An assessment of the adolescent social network and its relationship to program belongingness

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Thesis Proposal

# ABSTRACT

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# CHAPTER I: INTRODUCTION

## **Adolescent populations & Mentorship Interventions**

Providing interventions to adolescents has become a popular area of study in the psychological literature. The adolescent population goes beyond that of being older children or younger adults (Crosnoe & Johnson, 2011). They encompass a unique population that is subject to many biological changes. Furthermore, the transition from adolescence into adulthood can be a difficult one due to mental health issues and environmental influences. Adolescence is when individuals are at highest threat for risky health behaviors (Resnick et al., 1997) such as experimentation for use of legal and illegal drugs (Henry, Thornberry, & Huizinga, 2009), unsafe sexual practices and unsafe risk-taking behaviors due to delusions of invulnerability (Steinberg, 2007). These are just a subset of delinquent and problem behaviors that may be elicited by youth (Arthur et al, 2002; Broidy et al, 2003). Other behaviors that have a high risk of being elicited during adolescence include violence and aggressive tendencies (Resnick et al, 1997; Reiss & Roth, 1993). There are many factors that contribute to the likelihood of being vulnerable to these attitudes and risky habits.

Those that have a higher likelihood of generating these risky behaviors are referred to as *at-risk adolescents*. Although at-risk status varies on definition, it generally includes demographic features, home and community factors, and individual skill deficits which can negatively contribute to an individual’s ability to thrive academically, socially, emotionally, and physically (Mcdaniel & Yarbrough, 2016). These behaviors can often escalate into more serious behavior and subsequent consequences such as incarceration (Mcdaniel & Yarbrough, 2016). Given these considerations and outcomes, preventive efforts are needed to reduce levels of emotional stress and minimize behavioral difficulties amongst at-risk adolescents.

Adolescence serves as an important timepoint to intervene and prevent delinquent behaviors. In fact, past research indicates that a strong predictor of adulthood criminal outcomes is childhood delinquency (Makarios, Cullen, & Piquero, 2017). The importance of intervening at this critical timepoint during an individual’s life cannot be emphasized enough. Furthermore, serving as the last transition point into adulthood, the adolescent transitioning period is an efficient way to promote better health behaviors as they are more likely to live in a controlled environment with adult influences.

Therefore, it is necessary to provide helpful interventions to troubled youth. One such intervention method is providing youth with a positive mentoring relationship. Mentorship intervention programs provide adolescents with a role model straight from the community they both reside. It is suggested that creating a dyadic relationship between an adult mentor and youth mentee can improve outcomes through mechanisms of change (Rhodes, 2004). Mentors are encouraged to enhance coping strategies, reduce stressors and create an attachment to the youth mentee (DeWit et al, 2016). Meta-analytic reviews have shown that adolescents in mentorship programs show improvements in behavioral and psycho-social outcomes as compared to the non-mentored counterparts (DuBois, Portillo, Rhodes, Silverthorn, & Valentine, 2011; Tolan, Henry, Schoeny, Lovegrove, & Nichols, 2014).

## **Belongingness**

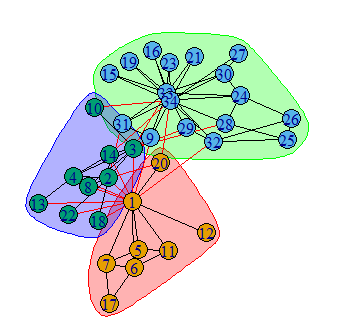
An important aspect of any community program, such as a mentorship program, is perceived belongingness to the program. Additionally, perceived belongingness is an essential psychological need (Galliher, Rostosky, & Hughes, 2004). The positive impact of feeling a sense of belonging has been studied for decades and is related to many positive outcomes (Allen & Bowles, 2012).

From a community program perspective, prior evidence suggests that youth who report higher belonging in a program are more likely to have more expressed satisfaction with their relationships (Marsh & Evans, 2009). Baunmeister & Leary (1995) have discussed the importance of belongingness during the adolescent time period and explain that it is a fundamental part of forming relationships with adolescent peers. Additionally, promoting positive social bonds between youth is an essential component to reducing delinquent behavior (Hirschi, 2017). It is important to look at both a youth’s feeling of belongingness and the social bonds they form while participating in a social program focused on building positive friendships between adolescent peers. Therefore, measuring belonging in an intervention program serves as an important feat to understand the true effect of the program. One such way to understand belongingness is social network analysis.

## **Social Network Analysis**

In recent years there has been a growing interest in understanding human relationships within the social and behavioral sciences. Studying social networks is one method to help researchers understand these relationships. A social network is defined as a set of relationships between objects and how they can be mapped in a social structure (Kadushin, 2012). In social sciences, the term is most commonly referring to people, but the social networks to any set of related objects. Social network approaches have been used in a diverse set of scientific domains from understand neuronal connections (Bassett & Sporns, 2017) to understanding animal behavior (Brent, 2015).

Every network consists of a set of actors with defining characteristics (a node) and lines to represent the connection between them (known as a tie or edge). A node is an object with defining characteristics to be analyzed within a network of other nodes with similar, or differing, characteristics (Luke, 2015). Social network analysis quantitatively measures the connection of nodes through edges (Kadushin, 2012). Nodes may have several attributes such as, but not limited to, personality characteristics, gender, and age. The connection of these nodes through edges help understand how many connections a node may possess and where those connections come from. Social networks can be viewed from a more ecological standpoint to identify clusters of nodes and the commonalities between them such as family members, friends, and acquaintances (see Leskovec & Mcauley (2012) for an example of clustered networks). A visual display of nodes with attributes, edges, and clustering effects can be seen in *Figure 1*.



*Figure 1.* A social network from the *Zachary’s karate club network* (Gfeller, 2007). This network displays a university karate class’ connections and the clustering between them. The nodes (circles) have differing colors to represent attributes about the actor displayed. The edges (lines) show the connections between these nodes with certain attributes. Furthermore, the edges may be colored to characterize an attribute of the connection. Lastly, the surrounding colors identify how nodes are clustered into groups.

To study the organization of these nodes and edges that make up a social network, we use social network analysis. Social networks analysis (SNA) helps to define and measure the connections among people, organizations, and/or other individual units (T. W. Valente, 2010). More specifically, SNA is the process of understanding social structures quantitatively through network theory and graph theory (Butts, 2008). A wide array of statistics can be derived from social network analysis – often called network statistics. Network statistics allow researchers to quantitatively measure all levels of a social structure (Krause, Croft, & James, 2007). Social network theory, the overall encompassing theory surrounding SNA, can be applied to a wide variety of levels spanning from the simple connection of two people, up to a collection of people and how those people are integrated in a set of systems (Kadushin, 2012).

## **Social Network Analysis in Psychological Research**

Psychological research often relies on self-report surveys to answer research questions. Therefore, social network survey methodologies have been created. Survey research with a social network component consists of questionnaires that ask about relationships among a specified target group (Serrat, 2017). Social network survey questionnaire data is otherwise known as egocentric data, in which the actor is responsible for identifying their own network (Mccarty, Bernard, Killworth, Shelley, & Johnsen, 1997). These questionnaires require careful thought. There are two common approaches to collecting social network data in survey research:

1. *Social Cognitive Mapping/Roster:* Originally developed by Cairns, Perrin, & Cairns (1985), this method shows survey responders a list of names of individuals within the network. Respondents are requested to selected all alters that they have a relationship with. Roster methods require the use of a stem question such as, “To whom do you report to at work?” or “Please select individuals you have a friendship with…”.
2. *Name Generator/Nomination method:* This method allows participants to name any one or several individuals within a network. The name that may be generated are arbitrary and limitless. A common prompt a participant may see is, “Please indicate five individuals that you would seek advice from within your office…”.

Both methodologies are notorious for creating enormous datasets - Datasets that are hard to sift through without a systematic and methodical approach. Both egocentric data collection methodologies have pros and cons. Roster methodology requires high participation to produce valid data (Wasserman & Faust, 1994). Additionally, a roster methodology may only be incorporated when all sets of potential alters in known (Butts, 2008). On the other hand, studies utilizing nomination methods have shown that subjects are likely to produce false negatives due to subjects forgetting or overall fatigue (Butts, 2008). Errors especially occur in instances where the ego (an individual node in the network) has many connections (Brewer, 2000).

These collection methods for social network analysis have been shown to have a useful place in community interventions. For example, Klovdahl (1985) created a social network intervention to identify and prevent HIV outbreaks within a homosexual population. DeLay and colleagues (2016) have used adolescent friendship networks to evaluate the Family Check-up model within adolescent populations. Kornienko, Dishion, & Ha (2018) used social network interventions to reduce antisocial and violent behaviors within adolescent population. Experimental research by Valente (2003) found differences in tobacco intervention programs that identified group leaders in network analysis. In summary measures and analysis of social network can inform and improve interventions directly.

Mentorship on Adolescents are often a population of interest in social network research. Years of research have promoted the influence of peer networks towards cigarette smoking (Ennett et al., 1993; Ennet et al., 2008) and other health behaviors. Additionally, recent studies have shown that adolescent alcohol consumption is directly mediated by the peer groups they associate with (Quiroga et al., 2018). More specifically, the dyadic nature of the mentor-mentee relationship allows for a heavy emphasis in social network approach to in mentorship research.

## **Proposal**

The purpose of this study is to combine the understanding of adolescent belongingness and social network principles in an adolescent mentorship program. The reasoning for this approach is to understand if it is necessary to collect and analyze the multitude of data that social network data creates.

Based on the similarities between social networks and belongingness, I hypothesize that a youth’s social network and score on a belongingness will grow at a similar trajectory. The collection, analysis and interpretation of social network data is complex and burdensome. Therefore, if we can determine that a youth’s belongingness in the program, an easy measure, is a good proxy for a youth’s friendships in the program. This proposal has the ability to minimizing the complexity of social network data by reducing its components to a measure of belongingness.

# CHAPTER II: METHODS

## **Data**

Data for this project will be collected from youth who participated in the Campus Connections (CC) mentoring intervention at Colorado State University (CSU). Campus Connections at CSU is a mentoring program for youth at heightened risk for poor developmental outcomes, such as behavior and emotional problems. It is flexibly designed to respond to the needs of a heterogeneous group of youth with varying risk levels. The program is grounded in theoretical and empirical research on positive youth development settings (Eccles & Appleton Gootman, 2002; Kelly, Ryan, Altman, & Stelzner, 2000; Tseng & Seidman, 2007) and Rhodes’ model of youth mentoring (Rhodes, 2005). See Haddock et al. (2013) and Weiler et al. (2015) for complete information on the program model.

Data were collected as part of a three-year grant funded by the William T. Grant (WTG) foundation to study two versions of a youth mentoring program. The first involved traditional dyadic mentoring, in which one mentor was assigned to one mentee to experience the 12-week program together. The second involved nesting 4 mentor-mentee pairs within mentor families. As a result, mentees were exposed to both a mentor of their own, as well as to 3 other mentor-mentee pairs in their mentor family over the course of the 12-week program. More information of the youth mentor family approach may be read in Haddock et al. (2013).

Campus Connections typically occurs four nights a week (Monday – Thursday) during a regular academic semester, with each mentee assigned to one night. Twenty-eight mentees are assigned to each night. Mentees were randomly assigned to either the experimental mentor family condition or the treatment-as-usual dyadic pairing mentorship condition. Study inclusion criteria include: Youth be aged 11-18 years of age, experience at-least one risk factor from the risk screening tool (Herrera, Dubois, & Grossman, 2013), and available to participate during the CC operating hours. Participants could not have participated in previous CC sessions to be eligible for this study.

Youth (the mentee) were referred to the CC program through several community agencies including the local school district, juvenile justice system, Department Human Services, and various youth and family agencies. Upon receipt of the referral, trained CC staff contacted potential participants and conducted an intake appointment to determine program eligibility and obtain assent and parental consent.

## **Measures**

In the proposed investigation, data will be drawn from multiple time-points. If eligible and willing to participate in the CC program, mentees were provided 5 surveys during their time at CC. Surveys were provided at week 1 (Baseline; wave 1), week 3 (wave 2), week 6 (wave 3), week 9 (wave 4), and week 11 (wave 5) of the 12-week program. Surveys were completed using Qualtrics, a web-based survey software. The Institutional Review Board at Colorado State University approved all the described procedures.

### *Belongingness*

Campus Connection mentees responded to a five-item scale that inquired about their belongingness at CC via an adaption of the belonginess measure created by Youth Development strategies, Inc. This measure was distributed at all five waves. At wave 1, youth participants were asked about their expectations to belong (i.e. “I feel like I will belong at Campus Connections”). For all other weeks, youth were asked about their present feelings of belongingness in the program (i.e. “I belong at Campus Connections”). All five time points showed stable and great internal consistency (α = .88 - .92).

### *Social Network*

Youth were asked to indicate their relationships with other youth, mentors, and staff in the program during wave 1-5 of the program. Youth were shown pictures of other youth, mentors, and program staff within the program. The youth were asked to select all that they had a relationship with. Youth were then asked to rate the relationship on a scale of 1-10 with the other youth in the program.

## **Analysis Plan**

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