

The Connection Project:
A Social Intervention to Reduce Drivers of Disparity for Disadvantaged Youth

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I. Overview - Major Questions

This project seeks to reduce the academic underachievement, school failure, and behavior and health problems that serve as long-term drivers of economic disadvantage for youth living in poverty and youth who are members of underrepresented racial or ethnic groups (henceforth, referred to as ‘at-risk youth’). We target a surprisingly potent mediating factor that, while increasingly recognized, has seldom been addressed via sustained intervention: the destructive ways that poverty and discrimination undermine social supports for at-risk youth. Our approach is based on the premise that the social and relational experiences of at-risk youth are key causal agents linked to their life outcomes, *and* that these experiences are *amenable to change*, even in resource-constrained environments.

For all of the attention paid to structural features of schools, neighborhoods, and other settings affecting youth, the extent to which teens do or do not feel *socially* supported in key settings appears as one of the strongest determinants of their future life outcomes. Yet, in spite of its potential power, this social support effect has received comparatively little attention. We begin from the premise that at-risk adolescents will interact with and influence one another whether or not society pays any attention to these interactions. Rather than leaving these peer processes unguided and unchecked, we address them directly with a series of documented-effective approaches to develop youths’ substantial latent capacities for mutual, prosocial support. Our approach builds upon a growing body of evidence that enhancing at-risk youths’ sense of connection, support, and belonging can set up a self-reinforcing process of social and behavioral engagement that can produce dramatic improvements in key life outcomes.

Our team combines the efforts of a senior scholar with extensive expertise in both adolescent peer processes and in developing and evaluating successful interventions for at-risk adolescents, together with one of the leading practitioner groups implementing innovative programming for at-risk teens on a national scale. We use this scholar-practitioner collaboration to implement a *successfully piloted, cost-effective, scalable* intervention for at-risk youth and to evaluate its impact via a fully randomized design. We will focus not just upon whether the intervention is effective, but also upon why, with whom, and under what conditions it works, so as to increase our understanding of the role of social connection processes in influencing life outcomes for at-risk youth.

We address four primary questions:

1. Can a social connection-based intervention alter critical academic, behavioral, and health outcomes (e.g., school achievement & attendance, risky sexual behavior, physical health and depressive symptoms) for at-risk youth?
2. To what extent do connection processes and related psychosocial mechanisms (e.g., sense of belonging, group trust, and bonding) at both the individual and small-group levels mediate changes in key outcomes?
3. Are program effects more pronounced for youth beginning the program at *greatest* risk (e.g., problematic academic/behavioral functioning in addition to demographic risk)?
4. Are the associations examined in the first three questions moderated by either program implementation characteristics (e.g., dosage, curriculum implementation) or group composition characteristics (e.g., proportion of at-risk students, group demographic heterogeneity)?

II. Theoretical and Empirical Rationale

The evidence is overwhelming that youth living in poverty and youth who are members of underrepresented racial/ethnic groups struggle with both short- and long-term disadvantage in our society. Academic difficulties, behavior and health problems are all more likely to be experienced by at-risk youth and are key drivers of long-term educational and financial disparities they experience (Jutte et al., 2010; Lee, 2002; Levine et al., 2007; Reardon, 2011; Shaw et al., 2006). These problems not only place youth at greatly increased risk of living in poverty across their lifetimes, they also sow the seeds of intergenerational patterns of poverty and disadvantage (Bird, 2007; East et al., 2007; Goldin & Katz, 2009). Students from racial/ethnic minority backgrounds and economically disadvantaged families are likely to leave school earlier, receive fewer degrees and certificates, and exhibit lower academic skills than their more privileged peers (Gamoran, 2001). These educational gaps and the economic consequences that follow appear to be *widening* over time and are directly linked to long-term economic disadvantage (Piketty, 2014; Reardon, 2011; Snyder, 2014). *Social disadvantage* also accrues from and contributes to a vicious cycle of exclusion from opportunities in mainstream society, ranging from career networking options to the availability of basic social and instrumental supports (Fries-Britt & Turner, 2002; Pinderhughes et al., 2001; Scaramella et al., 2008).

The proposed intervention seeks to enhance educational, behavioral, and health outcomes for demographically at-risk youth so as to reduce long-term inequality in social and economic outcomes. The **conceptual justification** for this project rests on three primary arguments:

1) Factors that undermine *social supports* for at-risk youth dramatically increase their vulnerability to academic, behavioral, and health difficulties that lead to unequal educational and economic outcomes.

2) In spite of the adversity they experience, substantial latent capacities for connection and social support exist within groups of at-risk youth.

3) Existing intervention principles and technologies now exist to let us activate these capacities for mutual support so as to enhance key life outcomes, but these technologies need to be integrated into a coherent and scalable package so as to engage and empower youth within their existing social settings.

A. The Effects of Undermined Social Support

The material adversities and structural insults faced by youth in poverty and youth who are members of underrepresented racial/ethnic groups are many and have been well catalogued (see e.g., Carter & Reardon, 2014); yet, the *social* processes by which racism and poverty undermine outcomes for these youth may be at least as powerful and far more insidious (Feagin, 2013). Parents stressed by racism, poverty, and fear for their children's safety struggle in under-resourced environments to offer needed social supports to stressed youths (Ceballo & Hurd, 2008). Adolescents appear biologically wired to turn to peers for support and social connection (Chein et al., 2011), but at-risk youth are far less likely to be exposed to the types of prosocial, peer experiences (e.g., activity-based clubs, organized teams, summer camps, etc.) that more advantaged youths can often take for granted (White & Gager, 2007). With little scaffolding and adult guidance, peer relationships, rather than becoming sources of support, can at times become significant stressors as struggling youth may find themselves ending up turning *on* one another rather than turning *to* one another (Seidman et al., 1999; Seidman et al., 1998). The result is

often settings where rejection, bullying, and social aggression are more likely to take hold (Barrera et al., 2002; Farmer et al., 2003).

At first glance, peer relationships in adolescence might appear as a relatively minor or ‘soft’ factor influencing life outcomes, but a wealth of hard data suggests otherwise. We know that humans can function, and even thrive, under a wide range of material conditions, *if* they have a strong social network. Yet, humans are also strikingly susceptible to conditions that undermine the quality of their social bonds. Social isolation, for example, is now known to create as great a risk for a variety of physical health problems, even including early *mortality*, as does cigarette smoking or obesity (Holt-Lunstad et al., 2010; House et al., 1988). Particularly in adolescence, lack of social connection and support, not only with adults but with peers, is one of the *strongest* proximal correlates of school dropout, risky sexual behavior, substance use, and other behaviors that hinder upwardly striving youth (French & Conrad, 2001; Jimerson et al., 2000; Resnick et al., 1997; Roseth et al., 2008; Shochet et al., 2006). Our own recent research suggests that long-term physical health problems are linked to a lack of strong social connections to peers in adolescence (Allen, Uchino, et al., in press). When at-risk youth are left feeling stressed and isolated, desperate and dysfunctional behavior often result—*not* due to a fundamental lack of skill or capacity, but rather, as a predictable human response to the absence of meaningful and supportive social relationships (Hall-Lande et al., 2007).

Related to lack of social support as a driver of underachievement is the profound sense of exclusion and alienation that at-risk youth often experience. Even at-risk youth who succeed academically may find themselves ostracized by peers who are threatened by their achievement; this fear of ostracism, in turn, undermines future performance (Cohen & Garcia, 2005). For adults, a sense of belonging is a fundamental need and basic human motivation (Baumeister & Leary, 1995; Walton & Cohen, 2011). For adolescents, this drive may be stronger still (Allen, 2015). Walton (2007) summarizes the youth perspective aptly, noting that “One of the most important questions that people ask themselves in deciding to enter, continue, or abandon a pursuit is, ‘Do I belong?’” Similarly, Crosnoe’s (2011) model of social marginalization notes that the interplay of the academic and social aspects of schooling directly influences the performance and engagement of adolescents in high school. A sense of acceptance by peers or ‘fitting in,’ Crosnoe argues, is particularly important in adolescence given the degree to which adolescents are developmentally focused on learning to interact successfully with their peers. Experimental research suggests that even brief, transitory experiences of exclusion from a social group can affect everything from well-being and self-control to test performance and measured IQ (Eisenberger et al., 2003; Twenge et al., 2003). Walton terms the experience that results from the confluence of these factors *belonging uncertainty*—the belief that ‘people like me do not belong here’—and notes that it likely contributes strongly to achievement problems and other problematic behaviors of at-risk youth (Walton & Cohen, 2007).

An additional pathway by which a lack of social support can operate to undermine achievement among at-risk students is by creating a sense of ongoing threat. Membership in valued social groups is a major source of individuals’ sense of self-integrity, and its absence creates an enduring sense of threat and isolation that reduces energy to cope with challenge (Cohen & Garcia, 2005; Cohen et al., 2006). Youth in poverty and youth who are members of underrepresented racial/ethnic minority groups must cope with both direct and implicit prejudice (Greenwald et al., 2009). Similarly, negative stereotypes about racial/ethnic minority students within the academic environment create a sense of threat that substantially undermines

performance, impairing capacities ranging from working memory to emotion regulation (Cohen et al., 2006; Forbes et al., 2008; Schmader et al., 2008; Steele & Aronson, 1995). Finally, the consequences of social threat—increased vigilance, threat appraisal, and lower performance—can in turn lead to greater future perceived threat and to further performance decrements in a viciously escalating recursive cycle (Cohen & Garcia, 2008).

In sum, a variety of social mechanisms, ranging from social isolation, to feelings of alienation and lack of belonging, to perceived threat and elevated stress levels, can dramatically undermine performance and behavior of youth who are members of underrepresented racial/ethnic groups and youth living in poverty. These social risk factors likely have substantial influence even over and above long recognized material and structural sources of risk in the lives of at-risk youth; they may in fact even be key mediators of the effects of some of these structural forces. The one hint of optimism suggested by these findings, however, is the possibility that these social factors may potentially be more amenable to change than many of the longstanding economic, material and structural disadvantages faced by at-risk youth.

B. Substantial Capacities for Support Exist Among At-risk Youth

An empowerment perspective suggests the possibility of capitalizing on existing potential *within* adolescent social relationships to begin to address some of the social risks they face. Adolescence appears as a particularly promising life stage for such an approach. Adolescent peer relationships are often of great concern to adults, in part, because as a society we do so little to make these relationships more prosocial (Allen & Allen, 2009). Yet, our relative inattention to the potential to enhance adolescent peer processes leaves them as low hanging fruit ripe for intervention. In seeking to engage adolescents in critical change processes, our approach is to swim with, rather than try to oppose, the strong basic developmental currents that drive adolescents toward their peers.

From this perspective, *the intense motivation and interest that peer relationships engender in adolescence provide a tremendous, and relatively untapped, potential context for positive youth development.* When prosocially directed, support from peers in adolescence has been identified as a primary factor in youth engagement in adaptive social goals and ultimately in adjustment to the work force in adulthood (Collins & van Dulmen, 2006; Wentzel, 1998; Zimmer-Gembeck et al., 2006). One of the strongest findings from the National Longitudinal Study of Adolescent Health is that the experience of caring and connectedness are critical to youth well-being across domains ranging from emotional health and sexuality to prevention of violence and substance abuse (Resnick et al., 1997). Although such connections often occur within families, youth who are able to form strong, supportive social relationships beyond their families also find that these can buffer against a wide range of stressors. Indeed, positive, non-familial relationships appear as one of the more promising sources of hope and support for at-risk youth (Hurd & Zimmerman, 2010; Hurd et al., 2013).

We proceed from the premise that latent capacities for social support and connection can be developed and nurtured in at-risk youth so as to develop powerful relationship resources that can enhance their efficacy and functioning. In contrast to the isolation, fear, and alienation that many adolescents bring to the high school experience, there also exists a unique and powerful peer bonding effect that can sometimes occur among groups of adolescents. In settings ranging from well-run summer camps, to wilderness trips, to group retreats, under the right conditions young people will sometimes feel safe enough to let down their guard a bit to share their hopes

and doubts with their peers. When peers are able in turn to react supportively this brings about still greater openness and still more profound instances of support, giving rise to a powerful *virtuous* cycle of growing trust and connection. The ultimate result is a bonding experience that can begin to transform the peer world from a source of competition and judgment to a powerful source of support, encouragement, and validation (Hattie et al., 1997; Michalski et al., 2003; Randall & Bohnert, 2009). Many adults can recall such positive experiences from their own adolescence, yet these experiences tend to occur sporadically at best, and not at all for many of the youths who are most lost in the peer world and who could most benefit from them. We have been working to identify the key ingredients that underlie such experiences and to develop ways to replicate them in a scalable fashion among groups of at-risk youth.

C. These Capacities Can Be Activated to Enhance Key Outcomes

Results from a series of recent intervention studies suggest that it is not only possible to enhance social connections among at-risk youth, but that doing so may be one of the most powerful and cost-effective tools we have to address problems leading to their long-term social and economic disadvantage (see e.g., Allen, 2015; Yeager & Walton, 2011). Although we are absolutely clear that a socially-focused approach does not directly address the substantial material and structural disadvantages faced by at-risk youth, considerable evidence suggests that if we can empower youth to address the social mediators of these disadvantages, we can change behavior and enhance key life outcomes (Catalano et al., 2004). A growing body of literature suggests that the non-cognitive skills targeted by socially-focused approaches have broad implications not just for social functioning, but for legal, educational, and career outcomes as well (Jones et al., 2015; Moffitt et al., 2011). Cost-benefit analyses of successful social-emotional learning programs find impacts on wages and social costs yielding an average return of \$11 for each dollar invested, further supporting the potential value of a socially-focused intervention approach (Belfield et al., 2015).

III. The Connection Project

Over the past three years, we have been developing, refining, and successfully piloting a scalable, time- and cost-effective intervention to activate at-risk youths' innate capacities for care, connection, and mutual support. We do not start from scratch, but rather *we build upon and employ the principles from of a range of socially-oriented approaches documented to be effective in enhancing life outcomes for at-risk youth*. Most importantly, we employ these principles in a carefully sequenced series of activities to steadily build a sense of group cohesion and support and to counter antagonistic and threatening social interaction processes. The end goal is both to create an experience-based context for social-emotional learning and to change youths' *ongoing* social milieu and relationships.

The result of our efforts is the *Connection Project*, consisting of twelve 45- to 60-minute sessions that build teens' capacities to give and get needed social supports in a prosocial context so as to enhance their motivation and capacity to pursue important life goals. As outlined in Figure 1 below, we employ four major categories of program input, *each* of which has been independently shown to enhance outcomes for at-risk youth: Values Affirmation, Belonging/Trust-building, the Helper-therapy Principle, and Narrative Development. These program inputs function by directly addressing one or more of the factors (e.g., belonging uncertainty, lack of social support, threat) that undermine performance of at-risk youth. We now employ them together in a carefully-sequenced, highly scalable approach designed to not only

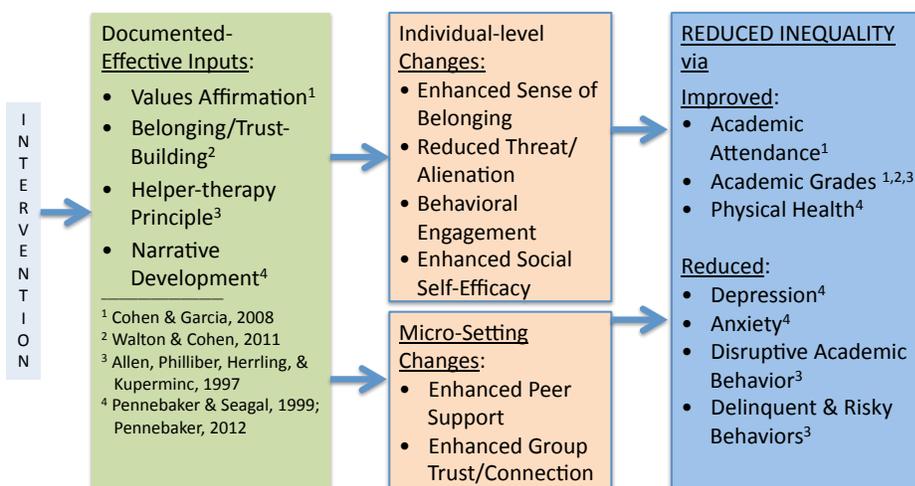


Figure 1 - Program Logic Model

capitalize on their individual effectiveness, but also to use them to gradually build a supportive relationship context in which at-risk teens can thrive.

We also employ a key setting factor: this intervention will take place as a pull out from school classes

(e.g., health, P.E.) that contain a *non-academically tracked* grouping of adolescents. This heterogeneous grouping approach has been found to be perhaps *the* key to avoiding iatrogenic effects in peer-based programs for at-risk youth, as heterogeneous groupings counter the tendency of homogenous groupings of poorly functioning youth to mutually reinforce antisocial behavior (Dishion et al., 2001; Gifford-Smith et al., 2005). Use of heterogeneous groupings of youth at different levels of functioning is also a key to the power of the social belonging focus of the intervention: Marginally functioning youths can come to feel accepted and supported *in* school and *with* and *by* other youths, including those functioning at higher academic levels and/or from different demographic groups.

Below we present a series of specific illustrations of the ways in which we implement our major program components, along with a description of the principles of effective youth interventions that they each employ. An outline of our full curriculum, illustrating how the principles discussed below are woven throughout the intervention, is presented in Appendix A.

A. Values Affirmation (Establishing Group Connection Norms)

Intervention Activity. Helping adolescents identify and enunciate their own prosocial values is increasingly being identified as a powerful lever of change (Cohen et al., 2006), and this is where we begin our intervention. Our connection focus provides a prime opportunity to enact this process. Although adolescents, like all humans, have a strong intrinsic motivation to connect with others, like many adults, they often fail to recognize the importance of such connections. Yet even tough, skeptical, and alienated youth both need and want social connection. Helping them recognize the extent to which these desires are widely shared and deserve to be taken seriously is a first step toward developing their prosocial values as well as gaining buy-in to the intervention.

Our opening session involves two values-focused components. We begin by very briefly describing the science supporting human connection—explaining that humans are literally pack animals, that being socially isolated is as detrimental to our physical health as factors such as obesity and cigarette smoking, and that the most natural, at-rest state of our brains occurs in the presence of strong connected relationships. We explain that many *adults* don't realize the value

Sample Activity	Intervention Principle Invoked	Mechanisms
<ul style="list-style-type: none"> Hearing Value of Connection Reading Quotes About Connection 	Establishing Group Norms (Dishion et al., 1999)	Recognizing that multiple cultures, individuals and disciplines value social connection
<ul style="list-style-type: none"> Choosing and Describing Favorite Quote 	<ul style="list-style-type: none"> Values Affirmation (Cohen et al., 2006) Trust (Clapp-Smith, 2009) 	<ul style="list-style-type: none"> Stating own values Hearing others' value connection

of connection and that many teens end up isolated, and that we are hoping to recruit youth in the *Connection Project* group to help begin to address these problems.

We next explain that we have identified a series of quotes on the importance of human connection throughout human history and across cultures (ranging from Socrates to Martin Luther King to Lady Gaga) and that we'd like them to help us

identify those quotes that will resonate most with young people. We post these intuitively appealing quotes on large sheets of paper around the room and ask youth to walk around reading them, placing stickers on their favorites, and standing by the one they think is strongest. We then ask each youth to state *why* they picked their favorite quote. This exercise begins our program with an intuitively powerful initial driver of connection: Youth not only read admired figures proclaiming the value of social connection, they hear *their peers* proclaim values of friendship, loyalty, trust, openness, and support, and they then *themselves* describe why they chose a given quote as their favorite.

Theoretical Rationale. This approach starts the process of building a sense of group trust and commonality (Clapp-Smith et al., 2009), and has several values-focused functions as well. The importance of peer group values for adolescent behavior is well-recognized (Allen et al., 2005; Brown et al., 2008), and working to guide those values in prosocial ways, as we do in our opening sessions, has been identified as one of the keys to making peer-based interventions effective (Gifford-Smith et al., 2005). On an individual level, reflecting upon and affirming personally important values has been identified as a key principle in reducing stress in threatening performance situations, particularly in environments in which stereotype threat is prominent (Cohen et al., 2006; Hanselman et al., 2014). Self-affirmation of core values reduces adolescents' sense of ego threat and directly addresses processes leading to long-term inequality. Even when employed via a short series of 15-minute written exercises, this self-affirmation approach has been found to yield a 40% reduction in the achievement gap in school grades, a reduction that persists and has an impact upon multiple types of underrepresented students (Cohen & Garcia, 2005; Miyake et al., 2010; Sherman, 2011).

Our approach recognizes, however, that written exercises are often anathema to academically underperforming youth. So as to gain the benefits of values-based approaches with this population, we employ a verbal, not written, approach and most importantly, we make values affirmation a *social* process. We also employ principles of motivational interviewing and self-determination that capitalize on the 'saying is believing' effect (Arkowitz et al., 2015; Markland et al., 2005). As with all of our units, we are not seeking to directly replicate the precise procedures of prior interventions (which were typically neither intended for group administration nor designed to be engaging if simply presented serially), but rather to apply their key principles as part of the larger goal of building an atmosphere of trust and mutual support (Yeager & Walton, 2011).

B. Social Belonging and a Sense of Safety and Common Humanity

Intervention Activity. A second key element of our approach involves enhancing youths' sense of social belonging. A long-recognized key to forming satisfying connections among group members is creating a sense of safety and belonging among its members (Kahn, 1990). Disadvantaged youth are often understandably mistrustful, not only of adults, but of one another (Seidman et al., 1999). Our activities are designed to both recognize that such trust will come slowly, but also to aid its development by gradually helping youth come to see how much they have in common with each other once we scratch beneath the surface. Recognizing that one's doubts and vulnerabilities, and strengths and interests are shared fosters both a sense of safety and a desire to engage with others in a group, while serving as a potent, psychologically active factor in its own right.

We pursue this safety and belonging goal in a number of ways. Early on, we present youths with a 'masks' activity in which we describe the ways that youths (and adults) can present a false view of themselves to the world via masks that use a social façade (e.g., "I take nothing seriously." "Everything is stupid and I'm above it all." "I like everything and am always happy." etc.) to cover up their real feelings. We ask students to fill out an *anonymous* questionnaire where they indicate whether or not they've used each of a series of masks in the past day, week, and year. The key to the activity is that we next collect these anonymous sheets, and redistribute them (so that no student has their own sheet). We then read through the items one at a time, asking students to stand up if the sheet they have is from someone who reported using that mask. Student reactions in the following discussion range from mildly surprised, to shocked, to reassured at learning how many of their classmates use the same masks that they do, and how frequently.

This activity is the first in a series of social belonging-focused interventions we utilize, letting youth see that they are not alone in their struggles. We follow this with a 'What's Beneath the Surface' activity in which students listen to, discuss, and play act vignettes illustrating that there's often more beneath the surface with other people than is at first apparent, and that we all have more in common than we realize.

Theoretical Rationale. The reduction in alienation and increase in a sense of belonging that we begin producing with these early activities has been repeatedly linked to dramatic academic, social, and health gains—particularly for disadvantaged youths who are most likely to be hampered by a feeling of *not* belonging in key settings. For example, using a one-hour social belonging intervention designed to show late adolescents that doubts about belonging are normal and not indicative of an actual lack of belonging, Walton has shown a capacity to halve the

Sample Activity	Intervention Principle Invoked	Mechanisms
<ul style="list-style-type: none"> Masks Exercise 'What's Beneath the Surface?' Exercise 	<ul style="list-style-type: none"> Sense of Belonging (Walton & Cohen, 2011) Enhancing Actual Connections (Wallace et al., 2012) Reduced Threat (Cohen et al., 2006) 	<ul style="list-style-type: none"> Establishing Commonality of Human Experience Reducing Posturing

achievement gap among African-American and European-American first-year college students, in addition to improving their health over a 3-year period (Walton & Cohen, 2011).

We use Walton's approach more directly in later sessions, but initially, we seek to get across the same 'belonging'

message *behaviorally* and *implicitly*. By employing a highly salient, peer-oriented, and physically active approach (e.g., having youths standing up, seeing the masks of actual classmates, role playing, etc.) we can engage students who are younger, more at-risk, and less likely to simply comply with tasks than Walton's early college population. In this task, social belonging becomes not simply an idea or cognitive appraisal, but an ongoing social experience.

Beyond changing youths' sense of belonging, the discussion that follows these activities is the first in a series of activities designed to enhance students' *actual* connections with one another. Evidence is compelling that increasing actual connections, not just a sense of belonging, can have substantial effects on both academic motivation and effort, and on mental and physical health (Bolger et al., 2000; Goodenow & Grady, 1993; Shochet et al., 2006; Spiegel et al., 1989; Wallace et al., 2012). Strong social connections appear particularly valuable when they occur across members of heterogeneous groups (e.g., in terms of race/ethnicity or achievement status), and have been found to substantially reduce both psychological and physiological markers of threat sensitivity (Page-Gould et al., 2008). Finally, by identifying and naming some of the more threatening facades students may use, we reduce their power and the likelihood of their use, thus beginning to create a sense of greater safety within the group and reducing the sense of threat students may experience (Cohen et al., 2006).

C. Reaching Out / Helper-therapy

Intervention Activity. Having established the ways in which youths share a 'common humanity' even in the midst of demographic and other differences, the heart of our intervention involves deepening the bonds that have begun forming, and deepening each teen's sense of themselves as a worthwhile individual with much to offer others.

Adolescents, perhaps like all of us, typically prefer to look outward not inward, and to be in roles that are active, not passive. A key feature of the *Connection Project* is that from the start, we present the program as about making students ambassadors of connection *to others*—and we frame their building connections with one another as a part of that process. For example, we start with skills training in listening (both to one another and to others in their larger social world), but it is skills training *in vivo*. Students learn an active-listening paradigm used by physicians and other healers to deal with emotional concerns of others (DeMaria et al., 2011; Leiblum et al., 2008). They then practice with one another in pairs, while discussing real issues—giving them experience as help-givers, not just help-receivers, while also building a sense of trust and support within individual dyads within groups (Dansereau et al., 1999; Levine & Moreland, 1990; Yammarino et al., 1998).

We follow this with more explicit 'reaching out' exercises. We use an exercise, titled with the Twitter hashtag '#YouMatter', in which students identify persons in their school who make students' lives a bit better but who often don't get recognized. Students then collectively devise and implement ways to let these people know that they matter, ranging from posters to student-created 'news show' videos. Similarly, we employ gratitude exercises in which students engage in similar activities with persons close to them in their lives (Tsang, 2006). We also use exercises (e.g., creating posters describing having survived challenging "Ninth grade moments") in which students look for ways to let younger students know that everyone experiences awkward moments but then survives.

Theoretical Rationale. These tasks all utilize the helper-therapy principle (Weinstein & Ryan, 2010), in which youth's self-perceptions and sense of self-efficacy change when they

Sample Activity	Intervention Principle Invoked	Mechanisms
Listening/Support Training	<ul style="list-style-type: none"> • Helper-therapy (Allen et al., 1997) • Skills training (Durlak et al., 2010) 	<ul style="list-style-type: none"> • Learning how to support others • Strengthening dyads within larger group
'#Youmatter' Activity	<ul style="list-style-type: none"> • Helper-therapy • Gratitude (Tsang, 2006) 	<ul style="list-style-type: none"> • Expressing gratitude & support toward others
'9th grade moments' Activity	<ul style="list-style-type: none"> • Helper-therapy • Coherent Narrative Development (Pennebaker, 1998) 	<ul style="list-style-type: none"> • Passing positive messages on to younger students • Recognizing own ability to overcome setbacks

come to see themselves as help givers and not just help receivers in their lives. This conceptual switch—letting students see themselves as *benefactors* not *beneficiaries* of an intervention—is linked to a number of positive psychosocial outcomes (Aronson et al., 2002; Yeager & Walton, 2011). For example, the striking impact of teens' outreach efforts on the teens themselves has been a core finding of the

remarkably successful *Teen Outreach Program* – in which volunteer service has been linked in rigorously controlled studies to greater than 60% reductions in school failure and teen pregnancy rates, with even stronger effects for more demographically at-risk youth (Allen et al., 1997; Allen & Philliber, 2001). (Note: *Teen Outreach* is currently being implemented in more than 30 states by one of the partners in this proposal (The Wyman Center)). One of the major obstacles to successfully scaling the program, however, has been the difficulty of identifying meaningful service activities for youth confined to a school classroom. The *Connection Project* employs the scalable approach of guiding and scaffolding youth to make highly meaningful contributions to others within their *existing* social milieu.

D. Narratives and Experiences of Connection

Intervention Activity. A final thread that runs throughout the intervention is focused on helping students construct a realistic narrative of themselves as connected, valued, and contributing members of the larger community. The goal is not simply to create connections among youth—valuable as these can be—but to help youth come to *recognize* and incorporate a narrative of greater belonging and connectedness into their core identities. We begin this narrative scaffolding process by first exposing students to relatively light, yet compelling narratives regarding connection. For example, early in the program, students watch a 3-minute video summarizing the inspirational story of a young man with autism who unexpectedly succeeds on the basketball court, but more importantly, gets remarkable and moving levels of support from his high school classmates (viewable on YouTube at: https://www.youtube.com/watch?v=Tui8EOdv_VU), thus emphasizing that very powerful connection is both *available* and incredibly *valuable* to all kinds of youth.

A second core activity—"You're Not Alone"—is explicitly based on Walton's (2011) social belonging intervention, using exercises in which students listen to and comment on stories of young people who have experienced social challenges and a lack of belonging in high school, but gone on to fare well. Consistent with our interweaving of themes of connection and reaching out, we move from the "You're Not Alone" exercise immediately into asking students to generate ways in which they can convey this message to younger students in their schools, neighborhoods, and families (e.g., creating 'Ninth grade moments' posters as described above).

A third activity, titled, "If you really knew me..." asks students to complete prompts such

as, “If you really knew me, you’d know that one thing I’m concerned about is…” These are then collected and read anonymously to the group. We find that students typically share many of the same concerns, and as they hear these voiced, they gain a sense of just how much they are *not* alone in their concerns. This activity also furthers our social belonging goal, as a live instantiation of the principles behind Walton’s intervention, as students come to recognize just how much they share in common with other group members.

Theoretical Rationale. Having worked to establish students’ positive narratives of their role in their school and peer group, these final intervention sessions employ principles from work on the growth-producing and healing power of developing coherent life narratives (Pennebaker, 2012). Reports from extreme situations (e.g., holocaust survivors) suggest that coherent narratives can provide a sense of predictability and control that can aid in mastering even the most challenging material circumstances (Frankl, 1962). The process of mentally organizing memories of past stressful experiences has been linked to outcomes from improved social functioning to improved immune function (Pennebaker, 1993, 1997, 2012; Pennebaker & Seagal, 1999).

The process of gradually coming to produce *coherent* stories is key and we scaffold this extensively (Pennebaker et al., 1988; Pennebaker & Seagal, 1999). Rather than ask for long written exercises, which would likely alienate teens with weak writing skills, we utilize a group, oral narrative approach. In one session late in the intervention, for example, students are asked to recall a defining challenge, problem, or stress they have faced in their lives—something that others should know about in order to really understand them. They jot down a few brief notes about the challenge and about ways they have grown and learned from it (even if overall it was not a positive experience). They are then given the opportunity to share this story out loud with the group, and the group is given the opportunity to respond in supportive ways. Although we emphasize that students can choose whether and how much to share, we find that in the atmosphere of safety, belonging, and support that we’ve created by the final sessions, students

often share profound experiences in moving ways. These stories then typically evoke strong, spontaneous expressions of support from peers, and teens find that they truly are not alone and that others can really get to know and support them in a deep way. In short, we take the principles of narrative work, and amplify them by making them *inter*-personal and not just *intra*-personal in nature.

We conclude the intervention, and help conclude our work building students’ sense of belonging

Sample Activity	Intervention Principle Invoked	Mechanisms
<ul style="list-style-type: none"> • Video Scaffolding Narratives of Connection • Narratives of Challenge 	<ul style="list-style-type: none"> • Coherent Narrative Development (Pennebaker, 1998) 	<ul style="list-style-type: none"> • Formulating/expressing own narrative of challenge and growth
<ul style="list-style-type: none"> • You’re Not Alone • If You Really Knew Me 	<ul style="list-style-type: none"> • Sense of Belonging (Walton et al., 2011) 	<ul style="list-style-type: none"> • Hearing others’ challenges and concerns • Recognizing commonality of struggles
<ul style="list-style-type: none"> • Strengths Recognition by Group 	<ul style="list-style-type: none"> • Social Belonging • Narrative Development • Social Support (see multiple previous cites) 	<ul style="list-style-type: none"> • Strong positive affirmation by multiple peers

and narratives of connection, with a ‘strengths recognition’ activity. In this activity, each student takes a turn as the focal student while group members each offering their assessment of multiple strengths that the focal student has to offer others. For most youth, hearing their many strengths (each speaker must describe a new strength) described by a myriad of other youths who have gotten to know them more deeply is an intensely moving experience that strengthens their view of themselves as successfully connected individuals. This activity serves as the final capstone of the narratives presented in the preceding sessions, solidifies the relationships formed, and leaves the students with a secure base from which to reach out to others and establish and maintain connections with their peers.

E. How this Approach Differs from Existing Programming

Ours is of course not the first intervention targeting social factors among adolescents who are members of underrepresented racial/ethnic groups and/or living in poverty. Yet, the vast majority of programs aimed at social-emotional learning (SEL) are targeted to younger students (for example, only 6 of 68 programs in a recent meta analysis of well-evaluated SEL programs targeted high school students and only a fraction of those were found effective (Durlak et al., 2010)). Conversely, as discussed above, the field has recently developed micro-interventions (lasting an hour or less) with promising effects—but these have typically been individually administered, reading and writing-intensive, geared toward older and more successful youths, and not particularly likely to be intrinsically engaging to at-risk high school youth, particularly if strung together in a random sequence. Similarly, the field has developed more intensive interventions (e.g., helper-therapy-oriented service-learning) that nonetheless are challenging to implement at scale. In sum, this is an area with numerous promising technologies, but which is crying out for intervention development that is a) based on documented-effective intervention principles; b) engaging to at-risk secondary school students; c) scalable; and d) lean enough to fit into a typical school schedule.

Relative to the existing programs on whose principles it is based, our approach has several strengths:

- (1) We use principles from the highly successful social belonging and narrative interventions, yet now design programming so that it can be group (vs. individually) administered, and we take advantage of this group administration to build motivation and engagement;
- (2) We modify approaches that depend upon extensive writing and reading to utilize speaking and listening within the group setting;
- (3) We utilize helper-therapy principles from highly successful service-learning interventions, but now make the service be direct, socially-focused, and most importantly, *in vivo* so that it is far more easily scaled within a school setting;
- (4) We employ key intervention principles in a peer context designed to be maximally engaging and cumulative—recognizing that a series of unrelated, discrete written activities, however efficacious with college-aged students, would likely fail to engage at-risk secondary school students.
- (5) Perhaps most importantly, our approach to social-emotional learning and social support development is primarily *experiential* in nature. Although social-emotional learning programs that take a didactic approach clearly have great potential, decades of research have

shown that behavioral experience is likely to engender far more powerful and sustained learning (Bandura, 1977, 1982). When students participate *together* in enacting key facets of the intervention, their buy-in and the subsequent impact of the intervention are magnified. This approach generates a deeper level of processing of intervention material and increases the likelihood of successful transfer of the content to new settings (Chase et al., 2009; Schwartz & Martin, 2004).

We also utilize knowledge gained over the past fifteen years about why early peer-based approaches struggled (i.e., a combination of homogeneously concentrating poorly functioning teens who reinforced one another's negative behavior, inadequate attention to changing/altering/addressing values and norms within peer groups, and weak adult leadership (Burlison et al., 2006; Dishion et al., 1999; Dishion et al., 2001; Gifford-Smith et al., 2005)). We address each of these factors directly by providing significant adult scaffolding and a strategic early focus on values development within the group. Further, although the majority (though not all) of our teens will be at demographic risk, by selecting from non academically-tracked classrooms, we bring together teens at different levels of academic and social functioning thus avoiding the homogeneous grouping problem.

In sum, we take the very best knowledge and principles from intervention activities shown to work with at-risk youth and early adults and bring them to bear synergistically and programmatically in small groups of youth using an *apply*, *extend*, and *fuse* approach: We do not attempt to replicate the exact procedures of prior approaches, but instead *apply* their key principles in our intervention (Yeager & Walton, 2011). We *extend* these approaches to a peer group venue that capitalizes on the intense peer focus of adolescence and is designed to make these activities particularly salient to at-risk youth. Finally, we *fuse* these approaches together in



Figure 2 – Using Program Inputs to Facilitate Group Connection & Support

a carefully designed sequence so as to gradually build the ingredients necessary to develop a strong sense of connection and support among youth, as illustrated in Figure 2. Although each of the key program elements has been independently shown to enhance outcomes for at-risk youth, by fusing them into a single coherent program, they act synergistically to create a powerful and supportive group experience that reinforces and amplifies the effects of each individual program component (hence the *two-headed* arrows in Figure 2). The *Connection Project* is thus designed to change the ways youth

interact with one another and with adults in at least a part of their social milieu in a way that is intended to last well past its conclusion.

F. Hypotheses, & Research Questions

The research focus of this proposal is designed both to assess the efficacy of the *Connection Project*, but also to learn more about *why, with whom, and under what conditions* it works so as to enhance our broader understanding of the role of social connection processes in the lives of at-risk youth. Thus, we will examine a range of program implementation and fidelity factors, as well as group process qualities during the implementation procedure that may help explain any variation in youth outcomes.

This proposal will explore questions about the efficacy of the *Connection Project* and its underlying theoretical foundation, using a combination of observational, self-, teacher-, and peer-report data, along with student academic outcome data. We begin with basic questions about program effects and then move from these to examine underlying mechanisms by which developing group connection processes may be linked to student outcomes and may mediate programmatic effects. Notably, prior findings suggest that the majority of the program elements we employ are likely to be at least somewhat helpful to *all* students, but most helpful to students who are living in poverty or are members of disadvantaged racial/ethnic groups, a hypothesis we will examine directly.

We thus seek to examine four overarching questions:

1. Can a social connection-based intervention approach succeed in altering critical academic, behavioral, and health outcomes (e.g., achievement & attendance, risky sexual behavior, physical health and depressive symptoms) for at-risk youth?
2. To what extent do connection processes and related psychosocial mechanisms (e.g., sense of belonging, group trust, and bonding) at both the individual and small-group levels mediate changes in key outcomes?
3. Are program effects more pronounced for youth beginning the program at *greatest* risk (e.g., problematic academic/behavioral functioning in addition to demographic risk)?
4. Are the relationships examined in the first three questions moderated by either program implementation characteristics (e.g., dosage, curriculum implementation) or group composition characteristics (e.g., proportion of at-risk youth, group demographic heterogeneity)?

IV. Methods

A. Iterative Pilot Process Results

We have engaged in an intensive piloting and development process over the past 3 years designed to: a) make intervention activities maximally engaging to at-risk youth in real-world settings; b) develop our organizational capacity for training and implementation; and c) utilize qualitative feedback from youth and facilitators at each iteration to eliminate less effective components and adapt and augment key activities. With the help of our Wyman Center national network of *Teen Outreach Program* implementing agencies, this program has now been extensively piloted in 4 different iterations involving 9 distinct *Connection Project* groups, 8 facilitators, and more than 90 youth across 3 diverse geographic locations (St. Louis, Missouri, El Paso, Texas, and Charlottesville, Virginia), most of which fit the at-risk profile we target in this proposal. We have received overwhelmingly positive qualitative feedback from youth from initial trials. More recently we began collecting quantitative data and although sample size dramatically limits power for our very preliminary analyses (i.e., n 's < 20), we nevertheless find

encouraging evidence of reductions in depression, and increases in self-worth and resilience for participating youth, with substantial effect sizes (i.e., d 's > 1.0), and results for each outcome significant at the $p < .05$ level, one-tailed. These preliminary findings further bolster the far more extensive evidence from existing research on the individual components of our program. The goal of our proposed research is to provide far more rigorous documentation of the efficacy of our approach and to use it to extend our knowledge of the role and potential of connection processes in the lives of at-risk youth.

B. Settings

As recent tragic events have made clear, Ferguson, Missouri epitomizes much of our country's struggles with issues of inequality and disadvantage, and thus provides an especially meaningful real-world setting in which to examine the efficacy of our approach. Our long history of partnering with school districts in this area via the Wyman Center has given us the credibility to implement our approach to reducing inequality in Ferguson and surrounding areas. We have strong partnerships with two districts in this area (Ferguson-Florissant and University City, see Appendix C, Letters of Support from both Superintendents *and* building Principals) who will each participate in this project. Together, these districts enroll more than 4,400 students across four high schools, including large numbers of students from racial/ethnic minority groups (82% African American, 4%; Hispanic, 12%; European-American; and 2% from other racial/ethnic groups) as well as a large (approximately 67%) sample of students on free-reduced school lunch. Given our plan to work with 10th and 11th graders in half-year sequences across two years, this gives us a pool of three cohorts of totaling more than 3,300 eligible students. We also have longstanding working relationships with several other neighboring districts with whom we could partner if problems arose in our two primary districts.

C. Design

Our overall design is intended to meet the Institute of Education Sciences (2015), *What Works Clearinghouse* standards for randomization, measurement, and analytic approach. Over the course of the study, 48 classes, averaging 9 students in each of the treatment and control groups will participate. The intervention will be conducted as a 'pullout' from a health, P.E., or similar class once weekly for 12 weeks. Within each selected class, approximately 9 students will be randomly assigned to the intervention condition with an additional 9 students assigned to the control condition. Control group students will receive 'business-as-usual' course material while intervention students receive the *Connection Project* intervention. All students will have forms sent home allowing parents to consent and students to assent to participate in the study as part of the initial entry of students into the school at the beginning of the school year.

Baseline student academic data will be obtained from schools for students for the academic period immediately preceding their entry into the intervention (e.g., prior Spring grades for students entering the research in the Fall). Other data will be obtained from students in a session prior to the start of the intervention. End of session data will be obtained from both intervention and control students, and a half-year follow-up will be obtained via school records and brief surveys for all students.

We will obtain a Department of Health and Human Services Certificate of Confidentiality for all data. This certificate legally forecloses the possibility of the data obtained being subpoenaed in criminal, civil, or child custody proceedings. Adolescents will be informed of this certificate, and reminded of procedures to assure their confidentiality at each measurement point.

D. Measures

Our measurement approach utilizes a combination of face valid measures of key outcomes, longitudinal data collection, and use of multiple reporters and methods for key process measures. Our goal is to capture the most critical constructs needed to evaluate the intervention and the processes that may mediate its impact, while managing the measurement burden for a sample with many members expected to have low tolerance for long questionnaires.

Timing of Data Collection

Demographic information will be obtained from existing school records. All outcome and potential mediator measures will be collected at pre- and post- assessments. The total battery is designed to be completed in approximately 40 minutes, however, it will be split across two class periods so as to minimize strain on student attention. Process measures will be obtained from both facilitators and from observational data (i.e., audio recordings, as described below) during the course of the intervention.

Demographic Information

We will gather demographic information regarding students (i.e., age, gender, race/ethnicity, grade level, free/reduced price lunch eligibility) directly from school records. We will similarly obtain group level data (group size, racial/ethnic composition, average academic level, free/reduced lunch eligibility, history of discipline problems).

Academic Performance and Behavioral Outcomes

Student Grades, Attendance, and Discipline Referrals. We will have access to school records data for all students including grade transcripts, attendance, referrals for special education, and disciplinary actions, all of which will be considered as both outcomes and as baseline covariates and moderators in analyses of student response to the intervention.

Disruptive Academic Behavior will be assessed with a 5-item Likert-type student-report scale (Midgley et al., 2000) regarding student behaviors that disrupt the classroom. It has strong internal consistency ($\alpha = .89$) and has been shown to be sensitive to the instructional environment (Ryan & Patrick, 2001). We also use the 8-item *teacher-report* Likert-type *defiance* subscale of the SNAP-IV (Swanson, 1992). This measure has demonstrated good internal consistency ($\alpha = .93$) and links to teacher instructional qualities (Gregory & Weinstein, 2008). This measure will be obtained at the end of the intervention from the teacher who was responsible for the larger class from which both intervention and control students are drawn.

Delinquent Behavior and Alcohol/Substance Abuse will be measured with a 12-item scale and a 10-item scale originally taken from the National Survey of Delinquency and Drug Use assessing behavior in the past 30 days (Elliott et al., 1985). This constellation of items has since been extensively validated and successfully used as outcome measures for psychosocial interventions for youth (Spoth et al., 2007).

Sexual Risk Behavior will be assessed via the Brief Sexual Experiences Questionnaire, which asks about presence/amount of sexual activity, number of partners, and use of any protection against pregnancy or sexually transmitted infections in the past 2 months, in a face-valid measure shown to demonstrate links to prior adolescent social relationship experiences (Oudekerk, Allen, et al., 2014; Oudekerk, Guarnera, et al., 2014).

Psychosocial Outcome Measures

Depressive Symptoms will be assessed with the Child Depression Inventory (Kovacs & Beck, 1977). This 27-item inventory is based on the Beck Depression Inventory and has been well-validated as a measure of depressive symptomatology in children and adolescents and linked to poor self-esteem, hopelessness, and negative cognitive attributions (Kazdin, 1990).

Social Anxiety will be assessed with the widely-used Brief Fear of Negative Evaluation Inventory, a 12-item Likert-scale measure that addresses concerns about approval of others in social situations with items such as “ I am afraid that others will not approve of me.” (Carleton et al., 2006; Collins et al., 2005).

Health Quality will be assessed with the 5-item Likert-style, self-report general health scale from the Medical Outcomes Study Short-form Health Survey (Ware et al., 2000), in which participants rate their perceptions of their overall physical health. This approach has been used extensively and found to be strongly related to concurrent biological markers of health and predictive of future health, including mortality, even after adjustment for key baseline covariates including depression and comorbidity (DeSalvo et al., 2006; McHorney et al., 1993; Stewart et al., 1988).

Number of Recent Doctor Visits in the past three months will be reported by students using a single item measure: “How many times have you been to the doctor in the past 3 months?” Students will be urged to estimate if they do not know. This assessment has previously been found to be sensitive to effects of social belonging interventions (Walton & Cohen, 2011).

Mediating Psychological Measures

Sense of belonging will be assessed with two scales: the 10-item Likert-style Social Integration scale from the Social Well-being measure which has been linked to a broad array of positive life outcomes (Keyes, 1998); and the 18-item Likert-style Psychological Sense of School Membership measure that has been specifically linked to at-risk students’ academic engagement and performance (Goodenow & Grady, 1993). Each scale has high internal consistency and demonstrated correlations with school achievement and academic motivation.

Children and Adolescent Social Support Scale. We will use the 10-item peer scale from this measure (Demaray & Malecki, 2002) to assess youth perceptions of the frequency and quality of social support they receive. In addition to construct validity and reliability, this measure has been correlated with youth social skills, self-concept, and behavior problems (Demaray & Malecki, 2002).

The Inventory of Parent and Peer Attachment (Armsden & Greenberg, 1987) peer scale will be used to assess adolescents’ perceptions of the quality of their overall relationship to their peers. Total attachment quality is calculated as the sum of 14 5-point Likert-style items capturing communication and trust and seven 5-point items (reverse-scored) capturing alienation from peers. The measure has been extensively used and validated both against observational data and in terms of key psychosocial outcomes (Allen et al., 2006; Allen et al., 2007).

Social Self-Efficacy will be assessed with the widely used 6-item Social Self Efficacy Scale (Sherer et al., 1982), which has been found to have both internal consistency, high construct validity and significant relation to measures of career development (Anderson & Betz, 2001).

Behavioral Engagement. Students will report on their own classroom engagement on a

10-item 4-point Likert-type scale (Skinner & Belmont, 1993). The scale has shown good internal consistency ($\alpha = .84$) and been found to be related to students' academic achievement (Reyes et al., 2012; Skinner et al., 2008; Skinner & Belmont, 1993).

Stereotype Threat will be assessed with three Likert-scale items with seven point response choices, previously found to be linked to student self-esteem and academic performance (Cohen & Garcia, 2005), for example, "In school, I worry that people will draw conclusions about me, based on what they think about my racial/ethnic group."

Intergroup Anxiety will be assessed with a 12-item measure (Stephan & Stephan, 1985), slightly adapted for adolescents, and linked to measures of prejudice and intergroup relations (Davies et al., 2011). Each item begins, "When interacting with people who are not from my racial/ethnic group, I feel..." with prompts ranging from "threatened" to "at ease" and participants noting the degree to which they feel each emotion.

Group trust/bonding. Using a sociometric approach, students will be asked the extent to which each other member in their class is someone to whom they "feel really close and connected" and someone they "can really be myself around." This yields both a measure of individual students' sense of connection/trust in the group, as well as group level measures of this construct. This approach has been previously found to predict class participation and achievement, as rated by teachers, as well as students' self-esteem, self-efficacy and (decreased) internalizing symptoms (Molloy, 2012, 2014). In addition, by using the entire class, not just the intervention group, as the target for this measure, it is possible to gain an index of possible *contagion effects* (e.g., increases in connection/trust between intervention and control group members). Group-level social network statistics will include two indices of group cohesion: *density* of group ties, and *group-level reciprocation rate*, (i.e., proportion of social ties in a group that are reciprocated), both of which will be analyzed via social network analysis (Moody & White, 2003; Wasserman & Faust, 1994).

Process measures

Fidelity of Implementation & Dosage will be assessed at both the individual and group levels. At the individual level, the number of sessions attended by individual students will be the primary dosage measure. At the group level, we will assess the number of sessions conducted, and percent attendance at each session as initial dosage measures. For implementation, we will obtain facilitator ratings of the extent of their use of each element of the curriculum after each session (e.g., used verbatim, used with adaptation, not used). In addition, we will obtain audio recordings of every third session, and these will be independently coded by two coders who will be trained to reliability on measures of *adherence to curriculum* and *level of student participation*.

Group process. The same audio recordings will be assessed for degree of student *engagement*, and *self-disclosure* during sessions (using scales we have developed and found reliable and valid in rating peer interactions in adolescence (Hare et al., 2011)), as well as the presence of *student behavior undermining program goals* (e.g., hostile, derogatory or distracting behavior) coded using previously developed scales for peer-to-peer interactions (Hare et al., in press; Oudekerk et al., 2015).

Facilitator promotion of adolescent autonomy and relatedness (Allen et al., 1994) will be assessed with a twelve-item scale regarding the extent to which facilitators are viewed by

students as promoting adolescent autonomy and relatedness. Items tap youths' perceptions of the extent to which their facilitator likes them and listens and takes into account what they have to say. This measure has high reliability (α 's = .84 to .86) and significant predictive links to student engagement (Hafen, Allen, Mikami, Anne, et al., 2012).

Financial and In-kind Costs of Implementation

We will track (via training logs, and facilitator surveys) facilitator time and any related costs of the program, both so that we can modify the intervention where necessary to increase efficiency, develop reliable cost estimates for future implementation, and begin to consider cost-benefit ratios relative to positive programmatic outcomes.

E. Analyses

General Analytic Approach

Initial reliability analyses, simple plots of data, and data transformations will be conducted to assess the psychometric adequacy of each of the measures being used. Cluster and factor analytic techniques will be utilized to combine variables where appropriate to obtain the strongest possible measures of key constructs. All primary analyses then proceed recognizing the hierarchically organized nature of the study data, with multiple observations obtained for students nested within classrooms within schools. Our primary approach to data analysis utilizes techniques that account for this multilevel data structure including latent growth curve analyses (for serially repeated measures), multi-level models (MLM), and structural equations models (Burchinal et al., 1994; Curran et al., 2004; Muthén & Curran, 1997; Raudenbush & Bryk, 2002; Singer & Willett, 2003).

Primary Analyses

Question 1: *Can a social connection-based intervention approach succeed in altering critical academic, behavioral, and health outcomes (e.g., achievement & attendance, risky sexual behavior, physical health and depressive symptoms) for at-risk youth?*

We begin addressing this question by comparing students and groups in the *Connection Project* and control conditions on changing levels of our primary outcome measures, considered at both the student and group levels, with students nested within groups. (Note: Although groups are also nested within schools and we will examine such nesting, our past experience intervening in secondary schools (Allen et al., 2011) suggests that between-school variance is likely to be quite modest after accounting for baseline variables, and the number of groups per school relatively low. Thus our design effect is likely to fall below the (2.0) threshold Muthén and Satorra (1995) have suggested as indicating a significant concern over such nesting. Hence we discuss nesting only up through the classroom level below.)

To test the impact of assignment to Treatment and Control conditions on student outcomes for initial pre- post- analyses, two-level analyses are used with students (level-1) nested within health, P.E., or similar classes (level-2). When also analyzing follow-up data, a three-level growth model is specified with repeated observations (level-1) nested within students (level-2), and students nested within groups (level-3). Primary outcomes include student academic behavior (e.g., attendance, discipline problems), performance (e.g., grades), physical and mental health outcomes (e.g., overall health, depressive symptoms), and social functioning (e.g., loneliness).

For illustrative purposes, we describe the more complex, 3-level model. The level-1 equation estimates a unique growth trajectory for an outcome at time t for student i in group j . The intercept (π_{0ij}) is defined as the student's status at the beginning of the intervention (time zero), and the slope (π_{1ij}) represents each student's rate of change in an outcome over the course of and following the intervention. Linear and non-linear growth trajectories will be examined to best represent the patterns of change over time, however we will assume linear change for the purposes of this proposal and the relevant equations below.

Level 1 model:

$$Y_{tij} = \pi_{0i} + \pi_{1i} (\text{TIME})_{ti} + e_{ti} \quad (\text{Eq. 1}).$$

In this equation,

Y_{tij} is the outcome measure at time t for student i in group j ;

(TIME) corresponds to the linear contrast coefficient;

π_{0i} is the estimated mean response (intercept) for student i at the beginning of the intervention (time zero)

π_{1i} is the rate of change (slope) over time in the outcome for student i ;

and e_{ti} is the level-1 error term

Level 2 model:

$$\pi_{0i} = \beta_{00} + \beta_{01}X_{ij} + \Upsilon_{0i} \quad (\text{Eq. 2a}).$$

$$\pi_{1i} = \beta_{10} + \beta_{11}X_{ij} + \Upsilon_{1i} \quad (\text{Eq. 2b}).$$

In these equations,

π_{ij} is the response for student i in classroom j ;

β_{00} is the mean response across all students;

β_{01} is the mean outcome score in classroom j ;

β_{10} is the average growth rate across students;

β_{11} is the main effect of treatment for the growth rates;

X_{ij} is the indicator for the treatment or control group;

and Υ_{ij} is the random error associated with student i in classroom j .

Level 3 model:

$$\beta_{0j} = \gamma_{00} + \mu_{0j} \quad (\text{Eq. 3a});$$

$$\beta_{1j} = \gamma_{10} + \mu_{1j} \quad (\text{Eq. 3b}).$$

In these equations,

γ_{00} is the grand mean;

γ_{10} is the average treatment effect;

μ_{0j} is the random error associated with the mean in classroom j ;

and μ_{1j} is the random error associated with the treatment effect across classrooms.

As an illustrative example, assume that student academic performance (π_{0ij}) and change over time (π_{1ij}) resulting from the level-1 model are outcomes in level-2 (student-level) models in which the effect of random assignment of individual students to the Treatment vs. Control condition is entered to assess the overall intervention effect, along with characteristics of students entered as covariates to explain between student variability in performance and change in performance over time. In the level-3 (group-level) model, variability in intercepts and slopes

across groups and in treatment effects at the group level will be estimated. It is hypothesized that there will be systematic differences in change in student performance attributed to the impact of participation in the *Connection Project*.

5. **Question 2:** *To what extent do connection processes and related psychosocial mechanisms (e.g., sense of belonging, group trust, and bonding) at both the individual and small-group levels mediate changes in key outcomes?*

Following initial analyses, we will focus upon assessing which aspects of the group setting (e.g., group cohesion, support, trust, self-disclosure) best predict changes in key student outcomes. Thus, in the presence of *Connection Project* effects, we will examine the hypothesis that specific qualities of social/behavioral interactions between students are group-level features that serve as the “active ingredients” of the program. Here we consider group process measures (e.g., observed levels of student engagement, self-disclosure, negative behavior) as mediators of program effects. We will use two methods to assess this mediation: multilevel SEM (Preacher & Hayes, 2008) and propensity score analyses (Lee, 2013; Schochet & Burghardt, 2007) to seek to maximize our ability to begin to learn as much as possible about potential causal processes within the intervention. With multilevel SEM, we will test the total indirect effect as well as the specific indirect effects (Preacher & Hayes, 2008) to obtain a full understanding of how the mediators jointly and uniquely explain the effects of the *Connection Project*. We will also test mediation in the full sample, and will use moderated mediation analyses (Preacher et al., 2007) to determine if the mediated effects vary significantly between the two samples. Tests of mediation will be conducted by determining whether including the across-time mean in-group processes accounts for the observed differences in changing levels of student motivation. To account for the fact that student variables are nested under classrooms, all models predicting adolescent outcomes will control for the random effects of classrooms/groups as a clustering factor. Even in the absence of strong programmatic effects, it will be possible to assess the validity of the theoretical model presented.

Question 3: *Are program effects more pronounced for youth beginning the program at greatest risk (e.g., problematic academic/behavioral functioning in addition to demographic risk)?*

This question will be answered from two different perspectives: In terms of moderation, we examine whether the program makes a greater difference for students who begin at higher levels of academic/behavioral risk, defined in terms of a composite factor of overall level of academic and behavioral problems at entry. We will utilize a similar analytic approach to that described above, but now apply it to considering whether our indicators of student academic risk interact with participation in the *Connection Project* to explain student outcomes. Based on prior research, we expect that students at greatest risk will be those most likely to benefit from participation. However, it is also the case that the vast majority of students in the program will be experiencing at least moderate demographic risk, as a result of membership in underrepresented racial/ethnic groups or experience of family poverty. We will examine these students (expected to comprise approximately 80% of the sample) separately to assess whether the *Connection Project* is effective within this group. From this perspective, we seek to demonstrate that the *Connection Project* can be effective within this group, whether or not it might also be effective with students who are less at-risk demographically.

Question 4: *Are the relationships examined in the first three questions moderated by*

either program implementation characteristics (e.g., dosage, curriculum implementation) or group composition characteristics (e.g., proportion of at-risk youth, group demographic heterogeneity)?

This question focuses on youth and program characteristics that may moderate outcomes, thus providing information about the conditions under which the program is most effective. Using the same approach described above, we specifically examine both group composition effects (e.g., presence of students functioning academically and behaviorally at higher vs. lower levels at entry) and dosage/implementation effects (e.g., # of sessions attended, facilitator fidelity to the curriculum).

To illustrate how we would test for moderator effects, we present an exemplar analysis regarding possible dosage effects. This analysis would primarily use those classrooms/students that received the intervention (i.e., treatment on the treated), although we will include as a covariate a group-level measure of control group performance on each outcome we assess. Our goal is to understand how student outcomes change as their classroom unit is exposed to treatment-related materials and sessions throughout the course of the *Connection Project*. We maintain a multilevel structure in these analyses since students are still nested within their classroom unit. We will consider linear and quadratic functions of dosage to allow for the possibility of diminishing returns with increasing dosage. As an example for the linear and quadratic impact of attendance, see the equations below.

Level 1 – Assessment: $\text{StudentOutcome}_{ij} = \beta_{0j} + \beta_{1j}(\text{attendance}_{ij}) + \beta_{2j}(\text{attendance}_{ij})^2 + r_{ij}$

Level 2 – Classroom: For each of the β s in the L1 model, a L2 mean (γ) and error term (U) will be estimated (e.g., $\beta_{0j} = \gamma_{00} + U_{0j}$; $\beta_{1j} = \gamma_{10} + U_{1j}$).

Attrition Effects and Missing Data

Although we expect that our close, longstanding relationship with the schools and communities within which we will be working will aid in minimizing attrition, our primary analyses will always be based upon an intent-to-treat approach in which data from all randomly assigned students will be considered in outcome assessments, regardless of degree of participation in the intervention (in some cases, we realize that we may only have school records/academic outcome data for such students).

To the extent that the amount of attrition is non-trivial, assessments of the nature of missingness (e.g., missing at random, missing completely at random) and its impact will be made using techniques for modeling incomplete longitudinal data within the analytic framework described above (McArdle & Hamagami, 2001). More generally, we will handle missing data with full information maximum likelihood analyses (for “MAR” data, including covariates for variables systematically predictive of missing data), and with multiple imputation procedures. We will carry out these analyses with Mplus where procedures for missing data imputation are readily available (Muthén & Muthén, 2015). In all cases, we will consider results of analyses both with and without special handling of missing data, so as to assess the generality of our results across statistical methodologies.

Diffusion/Contagion effects

We recognize the potential for contagion effects, in which participating students’ gains and enhanced social functioning may influence control group students with whom they may interact. Although challenging from an evaluation standpoint, such effects would ultimately be a

potentially significant benefit of the intervention to the extent they occur. Although we expect these effects to be modest in this intervention (as treatment and control group students likely share only one class together), we track these effects by assessing the degree to which individual members of the control group are friends with members of the treatment group within a class. We then use this as an index of *indirect connection to the intervention* and examine it as a potential factor in explaining outcomes in the control group. We then also examine this contagion construct as a potential moderator of the effectiveness of the *Connection Project* within a given classroom.

Power

Statistical power for the proposed study was assessed using Optimal Design software (Raudenbush et al., 2011; Spybrook et al., 2011). For our primary question regarding the overall effectiveness of the intervention, our design is a person-randomized, multi-site (with classrooms as the sites) trial with blocking at the site (i.e., classroom) level. Under the conservative assumptions of a small intervention effect ($\delta = .25$), modest inter-site variability in treatment effectiveness ($\sigma^2 = .05$), with 5% of outcome variance explained at the site (classroom) level, and 40% of variance in outcomes predictable from baseline measures, power is estimated at .92 to detect intervention effects. Notably, our assumed effect size is at the low end of the range observed in meta-analyses of positive psychology interventions (Bolier et al., 2013), and far lower than both effect size estimates in our pilot data and effect sizes in meta-analysis of social emotional learning programs that meet the ‘SAFE’ criteria of being sequenced, active focused and explicit in their goals (Durlak et al., 2010), as does the *Connection Project*. This effect size estimate is also significantly lower than that of the values affirmation, social belonging and helper-therapy approaches, each of which have yielded effect sizes of at least .50, even when used as one-shot interventions in isolation (Allen et al., 1997; Cohen et al., 2006; Walton & Cohen, 2011).

Under still more conservative assumptions, if we assume that only 65% of students in the intervention will both complete our measures and meet our definition of risk in terms of family poverty status or racial/ethnic minority status, power just within this subgroup of students will still be .80. Alternatively, if under our original assumptions, we experience greater than expected inter-site variance in treatment effect (i.e., $\sigma^2 = .10$), power remains at .86. Notably, however, as inter-site variance in treatment effectiveness increases, we gain correspondingly increasing power to examine process predictors of such variance (Goldstein et al., 2002).

Power will be similar for our moderator questions. The combined treatment-on-treated sample (only classrooms randomized into the intervention condition) would provide .80 power to detect relation between dosage and outcomes that are as small as $d = .31$. Though we recognize this may somewhat limit our ability to detect such effects, it will allow us to detect larger effects, which are most crucial to understanding the nature of overall program impacts.

F. Staffing and Timeline

The proposed intervention builds upon a unique scholar-practitioner partnership, combining the skills of one of the most experienced large-scale implementers of programming for youth at the secondary school level (the Wyman Center), with the efforts of one of the leading adolescent psychologists in the country with a track record of designing well-evaluated, high quality and high impact interventions (Joseph Allen). Our combined UVA – Wyman team has extensive experience developing, implementing, and evaluating social interventions for at-

risk youth on a large-scale. Wyman currently oversees the implementation of *Teen Outreach* with 68 different partners and 35,000 students across 31 states, and was recently one of 8 outstanding organizations (out of 250) recognized in the SCE Social-Emotional Learning Program Challenge program.

Joseph Allen, Ph.D., a former William T. Grant Scholar, will take leadership responsibility for all aspects of the project. With William T. Grant Foundation support, Dr. Allen recently co-developed a highly successful socially-focused, school-based intervention for teachers (*My Teaching Partner-Secondary*) that was found to enhance student achievement and peer relationships and to *reduce racial disparities* in school discipline practices. Results were published in *Science* and the *What Works Clearinghouse* (Allen et al., 2011; Gregory et al., 2014a; Gregory et al., 2014c; Mikami et al., 2011). Allen has published dozens of articles in top-tier journals on adolescent peer relationships and influences, and more than 120 articles overall (see vitae). He was also lead investigator in the original RCT documenting the efficacy of the *Teen Outreach Program* service-learning program (Allen et al., 1997). In addition, Allen is a licensed, practicing clinical psychologist specializing in working with adolescents with social disorders, and is thus highly experienced and attuned to the nuances of adolescent social development, motivation, and social relationship struggles.

Karen Guskin, Ph.D. will be responsible for co-leading all facets of the project with Dr. Allen with a particular emphasis upon local site-level data collection and adherence to study design. Prior to coming to Wyman, Guskin spent 14 years at Parents as Teachers National Center as the Director of Research and Quality Improvement where she led a team working on research, evaluation, and quality improvement for a network of over 2,000 affiliates. In that capacity, she served on evaluation teams working on large-scale Parents as Teachers' grants from the U.S. Departments of Education and Health and Human Services, including an i3 Validation grant, an Innovative Approaches to Literacy grant, a Responsible Fatherhood grant, and a HRSA MIECHV grant. She holds a doctorate in developmental psychology from Stanford University.

Christopher Hafen, Ph.D. will share responsibility for statistical analyses and program design. He has taken the lead statistical role in multiple papers produced from the evaluation of the highly successful *My Teaching Partner-Secondary* school-based intervention and helped to develop the current intervention (Allen, Hafen, et al., in press; Gregory et al., 2014a; Gregory et al., 2014c; Gregory et al., in press; Hafen & Allen, In press; Hafen, Allen, Mikami, & Gregory, 2012; Hafen, Hamre, et al., in press; Hafen, Ruzek, et al., In press; Mikami et al., 2011).

Allison Williams, Senior Vice President for Programming at Wyman will be responsible for development and oversight of district partnerships, hiring and administrative supervision of Wyman implementation staff, and integration of the project into Wyman's program offerings for ultimate dissemination nationally.

We augment the experience in our primary team with the expertise of two extraordinary advisors: **Tom Dishion, Ph.D.**, an internationally recognized expert in peer interaction processes, peer group interventions and factors that explain (and can help prevent) development of negative and iatrogenic processes within these interventions; and **Noelle Hurd, Ph.D.**, a current William T. Grant Scholar, with expertise in social processes, the role of social supports for minority and at-risk youth, adult mentoring, and implementation of innovative programming for at-risk youth in school settings (see vitae for both scholars in Appendix C).

Program implementation will occur with staff recruited through the same Wyman Center network used to recruit local staff for the *Teen Outreach Program*. Staff will be recruited based on prior demonstrated skill working with groups of youth. Several days of training in group management principles, handling potential difficult situations (e.g., abuse reporting requirements, etc.), and the mechanics of the *Connection Project* curriculum will be provided prior to the start of the intervention. This recruitment/training approach has already been found to be both successful and scalable in the large-scale implementation of Teen Outreach.

A detailed outline of the timeline for the study is presented in Appendix B. Following initial hiring and training, a program manager and a facilitator will each conduct six groups at a time for half-school-year periods over two-years (48 groups in total). These individuals will also be responsible for ongoing liaison with schools, as well as for collection of both treatment and control group questionnaire data. In addition, they will be responsible for participant tracking for collection of six-month follow-up data, including for those students who may have moved to another school or dropped out. Data entry of student questionnaire and academic data will occur at U.Va. on an ongoing basis as data come in with close coordination with program implementer and facilitator for data cleaning purposes. To maximize reliability, observational data will be coded in concentrated periods each summer.

G. Anticipated Products and Communication Plan

Results and information gained from this project will be used to inform the field about optimal approaches (and barriers) to implementing this and other similar socially-based intervention approaches for at-risk young people. In addition to the potential value of this specific program, concretely demonstrating the impact of social processes on key outcomes for at-risk youth can inform a range of interventions (from educational strategies to youth outreach programs). By combining strong basic and evaluative research expertise with an organization with extensive national implementation experience, our scholar-practitioner team will capitalize on the most recent thinking regarding ways to develop programs that are not only effective, but which also have the capability of gaining widespread implementation (Palinkas et al., 2015).

Our primary dissemination approach will involve: 1) using our extensive experience to publish results in top-tier, peer-reviewed, developmental, educational, and policy journals; 2) presentations at major national conferences for both academic and applied audiences; 3) using our broad network of academic, educational, and program implementation contacts to disseminate both results and the technology for implementing the program directly to practitioners nationally; and 4) direct replication within the Wyman Center national network of program implementers.

As noted above, Wyman already has extensive experience in the highly successful national dissemination of the *Teen Outreach Program* to similar populations of both youth and service providers. More specifically, Wyman is a member or contributor to multiple provider and dissemination networks (e.g., The Forum for Youth Investment, Ready by 21 National Conference, Deaconess Foundation, American Graduate: Let's Make it Happen Project, etc.), in addition to direct ongoing relationships with providers in more than 30 states currently. Allen is on the faculty in both Psychology and in the Curry School of Education at U.Va., and is also a member of the Center Advanced Study of Teaching and Learning (CASTL) at U.Va., with access to and a history of interaction with a broad array of academic and policy-relevant outlets for dissemination of education-related results (see budget justification for further information).

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