productive effect. These interviewees recalled advertisements that seemingly emphasized combat and violence, leading to a negative perception of service. Youth who do not agree with current U.S. policies or military posturing and who only see combat operations and wounded warriors, may close their minds to serving before a seed could even be planted. In this regard it is worth noting the Army's recent shift in the focus of its advertising toward the variety of jobs and roles fulfilled by Army service members, not simply traditional combat. JAMRS also has several campaigns underway to this effect, such as the "Today's Military" campaign, focused on parents of high school youth. The analysis provided here suggests this is a worthwhile line of advertising that should be continued, particularly in engaging youth with highly involved parents (e.g., four-year college-bound youth).

However, my analysis of HSLS09 (presented in Paper Two) and my interviews show that youth often felt that they themselves were the most influential related to their career decisions—not their parents. Given that many youth have neutral to negative perceptions of the military, **this could also be an opportunity for advertising and marketing campaigns to target a perception-(re)setting of youth**. Therefore, marketing should continue to directly engage youth to this end. For example, the Army's recently launched ad campaign noted above, "What's Your Warrior," is designed to showcase the range of career options for enlistees.

Finally, while not constituting a sample that would support generalizability, discussions with high school juniors suggest that perception (re)setting could be challenging. Many high school juniors interviewed had fairly set opinions about the military that were not necessarily accurate or based on anything tangible. Many of these youth exhibited confirmation bias—selectively consuming or believing information that validates existing perceptions—and cognitive dissonance—rejecting information in conflict with their perceptions or actions—in the context of opinions on military service. That is, youth may be more likely to dismiss facts or information that do not fit into their pre-determined views.

These underlying barriers could be observed in my interviews. For example:

> "Just the military in general is not my thing. I'm not like, you know, such a tough cookie. So like, boot camp and stuff like that I wouldn't handle well, I'm just too emotional."

> "I don't really like the military just as an institution and I really think there's no way, I don't see any way for anybody who thinks like me to be able to really work with the military."

> "Well, I've never really found interest in going off and joining some supposed expedition or getting into the fray of violence and stuff. That never really took hold… Almost everyone I know is... have pretty pacifist ideas. Not really. They are also I guess better off not really having to or being obligated to join the military in order to go to college or anything."

> "I appreciate the things that the military does, but I don't believe the military would be something I would be... I don't think I would want to face... Because they go through a whole bunch of hardships. Because when they get shipped out to overseas and the foreign countries, they go through a lot of stuff. I don't think I would want to put myself through that, with risking my life. But because a lot of service men they come... Some of them die for the country-" [youth whose father and uncle served in the military]

> "No, I'm not interested [in military service]. I don't really play violent video games, it doesn't interest me. I'm not into that kind of area of service…I mean, it's just not interesting to me. I don't find the gruesome, I don't find that interesting. It doesn't entertain me."

> "[I'm] Probably not fit enough."

> "I'm listed in a lot of, I guess, AP courses and the kids who are in those courses aren't interested in joining the military"

For these youth, having a negative perception of military service may be easier than acknowledging or being interested in and willing to address barriers, which are related to social norms, misinformation, and perceived self-efficacy. As explored in the next section, these youth may be more willing to adopt a different view of the military if they are exposed to campaigns that align with how they access and consume information, depending on the style, content, and medium of messaging.

Implications for Military Recruitment Planners

Youth career and educational decision-making is far more nuanced than youth may realize. Youth influencers act in concert with each other across the entire information network, in conjunction with youths' own preferences and goal-setting. Influencers may be in a youth's network because the youth sought them out, or because they were already in the youth's network for other reasons. It is a symbiotic, dynamic, and iterative process with many non-tangible factors (e.g., social environment, social-emotional wellbeing, focus, self-motivation, family dynamics and support) embedded.

As stated in Paper Two of this research study, youth decision-making about life immediately after high school generally consisted of the following stages: (1) gathering career and educational information; (2) setting career and educational goals; (3) creating a plan to achieve those goals; (4) gathering and processing more information relative to those goals; (5) applying to college, if college is part of the goal; and (6a) using pre-determined criteria to select which college to attend, usually in coordination with key influencers or (6b) deciding to work (or to enlist in the military) rather than to pursue college. Youth span the range of timing relative to each stage, and in my interviews, this was related to the non-tangible factors cited above. Some youth make it cleanly and quickly through the process while others get stuck on stage 1 and 2 for years.

Military recruitment planners could most effectively reach youth through outreach strategies that account for youth being in different stages of the process. Campaigns could be designed for the full youth life-course, creating multiple or regular points of engagement throughout. This is supported by my findings that many youth are involved in various aspects, and to varying degrees, of the career and educational planning process throughout high school. This way, outreach can reach youth at critical points in the process, including when they may be more willing and able to consume career information and consider the military as a choice. The timing of outreach should start early, be regular, continual, and accessible, and reach youth through multiple channels. Ideally it would be best to reach youth at the right moment, but the military will be better positioned if it is planting a seed all along. Enhanced data analytics could enable this, such as data mining and web-tracking when possible.[205] These analytics could incorporate age as a proxy for stage of decision-making and tailor outreach accordingly.

This translates to **outreach and engagement that covers a larger variation of content, variation in depth of content, variation in mediums and modes of delivery, and variation in length and style though continuation and expansion of existing campaigns**. All of these levers could target different audiences at different stages in their career and educational decision-

[205] The military is already conducting data-enabled outreach and recruiting, such as analyzing youth data at the metro-area and zip code level of data aggregation using internally-collected and publicly available data. However, there are legal limits to what the military is able to do through web-tracking and aggregating or merging data with third party vendors as is common practice in private-sector marketing.

making process—**meet youth where they are**. Content could be intentionally varied at the DoD and service-level to emphasize different aspects of the military and service, from what it is and does, to non-combat careers, to showcasing specific operations and impact. The DoD could grow and expand its "Know Your Military" YouTube channel, for example, that includes short videos for youth and children on what the military is.[206] The Army's "What's Your Warrior" campaign noted above is designed specifically to inform the public about both non-combat and combat roles.

Similarly, variation in depth could be ranging from very short or embedded videos to longer explorations of aspects of military life. Such explorations could confront uncertainties about self-efficacy head on, particularly for females as observed in Paper Two. Several female recruits noted watching others "like them" on YouTube detailing their military life gave them a sense of belonging and a confidence that they could be successful in the military. While some were official channels, some were unofficial channels created by servicemembers to share their experiences.

Expanding the variation in digital platforms used to engage youth could also help to meet more youth where they are online. The Army, Navy, and Air Force, for example, all have an e-sports gaming campaign targeting gamers.[207] Analogously targeted efforts on other platforms may prove effective for other target demographics of enlistment age. This is consistent with the variety of mechanisms identified in the I-Change model.

Moreover, **in addition to traditional marketing segmentation, military planners could effectively engage more youth by distinguishing and engaging youth in a social network context**. For example, military planners could distinguish youth of enlistment age between those with larger or stronger information networks versus youth with smaller or weaker information networks. Youth with larger networks may be easier to reach, through influencers and digitally, but may have varying degrees of focus and willingness to consume career information. (More ties are not necessarily better than less for some youth in making career decisions.) Therefore, general outreach that promotes exposure to military service across as many mediums as possible could heighten awareness and plant a growing seed. Conversely, youth with smaller or less dense networks may be harder to reach, also with varying degrees of career focus. A more targeted message oriented toward a key influencer may be far more effective than a blitz of general advertisements.

Given the legal and other challenges associated with micro-targeting individuals, one option may be to develop campaigns that market to youth in these categories as **a new type of market**

[206] The channel can be accessed here: https://www.youtube.com/user/DODvClips/featured (accessed April 29, 2020). For an example of a video directed at young children, see: https://www.defense.gov/Watch/Video/videoid/629899/ (accessed April 29, 2020). Future videos could similarly promote military exposure in youth without emphasizing combat.

[207] Werner, Ben, "Navy Drops TV Ads: Trades Super Bowl Spots for Esports, YouTube," USNI News, December 2019.

segmentation. Similar to the approaches discussed above, these campaigns could be informed by enhanced data analytics on youth attitudes and behaviors that include an age component and, when possible, variation in the messaging content. It could also include adding survey questions on youths' information network structure and composition to data collection efforts, possibly to JAMRS' Youth Poll, that can be aggregated and analyzed across potential groups of interest.[208] However, these campaigns would be well-served to also involve regular mixed-method research on youth information networks in a social network theoretical context. This includes evaluating mechanisms of communication, structure and composition of networks, and the evolution of youth networks.[209]

Finally, for outreach aimed at eliciting an interaction, especially for propensed youth, military planners should make it easy for people to get the information they need when they want to receive it. **The EAST framework—Easy, Attractive, Social, Timely—from the Behavioural Insights Team provides a potentially useful model for designing effective information and outreach campaigns to reach youth**.[210] The EAST framework is based on behavioral and decision-making research conducted by the Behavioral Insights Team (BIT). It is a truncated version of BIT's longer "MINDSPACE" behavioral intervention framework.[211]

This framework provides four key characteristics of a behavioral intervention to encourage or facilitate a desired action. "E"—Easy—means to make the desired action require minimal effort. For example, one interviewee noted that ease of information helped solidify their decision:

Speaker 1: So what made you ultimately choose the Air Force?

Speaker 2: [Recruiter] was straight to the point. Gave me more information than I could process and gave me sheets of paper that [said] "Hey, if you forget about it, here's all the different steps." And [recruiter] made it extremely easy for me.

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[208] JAMRS conducts a "Youth Poll" of a nationally representative sample of youth aged 16-24 on a rolling monthly basis. The survey tracks youth perceptions of military service, in addition to behaviors related to career planning. I recognize that the addition of new questions and/or segmentation methodologies may require a new System of Records Notice (SORN), which is time-consuming. Additional capabilities desired by the services and DoD agencies fall under the Privacy Act of 1974 (5 USC 552a[4]), OMB M-10-22 (Guidance for Online Use of Web Measurement and Customization Technologies), and DoD Instruction 8550.01 Section f(1)(b) ("Web Measurement and Customization Technologies"), OMB Circular A-108 (December 2016a), OMB Circular A-130 (July 28, 2016a), DoD Directive 5400.11 (October 29, 2014), DoD Regulation 5400.11-R (May 14, 2007), OMB ("Privacy Act Implementation-Guidelines and Responsibilities," 40 FR 29849-28978, July 9, 1975), and U.S. Department of Justice ("Overview of the Privacy Act of 1974"). For more, see Lim, Nelson, Bruce R. Orvis, and Kimberly Curry Hall, "Leveraging Big Data Analytics to Improve Military Recruiting," RAND Corporation, 2019.

[209] Mixed-methods includes qualitative interviews and focus groups with youth and key influencers. JAMRS occasionally interviews youth from JAMRS-administered surveys who are at least 17 years old currently.

[210] Behavioural Insights Team, "EAST: Four Simple Ways to Apply Behavioral Insights," 2014.

[211] See Paper One, "Youth Information Networks and Propensity to Serve in the Military: A Review of Relevant Literature," for a detailed discussion of MINDSPACE.

The other elements of EAST showcase the importance of tying into youths' information networks for effective outreach and engagement. "A"—Attractive—means making the action something the individual would want to do, that provides a direct benefit relative to the person's goals. "S"—Social—relates back to perception and norm setting, showing youth that people "like them" or those close to them are willing to serve. "T"—Timely—means getting youth information when they can use it, concurrently with the timing of their career and educational decision-making process. In segmenting youth by their information network attributes, considering differences in youth network density, function, and structure, interventions designed with EAST principles in mind could prove to be effective.

Conclusion

This research study is a first effort at mapping youth career and educational information networks in high school as they relate to the decision to serve in the military. It consists of three papers, of which this is the third and final paper.

This paper visualizes youth career and educational information networks across seven subgroups of interest. It then provides a starting point for how incorporating youth information networks into current military recruitment strategies and marketing campaigns might make them more effective. Specifically, this research finds that designing marketing strategies that are continual, include a wide range of platforms of dissemination, and vary by depth of content could better serve to meet youth where they are in their career and educational decision-making process. Further, given that the majority of youth begin their career and educational planning as early as freshman year in high school, incorporating an age-based dimension in marketing, content, and outreach is essential. Finally, segmenting youth by attributes of their information networks, such as density, structure, and function, in addition to traditional marketing segmentation, may enhance the effectiveness of outreach to youth and engagement.

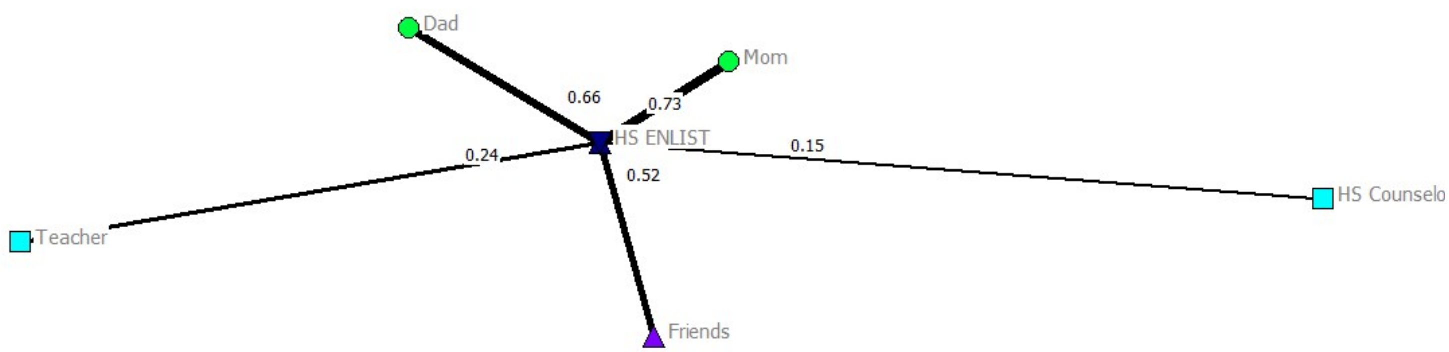
While these are possible implications of this research, additional study to further validate and expand upon these implications would further aid military recruitment planners. The idea of segmenting youth by information network attributes is different from traditional marketing segmentation (at the ZIP Code level or by characteristics such as "Fence Sitters") and should be explored further. For example, collecting data on youth information networks that is more comprehensive than the data presented here would enable greater use of formal social network analytic techniques to identify trends or patterns across groups of youth. As SNA is inherently mixed-methods in nature, this information could be combined with focus groups and interviews to provide qualitative details on how youth build and use their career and educational information network for greater insight.

Military recruitment is a perennial challenge. As conditions and society change—recruiting difficulty, the way youth communicate, the academic and social environment in which youth grow up, and formation of youth preferences and expectations—planners will routinely need to adjust how they effectively attract and engage with qualified youth. This research is one step to help planners move forward in new directions that are better aligned with today's youth.

Appendix A. Youth Information Networks, Freshman Year

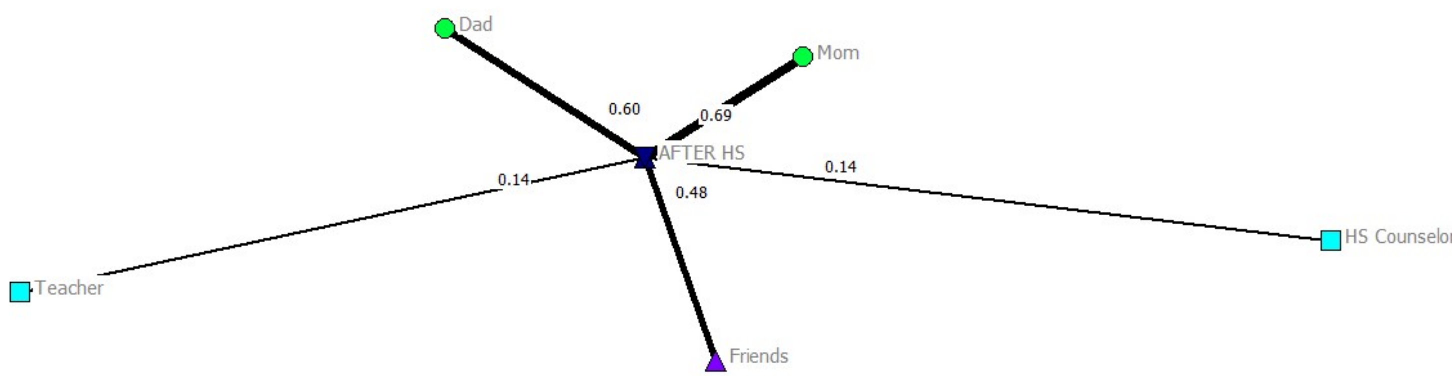
This Appendix provides the network visualizations of each outcome of interest from freshman year of high school as it relates to the decision of going to college. It is not comprehensive but considers many of the most important influencers to youth as depicted in the second report of this study. The networks were constructed from HSLS09 data, using the means provided in Appendix B as a measure for the strength of the network tie. As the visualizations demonstrate, differences in tie strength across influencers are apparent as early as freshman year of high school across groups.

Figure A.1. HS Enlist Information Network, College, Freshman Year



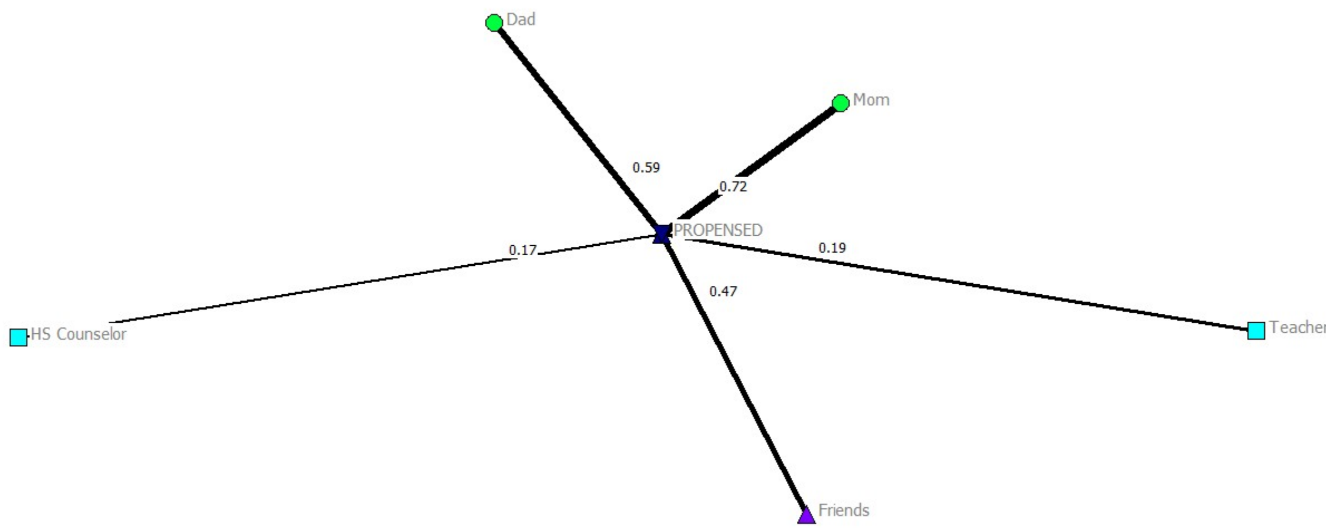
Source Data: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, Base year survey. Tabulations are author calculations.

Figure A.2. After HS Information Network, College, Freshman Year



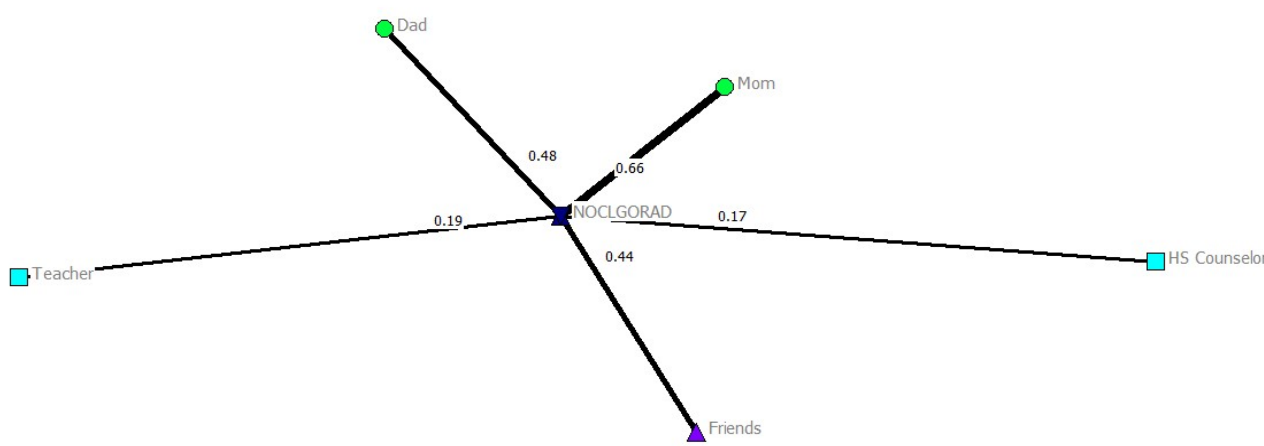
Source Data: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, Base year survey. Tabulations are author calculations.

Figure A.3. Propensed Information Network, College, Freshman Year



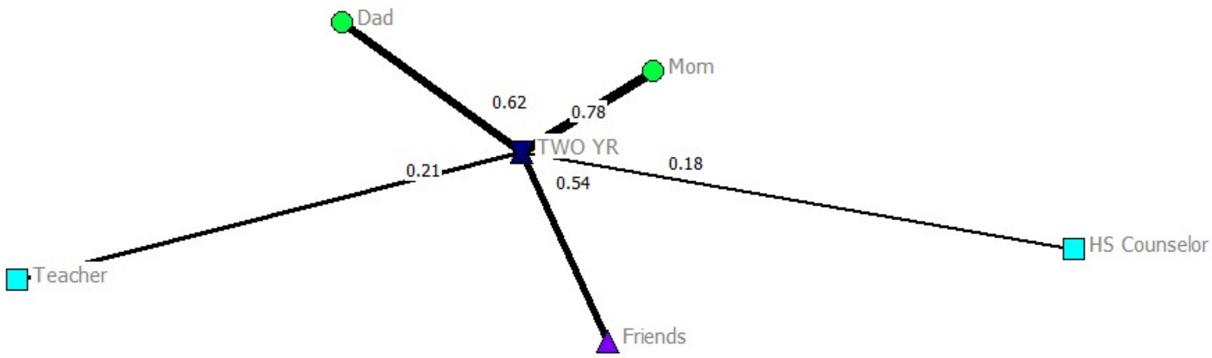
Source Data: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, Base year survey. Tabulations are author calculations.

Figure A.4. No College or Military Information Network, College, Freshman Year



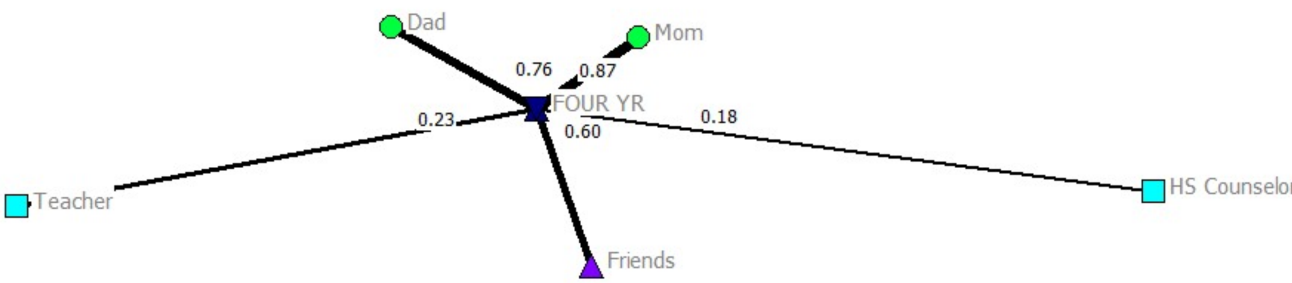
Source Data: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, Base year survey. Tabulations are author calculations.

Figure A.5. Two-Year College Information Network, College, Freshman Year



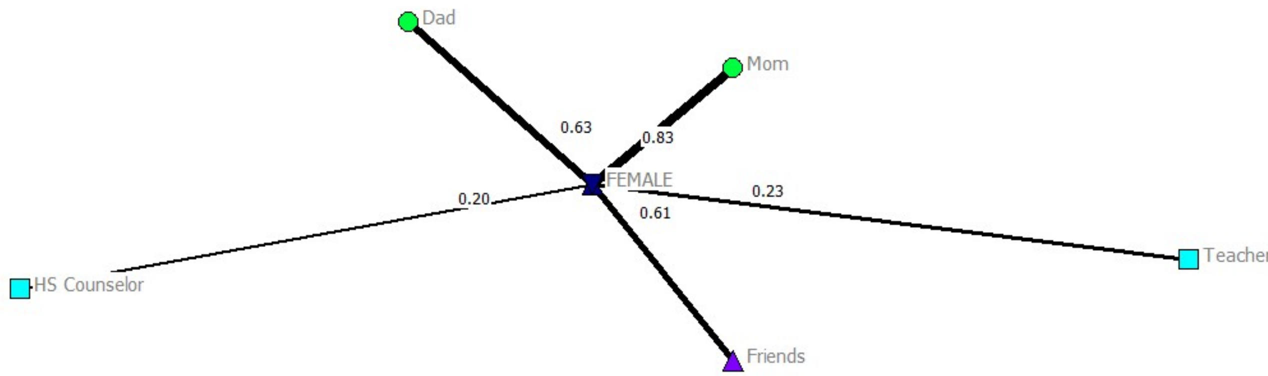
Source Data: U.S. Department of Education, National Center for Education Statistics, “High School Longitudinal Study of 2009 (HSLS:09),” 2009-16, Base year survey. Tabulations are author calculations.

Figure A.6. Four-Year College Information Network, College, Freshman Year



Source Data: U.S. Department of Education, National Center for Education Statistics, “High School Longitudinal Study of 2009 (HSLS:09),” 2009-16, Base year survey. Tabulations are author calculations.

Figure A.7. Female Information Network, College, Freshman Year



Source Data: U.S. Department of Education, National Center for Education Statistics, “High School Longitudinal Study of 2009 (HSLS:09),” 2009-16, Base year survey. Tabulations are author calculations.

Appendix B. Descriptive Statistics

Tables B.1–B.6 in this appendix provide the descriptive statistics derived from HSLS09 used in the creation of the social network visualizations. The mean (or proportion), sample size, and confidence interval (CI) are provided for each outcome of interest studied here. For more information on variable names and definitions, see Appendix C of below. Values for parent variables are not provided or used here for the two military sub-populations due to low response rates in HSLS09.

The values used for students talking to their parents during junior year of high school about college and for parents speaking to their teen about college were constructed by creating new binary variables—"S2AIDTALKPAR1" and "P2DISCCLGAPP1." These variables combined the options for number of discussions, so that "0" is having no conversations and "1" is the weighted proportion having at least one conversation on the subject. All other student and parent variables are binary by design, taking on values of 0 or 1. The response totals provided (N) are the number of responses for that survey question with a value of one (e.g., 162 respondents enlisted immediately out of high school) for each group.

Table B.1. Means, CI, and Sample Size Across Military Groups, Freshman Year

	HSENLIST			AFTERHS			PROP12		
	Mean	95% CI		Mean	95% CI		Mean	95% CI	
Range: 0-1	N=162			N=146			N=3,290		
S1MOMTALKCLG	**0.732**	0.636	0.828	**0.692**	0.567	0.818	**0.720**	0.693	0.748
S1MOMTALKJOB	**0.806**	0.721	0.891	**0.744**	0.623	0.864	**0.745**	0.721	0.770
	N=148			N=136			N=3,052		
S1DADTALKCLG	**0.661**	0.561	0.761	**0.596**	0.465	0.728	**0.589**	0.563	0.615
S1DADTALKJOB	**0.700**	0.606	0.795	**0.696**	0.563	0.828	**0.641**	0.615	0.666
	N=162			N=148			N=3,355		
S1FRNDTALKCLG	**0.520**	0.416	0.624	**0.481**	0.350	0.612	**0.468**	0.442	0.493
S1FRNDTALKJOB	**0.591**	0.488	0.694	**0.556**	0.436	0.676	**0.537**	0.511	0.563
	N=162			N=148			N=3,355		
S1TCHTALKCLG	**0.243**	0.133	0.352	**0.141**	0.056	0.227	**0.190**	0.167	0.213
S1TCHTALKJOB	**0.184**	0.107	0.261	**0.230**	0.124	0.337	**0.195**	0.174	0.216
	N=162			N=148			N=3,355		
S1CNSLTALKCLG	**0.154**	0.084	0.224	**0.139**	0.052	0.225	**0.171**	0.149	0.192
S1CNSLTALKJOB	**0.109**	0.055	0.162	**0.165**	0.072	0.258	**0.150**	0.131	0.169

Source: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, Base year survey. Tabulations are author calculations.

Table B.2. Means, CI, and Sample Sizes Across Non-Military Groups, Freshman Year

	NOCLGORAD			NOTFOURYR			FOURYRCLG			FEMALE		
	Mean	95% CI		Mean	95% CI		Mean	95% CI		Mean	95% CI	
Range: 0-1	N=3,218			N=4,580			N=6,626			N=9,866		
S1MOMTALKCLG	**0.658**	0.635	0.682	**0.784**	0.763	0.805	**0.867**	0.852	0.883	**0.833**	0.821	0.846
S1MOMTALKJOB	**0.707**	0.685	0.729	**0.783**	0.765	0.801	**0.847**	0.831	0.863	**0.839**	0.829	0.850
	N=2,917			N=4,258			N=6,399			N=9,219		
S1DADTALKCLG	**0.481**	0.449	0.512	**0.623**	0.601	0.644	**0.757**	0.739	0.774	**0.625**	0.610	0.641
S1DADTALKJOB	**0.547**	0.517	0.576	**0.638**	0.614	0.663	**0.746**	0.729	0.762	**0.630**	0.615	0.644
	N=3,305			N=4,642			N=6,667			N=9,985		
S1FRNDTALKCLG	**0.444**	0.418	0.470	**0.539**	0.513	0.564	**0.603**	0.581	0.626	**0.611**	0.594	0.628
S1FRNDTALKJOB	**0.513**	0.488	0.538	**0.563**	0.541	0.584	**0.622**	0.605	0.638	**0.640**	0.625	0.656
	N=3,305			N=4,642			N=6,667			N=9,985		
S1TCHTALKCLG	**0.194**	0.173	0.216	**0.209**	0.190	0.227	**0.227**	0.208	0.246	**0.234**	0.216	0.251
S1TCHTALKJOB	**0.180**	0.161	0.200	**0.201**	0.182	0.219	**0.220**	0.205	0.236	**0.233**	0.219	0.247
	N=3,305			N=4,642			N=6,667			N=9,985		
S1CNSLTALKCLG	**0.171**	0.151	0.192	**0.183**	0.159	0.208	**0.180**	0.163	0.198	**0.200**	0.184	0.216
S1CNSLTALKJOB	**0.139**	0.123	0.156	**0.149**	0.131	0.166	**0.145**	0.198	0.160	**0.159**	0.147	0.172

Source: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, Base year survey. Tabulations are author calculations.

Table B.3. Means, CI, and Sample Sizes Across Military Groups, Junior Year

	HSENLIST			AFTERHS			PROP12		
	Mean	95% CI		Mean	95% CI		Mean	95% CI	
Range: 0-1	N=153			N=137			N=3,990		
S2CLGSEARCH	**0.793**	0.714	0.871	**0.816**	0.706	0.925	**0.718**	0.693	0.743
S2TALKHSCNSL	**0.508**	0.399	0.617	**0.654**	0.492	0.817	**0.597**	0.560	0.634
S2CLGTOUR	**0.407**	0.302	0.512	**0.534**	0.326	0.742	**0.450**	0.426	0.474
S2JOBFAIR	**0.394**	0.285	0.504	**0.549**	0.384	0.713	**0.477**	0.451	0.503
S2CLGEXAMPREP	**0.317**	0.221	0.414	**0.455**	0.273	0.636	**0.336**	0.310	0.362
S2TALKCLGCNSL	**0.094**	0.037	0.151	**0.028**	0.000	0.067	**0.117**	0.100	0.134
Range: 0-1	N=156			N=138			N=4,030		
S2AIDTALKPAR1	**0.537**	0.431	0.643	**0.735**	0.593	0.877	**0.599**	0.576	0.621
Range: 0-1	N=157			N=139			N=4,014		
S2FRIENDCLG	**0.948**	0.911	0.984	**0.918**	0.860	0.976	**0.905**	0.888	0.922
Range: 0-1	N=135			N=124			N=3,255		
S2MCNSLREC	**0.323**	0.223	0.423	**0.488**	0.241	0.736	**0.352**	0.328	0.376
S2MTCHRREC	**0.246**	0.156	0.336	**0.395**	0.172	0.619	**0.295**	0.272	0.318
S2MPARREC	**0.222**	0.135	0.310	**0.241**	0.092	0.390	**0.272**	0.248	0.297
S2MFAMREC	**0.134**	0.064	0.204	**0.096**	0.000	0.205	**0.152**	0.133	0.171

	HSENLIST			AFTERHS			PROP12		
	Mean	95% CI		Mean	95% CI		Mean	95% CI	
S2MEMPREC	**0.059**	0.009	0.109	**0.009**	0.000	0.027	**0.066**	0.051	0.081
S2MFRIEND	**0.217**	0.128	0.305	**0.173**	0.058	0.287	**0.254**	0.232	0.276

Source: U.S. Department of Education, National Center for Education Statistics, “High School Longitudinal Study of 2009 (HSLS:09),” 2009-16, First follow-up survey. Tabulations are author calculations.

Table B.4. Means, CI, and Sample Sizes Across Non-Military Groups, Junior Year

	NOCLGORAD			NOTFOURYR			FOURYRCLG			FEMALE		
	Mean	95% CI		Mean	95% CI		Mean	95% CI		Mean	95% CI	
Range: 0-1	N=2,734			N=4,012			N=6,227			N=6,767		
S2CLGSEARCH	**0.644**	0.617	0.671	**0.840**	0.821	0.859	**0.924**	0.913	0.935	**0.866**	0.854	0.879
S2TALKHSCNSL	**0.591**	0.561	0.622	**0.623**	0.593	0.653	**0.671**	0.650	0.693	**0.645**	0.622	0.669
S2CLGTOUR	**0.391**	0.359	0.423	**0.484**	0.458	0.509	**0.635**	0.615	0.655	**0.519**	0.500	0.538
S2JOBFAIR	**0.457**	0.429	0.485	**0.498**	0.469	0.527	**0.498**	0.474	0.523	**0.487**	0.463	0.510
S2CLGEXAMPREP	**0.298**	0.265	0.331	**0.388**	0.363	0.412	**0.524**	0.501	0.547	**0.422**	0.404	0.440
S2TALKCLGCNSL	**0.124**	0.105	0.143	**0.138**	0.116	0.160	**0.110**	0.098	0.121	**0.127**	0.115	0.138
Range: 0-1	N=2,675			N=4,092			N=6,281			N=9,318		
S2AIDTALKPAR1	**0.574**	0.546	0.602	**0.690**	0.667	0.714	**0.747**	0.730	0.764	**0.710**	0.695	0.725
Range: 0-1	N=2,658			N=4,067			N=6,253			N=9,274		
S2FRIENDCLG	**0.903**	0.888	0.919	**0.923**	0.908	0.937	**0.943**	0.935	0.952	**0.936**	0.928	0.944
Range: 0-1	N=1,947			N=3,453			N=5,728			N=7,833		
S2MCNSLREC	**0.335**	0.300	0.369	**0.358**	0.333	0.384	**0.370**	0.350	0.390	**0.376**	0.359	0.394
S2MTCHRREC	**0.260**	0.230	0.290	**0.299**	0.275	0.323	**0.439**	0.417	0.461	**0.363**	0.345	0.380
S2MPARREC	**0.188**	0.165	0.211	**0.274**	0.249	0.299	**0.459**	0.436	0.482	**0.336**	0.316	0.356
S2MFAMREC	**0.113**	0.090	0.136	**0.153**	0.131	0.176	**0.204**	0.188	0.221	**0.162**	0.149	0.174
S2MEMPREC	**0.050**	0.038	0.061	**0.043**	0.028	0.058	**0.022**	0.016	0.028	**0.028**	0.022	0.035
S2MFRIEND	**0.205**	0.179	0.231	**0.232**	0.207	0.257	**0.327**	0.309	0.346	**0.265**	0.252	0.279

Source: U.S. Department of Education, National Center for Education Statistics, “High School Longitudinal Study of 2009 (HSLS:09),” 2009-16, First follow-up survey. Tabulations are author calculations.

Table B.5. Means, CI, and Sample Sizes Across Military Groups, Parental Indicators

	HSENLIST^			AFTERHS^			PROP12		
	Mean	95% CI		Mean	95% CI		Mean	95% CI	
Range: 0-1	N=69			N=46			N=870		
P2DISCCLGAPP1	**0.877**	0.788	0.965	**0.974**	0.932	1.017	**0.877**	0.843	0.910
Range: 0-1	N=69			N=46			N=848		
P2JOBFAIR	**0.249**	0.119	0.379	**0.121**	0.000	0.245	**0.224**	0.185	0.264
P2CLGTOUR	**0.407**	0.264	0.551	**0.226**	0.027	0.424	**0.377**	0.327	0.426

	HSENLIST^			AFTERHS^			PROP12		
	Mean	**95% CI**		**Mean**	**95% CI**		**Mean**	**95% CI**	
P2CLGSEARCH	**0.605**	0.462	0.748	**0.445**	0.091	0.800	**0.624**	0.580	0.668
P2TALKHSCNSL	**0.464**	0.314	0.615	**0.616**	0.294	0.938	**0.510**	0.461	0.558
P2TALKCLGCNSL	**0.193**	0.057	0.329	**0.074**	0.000	0.160	**0.122**	0.093	0.150
P2CLGEXAMPREP	**0.302**	0.170	0.434	**0.267**	0.040	0.493	**0.385**	0.331	0.440

^Due to small sample sizes, parent survey values are not included in this analysis.

Source: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, First follow-up survey. Tabulations are author calculations.

Table B.6. Means, CI, and Sample Sizes Across Non-Military Groups, Parental Indicators

	NOCLGORAD			NOTFOURYR			FOURYRCLG			FEMALE		
	Mean	**95% CI**		**Mean**	**95% CI**		**Mean**	**95% CI**		**Mean**	**95% CI**	
Range: 0-1	N=934			N=1,578			N=2,580			N=2,655		
P2DISCCLGAPP1	**0.827**	0.792	0.862	**0.907**	0.879	0.935	**0.956**	0.943	0.969	**0.925**	0.906	0.943
Range: 0-1	N=909			N=1,544			N=2,543			N=2,612		
P2JOBFAIR	**0.222**	0.179	0.265	**0.248**	0.202	0.294	**0.294**	0.267	0.321	**0.284**	0.258	0.310
P2CLGTOUR	**0.308**	0.266	0.349	**0.462**	0.415	0.509	**0.604**	0.573	0.636	**0.522**	0.494	0.551
P2CLGSEARCH	**0.515**	0.464	0.565	**0.619**	0.576	0.661	**0.838**	0.816	0.859	**0.740**	0.712	0.769
P2TALKHSCNSL	**0.487**	0.436	0.538	**0.472**	0.415	0.528	**0.538**	0.507	0.569	**0.506**	0.473	0.540
P2TALKCLGCNSL	**0.141**	0.100	0.182	**0.140**	0.113	0.168	**0.161**	0.138	0.184	**0.159**	0.136	0.181
P2CLGEXAMPREP	**0.247**	0.203	0.292	**0.410**	0.373	0.448	**0.616**	0.584	0.648	**0.478**	0.448	0.509

Source: U.S. Department of Education, National Center for Education Statistics, "High School Longitudinal Study of 2009 (HSLS:09)," 2009-16, First follow-up survey. Tabulations are author calculations.

Appendix C. Variable Names and Meanings

The variable names used in this report follow the naming convention as designated by the U.S. Department of Education. Each variable begins with a letter, “S”, “P”, or “X”, which stands for “Student”, “Parent”, or “Composite”. Student means the variable came from the student survey (e.g., the student answered the question), while Parent means the variable came from the parent survey. Composite variables are generated by the Department of Education and are designed for use in research and analysis of data. They are commonly used variables such as socio-economic status, gender, and educational attainment of parents, and impute missing values to enable a complete representation of the sample. The next position is filled by a number, “1” or “2”, to designate survey wave. For example, “1” reflects the first wave, or 2009 wave, while “2” reflects the second wave, or 2012 follow-up survey. The remainder of the name is a brief description of the variable.

All variables included in the analysis are defined as follows:

Table C.1. Variable Names and Definitions

Student Variables	
S1MOMTALKM	Student talked to mother about which math course to take
S1MOMTALKS	Student talked to mother about which science course to take
S1MOMTALKOTH	Student talked to mother about other courses to take
S1MOMTALKCLG	Student talked to mother about going to college
S1MOMTALKJOB	Student talked to mother about possible jobs or careers
S1MOMTALKPROB	Student talked to mother about personal problems
S1DADTALKM	Student talked to father about which math course to take
S1DADTALKS	Student talked to father about which science course to take
S1DADTALKOTH	Student talked to father about other courses to take
S1DADTALKCLG	Student talked to father about going to college
S1DADTALKJOB	Student talked to father about possible jobs or careers
S1DADTALKPROB	Student talked to father about personal problems
S1FRNDTALKM	Student talked to friends about which math course to take
S1FRNDTALKS	Student talked to friends about which science course to take
S1FRNDTALKOTH	Student talked to friends about other courses to take
S1FRNDTALKCLG	Student talked to friends about going to college
S1FRNDTALKJOB	Student talked to friends about possible jobs or careers
S1FRNDTALKPROB	Student talked to friends about personal problems
S1TCHTALKM	Student talked to a teacher about which math course to take
S1TCHTALKS	Student talked to a teacher about which science course to take
S1TCHTALKOTH	Student talked to a teacher about other courses to take

Student Variables	
S1TCHTALKCLG	Student talked to a teacher about going to college
S1TCHTALKJOB	Student talked to a teacher about possible jobs or careers
S1TCHTALKPROB	Student talked to a teacher about personal problems
S1CNSLTALKM	Student talked to school counselor about which math course to take
S1CNSLTALKS	Student talked to school counselor about which science course to take
S1CNSLTALKOTH	Student talked to school counselor about other courses to take
S1CNSLTALKCLG	Student talked to school counselor about going to college
S1CNSLTALKJOB	Student talked to school counselor about possible jobs or careers
S1CNSLTALKPROB	Student talked to school counselor about personal problems
S1NOTALKM	Student talked to no one about which math course to take
S1NOTALKS	Student talked to no one about which science course to take
S1NOTALKOTH	Student talked to no one about other courses to take
S1NOTALKCLG	Student talked to no one about going to college
S1NOTALKJOB	Student talked to no one about possible jobs or careers
S1NOTALKPROB	Student talked to no one about personal problems
S2AIDTALKPAR1	Student talked with parents about financial aid for college *(author derived)*
S2TALKHSCNSL	Student talked with a high school counselor about options for life after high school
S2FRIENDCLG	Student talked to friends about life after high school *(author derived)*
S2TALKCLGCNSL	Student talked about options with a counselor hired by family to help prepare for college admission
S2MCNSLREC	Student took junior year math course because his/her counselor recommended it
S2MTCHRREC	Student took junior year math course because his/her teacher recommended it
S2MPARREC	Student took junior year math course because his/her parents recommended it
S2MFAMREC	Student took junior year math course because another family member recommended it
S2MEMPREC	Student took junior year math course because his/her employer recommended it
S2MFRIEND	Student took junior year math course because his/her friend recommended it
S2CLGTOUR	Student has attended a program at or taken a tour of a college campus
S2CLGSEARCH	Student has searched the Internet for college options or read college guides
S2JOBFAIR	Student attended a career day or job fair
S2CLGCLASS	Student sat in on or has taken a college class
S2INTERN	Student participated in an internship or apprenticeship related to career goals
S2CAREERJOB	Student worked or volunteered in a job related to career goals

	Student Variables
S2CLGEXAMPREP	Student took a course to prepare for a college admission exam such as SAT or ACT
S2MCLUB	Student participated in math club since the fall of 2009
S2SCLUB	Student participated in science club since the fall of 2009
S2SPORTS	Student participated in organized sports since the fall of 2009
S2ART	Student participated in art since the fall of 2009
S2MUSIC	Student participated in music or dance since the fall of 2009
S2CLUB	Student participated in other groups or club activities since the fall of 2009
S2DRAMA	Student participated in theater or drama since the fall of 2009
S1HRACTIVITY	Time student spent participating in extracurricular activities such as sports teams, clubs, band, student government
S1HRWORK	Time student spent working for pay not including chores or house jobs
S1HRFAMILY	Time student spends with family
S1HRFRIENDS	Time student spends hanging out or socializing with friends
S1HRTV	Time student spends watching television or movies
S1HRVIDEO	Time student spends playing video games
S1HRONLINE	Time student spends chatting or surfing online
S2MPERSON1	Student sees self as a math person *(author derived)*
S2SPERSON1	Student sees self as a science person *(author derived)*
S2MLEARN	Student agrees that most people can learn to be good at math
S2MBORN	Student agrees that you have to be born with the ability to be good at math
S2MUSELIFE	Student agrees that math is useful for everyday life
S2MUSECLG	Student agrees that math is useful for college
S2MUSEJOB	Student agrees that math is useful for a future career
Parent Variables	
P2DISCCOURSES	Number of times parent discussed selecting courses or programs at school with teen
P2DISCCLGEXAM	Number of times parent discussed preparing for college entrance exams such as ACT, SAT, or ASVAB with teen
P2DISCCLGAPP	Number of times parent discussed applying to college or other schools after high school with teen
P2DISCCAREER	Number of times parent discussed possible careers with teen
P2DISCJOBS	Number of times parent discussed jobs child might want after high school
P2DISCEVENTS	Number of times parent discussed community, national, and world events with teen
P2DISCTROUBLE	Number of times parent discussed things that are troubling teen with teen
P2JOBFAIR	Parent attended a career day or job fair with teen

Student Variables	
P2CLGTOUR	Parent arranged for teen to attend a program at or take a tour of a college campus
P2CLGSEARCH	Parent searched the Internet for college options or read college guides
P2TALKHSCNSL	Parent talked with a high school counselor about teen's options for life after high school
P2TALKCLGCNSL	Parent talked about teen's options with a counselor hired by family to help teen prepare for college admission
P2CLGEXAMPREP	Parent arranged for teen to take a course to prepare for a college admission exam such as SAT or ACT
P2HISP1	Responding parent is of Hispanic origin
X2PAR1EDU	Responding parent's highest level of educational attainment, 2012 survey wave
X1PAR1EDU	Responding parent's highest level of educational attainment, 2009 survey wave
X1SESQ5	Household income quintile

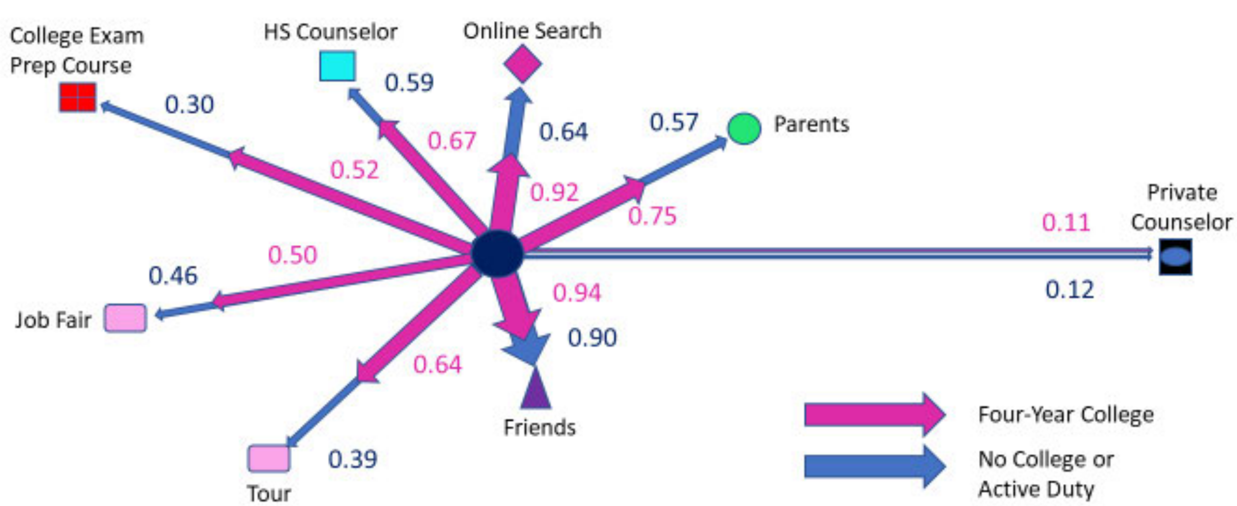
Source: U.S. Department of Education, National Center for Education Statistics, “High School Longitudinal Study of 2009 (HSLS:09),” 2009-16, Base year, first follow-up, and second follow-up survey. Tabulations are author calculations.

Appendix D. Visual Comparison of Four-Year and No College Information Networks, Junior Year

The largest difference in participation in college and life planning activities across students and parents is between youth who went on to enroll in four-year colleges and youth who neither enrolled in college nor enlisted in the military. This appendix provides a network visualization that overlays the HSLS09 proportions as presented in the body of this report and Appendix A for these outcomes. Figure D.1 provides the visualization for students, while Figure D.2 provides the visualization for parents.

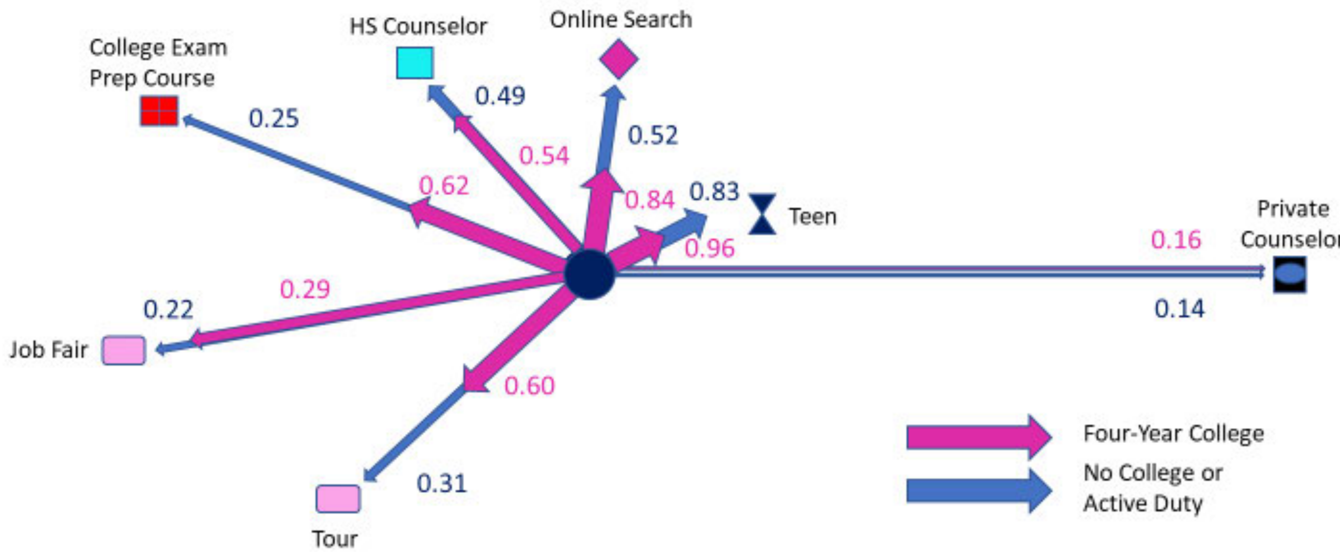
As Figure D.1 demonstrates, differences for students range from negligible (private counselor, friends, job fair) to 28 percentage points for online search and 25 percentage points for going on a college tour. Similarly, Figure D.2 shows differences for parents engaging in planning activities on behalf of their teen range from negligible (private counselor) to 37 percentage points for enrolling their teen in a college exam prep course, 32 percentage points for doing an online search, and 29 percentage points for organizing a college tour. Interestingly, about half of parents for both youth groups had similar rates of speaking with a HS counselor.

Figure D.1. HSLS09 Student Comparison of Four-Year College and No College Youth, Junior Year



Source Data: U.S. Department of Education, National Center for Education Statistics, “High School Longitudinal Study of 2009 (HSLS:09),” 2009-16, First follow-up survey. Tabulations are author calculations.

Figure D.2. HSLS09 Parent Comparison of Four-Year College and No College Youth, Junior Year



Source Data: U.S. Department of Education, National Center for Education Statistics, “High School Longitudinal Study of 2009 (HSLS:09),” 2009-16, First follow-up survey. Tabulations are author calculations.

References

Behavioural Insights Team, "Mindspace: Influencing Behavior through Public Policy," 2010.

Behavioural Insights Team, "EAST: Four Simple Ways to Apply Behavioral Insights," 2014.

Bell, David and David Blanchflower, "Young People and the Great Recession*," Oxford Review of Economic Policy*, Vol 27, No. 2: 241-267, 2011.

Borgatti, S. P., *Netdraw Network Visualization*, Analytic Technologies: Harvard, MA, 2002.

Burt, Ronald, "Structural Holes and Good Ideas," *American Journal of Sociology*, Vol 110, No 2: 349-99, 2004.

Center for Naval Analysis, "Population Representation in the Military Services: FY2016 Summary Report," 2017.

Coleman, James S. "Social Capital in the Creation of Human Capital," *American Journal of Sociology*, Vol. 94: S95–S120, 1998.

Gibson, Jennifer Lee, Brian K. Griepentrog, and Sean M. Marsh, "Parental influence on youth propensity to join the military," *Journal of Vocational Behavior*, 70: 525-541, 2007.

Granovetter, Mark, "The Strength of Weak Ties," *American Journal of Sociology*, 78:1360-80, 1973.

Hanneman, Robert and Mark Riddle, Introduction to Social Network Methods, Chapter 9: Ego Networks, Accessed August 2019: http://faculty.ucr.edu/~hanneman/nettext/C9_Ego_networks.html.

Hume, Susannah and Jessica Heal, "Moments of Choice," Behavioural Insights Team, 2016.

Joint Advertising and Marketing Research Studies (JAMRS), "The Prospect's Journey Told Through the Experiences of Propensed Youth," U.S. Department of Defense, 2018.

Kahneman, Daniel, *Thinking Fast and Slow*, Farrar, Straus, and Giroux Books: New York, NY, 2011.

Lash, Dave and Grace Belfiore, "5 Essentials in Building Social Capital," Next Generation Learning Challenges, 2017.

Lim, Nelson, Bruce R. Orvis, and Kimberly Curry Hall, "Leveraging Big Data Analytics to Improve Military Recruiting," RAND Corporation, RR-2621-OSD, 2019.

Michie, Susan, Robert West, Roma Campbell, Jamie Brown, and Heather Gainforth, *ABC of Behaviour Change Theories*, Silverback Publishing: Great Britain, 2014.

Michie, Susan, Maartje M. van Stralen, and Robert West, “The behaviour change wheel: A new method for characterising and designing behaviour change interventions,” *Implementation Science*, Volume 6, Article number: 42, 2011.

Mortimer, J. T., M. Vuolo, J. Staff, S. Wakefield, and W. Xie, “Tracing the Timing of “Career” Acquisition in a Contemporary Youth Cohort,” *Work and Occupations*, 35(1): 44–84, 2008.

National Commission on Military, National, and Public Service, “Inspired to Serve: Executive Summary,” 2020.

National Commission on Military, National, and Public Service, “Interim Report,” January 2019.

Orvis, Bruce R., Martin T. Gahart, and Alvin K. Ludwig, “Validity and Usefulness of Enlistment Intention Information,” RAND Corporation, R-3775-FMP, 1992.

Perry, Brea L., Bernice A. Pescosolido, and Stephen P. Borgatti, *Egocentric Network Analysis: Foundations, Methods, and Models*, Cambridge University Press: New York, NY, 2018.

Phillips, Dave and Tim Arango, “Who Signs Up to Fight? Makeup of U.S. Recruits Shows Glaring Disparity,” *New York Times*, January 2020.

Robbins, Gary, *Doing Social Network Research: Network-Based Research Design for Social Scientists*, Sage Publications Ltd: Thousand Oaks, CA, 2015.

Schake, Kori, and Jim Mattis, *Warriors & Citizens: American Views of Our Military*, Hoover Institution Press: Stanford, CA, 2016.

Wasserman, Stanley and Katherine Faust, *Social Network Analysis: Methods and Applications*, Cambridge University Press: New York, NY, 1994.

Werner, Ben, “Navy Drops TV Ads: Trades Super Bowl Spots for Esports, YouTube,” USNI News, December 2019.