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Understanding strengths: Developmental changes and effects of protective factors in a
community prevention trial

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A dissertation
submitted in partial fulfillment of the
requirements for the degree of

Doctor of Philosophy

University of Washington

2014

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Program Authorized to Offer Degree:
School of Social Work

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Abstract

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Using empirical evidence to inform social work practice is consistent with the profession's commitment to beneficence and avoiding harm. Thirty years of prevention research has produced a wealth of tested-and effective programs that target known risk and protective factors for social, emotional, and behavioral health. Ineffective or untested strategies based on intuition, however, are largely being used. This dissertation study integrates the strengths perspective with prevention principles and investigates the development and role of protective factors to provide evidence for improving community-based prevention. Data come from the Community Youth Development Study, the first randomized-controlled trial of Communities That Care (CTC). CTC is a science-based community prevention system that mobilizes community coalitions to promote healthy youth development. The first paper examined the developmental trajectories of youth protective factors and the extent to which the trajectories vary by gender. Findings indicated that youth protective factors declined through middle school but the trajectories changed as youth entered high school – protective factors either slowed in the rate of decline or increased. Although females reported significantly higher levels of protective factors, there was no evidence of differential trajectories by gender. The second paper examined the variation in the sustained effect of CTC on youth protective factors. Findings suggested that the effect of CTC on

increasing youth protective factors was sustained beyond the implementation phase for males but not for females. Findings also indicated that CTC had a more positive effect on protective factors among low-risk males. Finally, the third paper tested whether the effect of CTC on youth protective factors mediates the effect of CTC on youth behavioral outcomes such as delinquency and substance use. CTC significantly affected levels of four protective factors measured at grade 8, and the levels of these protective factors at grade 8 significantly mediated the effect of CTC on youth delinquency and smoking behaviors in grade 10. The results of this dissertation contribute to the understanding of youth protective factors and have specific implications for strength-based community prevention strategies that seek to achieve healthy youth development by building protection.

TABLE OF CONTENTS

	Page
List of Figures	ii
List of Tables	iii
Introduction	1
Paper 1: Change in protective factors across youth development	
Introduction.....	9
Methods.....	19
Results.....	24
Discussion.....	29
References.....	39
Paper 2: Assessing sustained effects of Communities That Care on youth protective factors in grade 10	
Introduction.....	46
Methods.....	55
Results.....	64
Discussion.....	67
References.....	78
Paper 3: Protective Factors Mediate the Effects of Communities That Care on Youth Delinquency and Smoking	
Introduction.....	90
Methods.....	94
Results.....	102
Discussion.....	104
References.....	110
Conclusion	115
Bibliography	118

LIST OF FIGURES

Figure Number	Page
1.1 Change in community protective factors for males and females: Grades 5-12	34
1.2 Change in family protective factors for males and females: Grades 5-12.....	35
1.3 Change in school protective factors for males and females: Grades 5-12.....	36
1.4 Change in peer protective factors for males and females: Grades 5-12	37
1.5 Change in individual protective factors for males and females: Grades 5-12	38
2.1 Communities That Care logic model	69
2.2 Flow of communities and participants in the randomized trial.....	70
3.1 Mediation model of youth behavior change using Communities That Care	107

LIST OF TABLES

Table Number	Page
1.1 Protective factors assessed in the Youth Development Survey	33
2.1 Youth demographic characteristics in 24 CYDS communities	71
2.2 Protective factors assessed in the Youth Development Survey	72
2.3 List of risk factors from Grades 5 & 6	73
2.4 Protective factors by Grade 10 in CTC and control communities	74
2.5 Global Test Statistics for each subgroup	75
2.6 Protective factors by Grade 10 among boys and girls	76
2.7 Protective factors by Grade 10 among high risk and not high-risk boys	77
3.1 Multilevel models predicting the effects of CTC on delinquency and smoking	108
3.2 Multilevel models of hypothesized relationships	109

ACKNOWLEDGMENTS

The completion of this dissertation marks a new chapter in my life. Along the way, I have received incredible support and encouragement from family, friends, colleagues, and mentors. First and foremost, I want to thank my family who believed in me and in my dreams to change the world without the slightest hint of doubt. Their trust made it possible for me to stay strong and firm no matter how big an obstacle I faced. Mom, dad, and Kevin, I love you!

I send my warm thanks to all the mentors in my life. I thank my high school mentors, Ms. Margaret Estrada, who helped me transition into this foreign country and encouraged me to speak up, and Mr. Valentino Harrison, who was the first to see and grow the seeds of a social worker in me. I thank Dr. Bill Kelly, my senior thesis advisor, who taught me how to listen to the dreams of my heart and not what the world expects. His deep respect for humanity and humility as a scholar is an example I set for myself when working with diverse communities. I am deeply indebted to Dr. Rosemary Sarri, my master's thesis advisor, who gave me the critical eye to see the intricacies of social work issues and the need for integrating micro and macro social work practice and research. She is an inspiration to my life as a social worker and a scholar!

I express a deep and humble gratitude to my Chair Dr. J. David Hawkins for sharing his lifelong passion for prevention and his dedication to make a difference in the world through research. His uncompromising commitment to excellence helped me grow tremendously as a scholar. I thank Dr. Sabrina Oesterle for selflessly sharing her time and brilliance with me, especially during the last phase of my dissertation work. Words cannot express enough gratitude for their tireless support. I thank my reading committee members, Drs. David Hawkins, Sabrina Oesterle, Karl Hill, and Peter Pecora for their genuine desire to make my work better and their time in providing feedback and sharing ideas for my dissertation. I am also very thankful to Dr.

Alexes Harris, my Graduate School Representative, for her service beyond what the school requires and her mentorship. Her words of encouragement and example as an engaged scholar helped me persevere during the hardest times. I also want to thank Dr. Karl Hill, Dr. Richard Catalano, and Dr. Paula Nurius for their amazing mentorship throughout my doctoral training.

I send many thanks to each member of the Community Youth Development Study research team, who played a significant role in teaching me how to collaborate in an interdisciplinary environment and grow as a prevention scientist. I thank Dr. Robert Abbott, Dr. Eric Brown, Dr. Margaret Kuklinski, Dr. Sabrina Oesterle, and Dr. Isaac Rhew for sharing their time to provide methodological and substantive support. I am grateful for data manager John Briney and the technical support of John Dwyer and Wilson Chau.

Special thanks to my dear colleagues and friends Maria Rodriguez, Amanda Gilman, and Kari Gloppen, with whom I shared tears, laughter, and pain through this doctoral journey and witnessed each other's growth. The last phase of the dissertation would have been unbearable without this precious friendship. I also thank Dr. Valerie Shapiro for her dear friendship, support, and mentorship. A special shout out to my wonderful cohort, Ciwang Teyra, Maria Rodriguez, Tracy Brazg, Sharon Borja, Chiho Song, and Danae Dotolo for being my family away from home during the doctoral program: Surely we are the best cohort!

Finally, Dean, my husband and my better half, I cannot thank you enough for your incredible patience and encouragement to support my dreams, even when it meant being apart for six years! Your work with young people in the juvenile justice system brings a sense of reality to my work and grounds me as a social work scholar. I cannot wait to share our passion to serve young people together for the rest of our lives!

DEDICATION

To my student A. L. from Camp Kilpatrick – you make this journey a worthwhile endeavor!

INTRODUCTION

Healthy adolescent development depends on safe and supportive environments that are free from violence and from the risks of physical, mental, and emotional harm environments that provide opportunities for youths to build strong and meaningful connections with their families, their schools, and their communities. Adolescents greatly benefit from engagement in activities in which their value is demonstrated and affirmed and their inherent talents, capabilities, and strengths are enhanced.

— NASW Standards for the Practice of Social Work with Adolescents

The social work profession emphasizes the importance of strength-based practice, policy, and research. Rather than simply diagnosing problems and identifying deficits in individuals, social workers focus on the possibility and capability of individuals to overcome problems and change for the better (Saleebey, 1996; Weick, Sullivan, & Walter, 1989). The fundamental premise of a strengths-perspective is that individuals will indeed fare better if they “identify, recognize, and use the strengths and resources available in themselves and their environment” (Graybeal, 2001, p. 234). As described in introduction to the NASW Practice tools with Children, youth, and families, “social workers specialize in building upon the strengths within a family and their community to help provide a safe and loving environment for their children.” Thus, strength-based practice is inherently grounded in a person-in-environment perspective where “strength” does not stem from individuals alone but also from the surrounding environment – friends, families, schools, neighborhoods, etc. (Kemp, Whittaker, & Tracy, 1997). Despite the emphasis on strength-based research and practice, research that assesses strengths and evaluates intervention effects on strengths that could potentially provide information on which strengths are important and how to build these strengths in young people is under-

developed (Cosden, Panteleakos, Gutierrez, Barazani, & Gottheil, 2004). Beyond a simple conceptual framework that defines the perspective that we as social workers take, there needs to be concerted effort to provide empirical evidence for strengths-based research and practice.

In this dissertation, I adopt the risk and protective factor paradigm to define and understand strengths across youth development. Protective factors, here, are factors that decrease the likelihood of problem behaviors and increase the likelihood of positive behaviors (Bowers et al., 2011; Hartman, Turner, Daigle, Exum, & Cullen, 2009; Hawkins, Catalano, Miller, 1992; Lösel & Farrington, 2012; O'Donnell, Hawkins, & Abbott, 1995). A systematic assessment of risk and protective factors provides information about young people's individual and social domains of influence, which in turn allows for a more fitting service that meets their needs and strengths (Arthur, Hawkins, Pollard, Catalano, & Baglioni, 2002). Thus, increasing the use of effective practice strategies that assess and build protective factors among young people is an important task for social workers advocating for the health and wellbeing of young people. I examine a community prevention system that increases the use of data and the implementation of tested and effective programs to build youth protective factors across individual, family, school, and community domains.

Moving Towards Effective Community-Based Practice

Adolescence is a time of physical, emotional, and psychological change (Ruble, Martin, & Berenbaum, 2006). With the expanding independence and autonomy, this transitory developmental stage is characterized by increased conflicts with parents, mood disruptions, and risk behaviors (Arnett, 1999). It is common to view youths' experimentation with various risk behaviors (e.g., substance use, law-breaking behaviors, sex) as part of the normative developmental process, which generally does not lead to persisting problems (Steinberg &

Morris, 2001). In the 1980s, however, alarmed by the increase in youth delinquency – both violent and nonviolent, the U.S. government formally processed many young people in the Juvenile Justice System (Sarri, 2014). Despite the decrease in youth delinquency as well as youth confinement rates in the past decade, over 70,000 youth in the U.S. are detained at any given night (OJJDP, 2011), 40% of whom are confined for minor offenses including drug possession and technical violations of probation (Sickmund, Sladky, Kang, Puzzanchera, 2013; Mendel, 2012). In 2010, more than 31 million youth were under the supervision of the juvenile court (Puzzanchera & Hockenberry, 2013), the highest number per capita youth in the world and five times higher than the second highest country (Hazel, 2008). Youth confinement, however, has been found to be ineffective both in crime prevention and youth rehabilitation (Petteniti, Walsh, & Velazquez, 2009; Mendel, 2012; Aizer & Doyle, 2013) and costly for taxpayers: States pay approximately 5.7 billion dollars each year incarcerating youth (Petteniti, Walsh, & Velazquez, 2009; Aos, Mayfield, Miller, & Pennucci, 2004). Furthermore, the juvenile justice system disproportionately affects youth of color creating greater disparities across racial and ethnic communities (Soler & Garry, 2009; Hsia, Bridges, & McHale, 2004; Leiber, 2002).

In the last 40 years, the field of prevention science has produced much research evidence that suggests youth substance use, violence, delinquency, and other problem behaviors are preventable (Catalano et al., 2012; Fraser, Kirby, & Smokowski, 2003). Instead of trying to “fix” the problems after they occur, universal preventive approaches give opportunities for all youth to develop in a healthy manner by targeting known risk and protective factors that predict the likelihood of problem behaviors (O’Connell, Boat, & Warner, 2009; Coie et al., 1993). Despite the increased knowledge and availability of tested and effective prevention programs (Catalano, Hawkins, Berglund, Pollard, & Arthur, 2002), untested and ineffective strategies are still being

used (Fraser, Kirby, & Smokowki, 2004; Gambrill, 2006; Rosen, 2003; Thyer & Myers, 2011). As many states start seeking out community-based programs as alternatives to youth confinement (Sarri, 2014; Petteniti, Walsh, & Velazquez, 2009), there needs to greater effort in increasing the use of evidence-based practice.

Communities That Care (CTC) is a community-driven strategy that increases the use of scientific evidence in community-wide prevention. CTC engages community leaders from diverse sectors to build a new infrastructure for prevention service delivery. The CTC process trains community leaders and encourages them to engage other community members to build a self-sustaining capacity for community-wide prevention. Using epidemiological data to assess the risk and protective factor profiles of their community youth, community leaders choose tested and effective programs that best match the needs and strengths of their community and are trained to implement these programs with fidelity. This flexibility allows community leaders to choose various prevention programs that can address needs of youth in the community. In doing so, CTC brings science to practice, combining local knowledge and scientific evidence, to promote positive youth development.

Main Objectives

This dissertation uses data from a community-randomized trial of CTC in 24 communities across 7 states. Previous research suggests that CTC increased the use of tested and effective programs (Fagan, Hanson, Hawkins, & Arthur, 2008), reduced community-targeted risk factors (Hawkins, Brown, Oesterle, Arthur, Abbott, & Catalano, 2008), increased protective factors (Kim, Gloppen, Rhew, Oesterle, & Hawkins, 2014), and reduced problem behaviors in a panel followed from grade 5 through high school (Hawkins, Oeterle, Brown, Arthur, Abbott, Fagan, & Catalano, 2009; Hawkins, Oesterle, Brown, Monahan, Abbott, Arthur, & Catalano,

2012). In the first paper, I examine the developmental trajectories of theory-based protective factors across adolescent development. The information on how each protective factor develops from the elementary through high school periods provides empirical evidence for timing and targets of preventive interventions. In the second paper, I examine the variation in the sustained effect of CTC on youth protective factors. By testing whether gender and baseline levels of risk influenced the effect of CTC on protective factors, I seek to understand for whom and under what conditions CTC increases protection. In the third paper, I test whether the effect of CTC on youth protective factors mediates the effect of CTC on youth problem behaviors of delinquency and tobacco use later in development. This analysis investigates the mechanisms by which CTC affects youth behaviors. My dissertation provides research evidence for contextual adaption of community-based prevention by examining the developmental growth of protective factors and by assessing the conditions and processes of how a community-wide prevention system strengthens protective factors and, in turn, affects youth behavior.

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PAPER 1

CHANGE IN PROTECTIVE FACTORS ACROSS ADOLESCENT DEVELOPMENT

Introduction

Comprehensive community initiatives that promote prosocial opportunities and norms are important contributors to healthy youth development. Understanding the developmental changes in factors that lead to healthy youth development provides important information for the appropriate timing and targets for community-based prevention. This study examines the developmental trajectories of theory-guided predictors of prosocial behaviors.

Early descriptions of the physical, psychological, and environmental changes that adolescents experience were depicted primarily as “storm and stress” (Hall, 1904), characterized by increased conflicts with parents, mood disruptions, and risk behaviors (Arnett, 1999). Many scholars focused on understanding the developmental epidemiology of problems and negative experiences that occur during adolescent development, and knowledge in this area has grown substantially (Arnett, 1992; 1999; Brooks-Gunn & Warren, 1989). Prevention scientists adopted a public health approach to address the increasing rates of behavioral problems in adolescence by identifying precursors that affect the likelihood of adolescent problem behaviors (Catalano et al., 2012; Coie et al., 1993; Fraser et al., 2004). These precursors include contextual and individual risk factors such as neighborhood disorganization, economic deprivation, and rebelliousness that increase the likelihood of problem behaviors (Arthur, Ayers, Graham, & Hawkins, 2003; Hawkins, Catalano, & Miller, 1992). As more empirical evidence verified a range of risk factors for problem behaviors, many preventive interventions were developed that successfully reduce risk and prevent problem behaviors (Fraser et al., 2004; Hawkins, Catalano, & Miller, 1992;

Welsh & Farrington, 2007). Because the likelihood of risk exposure increases during adolescence (Catalano et al., 2012; Masten & Cicchetti, 2010), reducing risk is an effective strategy to prevent problem behaviors (Farrington, 2000; Welsh & Farrington, 2007).

However, researchers have devoted less effort to understanding the positive aspects of adolescent development. In the last two decades, recognizing that problem free is not fully prepared (Pittman, 1991), researchers and practitioners have become increasingly interested in understanding factors that decrease the likelihood of problem behaviors and increase the likelihood of positive behaviors. Researchers, however, have conceptualized protection in various ways (Fraser, Kirby, & Smokowski, 2003; Farrington & Ttofi, 2012; Losel & Farrington, 2012). Some have argued that protective factors are simply the opposite end of risk factors – risk and protection as a one-dimensional continuum with risk at one end and protection at the other (White, Moffitt, & Silva, 1989). Stouthamer-Loeber and colleagues (1993) modified this conceptualization to test whether the same variable can have both a risk and a protective effect depending on which end of the continuum an individual falls on that variable (also see Stouthamer-Loeber et al., 2002; Farrington & Loeber, 2000). Others have argued that protective factors are factors that protect against risk and thus, should not be considered as the opposite end of risk factors (Rutter, 1987; Durlak, 1998; Garmezy, Masten, & Tellegen, 1984). Rutter (1987), for example, suggested that protective factors are meaningful only in the context of risk, i.e., – the effect of protective factors moderates or buffers the effects of risk exposure (Fraser, Kirby, & Smokowski, 2003; Garmezy et al., 1984). Sameroff (2006) suggested the term “promotive” factors to distinguish constructs that increase the likelihood of positive behaviors from “protective factors” that moderate the effect of exposure to risk. However, the term promotive factors has not been widely used (Fraser, Kirby, & Smokowski, 2003). In this paper, I use the

term protective factors to refer to either protective or promotive factors for simplicity (Catalano et al., 2012). In response, prevention science expanded as a field, moving from being single-problem focused to understanding risk and protective factors that relate to multiple problem behaviors as well as positive behaviors (Catalano, Hawkins, Berglund, Pollard, & Arthur, 2002). Studies have shown that protective factors mitigate the development of problem behaviors (Bowers et al., 2011; Hartman, Turner, Daigle, Exum, & Cullen, 2009; Hawkins, Catalano, & Miller, 1992; Lösel & Farrington, 2012; O'Donnell, Hawkins, & Abbott, 1995), and various preventive programs have targeted protective factors as a mechanism to promote healthy youth outcomes (Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2004; Gavin, Catalano, David-Ferdon, Gloppen, & Markham, 2010).

In the last two decades, both resilience and positive youth development studies that focus primarily on individual strengths have made significant contributions to the understanding of positive aspects of youth development, particularly in defining and measuring positive functioning (Masten, 2014). As a concept that emerged to understand individuals who progressed well even in the face of extreme adversity (i.e., violence, abuse, homelessness, war, or disaster), resilience research examined individual and contextual protective factors that helped individuals meet developmental tasks and achieve adaptive functioning (Kolar, 2011; Masten & Narayan, 2012; Resnick & Taliaferro, 2011; Rutter, 1987; Zolkoski & Bullock, 2012). Many individual protective factors as well as family and community protective factors have been identified (Benzies & Mychasiuk, 2009; Werner, 1990). Although resilience research has identified protective factors that increase individuals' resilience, most research on this topic has focused on the developmental patterns of adaptive functioning or psychopathology over time and not on the development of protective factors themselves.

Positive youth development research has contributed to the understanding of the role of developmental assets in predicting optimal functioning or thriving (Geldhof et al., 2014; Masten, 2014). Indicators of positive youth development include competence (social, behavioral, emotional, and moral competence), confidence (self-efficacy, belief in the future), connection (bonding), character (prosocial norms, spirituality), and caring (empathy) (Bowers, Geldhof, Johnson, Lerner, & Lerner, 2014; Gavin, Catalano, & Markham, 2010; Geldhof et al., 2014). Further, positive youth development research has highlighted the opportunities and experiences as well as the supportive contexts in which youth are recognized for their efforts and contributions necessary for youth to thrive (Roth & Brooks-Gunn, 2003). These opportunities and supportive contexts have also been labeled developmental assets. The Search Institute has identified 40 developmental assets essential for enhancing a broad range of positive youth outcomes (Mannes, Roehlkepartain, & Benson, 2004). Although empirical evidence suggests a strong association between developmental assets and positive outcomes or thriving measures, a strong theoretical explanation is largely missing. Moreover, most studies of developmental assets are based on cross-sectional or short-term longitudinal studies (Mueller et al., 2011; Scales, Benson, Leffert, & Blyth, 2000; Schmid et al., 2011). For example, Scales et al. (2000), using findings from a cross-sectional cohort study, suggest that the number of developmental assets youth report declines across youth development. They suggest that youth development programs should seek to increase the number of assets youths report. This growing knowledge about protective factors raises the question of how protective factors change over the course of adolescent development.

Understanding the developmental epidemiology of factors shown to decrease the likelihood of problem behaviors and increase the likelihood of positive behaviors over time has

both theoretical and practical importance. The developmental trajectories of protective factors can provide empirical evidence for understanding the development of prosocial behaviors. Practically, this can help guide the timing of preventive interventions across youth development. For example, preventive programs can seek to reduce risk and increase protection early in a child's life to decrease the harm of accumulated risk (Masten, 2001). Alternatively, they may seek to counter increasing levels of risk exposure in adolescence by building protection during adolescence (Catalano et al., 2012; Toumbourou & Catalano, 2005). In this paper, we seek to examine changes in the prevalence of protective factors during adolescence to provide information useful for developmentally appropriate preventive intervention programming.

Theoretical Framework: Social Development Model

Human development occurs through continuous interactions with different social systems, such as family, friends, schools, and communities, all of which are heavily influenced by the social cultural norms (Bronfenbrenner, 1979). Relational developmental systems theory (Overton & Lerner, 2014) suggests that multiple transactions that occur between social contexts and individuals determine developmental pathways. Thus, aligning the resources present in the multiple social contexts that surround the youth with the strengths and assets the individual possesses is an important task for positive youth development (Benson, Scales, Hamilton, & Sesma, 2006; Bowers et al., 2014; Roth & Brooks-Gunn, 2003). Although these theories emphasize the importance of understanding the transactions between individuals and their social and developmental contexts, they lack specificity in explicating developmental pathways and how these transactions occur over time.

It is important to understand the development of both positive and negative influences from multiple social contexts across adolescence, a time during which individuals are exposed to

increasing numbers of risks. Empirical evidence suggests that positive and negative influences and outcomes are not always inversely related to one another (Arbeit et al., 2014; Lewin-Bizan et al., 2010). Thus, a theoretical framework that specifies and accounts for individual and contextual influences across development as well as complex relationships between both positive and negative influences is needed (Catalano, Gavin, & Markham, 2010). The social development model (SDM; Catalano & Hawkins, 1996; Hawkins & Weis, 1985) uses the risk and protective paradigm within a life course perspective to explicate the development of both prosocial and antisocial behaviors across the life span. The SDM explains the development of behaviors by specifying predictive relationships and processes across developmental contexts and stages. The SDM integrates elements from social control theory, social learning theory, and differential association theory (Catalano & Hawkins, 1996). The SDM specifies constructs including opportunities, involvement, skills, rewards or reinforcements, bonding, and beliefs on parallel pathways to prosocial or antisocial behaviors.

Specifically, social control theory (Hirschi, 1969) suggests that bonds to prosocial society deter individuals from engaging in deviant behaviors but does not specify the process through which attachment, commitment, and belief develop. The SDM uses elements of differential association theory and social learning theory to explicate this process. As described by Sutherland (1973), differential association theory suggests that youths from different social contexts are exposed to varying degrees of opportunities to be involved in crime (i.e. interactions with those involved in crime, disorganized neighborhoods). These opportunities allow youths to be exposed to antisocial (or prosocial) individuals with definitions favorable (or unfavorable) to crime from whom they learn skills and techniques to engage in antisocial (or prosocial) behaviors (Matsueda, 1988). The SDM takes the differential opportunities described by

differential association theory and further explicates the development of both prosocial and antisocial pathways. Finally, the SDM uses social learning theory (Akers, 1977) to explain how children learn patterns of behavior (Catalano & Hawkins, 1996). Children learn behaviors if they receive rewards or reinforcement for their involvement in pro- or antisocial behaviors. To the extent their involvement is skillful, reinforcement is more likely to occur. Involvement that is reinforced is hypothesized to strengthen bonding of young people to the individuals or groups who provide reinforcement. Thus, the SDM asserts that the social development process that leads to bonding is the result of opportunities, skills, and recognition within different social contexts that contribute to individuals' attachment and commitment to those socialization units. Social bonds in turn increase the likelihood that youth will adopt the beliefs and standards of behavior of those social units.

The prosocial path hypothesizes that providing individuals with opportunities for prosocial involvement, teaching the skills to participate in prosocial activities, and recognizing or reinforcing individuals for skillful participation in prosocial activities will lead to the development of social bonds between the individual and the socializing unit providing the prosocial opportunities, skills, and recognition. If these social bonds are well established and the standards for prosocial behavior of the socializing unit(s) are clear, it is expected that the youth will engage in prosocial behaviors as a result. These opportunities, skills, recognition, bonding, and beliefs that lead to prosocial behaviors across different socializing units (e.g., peers, family, school, community) are protective factors. For example, when families provide opportunities for children to contribute to family life and reward children for their skillful participation, children are expected to become bonded to their families and to be more likely to adopt the behavioral standards of their families. If the families communicate prosocial standards and norms, bonded

children are likely to adopt these norms and to engage in prosocial behaviors and avoid behavioral health problems.

A parallel risk path hypothesizes that when opportunities, skills, recognition, bonding, and beliefs are antisocial, these processes lead to increasing the likelihood of antisocial behavior. The SDM, thus, provides a comprehensive understanding of how risk and protective factors develop over time across multiple socializing units. This specified causal process of the development of both antisocial and prosocial behaviors can also theoretically guide the development and implementation of prevention programs (Abbott et al., 1998; Catalano, Kosterman, Haggerty, Hawkins, & Spoth, 1998; Hawkins, Catalano, Kosterman, Abbott, & Hill, 1999; Mason, Kosterman, Hawkins, Haggerty, & Spoth, 2003).

Developmental Turning Point: Transitions Across Adolescence

Youth encounter new social and environmental contexts (e.g., family, peer, school, community) as they develop, and need to adapt to multiple transitions that occur across and within these different contexts – one of which is school transitions (Benner & Graham, 2009; Eccles, 2004; Eccles et al., 1993; Roeser, Eccles, & Sameroff, 2000). School transitions during adolescence are naturally occurring transitions for most U.S. students who receive public education as they transition from the home to elementary school, from elementary to middle school, and from middle to high school, although there are some differences in these transition patterns. As individuals are introduced to new settings, new rules, new peers, and new teachers, the mismatch between social settings and individual development (Eccles et al., 1993) can create distress (Benner, 2011). Thus, transitions across these social settings can provide important opportunities for behavioral continuity or change (Elder, 1998), especially during adolescence.

Many studies have focused on the negative outcomes of the transition from elementary to middle school, such as decline in academic motivation and achievement (Benner, 2011; Eccles, 2004; Simmons & Blyth, 1987; Wigfield, Eccles, Mac Iver, Reuman, & Midgley, 1991). Less is known about how the transition to high school affects developmental trajectories during middle to late adolescence. The studies conducted are mostly short-term longitudinal or cross-sectional in nature (Benner & Graham, 2009; Witherspoon & Ennett, 2011). Although some studies have suggested a continuing decline in academic achievement, school belonging, and activity participation following the transition to high school (Akos & Galassi, 2004; Benner & Graham, 2009; Gifford & Dean, 1990; Roderick, 2003), other studies have indicated an increase in school bonding past 10th grade (Stanley, Comello, Edwards, & Marquart, 2008). Benner (2011) conducted a longitudinal study of high school transition from 7th to 10th grade across eight waves (two waves of data collected each academic year). The study found that even adolescents who were doing well in middle school experienced academic and psychological disruptions following the transition to high school and continued to struggle during high school. Moreover, academic success and school belonging declined, despite an increase in school engagement.

Examining the developmental trajectories of individual, peer, family, community, and school-related protective factors across school transitions provides a relevant context for understanding the social transitions as well as normative developmental changes adolescents experience during this time. Furthermore, as gender identity becomes more pronounced during adolescence (Galambos, Berenbaum, & McHale, 2009; Hill, J P & Lynch, M E, 1983), exploring possible gender differences in the development of protective factors is important. Bussey and Bandura's (1999) social cognitive theory of gender development suggests that complex social subsystems as well as cognitive processes influence gender development. They argue that boys

and girls encounter different kinds of modeling and receive different feedback from their peers, families, and teachers based on their gender during their development.

In the same way, protective factors may develop differently for boys and girls as their families, peers, and school systems may provide them with different kinds of opportunities and recognition for different kinds of behavior based on their gender. These differences may provide valuable insight for prevention as to when and what protective factors to target across male and female development. Although research suggests that females are more prone to prosocial behaviors compared to their male counterparts (Kokko, Tremblay, Lacourse, Nagin, & Vitaro, 2006) and fare better in terms of academic outcomes (Witherspoon & Ennett, 2011), few studies have examined gender differences in the development of protective factors from childhood to adolescence (Galambos et al., 2009). This study examines the developmental trajectories of prevalence of protective factors across individual, peer, family, school, and community domains in middle school and high school for boys and girls.

Methods

Sample

The data come from the Community Youth Development Study (CYDS), a multi-site community randomized trial of the Communities That Care prevention system involving 24 communities in seven states. CYDS communities are small- to moderate-sized incorporated towns with their own governmental, educational, and law enforcement structures, ranging in population size from 1,500 to 41,000 residents.

Annual surveys of a panel of public school students were conducted beginning during the 2003 - 2004 academic year when students were in fifth grade. The first wave of data was collected in the spring of 2004, when the panel was in Grade 5, and served as the pre-intervention baseline assessment. The second wave of data was collected in Grade 6 and included recruitment of additional eligible students who were not surveyed in Grade 5. The final longitudinal panel included 4,407 students (2,405 from CTC communities and 2,002 from control communities) who completed a Wave 1 and/or Wave 2 survey. Students who remained in the communities for at least one semester were followed and surveyed for each subsequent wave of data collection, even if they left the community. The seventh wave of data collected in the spring of 2011, when students in the panel were in the 12th grade, was completed by 92.5% of the sample students in the longitudinal panel (91.6% in the control and 93.3% in the experimental condition). Since we are interested in understanding the normative developmental trajectories of protective factors without the influence of the CTC intervention, we use the 2,002 students in the control sample for this paper.

Measures

Protective factors. Opportunities, skills, recognition, attachment/commitment, and belief across multiple domains are all important for healthy social development (Fleming, Catalano, Oxford, & Harachi, 2002; Roosa et al., 2011; Sullivan & Hirschfield, 2011). Fifteen protective factors measuring these SDM constructs are assessed using scales consisting of two to six items each. These items are from the Communities That Care Youth Survey that has demonstrated adequate psychometric properties across gender and racial groups (Glaser, Van Horn, Arthur, Hawkins, & Catalano, 2005). These protective factors are divided into five domains – individual, peer, family, school, and community (See Table 1.1). Protective factors measured in this study include opportunities for prosocial involvement in each domain, social skills of individual youths, reward or reinforcement for prosocial involvement in each domain, attachment to the family and the community, commitment to school, and healthy beliefs and clear standards for behavior. Academic failure and low commitment to school have previously been used as risk factors for delinquent behavior and drug use (Maguin & Loeber, 1996). However, because good grades are theorized in the SDM as an indicator of reinforcement for prosocial behavior, and high commitment to school is conceptualized an indicator of prosocial bonding in the school domain, these constructs were included in the present analyses as protective factors. To calculate protective factor scores, scale items were standardized and then averaged at each wave. To allow comparison of protective factor scores across time, scale scores were standardized across all six waves of data from Grade 5 through Grade 12.

<Insert Table 1.1>

Student characteristics. Variables measuring student characteristics that could affect levels of protection are included as covariates in analyses. Student characteristics include

student's age at sixth-grade survey, gender (1 = male, 0 = female); race (1 = White, 0 = other); whether the student is Latino(a) (1 = yes, 0 = no); parental education level (ranging from 1 = grade school or less to 6 = graduate or professional degree); religious attendance in Grade 5 (0 = never to 4 = about once a week or more); and rebelliousness, which consisted of the mean of three items: I like to see how much I can get away with; I ignore rules that get in my way; and I do the opposite of what people tell me, just to get them mad (1 = very false to 4 = very true). Religious attendance and rebelliousness from the CTCYS were included as covariates because theoretical and empirical evidence suggests a fairly strong association between these two variables and other protective factors. For example, individuals who identify themselves to be religious tend to have more opportunities to be involved in various clubs and volunteer activities (Saroglou, Pichon, Trompette, Verschueren, & Dernelle, 2005). Individuals with rebellious tendencies are less likely to follow the norms and boundaries of social institutions, such as family, school, and community, which will affect the way in which they interact with these social institutions (Arthur et al., 2002; Nurco & Lerner, 1999).

Missing Data

Among the 2,002 students in the longitudinal panel within the control sample, 26.5% did not complete the survey in the first wave because they were part of the accretion sample in Grade 6. Only a small percentage of students in the control sample (8.5%) were not available for a follow-up interview in Grade 12. To ensure validity of students' self-report, students' data at each wave were excluded from analyses if they reported being honest only "some of the time" or less, having used a fictitious drug, or having used two of three drugs on 40 or more occasions in the past month at that data collection point (1.1% excluded in Grade 5; 0.6% excluded in Grade 6; 1.0% excluded in Grade 7; 1.5% excluded in Grade 8, 2.0% excluded in Grade 9, 1.4%

excluded in Grade 10; and 1.8% excluded in Grade 12). Missing data were imputed using multiple imputation methods to obtain unbiased estimates of model parameters and their standard errors, assuming that data are missing at random (Schafer & Graham, 2002). Using NORM version 2.03 (Schafer, 2000), 40 separate data sets including data from all seven waves from Grade 5 through Grade 12 were imputed (Graham, Taylor, Olchowski, & Cumsille, 2006). To facilitate imputation, the number of variables in the imputation model was imputed within domain. Protective factors in family, school, and community domains were imputed separately and individual and peer domains were imputed together. Imputation models included student and community characteristics, protective factors within a domain across all seven waves, and community membership. Imputed datasets were combined and analyses were averaged across the 40 imputed datasets using Rubin's rules (Rubin, 1987).

Analysis

We used three-level hierarchical modeling (Raudenbush & Bryk, 2002) to address the nested nature of the data. We estimated the average trajectories of protective factors over time, accounting for variation across individuals and communities. Based on the observed patterns of the trajectories, we examined both quadratic and piece-wise models. We considered conceptual as well as practical implications for prevention to choose piece-wise growth modeling with two time phases: elementary through middle school for Phase 1 and high school for Phase 2. The piece-wise approach effectively represents trajectories across individuals' development within the context of transitioning from middle school to high school. Additionally, it could identify a specific developmental period (middle school or high school) during which prevention programming might be most effective to affect protective factors.

We also used empirical data to identify the specific grade at which to begin the high school trajectory for each protective factor. Most protective factors showed a distinct change in trajectory in ninth grade (i.e., from negative to positive trajectory, from negative to flat trajectory). For these factors, the first time phase included Grades 5 through 9 and the second phase included Grades 9 through 12, with time centered at 9th grade. Four protective factors, including school opportunities for prosocial involvement, peer recognition for prosocial involvement, social skills, and healthy belief, showed a distinct change in trajectory at the end of eighth grade. Here, the first time phase included Grades 5 through 8 and the second phase included Grades 8 through 12, with time centered at 8th grade. In summary, depending on the trajectory observed in the raw data, for each protective factor we considered eighth grade or ninth grade as a transitional point from middle school to high school. We included individual characteristics (i.e., age, gender, race/ethnicity, parental education, religious attendance, and rebelliousness) as time-invariant covariates in level 2 to account for possible intercept differences based on these characteristics. To estimate the difference in trajectories for males and females, we allowed the time slopes in level 1 to vary across gender in level 2. All analyses were conducted using HLM version 6.0.

Fifteen growth models were estimated to examine how each protective factor conceptualized in the SDM develops differentially during the middle school period versus during the high school period.

Results

Community Domain

Figure 1.1 shows the developmental patterns of protective factors in the community domain for males and females. Males reported significantly lower levels of opportunities for prosocial involvement than females across all grades (e.g., Grade 5 $B = -0.176$, $p < 0.001$; Grade 8 $B = -0.138$, $p < 0.001$) with the exception of Grade 12. In twelfth grade, males reported 0.05 standardized units lower opportunities for prosocial involvement compared to females but this difference was not statistically significant ($B = -0.05$, $p = 0.34$). Males initially reported significantly lower levels of recognition for prosocial involvement in elementary school years (Grade 5 $B = -0.15$, $p < 0.01$; Grade 6 $B = -0.097$, $p < 0.01$) but later reported higher levels than females starting in eighth grade. The difference, however, was not statistically significant (e.g., Grade 12 $B = 0.073$, $p = 0.138$). Males also reported significantly higher levels of community attachment than females starting in ninth grade (e.g., Grade 9 $B = 0.08$, $p < 0.05$; Grade 12 $B = 0.113$, $p < 0.05$). The level difference between males and females were not statistically significant in other grades.

Both males and females experienced a decrease in the levels of community protective factors from fifth through ninth grade but females experienced a steeper decline than males, with rates of decline for recognition (males $B = -0.159$, females $B = -0.209$, $p < 0.001$) and attachment (males $B = -0.02$, females $B = -0.05$, $p < 0.05$) reaching statistical significance. The coefficients for males and females indicate the rate of change in protective factors each year. For example, males reported 0.159 standardized units decline each year in recognition while females reported 0.209 units decline. As individuals transitioned from middle to high school, both males and females experienced an increase in the levels of opportunities and recognition for prosocial

involvement. These increases were not significantly different across gender. The mean level of attachment to community declined further and at similar rates for both males and females during high school.

<Insert Figure 1.1>

Family Domain

Figure 1.2 shows the developmental patterns of protective factors in the family domain for males and females. The levels of family protective factors were not significantly different between males and females at any year with the exception of family attachment during sixth through eighth grade. For example, males reported significantly higher levels of attachment to family than females in grade 7 (e.g., Grade 7 $B = 0.071$, $p < 0.05$). Both males and females reported a decline in all family protective factors over elementary and middle school periods. This decline was significantly different only for family recognition, for which females experienced a greater decrease than males during this time (males $B = -0.195$, females $B = -0.223$, $p < 0.05$). In high school, all family protective factors trended positively for females. In contrast, levels of family protective factors continued to decline for males in high school, though at a slower rate than prior to entering high school in ninth grade. The slopes during high school were significantly different by gender for recognition for prosocial involvement (males $B = -0.019$, females $B = 0.022$, $p < 0.05$) and attachment to family (males $B = -0.03$, females $B = 0.03$, $p < 0.01$).

<Insert Figure 1.2>

School Domain

Figure 1.3 shows the developmental patterns of protective factors in the school domain for males and females. Males reported significantly lower levels of opportunities for prosocial

involvement (e.g., Grade 6 $B = -0.189$, $p < 0.001$, Grade 10 $B = -0.10$, $p < 0.01$) and academic success (e.g., Grade 6 $B = -0.164$, $p < 0.001$) than females across all years with the exception of levels of opportunities in Grade 12. In twelfth grade males continued to report lower levels of opportunities for prosocial involvement than females but the difference was not statistically significant. In grades 5 through 7, males reported significantly lower levels of recognition for prosocial involvement (e.g., Grade 6 $B = -0.135$, $p < 0.001$) and commitment to school (e.g., Grade 7 $B = -0.169$, $p < 0.001$) than females. Level differences by gender were not statistically significant in other years.

Both females and males experienced a decrease in levels of all school protective factors in elementary and middle school periods, ending in either eighth or ninth grades. The difference in the rate of decline between males and females was statistically significant only for recognition where females experienced a faster decline (males $B = -0.188$, females $B = -0.237$, $p < 0.001$). While school commitment continued to decline – showing a linear decline across the entire period from Grade 5 through 12 – opportunities, recognition, and academic success showed an increase in levels during the high school period, starting in either eighth or ninth grades, for both males and females. Differences in the slopes between males and females did not reach statistical significance.

<Insert Figure 1.3>

Peer Domain

Figure 1.4 shows the developmental patterns of protective factors in the peer domain for males and females. Males and females reported a significant difference in levels of protective factors in this domain. Males reported significantly lower levels of interaction with prosocial peers (e.g., Grade 5 $B = -0.287$, $p < 0.001$; Grade 8 $B = -0.305$, $p < 0.001$) and recognition for

prosocial involvement (e.g., Grade 5 B = -0.123, $p < 0.01$; Grade 8 B = -0.231, $p < 0.001$) compared to females across all years with the exception of levels of interaction with prosocial peers in Grade 12 (Grade 12 B = -0.086, $p = 0.07$).

During elementary and middle school periods, males and females reported similar rates of decline in their interaction with prosocial peers (males B = -0.124, females B = -0.118, $p = 0.69$) as well as the rates of decline in recognition for prosocial involvement (males B = -0.262, females B = -0.226, $p = 0.07$). In the high school period, males reported a slight increase in their interaction with prosocial peers, while females continued to report a decrease in interaction with prosocial peers and this difference in rates was statistically significant (males B = 0.03, females B = -0.04, $p < 0.001$). During the high school period, respondents reported increasing recognition from peers for prosocial involvement, but the rates of increase were not significantly different between males and females.

<Insert Figure 1.4>

Individual Domain

Figure 1.5 shows the developmental patterns of protective factors in the individual domain for males and females. In this domain, across all years, males reported significantly lower levels of all protective factors, including prosocial involvement (e.g., Grade 10 B = -0.261, $p < 0.001$), refusal skills (e.g., Grade 8 B = -0.345, $p < 0.001$), and healthy beliefs (e.g., Grade 12 B = -0.379, $p < 0.001$), compared to females. Males and females both experienced a decline in prosocial involvement through 9th grade and became increasingly more involved in prosocial activities from 9th through 12th grade.

Both males and females reported a decline in prosocial involvement, refusal skills, and healthy beliefs during elementary and middle school periods. The rates of decline for prosocial

involvement and healthy beliefs did not significantly vary by gender but males experienced a decline in refusal skills at a significantly faster rate than females (males $B = -0.258$, females $B = -0.179$, $p < 0.001$). During the high school period prosocial involvement and refusal skills increased in prevalence for both males and females and the rates of decline did not differ significantly by gender. Healthy beliefs continued to decline for males but increased for females during this time and the difference in average prevalence of healthy beliefs by gender were statistically significant (males $B = -0.04$, females $B = 0.01$, $p < 0.001$).

<Insert Figure 1.5>

Discussion

This is among the first studies to examine the developmental epidemiology of protective factors across adolescent development using a longitudinal design. The goal of this study was to understand how theoretically specified protective factors develop over time and the extent to which levels and growth trajectories of protective factors differ between males and females.

Some of the findings of this paper are consistent with current literature that suggests that the stressful nature of adolescents' transition to high school results in declines in school belonging (Akos & Galassi, 2004; Benner & Graham, 2007, 2009; Reyes, Gillock, Kobus, & Sanchez, 2000; Weiss & Bearman, 2007). Commitment to school declined consistently over time in this sample. However, a distinct turning point in the development of some protective factors emerged as adolescents transitioned from middle school to high school. While the levels of all SDM protective constructs of opportunities, recognition, skills, and belief declined during the middle school period, they either decreased at a significantly slower rate or began to increase after the transition to high school. In contrast to many studies that suggest negative experiences following the transition to high school (Benner, 2011; Cillessen & Mayeux, 2007; Karriker-Jaffe, Foshee, Ennett, & Suchindran, 2008; Stanley et al., 2008), the findings here suggest that levels of many protective factors increase following the transition to high school.

Interestingly in spite of reported increases in opportunities, skills, and recognition during high school, this sample reported continued declines in school commitment and community attachment during high school. This finding is inconsistent with the SDM, which hypothesizes that increasing opportunities, skills, and recognition in school and community domains will result in increased bonds of commitment and attachment to those domains. This may indicate that bonding trajectories of commitment and attachment are established earlier in development

and are not easily changed by changes in opportunities, skills and recognition during high school. (Lonczak, Huang, Catalano, Hawkins, Hill, Abbott, Ryan & Kosterman, 2001; Catalano, Kosterman, Hawkins, Newcomb, & Abbott, 1996). It is also possible that the changes in opportunities, skills and recognition were not of sufficient magnitude to affect bonding trajectories. Regardless, the current data do not support the SDM's hypothesis that changes in the prevalence of opportunities, skills and recognition during high school will result in changes in bonding trajectories of commitment to school and attachment to community during this developmental period. In contrast, as shown in Figure 1.2, the trajectories of opportunities and recognition in the family were paralleled for both boys and girls, by similar trajectories in family attachment, as hypothesized by the SDM: decreasing opportunities and recognition paralleled by decreased family attachment and increasing opportunities and recognition in the family paralleled by increased family attachment. It is not clear why links between opportunities recognition and bonding are observed in the trajectories of protective factors in the family but not in the school or community domains. Future studies should focus on testing the prosocial pathways of the SDM during the high school period to better understand the predictors of trajectories of bonding to school and community during this period.

Consistent with other study findings that report higher levels of prosocial behaviors and greater academic success in schools among females than males (Carlo, Crockett, Randall, & Roesch, 2007; Eccles et al., 1993; Witherspoon & Ennett, 2011), females in our sample experienced higher levels of protective factors than males in individual, peer, and school domains. In the family domain, males and females reported little difference in levels of protective factors from elementary through high school. In the community domain, except for opportunities for prosocial involvement, males reported higher levels of community protective

factors than females as they transitioned into high school. These differences in average levels of protection between males and females suggest that males may benefit more from preventive interventions seeking to strengthen protection than females. For example, males might benefit from more opportunities for prosocial involvement and greater focus on teaching refusal skills than females. Programs that primarily focus on acquisition of skill-based learning, such as Life Skills Training (Botvin, 1979-1996) and PATHS (Greenberg & Kusche, 2006), can increase social emotional competence and facilitate prosocial peer norms among males (Catalano et al., 2004).

Female adolescents experienced significantly steeper declines than their male counterparts in the amount of recognition they received from family (males $B = -0.195$, females $B = -0.223$, $p < 0.05$), community (males $B = -0.159$, females $B = -.209$, $p < 0.001$), and school (males $B = -0.188$, females $B = -0.237$, $p < 0.001$). Although females were provided with more prosocial opportunities to be involved and were more likely than males to be prosocially involved, females were less likely than males to report being recognized for their involvement. Prevention programs implemented during middle and high schools in communities, schools, and families, should pay particular attention to enhancing recognition for females across family, school, and community to encourage their active participation in prosocial contexts. For example, programs implemented in school and family domains (i.e., Seattle Social Development Project,) (Catalano et al., 2004) could seek to ensure that teachers and parents provide recognition for females for effort, improvement, and achievement.

Although the study found statistically significant differences between males and females in terms of levels and rates of decline or incline in protective factors, these statistically significant findings must be interpreted with caution. Given the relatively large sample size, this

study had statistical power to detect minor differences. Some protective factors, however, such as community recognition and school recognition indicated larger differences in change rates with smaller standard errors, possibly allowing for substantive interpretation of the difference.

Nevertheless, the overall shape of the trajectories between males and females was very similar indicating the same tipping point that defined the transitional period from middle to high school in the trajectories of protective factors. These data provide no evidence to suggest that prevention programs need to be implemented in different developmental periods for males and females:

Both females and males would benefit from early prevention programming that could slow the rate of decline in protective factors during elementary and middle school. In fact, a recent evaluation of Communities That Care (CTC), a science-based prevention system using community coalitions, found that a comprehensive effort that engaged communities, schools, families, and youth successfully enhanced protective factors by the end of 8th grade (Kim, Gloppen, Rhew, Oesterle, & Hawkins, in press).

This study has limitations. The study is based on self-reported data from a sample of youth from small incorporated towns and thus the findings of this study may not be generalizable to a large urban context. In addition, having 11th-grade data would have provided further clarity in understanding the trajectories of protection during high school. However, this study provides a reliable understanding of developmental changes in self-reported exposure to protective factors during middle and high school from ages 10 to 18 for a sample of youth from small towns across seven states. These data are potentially useful for informing community efforts to promote healthy youth development.

Table 1.1. Protective Factors assessed in Youth Development Survey

Scales	# of items (α)	Sample item
COMMUNITY		
Opportunities for prosocial involvement	2 (0.84)	There are lots of adults in my neighborhood I can talk to about something important
Recognition for prosocial involvement	3 (0.74)	My neighbors notice when I'm doing a good job and let me know about it
High neighborhood attachment	3 (0.84)	I like my neighborhood
FAMILY		
Opportunities for prosocial involvement	3 (0.78)	My parents ask me what I think before most family decisions affecting me are made
Recognition for prosocial involvement	4 (0.78)	My parents notice when I'm doing a good job and let me know about it
Attachment	4 (0.76)	Do you feel very close to your mother?
SCHOOL		
Opportunities for prosocial involvement	5 (0.65)	There are lots of chances to be part of class discussions or activities
Recognition for prosocial involvement	4 (0.74)	My teachers notice when I'm doing a good job and let me know about it
High commitment to school	6 (0.81)	Now thinking back over the past year in school, how often did you try to do your best work in school?
Academic success	2 (0.71)	Putting them all together, what were your grades like last year? (e.g. A's B's)
PEER		
Interaction with prosocial peers	5 (0.70)	In the past year (12 months), how many of your best friends have participated in clubs, organizations or activities at school?
Recognition for prosocial involvement	4 (0.74)	What are the chances you would be seen as cool if you worked hard at school?
INDIVIDUAL		
Prosocial involvement	3 (0.69)	How many times in the past year (12 months) have you participated in clubs, organizations, or activities at school?
Refusal skills	4 (0.68)	You're at a store with friend. Your friend steals a magazine...What would you do now?
Healthy beliefs and clear standards	4 (0.74)	It is important to be honest with your parents, even if they become upset or you get punished

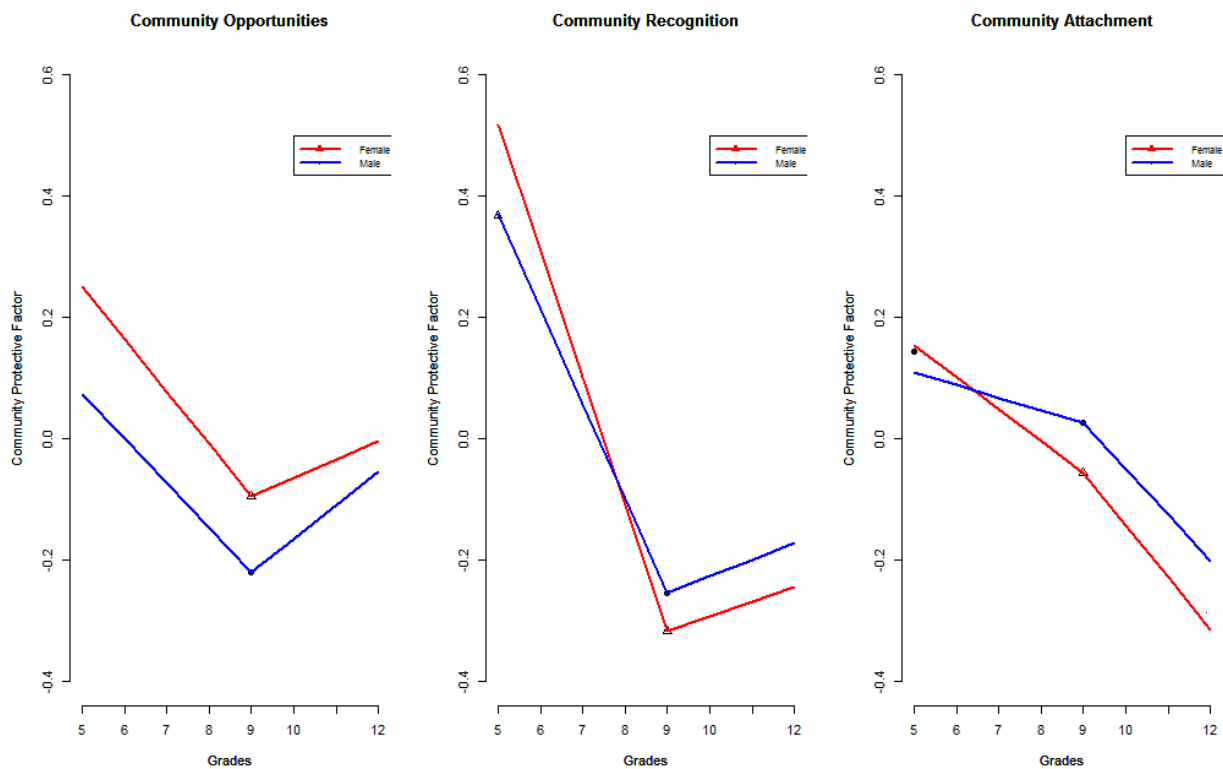


Figure 1.1. Change in community protective factors for males and females: Grades 5-12

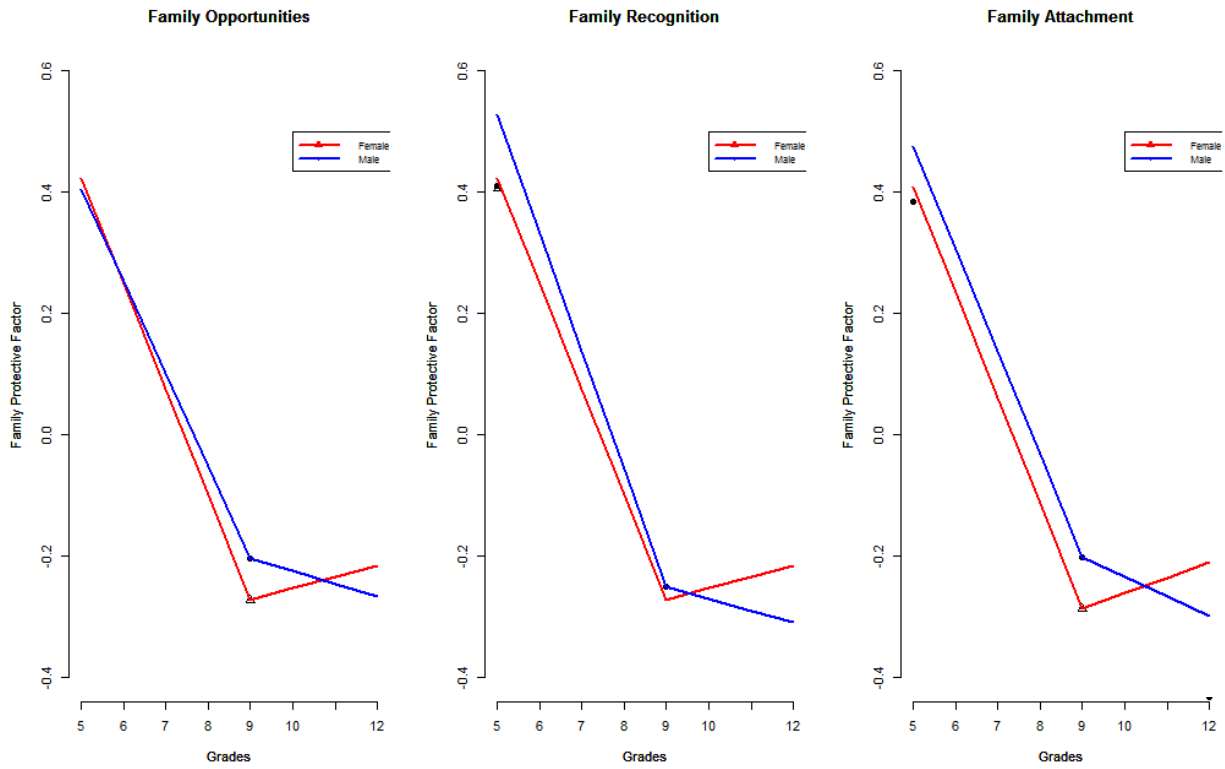


Figure 1.2. Change in family protective factors for males and females: Grades 5-12

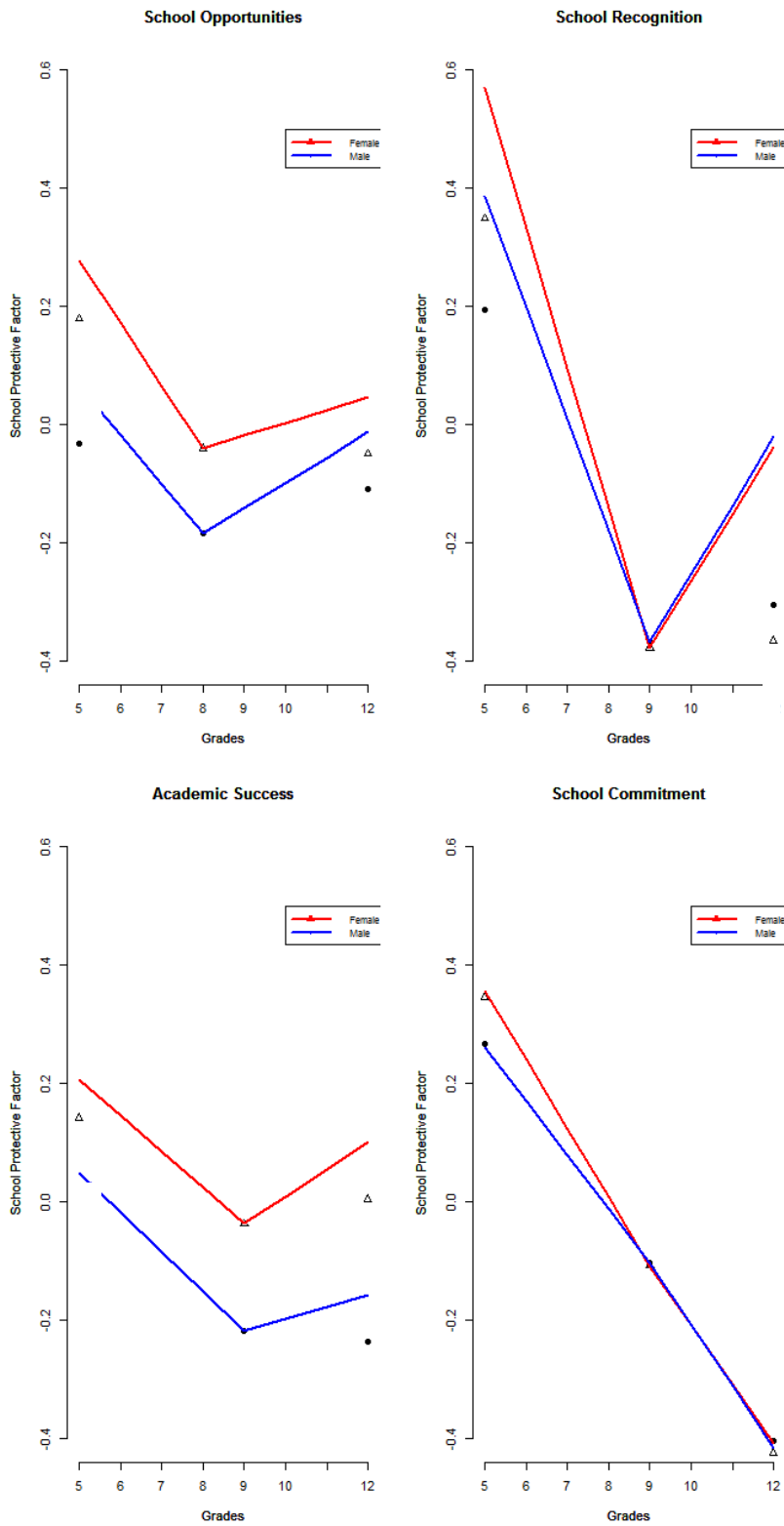


Figure 1.3. Change in school protective factors for males and females: Grades 5-12

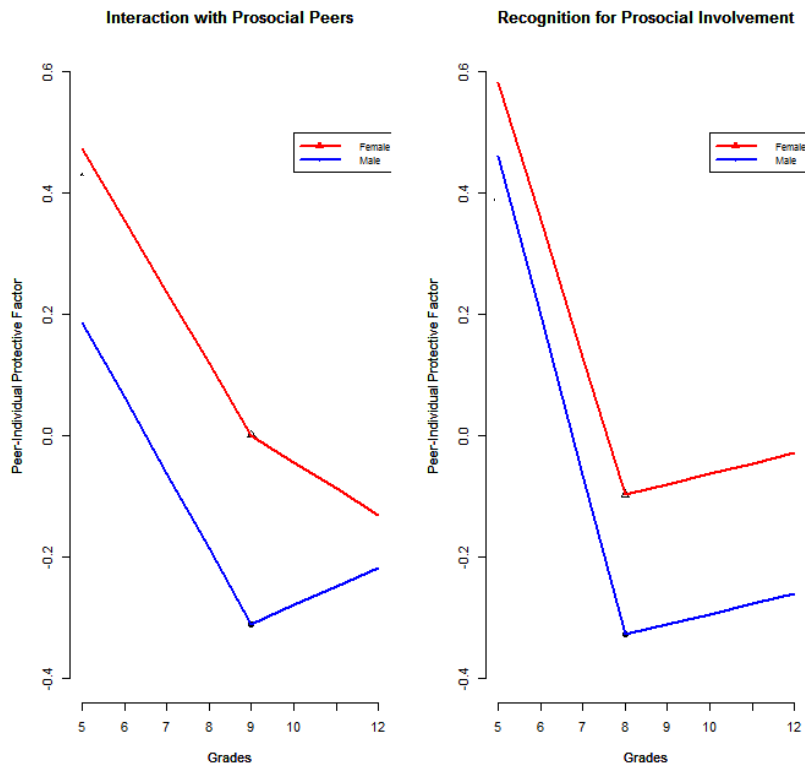


Figure 1.4. Change in peer protective factors for males and females: Grades 5-12

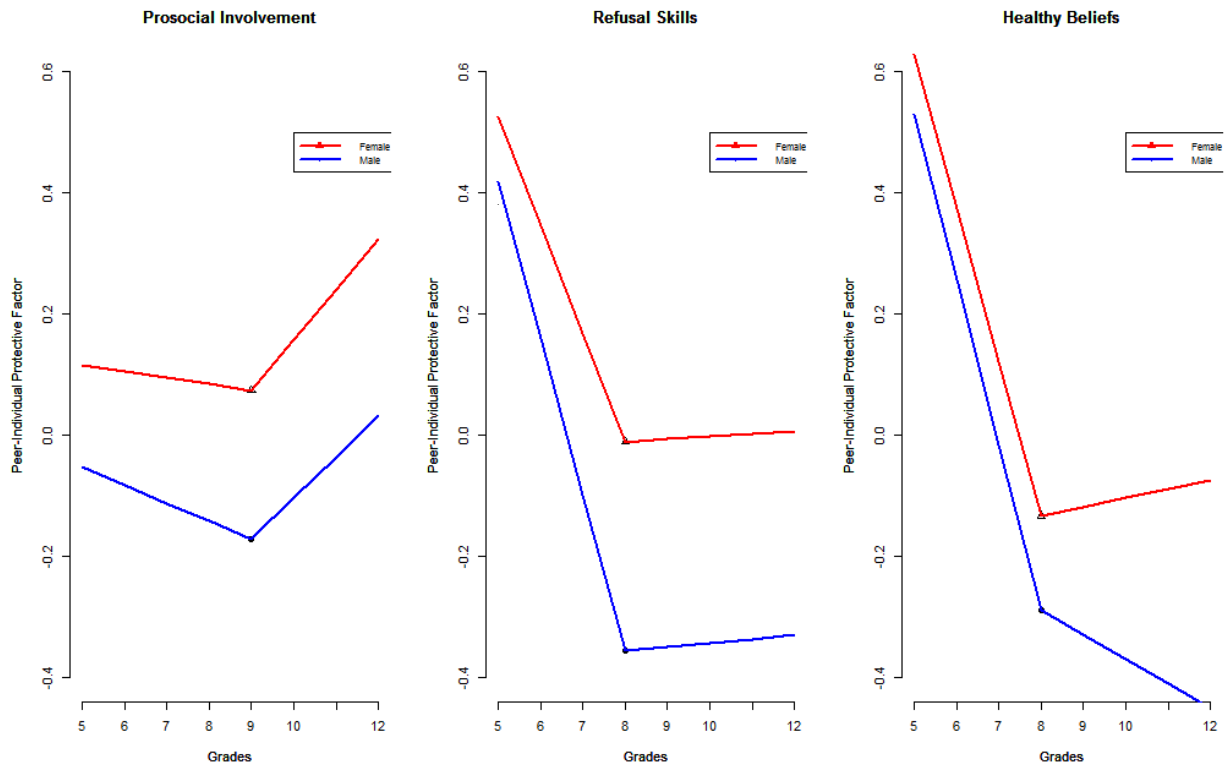


Figure 1.5. Change in individual protective factors for males vs. females: Grades 5-12

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PAPER 2

ASSESSING SUSTAINED EFFECTS OF COMMUNITIES THAT CARE ON YOUTH PROTECTIVE FACTORS IN GRADE 10

Introduction

Using empirical evidence to inform social work practice is consistent with the profession's commitment to beneficence and avoiding harm (Gambrill, 2006). Because the social work profession holds accountability to clients' well-being as well as the larger social welfare, practice decisions should be based on evidence from scientific research (Rosen, 2003). Furthermore, as all clients have the right to competent practice that reflects current knowledge and research evidence, all social work practitioners and researchers must critically examine how and in what ways research can inform practice (DePanfilis, 2014). Fraser et al. (2004) argued that, "the essence of social work research is the study of intervention – the development and design of systematic change strategies" (p. 210). Recent advances in substantive and methodological knowledge have allowed the development and empirical testing of theory-driven interventions using the risk factor perspective. A big contribution to this area came from the field of prevention science (Fraser et al., 2004). The basic premise underlying prevention science holds that identifying and targeting risk and protective factors that predict the likelihood of social, emotional, and behavioral health can prevent problems before they occur (Coie et al., 1993; Hawkins, 2006). For example, implementing tested and effective programs for youth delinquency and violence prevention could reduce billions of taxpayer dollars spent in incarcerating youth in the juvenile and criminal justice systems (Henrichson & Delaney, 2012; Petteruti, Walsh, & Velazquez, 2009).

Thirty years of prevention research has produced a wealth of tested and effective programs that target known risk and protective factors (Coie et al., 1993; O'Connell, Boat, & Warner, 2009) for social, emotional, and behavioral health – enough scientific evidence to adequately address the complex tasks of social work practitioners (Reid, 2001). Ineffective or untested strategies based on intuition, however, are largely being used (Fraser et al., 2004; Gambrill, 2006; Rosen, 2003; Thyer & Myers, 2011). In order to empower communities and provide tools to use epidemiological data as well as local knowledge to implement tested and effective programs addressing community-specific issues, Hawkins and Catalano developed the Communities That Care Prevention System (CTC) (Hawkins, Catalano, & Associates, 1992). CTC is a universal prevention strategy that uses coalitions as a vehicle to adopt a science-based approach to reducing risk and enhancing protection to prevent problem behaviors and promote healthy youth development community-wide. The present study tests the sustained effect of CTC on youth protective factors and examines the extent to which CTC differentially affected sub-populations.

Why Protective Factors?

The social work profession emphasizes the importance of strength-based practice, policy, and research. Rather than simply diagnosing problems, social workers focus on the possibility and capability of individuals to overcome problems and change for the better. The fundamental premise of a strengths-perspective is that the individuals will indeed fare better if they “identify, recognize, and use the strengths and resources available in themselves and their environment” (Graybeal, 2001, p. 234). Prevention scientists who initially took a problem-focused approach (Farrington, 2000, 2003; Welsh & Farrington, 2007) to identify risk factors to prevent the development of health related problems became increasingly interested in protective factors -

“traits, conditions, situations, and episodes that appear to alter or even reverse predictors of negative outcomes and enable individuals to circumvent life stressors” (Benard, 1991, p.2) (O'Connell et al., 2009). By identifying the personal and environmental sources of social competence and wellness, Benard (1991) suggested that the field of prevention could better plan for and develop interventions that enhance key elements for healthy development. Over the years, many studies have identified protective factors in the individual, family, school, and community domains that can mitigate the effects of risk exposure and decrease the likelihood of problem behaviors (Bowers et al., 2011; Hartman et al., 2009; Hawkins, Catalano, & Miller, 1992; Losel & Farrington, 2012; O'Donnell et al., 1995). Also, more preventive interventions have developed that enhance protection as a mechanism to prevent health and behavior problems and promote positive youth outcomes (Arthur et al., 2002; Pollard, Hawkins, & Arthur, 1999).

Community members are concerned with building protection for young people in addition to reducing risk (Perkins, Borden, Vallaruel, 2001). Following the prevention principle that suggests reducing risk and enhancing protection as the initial step to affecting behavioral change (Coie et al., 1993), this study examines the sustained effect of CTC on protective factors. Prior analyses of data from the Community Youth Development Study (CYDS), a community-randomized trial of CTC, found that youth in a longitudinal panel from CTC communities reported significantly higher levels of protective factors than their control community counterparts, during the implementation of CTC when panel students were in eighth grade (Kim et al., 2014). Understanding the extent to which the effect on protective factors was sustained 6 years after initial implementation of CTC and 1 year after study support and technical assistance to CTC communities ended provides important information regarding the sustainability of CTC's effects on protective factors into the high school period of social development.

Why Subgroups?

CTC is a universal prevention strategy not intended to target specific populations. Although CTC is not expected to have a differential effect for certain groups of individuals, some universal prevention programs have shown effects for specific subgroups such as boys or girls (Kulis, Yabiku, Marsiglia, Nieri, & Crossman, 2007; Longshore, Ellickson, McCaffrey, & St. Clair, 2007; Mason et al., 2009; Yin & Ware, 2000) or individuals at high risk for behavioral problems (Allen & Philliber, 2001; Kellam et al., 2008). Testing the variation in the effects of CTC provides important information for contextual adaptation (DePanfilis, 2014; Fraser & Galinsky, 2010; Gardner et al., 2009; O'Connell et al., 2009) of CTC – for whom and in what conditions CTC works best. This is particularly important for social work practice, as many practitioners have argued that not all interventions are generalizable to everyone (Gibbs & Gambrill, 2002). Despite the increasing awareness of the importance of understanding differential effectiveness of interventions, very few intervention studies have done so. Subgroups can be defined in many ways, such as by socio-demographic characteristics or risk status (Fraser & Galinsky, 2010). In this study, we examine whether CTC had a differential effect by gender as well as risk status at baseline.

Gender

Gender identity development is especially pertinent during adolescence (Ruble et al., 2006). In addition to the physical and biological changes adolescents experience in their development, gender identity is intensified also through socialization: reinforcement for gender roles, behaviors, and attitudes (Hill & Lynch, 1983). Furthermore, Miller (1986) argues that because males and females are influenced by very different cultural and psychological forces, generalizing from one gender to the other (in earlier days, from males to females) inadequately

describes or explains the assigned roles and norms confined by gender. For example, females are generally assigned to the realm of building relationships. This assignment affects the way in which males and females interact with others and the larger social systems. Likewise, risk and protective factors are also social indicators influenced and redefined by individuals' social experience (Amaro, Blake, Schwartz, & Flinchbaugh, 2001; Blake, Amaro, Schwartz, & Flinchbaugh, 2001). Etiological studies of risk and protective factors also suggest that risk and protective factors differentially affect males and females (Amaro et al., 2001; Fagan, Van Horn, Hawkins, & Arthur, 2007). This has implications for developing programs that target gender-appropriate risk and protective factors as well as evaluating intervention programs by gender to ensure that the intended effect was made for both males and females. For example, in a review of substance use prevention program effects, Blake et al. (2001) found that interventions that focused more on building social skills and changing social influences and norms were more effective among girls than boys. Although there are theoretical and empirical basis for gender differences, few studies have examined the variation of intervention effects by gender (Blake et al., 2001; Kumpfer, Smith, & Summerhays, 2008; Longshore et al., 2007). Prior analyses from the CYDS panel suggested that CTC may have had a stronger effect among boys than girls in reducing alcohol and smokeless tobacco use in grade 8 (Oesterle, Hawkins, Fagan, Abbott, & Catalano, 2010). Similarly, in grade 10, CTC showed a marginally greater effect on reducing delinquency for boys than for girls (Oesterle, Hawkins, Fagan, Abbott, & Catalano, 2014).

The present study used subgroup analyses as well as interaction analyses to examine the extent to which the effect of CTC varied by gender in increasing protective factors. CTC is a universal prevention system that does not target specific subpopulations. However, given the differing gender socialization process that results in higher levels of protective factors among

females than males (Eccles et al., 1993; Ruble et al., 2006) and some evidence to suggest that CTC had greater effects on behavioral outcomes among males than females, we hypothesized that CTC may have increased the levels of protective factors more so among males than females in grade 10. We tested the differential effectiveness of CTC on protective factors by gender even when there was no significant CTC effect in the full sample. This strategy is important because it may unmask effects of the intervention that exist only for certain subgroups or effects that are in different directions across subgroups (Kumpfer et al., 2008).

Risk

Research evidence suggests that individuals with high risk tend to have low levels of protection whereas most individuals with low risk develop high levels of protection (Pollard et al., 1999). Change strategies that provide youth with positive opportunities to learn new skills or participate in constructive activities, then, could potentially have greater benefit for high risk individuals who have few positive opportunities. Findings on differential effects of preventive interventions, however, are largely mixed. Some studies have found significantly positive program effects for both low- and high-risk groups but found larger effects for the high-risk group (Allen & Philliber, 2001; Dawson-McClure, Sandler, Wolchik, & Millsap, 2004; Gardner et al., 2009; Stoolmiller, Eddy, & Reid, 2000; Tolan, Gorman-Smith, & Henry, 2004). Others have found stronger effects for the low-risk group (Eisen, Zellman, Massett, & Murray, 2002; Eisen, Zellman, & Murray, 2003; Perry et al., 2002). There are also other studies where program effects were found only among the high-risk group (Kellam et al., 2008; Khoo, 2001).

Beyond program-level effects, studies of comprehensive community-based prevention systems have also examined possible differential effects by baseline risk. For example, PROSPER, a community-based prevention strategy that uses a community-university partnership

model, had a stronger effect among higher-risk youth on substance use compared to lower-risk youth (Spath et al., 2007). Previous analyses of the CYDS panel, however, showed little evidence for significant variation in the effects of CTC on substance use and delinquency by baseline risk measures. In grade 8, results suggested that CTC may have had a greater effect in reducing the number of past year delinquency among those who had not initiated delinquent behaviors at baseline than those who had initiated but did not find differential effects by baseline levels of risk or substance use (Oesterle et al., 2010). In grade 10, the effect of CTC on reducing problem behaviors was stronger among baseline nonsmokers and nondelinquent and nonviolent youth (Oesterle et al., 2014).

Risk-related groups can be defined in many ways. One way is to aggregate across various risk factors – either across domains or domain-specific – to determine individuals’ risk-level at baseline (Dawson-McClure et al., 2004; Gardner et al., 2009; Pollard et al., 1999). Studies in which the intervention targets specific behaviors, such as delinquency or substance use, individuals who exhibit those behaviors at baseline are categorized as high-risk (Allen & Philliber, 2001; Eisen et al., 2002; Oesterle et al., 2010; Oesterle et al., 2014).

In this study, risk-related subgroups were defined as individuals who initiate substance use or delinquency early and those with high cumulative risks and examine the extent to which the effect of CTC varied by these risk measures in increasing protective factors using subgroup analyses as well as interaction analyses. Although these high-risk individuals may encounter fewer opportunities to participate in school or community programs, the CTC process is expected to reach out to all young people – both high and low risk – in the community. Thus, a differential effect of CTC by these risk measures is not expected.

Communities That Care (CTC)

CTC is a universal prevention system that mobilizes coalitions to use evidence-based programs with the goal of achieving a community-wide effect on healthy youth development. CTC's theory of change is shown in Figure 2.1. Providing training and technical assistance to a coalition or board of diverse community stakeholders to implement the 5 phases of Communities That Care is expected to create a well-functioning and focused coalition with strong linkages throughout the community. CTC coalitions assess levels of young peoples' exposure to risks and protective factors in the community and choose evidence-based programs to address risk factors that are most prevalent in their community. CTC coalitions target 2 to 5 elevated risk factors in the community to address with evidence-based policies and programs and may also prioritize protective factors to they want to strengthen. However, they are not required to target specific protective factors.

<Insert Figure 2.1>

The work of the coalition installing the CTC system is expected to change the community's prevention service system indicated by community wide adoption of a science-based approach to prevention, collaboration on prevention, community support for prevention, community norms for healthy behavior, and the use of the social development strategy (See Figure 2.1). The adoption of a science-based approach to plan and implement community prevention services is theorized to be the primary mechanism by which CTC can decrease health and behavior problems among young people community wide (Arthur, Glaser, & Hawkins, 2005). However, adoption and use of the social development strategy throughout the community is another mechanism by which CTC seeks to increase positive youth outcomes.

CTC is theoretically-driven by the Social Development Model (SDM) (Catalano & Hawkins, 1996; Hawkins & Weis, 1985). SDM explains the development of human behavior across the life course in two distinct pathways – antisocial and prosocial. By integrating elements of social learning, social control, and differential association theories, SDM states that opportunities, recognition, and skills for behavior can create bonding between the individual and the socializing unit providing these opportunities, recognition, and skills. If the bonding is strong, the individual will adopt the belief and standards of that socializing unit and behave according to this belief system. The prosocial pathway of SDM is called the social development strategy. The social development strategy is a facilitating force for both coalition members and community youth by promoting bonding to prosocial others and positive behaviors.

As part of the CTC process, prevention coalitions are trained in and encouraged to use the social development strategy in their daily interactions with all young people and to promote the use of this strategy throughout the community. For example, when a student is provided with the opportunity to participate in class, is given the skills to participate, and is recognized for participating, the student will be positively bonded to the teacher providing the reinforcement and will conform to the belief and ideals of the teacher. This student is more likely to complete assigned homework and engage in prosocial behaviors at school. In addition, all members of the community are encouraged to spread this strategy through the use of PowerPoint presentations in formal and informal meetings with schools, families, and community groups. As each of the SDM construct – opportunities, recognition, skills, bonding, and belief – represents a protective factor, the use of the social development strategy community wide is expected to strengthen protective factors. This change in protective factors is, in turn, expected to change youths' behaviors.

Methods

Description of CYDS

The CYDS is the first community-randomized trial of CTC to investigate whether CTC implementation decreased risk, increased protection, and reduced youth problem behaviors in communities. Communities in the CYDS were selected from 41 communities across the states of Colorado, Illinois, Kansas, Maine, Oregon, Utah, and Washington. These states previously had participated in a naturalistic study of the diffusion of science-based prevention strategies (Arthur, Glaser, & Hawkins, 2005). The state agencies responsible for drug abuse prevention in these states identified 20 communities that were trying to implement risk- and protection-focused prevention services. The 20 communities were matched within state on population size, racial and ethnic composition, economic indicators, and crime rates with comparison communities that were thought not to be using risk- and protection-focused prevention. During the 5 years of that study, 13 of the 20 community pairs did not advance in their use of science-based prevention to the point of implementing tested and effective preventive interventions to address community risks (Arthur et al., 2003) and were deemed eligible for inclusion in the CYDS. Recruitment of communities for the CYDS required securing letters from the superintendent of schools, the mayor or city manager, and the lead law enforcement officer of each community, agreeing for their community to be randomly assigned to receive CTC or serve as a control community, and agreeing to all data collection activities necessary for the project. From the 13 pairs of eligible matched communities, 12 pairs were recruited for the CYDS study. One community from each matched pair was randomly assigned to either the intervention (CTC) or control condition by a coin toss. CYDS communities are incorporated towns with their own governmental, educational, and law enforcement structures, ranging in population size from 1,500 to 41,000 residents (See

Table 2.1).

<Insert Table 2.1>

CTC Implementation

In the 12 intervention communities, CTC training and implementation began in the summer of 2003. All intervention communities received six trainings from CTC trainers over 9 to 12 months. Community leaders were introduced to the CTC system and identified an existing or created a new community coalition of diverse stakeholders to implement CTC. Coalition members were trained to use data collected using the CTC Youth Survey of 6th-, 8th-, 10th-, and 12th-grade students in 1998, 2000, and 2002 in the earlier study to (a) prioritize elevated risk factors to target with preventive actions, (b) choose tested and effective prevention policies and programs to address prioritized risk factors, (c) implement these policies and programs with fidelity, and (d) monitor implementation and outcomes of these newly installed policies and programs. Because the CYDS was initially funded for 5 years, CTC communities were asked to focus their prevention efforts on 10- to 14-year-old youths (Grades 5 through 9) and their families and schools so that possible effects on drug use and delinquency could be observed during the study period. During this time, CYDS implementation staff provided technical assistance through weekly phone calls and e-mails and yearly site visits to CTC communities. Control communities received data from the CTC Youth Surveys administered in their schools every 2 years, but no other training or technical assistance from the study.

Based on the community-specific profile of risk that emerged from the CTC Youth Survey data, CTC communities prioritized two to five risk factors to be targeted by prevention policies and programs. By June of 2004, intervention communities had selected interventions from a menu of tested and effective prevention policies and programs to address their prioritized

risk factors and had made plans to implement these programs with fidelity. The programs selected had been found effective in reducing problem behaviors (i.e., substance use and delinquency) in at least one well-controlled trial (Hawkins & Catalano, 2004). Community coalitions implemented one to five tested programs, with an average of three programs, in their communities each year. The programs were implemented by local providers and community volunteers. Programs included universal school-based programs (e.g., All-Stars, Life Skills Training, Lion's Quest Skills for Adolescence, Project Alert, Olweus Bullying Prevention Program, and Program Development Evaluation Training), selective programs for youth thought to be at elevated risk (e.g., Participate and Learn Skills, Big Brothers Big Sisters, Stay Smart, and academic tutoring), and universal family-focused programs (e.g., Strengthening Families 10-14, Guiding Good Choices, Parents Who Care-Staying Connected with Your Teen, and Family Matters) (Fagan, Hanson, Hawkins, & Arthur, 2008b; Quinby et al., 2008).

Previous analyses found that CTC communities successfully implemented the CTC system with fidelity (Fagan, Hanson, Hawkins, & Arthur, 2009; Quinby et al., 2008), implementing 90% of the core components of the CTC system; and reported higher levels of adoption of a science-based approach to prevention 1.5 years after CTC implementation compared to control communities (Brown, Hawkins, Arthur, Briney, & Abbott, 2007). CTC communities had also selected and implemented more tested and effective prevention programs than control communities with high rates of adherence to core program components, high-quality delivery, and required dosage (Fagan, Hanson, Hawkins, & Arthur, 2008a). Beyond the implementation phase of CTC when the research study funded training and technical assistance ended, CTC communities continued to report higher levels of adoption of a science-based approach to prevention than control communities (Rhew, Brown, Hawkins, & Briney, 2013).

CTC coalitions also maintained high levels of implementation fidelity (Gloppen, Arthur, Hawkins, & Shapiro, 2012) and continued to report increased use of tested and effective programs compared to their control counterparts (Fagan, Hanson, Briney, & Hawkins, 2012).

Sample

Data used in the analyses were obtained from annual surveys of a panel of public school students who were in the fifth grade during the 2003 - 2004 academic year in the 24 CYDS communities (Brown et al., 2009). Tested and effective prevention programs were implemented in the 12 CTC communities starting in the summer and fall of 2004. The first wave of data, when the panel was in Grade 5, was collected in the spring of 2004 and served as the pre-intervention baseline assessment. The second wave of data was collected in the spring of 2005 (Grade 6) and included additional students who were not surveyed in Grade 5. Parents of 4,420 students (76.4% of the eligible students) provided written informed consent for their child's participation in the study. The consent rate did not differ by intervention condition (76.7% for students in control communities and 76.2% for students in CTC communities). Thirteen students whose parents provided consent were absent or refused to complete the survey. The final longitudinal panel included 4,407 students (2,405 from CTC communities and 2,002 from control communities) who completed a Wave 1 or Wave 2 survey. Students who remained in the communities for at least one semester were followed and surveyed for each subsequent wave of data collection, even if they left the community. The sixth wave of surveys collected in the spring of 2009, when students in the panel were in the tenth grade, was completed by 93.8% of the sample students (93.2% of the sample from CTC communities and 94.6% of the sample from control communities) in the longitudinal panel (see Figure 2.2 for full CONSORT diagram). There was no systematic bias due to differential attrition by intervention condition. When students in the

panel were in the tenth grade, CTC intervention support had been ended for 1 year and prevention programs had been implemented for 4.67 years in CTC communities.

<Insert Figure 2.2>

Students completed the Youth Development Survey (YDS) (Social Development Research Group, 2005-2007), a self-administered paper survey, during a 50-minute class period in school. To ensure confidentiality, identification numbers were assigned but names and identifying information were not included on the surveys. Students read and signed assent forms indicating that they were fully informed of their rights and agreed to participate in the study. Students received small incentives worth \$5 to \$8 upon completion of the survey. The University of Washington Human Subjects Review Committee approved this procedure.

Measures

Protective factors. Fifteen protective factors specified in the social development strategy were assessed using scales consisting of two to six items each (See Table 2.2). These factors are divided into five domains – individual, peer, family, school, and community. Protective factors measured include opportunities and recognition for prosocial involvement in each domain, social skills, attachment to the family and the community, commitment to school, and healthy beliefs and clear standards for behavior (for a theoretical explanation of each construct, see Catalano & Hawkins, 1996; Hawkins & Weis, 1985). Scale items were standardized at each wave before averaging them to calculate the scale score. To allow comparison of protective factor scores across time, scale scores were standardized across all six waves of data from grade 5 through grade 10. Because good grades are included in the social development strategy as an indicator of reinforcement for prosocial behavior and commitment to school is included in the social development strategy as an indicator of prosocial bonding in the school domain, these constructs

were included in the present analyses as protective factors and were not included in calculating the risk factor score. Each protective factor scale has shown good reliability in prior studies (Arthur et al., 2002).

<Insert Table 2.2>

Community and student characteristics. Variables measuring student and community characteristics were included as covariates in analyses. This is to control for the possible effects of variables other than the CTC intervention that could influence youth behavioral outcomes. Community characteristics include the total student population in the community and the percentage of students eligible for free or reduced-price school lunch. Because communities rather than students were randomized, intervention condition (1 = CTC communities, 0 = control communities) as well as the community covariates are community-level variables. Student characteristics include student's age at sixth-grade survey, gender (1 = male, 0 = female); race (1 = White, 0 = other); whether the student was Hispanic (1 = yes, 0 = no); parental education level (ranging from 1 = grade school or less to 6 = graduate or professional degree); religious attendance in Grade 5 (0 = never to 4 = about once a week or more); and rebelliousness ($\alpha = 0.69$), which consisted of the mean of three items: I like to see how much I can get away with; I ignore rules that get in my way; and I do the opposite of what people tell me, just to get them mad (1 = very false to 4 = very true).

Gender (1 = male, 0 = female) was also used for dividing up the sample for subgroup analyses.

Baseline risk. Youth were identified as high risk if they had 1) initiated substance use early (by grade 5); 2) engaged in delinquent behavior in the past year by grade 5; or 3) reported high levels of risk factors at baseline. The baseline measure of lifetime substance use (1 = use and 0 = no

use) was created from the dichotomous measures of student-reported lifetime use of alcohol, cigarette, or marijuana at baseline (“Have you ever had more than just a sip or two of beer, wine, or hard liquor [for example, vodka, whiskey, or gin]?” “Have you ever smoked a cigarette, even just a puff?” and “Have you ever used marijuana?”). Delinquent behavior was based on student reports of four delinquent acts (stealing, property damage, shoplifting, and attacking someone) in the past year. If students reported engaging in any of the four behaviors in the past year, they were coded as 1 “delinquent” or 0 “not delinquent”. To measure overall risk at baseline, standardized risk factor scales (See Table 2.3) were averaged across all domains. The overall risk factor score at baseline was dichotomized into high risk (top 25% of score distribution, coded 1) and not high risk (coded 0) groups.

<Insert Table 2.3>

Missing Data¹

Among the 4,407 students in the longitudinal panel, 26.5% were part of the accretion sample in Grade 6 and did not complete the survey in the first wave. Overall, 93.5% of the panel students participated in at least five of the six waves of data collection (93.2 % in the experimental sample and 94.6% in the control sample). A small percentage of students did not meet the validity screen and were excluded from analyses (0.7% in Grade 5 and 1.6% in Grade 10) because they reported being honest only “some of the time” or less, having used a fictitious drug, or having used two of three drugs on 40 or more occasions in the past month. If students met one of these criteria in a given year, their data were considered invalid and set to missing for that year. Item nonresponse rate was very low ranging from 0.2% (for specific delinquency item in grade 5) to 1.3% (for lifetime alcohol use in grade 5). Missing data were imputed using multiple imputation methods

¹ Current analyses did not include risk factor variables in the imputation models but were separately added onto already imputed protective factor scales. I will be re-imputing all the variables in the same model before publishing this paper. The findings of this study are not expected to change.

to obtain unbiased estimates of model parameters and their standard errors, assuming that data are missing at random (Schafer & Graham, 2002). Using NORM version 2.03 (Schafer, 2000), 40 separate data sets including data from all six waves from grade 5 through grade 10 were imputed separately by intervention condition (Graham et al., 2006). To facilitate imputation, the number of variables in the imputation model was limited by imputing within domain (individual/peer, family, school, and community). Imputation models included student and community characteristics, protective factors within a domain across all 6 years, baseline risk measures (i.e., risk factors, problem behaviors), and community membership. Imputed data sets for each condition were combined and analyses will be averaged across the 40 imputed datasets using Rubin's rules (Rubin, 1987).

Analysis

Three-level hierarchical linear modeling (Raudenbush & Bryk, 2002) was used to examine the mean level of protective factors among youths in CTC communities and control communities in grade 10 controlling for baseline protective factors and individual and community characteristics (grand mean centered). We estimated random intercept models using HLM version 6.0 (Raudenbush, Bryk, Cheong, & Congdon, 2004) to account for variation within students, students within communities, and communities within matched pairs of communities. Using the results from the individual multilevel analyses of each protective factor, we calculated the Global Test Statistic (GTS) to examine the overall effect of CTC on protective factors and account for the multiple dependent variables as well as the correlated nature of the outcomes tested (Feng & Thompson, 2002).

To obtain the effect size (and confidence interval) of CTC in each subgroup, all outcomes were examined separately by gender and each baseline risk measure. To test whether

the CTC effect varied significantly by subgroup, the interaction between the student-level variable for baseline risk or gender with the community-level variable for intervention status (0 = control community, 1 = CTC community) was included in analyses of the full sample. I also tested whether the effect of CTC varied by baseline risk measures within gender subgroups. Since the 24 CYDS communities were matched in 12 pairs before randomization, the significance of the interaction effect was tested using a two-tailed critical t-value with $p-1=11$ degrees of freedom. Given the small power to detect interaction, alpha at 0.10 was used.

Results

Previous findings in Grade 8 reported significantly higher levels of overall protection among youth in CTC communities compared to those in control communities (Kim et al., in press). Although CTC increased overall levels of protective factors in the longitudinal panel in CTC communities in grade 8, this overall effect on protection was not sustained in grade 10. The global test statistic based on HLM analyses did not reveal overall significantly higher levels of protective factors in the panel from CTC communities than panel members in control communities in grade 10. While panel youths in CTC communities reported higher levels of protective factors in community, family, peer, and individual domains, these differences were not statistically significant. Panel youth from CTC communities reported lower levels of protection in the school domain than panel youths from control communities, but this difference was not statistically significant (See Table 2.4).

<Insert Table 2.4>

Moderation by Gender

In contrast, the Global Test Statistic across all protective factors showed that by the end of 10th grade males in CTC communities reported higher overall levels of protective factors than males in control communities across all domains (GTS $t=2.101$, $p=0.047$) as well as in the family (GTS $t=2.356$, $p=0.027$) domain (See Table 2.5). Within specific domains, males in CTC communities reported significantly higher levels of community opportunities ($b=0.113$, $p<0.05$), family attachment ($b=0.121$, $p=0.050$), and social/refusal skills ($b=0.100$, $p<0.05$) compared to the males in control communities. However, no significant differences in levels of protection by intervention condition were found for females. The gender interaction effect was statistically

significant for social/refusal skills ($p < 0.05$) and marginally significant for community opportunities ($p = 0.07$) and family attachment ($p = 0.08$) (See Table 2.6).

<Insert Table 2.5>

<Insert Table 2.6>

Among males, those who were categorized into the “not high risk” group (bottom 75% of baseline risk factor score) reported significantly higher levels of protective factors across all domains (GTS $t = 3.053$, $p < 0.01$) as well as community (GTS $t = 2.132$, $p < 0.05$), family (GTS $t = 2.845$, $p < 0.01$), and individual (GTS $t = 3.554$, $p < 0.01$) domains compared to “not high risk” males in control communities in grade 10 (See Table 2.5). Within specific domains, community opportunities ($p < 0.05$) and social/refusal skills ($p < 0.01$) were significantly higher among not-high risk group males in CTC communities compared to their control counterpart. However, no significant differences by intervention condition were reported among high risk males. The risk interaction within the male subgroup was marginally significant for community opportunities ($p < 0.08$) (See Table 2.7). There was no evidence to suggest, however, that CTC differentially affected males by baseline substance or delinquency. Among females, no differential effect was found by baseline risk scores, substance use, or delinquency (Results not tabled).

<Insert Table 2.7>

Moderation by Baseline Risk Score, Substance Use, and Delinquency

Among youth in the “not-high risk” group, those in CTC communities reported significantly higher levels of protective factors in the family domain at the end of grade 10 (GTS $t = 2.395$, $p < 0.05$) (See Table 2.5). Within specific domains, CTC panel youth in the “not-high risk” group reported significantly higher levels of community opportunities in grade 10 than those in control communities ($b = 0.08$, $p = 0.050$). Among youth in the high risk group, those in CTC communities

reported significantly lower levels of academic success in grade 10 compared to those in control communities ($b=-0.157$, $p=0.04$). Interaction effects were significant for academic success ($p=0.007$). The results of the current analyses found that intervention effects on protective factors in Grade 10 did not vary significantly by baseline status of substance use or delinquency (Results not tabled).

Discussion

The goal of this paper was to examine the variation in the effect of CTC on youth protective factors 1 year after research-supported funds and technical assistance ended. CTC had a statistically significant effect on increasing overall protection in grade 8 (Kim et al., in press), during the CTC implementation phase. Although this effect was not sustained among the overall sample in grade 10, the findings of this study suggested some evidence of variation in the effect of CTC on youth protective factors by gender and baseline risk measure.

Gender analyses suggested that CTC may have had a more positive effect among males than females. Males in CTC communities reported higher levels of overall protection by grade 10 compared to males in control communities while no differences by intervention condition were found among females. Given the higher levels of protective factors among females than males, we suspect that boys may have had more room for improvement and thus experienced greater benefits of CTC.

Baseline risk analyses suggested that the effect of CTC varied by baseline risk level when baseline risk was measured using the average levels of risk factor scales in grade 5 but not when baseline risk was measured by baseline status of substance use or delinquency. Findings suggested that CTC may have had a more positive effect among the not-high risk group compared to the high risk group. Youth in the not-high risk group in CTC communities reported significantly higher levels of family protection compared to youth in the not-high risk group in control communities. Males in the not-high risk group in CTC communities reported significantly higher levels of protective factors across all domains as well as community, family, and individual domains than did males in the not-high risk group in control communities at the end of grade 10. Despite implementing selective prevention programs (e.g., Big Brother and Big

Sisters) to target high-risk youth in CTC communities, CTC did not appear to have a positive effect on increasing protective factors among high risk males at the end of grade 10. Training community leaders to select and implement more selective programs while implementing universal programs may be important to reach males at high-risk. Also, it is unclear why high risk youth in CTC communities reported significantly lower levels of academic success than those in control communities at the end of grade 10.

This study has limitations. Data are reports of youth from small incorporated towns and thus findings of this study may not be generalizable to larger cities. CTC has been implemented in larger cities where neighborhood size is comparable to the neighborhood implementing CTC. However, CTC has not been experimentally tested in urban settings. The subgroups identified are just a few of many other subgroups of interest in social work. There is value in understanding the differences by baseline risk, as studies have found that youth with higher levels of risk fail to develop high levels of protective factors (Pollard et al., 1999).

With a training manual publicly available, CTC has great potential for widespread dissemination as a sustainable community prevention strategy. Thus, it is important to understand the degree to which the effects of CTC on youth outcomes were sustained beyond the end of study-provided resources that supported the installation of CTC. Furthermore, it is important to examine whether CTC had a differential effect on boys and girls and on subgroups of low-risk versus high-risk individuals, to understand the degree to which the effect of universal interventions vary by individual characteristics. This has direct implications for social work practice as it may reveal information on how to improve CTC process for certain subgroups (Fraser & Galinsky, 2010; Gardner et al., 2009).

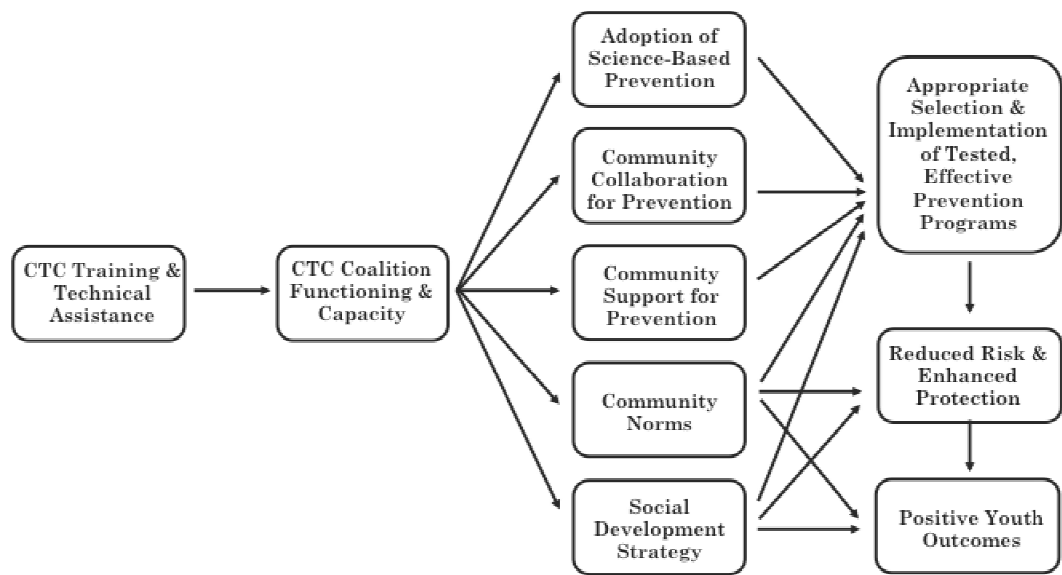


Figure 2.1. Communities That Care logic model

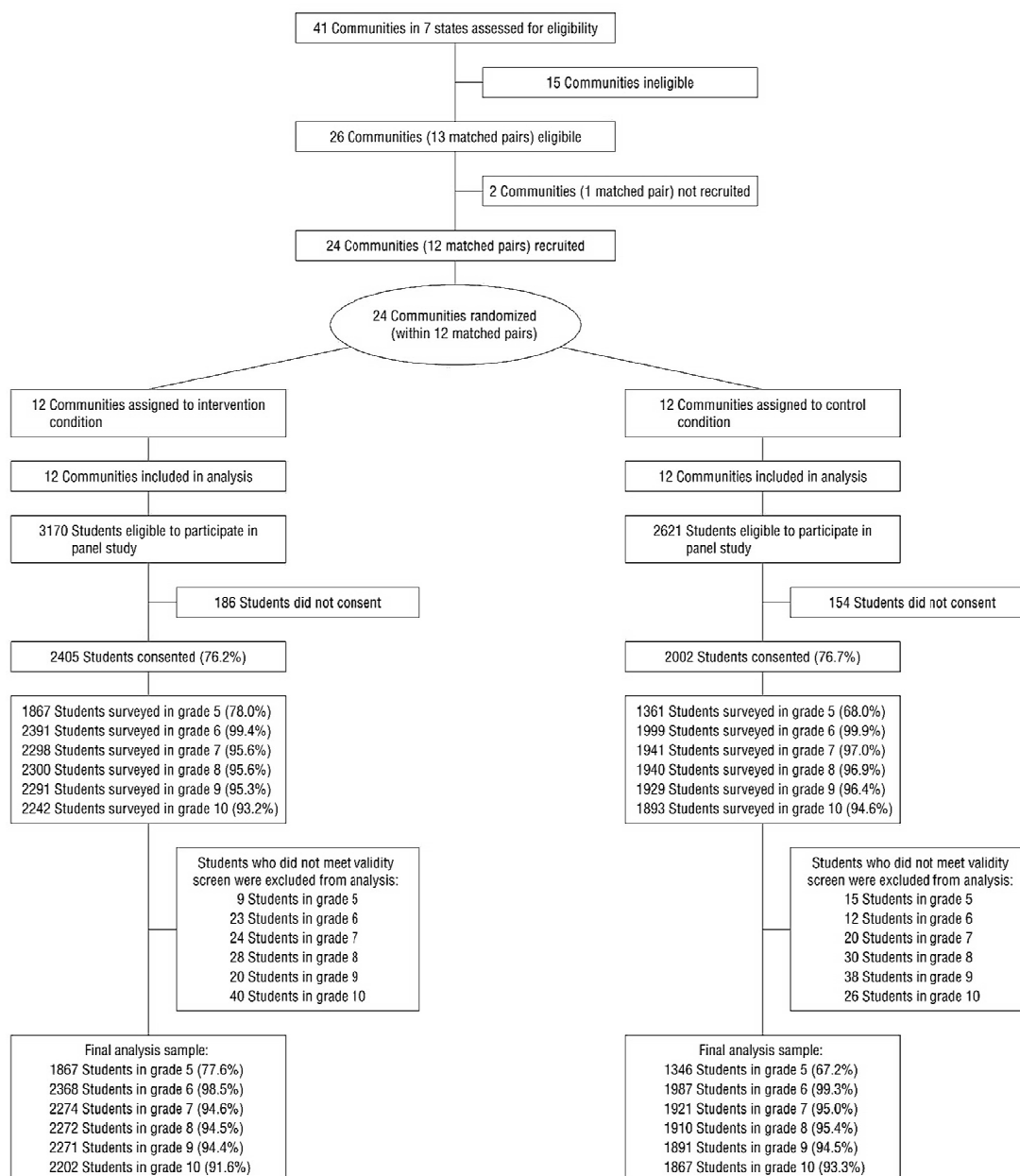


Figure 2.2. Flow of communities and participants in the randomized trial

Table 2.1. Youth^a Demographic Characteristics of 24 CYDS Communities

	Control Communities			CTC Communities		
	Mean	Minimum	Maximum	Mean	Minimum	Maximum
Total Population ^b	3,960	559	11,001	4,014	458	9,455
Race/Ethnicity, % ^b						
European American	85.1	63.7	97.1	85.4	57.6	96.1
Hispanic Origin	13.1	0.9	54.7	13.1	1.0	76.4
African American	2.5	0.0	20.3	2.6	0.0	21.1
Eligible for Free/Reduced-Price Lunch, % ^c	38.2	20.6	63	34.9	20.7	65.9

^a Youth under the age of 18

^b (U.S. Census Bureau, 2000)

^c (National Center for Education Statistics, 2002-2003)

Table 2.2. Protective Factors assessed in Youth Development Survey

Scales	# of items (α)	Sample item
COMMUNITY		
Opportunities for prosocial involvement	2 (0.80)	There are lots of adults in my neighborhood I can talk to about something important
Recognition for prosocial involvement	3 (0.91)	My neighbors notice when I'm doing a good job and let me know about it
High neighborhood attachment	3 (0.81)	I like my neighborhood
FAMILY		
Opportunities for prosocial involvement	3 (0.82)	My parents ask me what I think before most family decisions affecting me are made
Recognition for prosocial involvement	4 (0.76)	My parents notice when I'm doing a good job and let me know about it
Attachment	4 (0.77)	Do you feel very close to your mother?
SCHOOL		
Opportunities for prosocial involvement	5 (0.70)	There are lots of chances to be part of class discussions or activities
Recognition for prosocial involvement	4 (0.75)	My teachers notice when I'm doing a good job and let me know about it
High commitment to school	6 (0.77)	Now thinking back over the past year in school, how often did you try to do your best work in school?
Academic success	2 (0.76)	Putting them all together, what were your grades like last year?
PEER		
Interaction with prosocial peers	5 (0.74)	In the past year (12 months), how many of your best friends have participated in clubs, organizations or activities at school?
Recognition for prosocial involvement	4 (0.84)	What are the chances you would be seen as cool if you worked hard at school?
INDIVIDUAL		
Prosocial involvement	3 (0.70)	How many times in the past year (12 months) have you participated in clubs, organizations, or activities at school?
Social skills	4 (0.64)	You're at a store with friend. Your friend steals a magazine...What would you do now?
Healthy beliefs and clear standards	4 (0.69)	It is important to be honest with your parents, even if they become upset or you get punished

Table 2.3. List of Risk Factors from Grades 5 & 6

Description	Alpha ¹
Community Domain	
Neighborhood disorganization	0.758
Low neighborhood attachment	0.826
Perceived availability of drugs	0.754
Laws and norms favorable to drug use	0.762
Family Domain	
Parental favorable attitudes towards drug use	0.905
Parental favorable attitudes towards antisocial behavior	0.85
Family history of antisocial behavior	0.693
Poor family management	0.673
Family conflict	0.737
Peer/Individual Domain	
Perceived risk of drug use	0.962
Favorable attitudes towards drug use	0.79
Favorable attitudes towards antisocial behavior	0.75
Rewards for antisocial involvement	0.887
Friends' use of drugs	0.785
Interaction with antisocial peers	0.662
Intentions to use drugs	0.651

¹ For the purpose of accounting for missing data in grade 5, standardized risk factor scales were averaged across grades 5 and 6. Risk factor scales only available in grade 6 data were used as is.

Table 2.4. Protective Factors by Grade 10 in CTC and Control Communities

Protective Factors by Domain	CTC v. Control	t	d.f.	p	Global Test Statistic	
Community						
Opportunities	0.0608	1.55	9	0.1556	t=1.169 p=0.254	t=1.220 p=0.235
Recognition	0.0568	1.058	9	0.3176		
Attachment	0.0010	0.048	9	0.9628		
Family						
Opportunities	0.0522	1.071	9	0.3120	t=1.158 p=0.143	
Recognition	0.0591	1.227	9	0.2510		
Attachment	0.0555	1.347	9	0.2109		
School						
Opportunities	-0.0021	-0.041	9	0.9682	t=-0.332 p=0.743	
Recognition	-0.0141	-0.255	9	0.8045		
Academic Success	-0.0316	-0.503	9	0.6270		
Commitment	-0.0079	-0.133	9	0.8971		
Peer						
Interaction w/ prosocial peers	0.0861	1.652	9	0.1329	t=1.484 p=0.151	
Recognition	0.0498	0.901	9	0.3911		
Individual						
Prosocial involvement	0.0135	0.315	9	0.7599	t=1.144 p=0.277	
Social skills	0.0328	1.059	9	0.3172		
Healthy belief	0.0570	1.481	9	0.1727		

Table 2.5. Global Test Statistics for each subgroup

	Baseline Risk Score				Gender				Boys			
	High Risk Group		Not-High Risk Group		Girls		Boys		High Risk Group		Not-High Risk Group	
	By Domain	All Domains	By Domain	All Domains	By Domain	All Domains	By Domain	All Domains	By Domain	All Domains	By Domain	All Domains
Protective Factors												
Community												
Opportunities Recognition Attachment	t=0.141 p=0.889		t=0.673 p=0.508		t=0.079 p=0.937		t=1.835 p=0.08		t=1.169 p=0.254		t=2.132 p=0.044	
Family												
Opportunities Recognition Attachment	t=-0.202 p=0.841		t=2.395 p=0.025		t=0.425 p=0.675		t=2.356 p=0.027		t=1.158 p=0.143		t=2.845 p=0.009	
School												
Opportunities Recognition Academic Success Commitment	t=-1.984 p=0.059	t=-0.577 p=0.569	t=-0.396 p=0.696	t=1.869 p=0.074	t=-0.531 p=0.601	t=0.225 p=0.824	t=-0.034 p=0.973	t=2.104 p=0.047	t=-0.332 p=0.743	t=1.220 p=0.235	t=-0.899 p=0.189	t=3.053 p=0.006
Peer												
Interaction w/ prosocial peers Recognition	t=1.048 p=0.306		t=1.627 p=0.117		t=1.975 p=0.06		t=0.635 p=0.532		t=1.484 p=0.151		t=1.621 p=0.059	
Individual												
Prosocial involvement Social skills Healthy belief	t=-0.375 p=0.711		t=1.869 p=0.074		t=-0.333 p=0.742		t=1.849 p=0.077		t=1.144 p=0.277		t=3.554 p=0.002	

Table 2.6 Protective Factors by Grade 10 among boys and girls in CTC and Control Communities

	Girls			Boys			Gender Interaction	
	CTC vs. Control	t-value	p-value	CTC vs. Control	t-value	p-value	t-value	p-value
Community								
Opportunities	0.028	0.493	0.634	0.113	2.425	0.038	1.983	0.073
Recognition	0.004	0.066	0.949	0.080	1.274	0.235	0.854	0.411
Attachment	-0.011	-0.381	0.712	0.011	0.499	0.630	0.658	0.524
Family								
Opportunities	0.005	0.080	0.938	0.100	1.718	0.120	1.379	0.195
Recognition	0.055	1.154	0.278	0.077	1.275	0.234	0.291	0.776
Attachment	-0.010	-0.214	0.835	0.121	2.266	0.050	1.906	0.083
School								
Opportunities	0.011	0.225	0.827	-0.003	-0.055	0.957	-0.469	0.648
Recognition	-0.051	-0.901	0.391	0.015	0.207	0.841	1.286	0.225
Academic Success	-0.038	-0.544	0.600	-0.009	-0.130	0.899	1.184	0.261
Commitment	-0.013	-0.218	0.832	-0.009	-0.116	0.910	0.210	0.838
Peer								
Interaction w/ prosocial peers	0.097	1.794	0.106	0.079	1.191	0.264	0.079	0.938
Recognition	0.073	1.129	0.288	0.035	0.590	0.570	-0.827	0.426
Individual								
Prosocial involvement	-0.002	-0.036	0.972	0.039	0.846	0.419	0.526	0.609
Social skills	-0.039	-0.949	0.367	0.100	2.554	0.031	3.052	0.011
Healthy belief	0.009	0.204	0.843	0.105	2.136	0.061	1.298	0.221

Table 2.7. Protective Factors by Grade 10 among high risk and not high-risk boys in CTC and Control Communities

	High Risk			Not high risk			Risk Interaction	
	CTC vs. Control	t-value	p-value	CTC vs. Control	t-value	p-value	t-value	p-value
Community								
Opportunities	0.003	0.048	0.963	0.146	2.962	0.016	-1.927	0.080
Recognition	0.000	-0.002	0.998	0.106	1.679	0.127	-1.557	0.148
Attachment	0.014	0.341	0.741	0.006	0.238	0.817	0.256	0.803
Family								
Opportunities	0.047	0.503	0.627	0.109	1.896	0.090	-0.701	0.498
Recognition	-0.013	-0.182	0.860	0.110	1.907	0.089	-1.550	0.149
Attachment	0.054	0.699	0.502	0.131	2.549	0.031	-0.844	0.417
School								
Opportunities	-0.111	-1.621	0.139	0.040	0.855	0.415	-2.115	0.058
Recognition	-0.128	-1.368	0.204	0.063	0.933	0.375	-2.667	0.022
Academic Success	-0.130	-1.552	0.155	0.022	0.325	0.753	-1.976	0.074
Commitment	-0.092	-0.728	0.485	0.022	0.338	0.743	-1.000	0.339
Peer								
Interaction w/ prosocial peers	-0.002	-0.036	0.972	0.113	1.663	0.131	-1.613	0.135
Recognition	0.016	0.217	0.833	0.066	1.089	0.304	-0.795	0.443
Individual								
Prosocial involvement	-0.061	-0.702	0.500	0.074	1.491	0.170	-1.546	0.150
Social skills	-0.006	-0.086	0.933	0.136	3.332	0.009	-1.772	0.104
Healthy belief	0.024	0.361	0.726	0.137	2.947	0.016	-1.618	0.134

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PAPER 3

PROTECTIVE FACTORS MEDIATE THE EFFECT OF COMMUNITIES THAT CARE ON YOUTH DELINQUENCY AND SMOKING

Introduction

The prevention of smoking and delinquency among adolescents are important public health issues in the United States. Studies have shown that early development of these behaviors puts young people at greater risk for future chronic smoking and crime as well as other mental, physical, and behavioral health problems (Sampson & Laub, 2003; Buchmann, Blomeyer, Jennen-Steinmetz, Schmidt et al., 2013; Kendler, Meyers, Damaj, & Chen, 2013; Delisi, Nepple, Lohman, Vaughn, & Shook, 2013; Sawyer, Affifi, Blakemore, 2012; Catalano, Fagan, Gavin et al., 2012). According to the U.S. National Youth Risk Behavior Survey, in 2011, 23.3% of youth between 9th and 12th grades had used at least one variation of tobacco products in the past month, 32.8% had engaged in a physical fight, and 16.6% had carried a weapon in the past year (Center for Disease Control, 2013). Although many adolescents only experiment with risk-taking behaviors (Steinberg & Morris, 2001), some persist and come in contact with the juvenile justice system, which costs states millions of dollars each year (Petteniti, Walsh, Velazquez, 2009). Thus, preventing problem behaviors before they become less amenable to change may be an effective strategy to reduce the short- and long-term negative consequences of problem behaviors among young people (Coie et al., 1993; Catalano, Fagan, Gavin et al., 2012; Catalano, 2007).

In the last three decades, many prevention programs that target empirically verifiable risk and protective factors for problem behaviors have been developed and found to be effective in reducing substance use, delinquency, and violence among young people (O'Connell, Boat, &

Warner 2009; Catalano & Hawkins, 2002; Fagan & Catalano, 2012; Aos, Lee, Drake et al., 2011). Most evaluations, however, have focused primarily on “whether” the programs are effective but not much on “how” the program works to achieve effectiveness (Greca, Silverman, & Lochman, 2009; Kazdin & Nock, 2003). Despite the emphasis on targeting risk and protective factors as one of the main prevention principles to reduce problem behaviors and promote positive behaviors (Coie et al., 1993), few researchers have examined the theorized mediating mechanism (Vitaro, Brendgen, & Tremblay, 2001). Mediators can explain the processes by which prevention programs affect behaviors as well as the mechanisms by which behaviors change (Orlando Ellickson, McCaffrey, & Longshore, 2005). By directly testing the theory of change, mediation analysis provides practical information for program improvement, such as identifying which program component or behavior targets produce the best results (MacKinnon, Taborga, & Morgan-Lopez, 2002).

Despite the increased interest in protective factors, much less is known about the role of protective factors in the development of problem behaviors (Office of Surgeon General, 2001) especially because problem behaviors are more strongly related to risk factors (Cleveland, Feinberg, Bontempo, & Greenberg, 2008). Jessor and colleagues suggested that protective factors are strongly related to engaging in prosocial behaviors (2006), and thus increasing protective factors could potentially help young people avoid problem behaviors. This is consistent with social work’s strengths-perspective that encourages all social work professionals to focus on strengths rather than deficits (Saleebey, 1996). However, empirical evidence of increasing protective factors as a mechanism to prevent problem behaviors among young people has primarily focused on building resilience in the context of extreme adversity (Cicchetti, 2010; Masten, 2011). Although this is important, all adolescents need the tools to overcome and cope

with the everyday stress and temptations during development (DiCorcia & Tronick, 2011). Thus, understanding the role of protective factors in the development of young people with varying degrees of risk is important.

This paper tested whether the effect of Communities That Care (CTC) on youth problem behaviors was mediated by youth protective factors (See Figure 3.1). Previous analyses found that CTC significantly increased levels of overall protection community-wide by the end of grade 8 (Kim et al., in press) in a panel of students followed from grade 5. CTC also significantly reduced the incidence of cigarette, smokeless tobacco, and alcohol use, and delinquent behaviors of panel students by the end of grade 10 (Hawkins et al., 2012). This paper explores the extent to which protective factors in 8th grade are one of the possible mechanisms by which CTC affected youth problem behaviors in 10th grade.

<Insert Figure 3.1>

Communities That Care (CTC)

CTC is a universal prevention system that engages coalitions to use evidence-based programs with the goal of promoting healthy youth development. By training community leaders to adopt a science-based approach to prevention, such as using epidemiological data and scientific evidence for prevention planning, the CTC system seeks to improve the delivery of community prevention services. These changes in the prevention service system are expected to reduce the risks and strengthen the protective factors to which a community's youths are exposed. The change in risk and protective factors is, in turn, expected to change youths' behaviors.

CTC is theoretically-driven by the Social Development Model (SDM) (Hawkins & Weis, 1985; Catalano & Hawkins, 1996). SDM explains the development of human behavior across the

life course in two distinct pathways – antisocial and prosocial. By integrating elements of social learning, social control, and differential association theories, SDM states that opportunities, recognition, and skills for behavior can create bonding between the individual and the socializing unit providing these opportunities, recognition, and skills. If the bonding is strong, the individual will adopt the belief and standards of that socializing unit and behave according to this belief system. For example, when an adult in the community asks a youth to help mow the lawn (opportunity) while teaching the youth how to use the lawnmower (skills), and recognizes or rewards the youth's help after a job well-done, the youth will be positively bonded to this particular adult and will conform to the belief and ideals of the adult. If the adult communicates prosocial values to the youth, the youth will more likely to engage in prosocial behaviors. As part of the CTC process, prevention coalitions are trained in and encouraged to use the social development strategy – the prosocial pathway of SDM – in their daily interactions with all young people and to promote the use of this strategy throughout the community. With the use of the social development strategy to strengthen protection community-wide, we hypothesized that increased levels of protective factors might explain the lower prevalence of smoking and delinquent behaviors.

Methods

Description of CYDS

The CYDS is the first community-randomized trial of CTC to investigate whether CTC implementation decreased risk, increased protection, and reduced youth problem behaviors in communities. Communities in the CYDS were selected from 41 communities across the states of Colorado, Illinois, Kansas, Maine, Oregon, Utah, and Washington. These states previously had participated in a naturalistic study of the diffusion of science-based prevention strategies (Arthur et al., 2005). The state agencies responsible for drug abuse prevention in these states identified 20 communities that were trying to implement risk- and protection-focused prevention services. The 20 communities were matched within state on population size, economic indicators, and crime rates with comparison communities that were thought not to be using risk- and protection-focused prevention. Recruitment of communities for the CYDS required securing letters from the superintendent of schools, the mayor or city manager, and the lead law enforcement officer of each community, agreeing for their community to be randomly assigned to receive CTC or serve as a control community, and agreeing to all data collection activities necessary for the project. During the 5 years of the study period, 13 of the 20 community pairs had not advanced in their use of tested and effective preventive interventions to address community risks (Arthur et al., 2003) and were deemed eligible for inclusion in the CYDS. From the 13 pairs of eligible matched communities, 12 pairs were recruited for the CYDS study. One community from each matched pair was randomly assigned to either the intervention (CTC) or control condition by a coin toss. CYDS communities are incorporated towns with their own governmental, educational, and law enforcement structures, ranging in population size from 1,500 to 41,000 residents.

CTC Implementation

In the 12 intervention communities, CTC training and implementation began in the summer of 2003. All intervention communities received six trainings from CTC trainers over 9 to 12 months. Community leaders were introduced to the CTC system and identified either new or existing community coalition of diverse stakeholders to implement CTC. Coalition members were trained to use data collected using the CTC Youth Survey of 6th-, 8th-, 10th-, and 12th-grade students in 1998, 2000, and 2002 in the earlier study to (a) prioritize elevated risk factors to target with preventive actions, (b) choose tested and effective prevention policies and programs to address prioritized risk factors, (c) implement these policies and programs with fidelity, and (d) monitor implementation and outcomes of these newly installed policies and programs. Because the CYDS was initially funded for 5 years, CTC communities were asked to focus their prevention efforts on 10- to 14-year-old youths (Grades 5 through 9) and their families and schools so that possible effects on drug use and delinquency could be observed during the study period. During this time, CYDS implementation staff provided technical assistance through weekly phone calls and e-mails and yearly site visits to CTC communities. Control communities received data from the CTC Youth Surveys administered in their schools every 2 years, but no other training or technical assistance from the study.

Based on the community-specific profile of risk that emerged from the CTC Youth Survey data, CTC communities prioritized two to five risk factors to be targeted by prevention policies and programs. By June of 2004, intervention communities had selected interventions from a menu of tested and effective prevention policies and programs to address their prioritized risk factors and had made plans to implement these programs with fidelity. The programs selected had been found effective in reducing problem behaviors (i.e., substance use and

delinquency) in at least one well-controlled trial (Hawkins & Catalano, 2004). Community coalitions implemented one to five tested programs, with an average of three programs, in their communities each year. The programs were implemented by local providers and community volunteers. Programs included universal school-based programs (e.g., All-Stars, Life Skills Training, Lion's Quest Skills for Adolescence, Project Alert, Olweus Bullying Prevention Program, and Program Development Evaluation Training), selective programs for youth thought to be at elevated risk (e.g., Participate and Learn Skills, Big Brothers Big Sisters, Stay Smart, and academic tutoring), and universal family-focused programs (e.g., Strengthening Families 10-14, Guiding Good Choices, Parents Who Care-Staying Connected with Your Teen, and Family Matters) (Fagan et al., 2008b; Quinby et al., 2008).

Previous analyses found that CTC communities successfully implemented the CTC system with fidelity (Fagan et al., 2009; Quinby et al., 2008) and reported higher levels of adoption of a science-based approach to prevention 1.5 years after CTC implementation compared to control communities (Brown et al., 2007). CTC communities had also selected and implemented more tested and effective prevention programs than control communities (Fagan et al., 2008a). Beyond the implementation phase of CTC when the research study funded training and technical assistance ended, CTC communities continued to report higher levels of adoption of a science-based approach to prevention than control communities (Rhew, Brown, Hawkins, & Briney, 2013). CTC coalitions also maintained high levels of implementation fidelity (Gloppen, Arthur, Hawkins, & Shapiro, 2012) and continued to report increased use of tested and effective programs compared to their control counterparts (Fagan, Hanson, Briney, & Hawkins, 2012).

Sample

Data used in the analyses were obtained from annual surveys of a panel of public school students who were in the fifth grade during the 2003 - 2004 academic year in the 24 CYDS communities (Brown et al., 2009). Tested and effective prevention programs were implemented in the 12 CTC communities starting in the summer and fall of 2004. The first wave of data, when the panel was in Grade 5, was collected in the spring of 2004 and served as the pre-intervention baseline assessment. The second wave of data was collected in the spring of 2005 (Grade 6) and included additional students who were not surveyed in Grade 5 (because their parents had not yet consented or because they had just recently moved to the community). Parents of 4,420 students (76.4% of the eligible students) provided written informed consent for their child's participation in the study. The consent rate did not differ by intervention condition (76.7% for students in control communities and 76.2% for students in CTC communities). Thirteen students whose parents provided consent were absent or refused to complete the survey. The final longitudinal panel included 4,407 students (2,405 from CTC communities and 2,002 from control communities) who completed a Wave 1 or Wave 2 survey. Students who remained in the communities for at least one semester were followed and surveyed for each subsequent wave of data collection, even if they left the community. The sixth wave of surveys collected in the spring of 2009, when students in the panel were in the tenth grade, was completed by 93.8% of the sample students (93.2% of the sample from CTC communities and 94.6% of the sample from control communities) in the longitudinal panel. There was no systematic bias due to differential attrition by intervention condition. When students in the panel were in the tenth grade, CTC intervention support from the study had been ended for 1 year and prevention programs had been implemented for 4.67 years in CTC communities.

Students completed the Youth Development Survey (YDS) (Social Development Research Group, 2005-2009), a self-administered paper survey, during a 50-minute class period in school. To ensure confidentiality, identification numbers were assigned but names and identifying information were not included on the surveys. Students read and signed assent forms indicating that they were fully informed of their rights and agreed to participate in the study. Students received small incentives worth \$5 to \$8 upon completion of the survey. The University of Washington Human Subjects Review Committee approved this procedure.

Measures

Protective Factors

A composite of four protective factors found to be significantly higher among panel youth in CTC communities than among control youth in the longitudinal panel in grade 8 (See Kim et al., in press for details) was created. These protective factors include community opportunity for prosocial involvement, school recognition for prosocial involvement, refusal skills, and interaction with prosocial peers. Scale items of each protective factor were standardized at each wave before averaging them to calculate the total scale score. Each protective factor scale has shown good reliability in prior studies (Arthur et al., 2002). To control for baseline levels of protective factors in the mediation analyses, a parallel composite variable was created using the same 4 protective factor scales from grade 5.

Smoking and Delinquent Behavior

Smoking behavior was measured by the prevalence of past month cigarette use (1 = some, 0 = none) in grades 5 and 10. Delinquent behavior in grade 5 was measured as any incidence of 4 delinquent acts (stealing, property damage, shoplifting, or attacking someone with intent to harm) in grade 5. Overtime, developmentally appropriate questions about more serious

delinquent behavior (carrying a gun to school, beating someone up, stealing a vehicle, selling drugs, or being arrested) were added to the survey. Delinquent behavior in grade 10 was measured as self-reported participation in any of these 9 delinquent acts in the past year. There were no statistically significant differences in the prevalence of smoking behavior or delinquency by intervention status at baseline (Brown et al., 2009; Hawkins et al., 2008).

Community and student characteristics

Variables measuring community and student characteristics were included as covariates in analyses. Because communities rather than students were randomized, intervention condition is a community-level variable (1 = CTC communities, 0 = control communities). Including community-level covariates improves the precision of estimating intervention effects and also adjusts for possible changes in matched communities across waves (Brown, Graham, & Hawkins, 2009; Murray, 1998). Community characteristics include the total student population in the community and the percentage of students eligible for free or reduced-price school lunch. Community randomization, however, does not guarantee equivalence at the individual level (Murray, 1998; Schafer & Kang, 2008). To further increase precision, student characteristics were included as individual-level covariates. Student characteristics include student's age at sixth-grade survey, gender (1 = male, 0 = female); race (1 = White, 0 = other); whether the student self-identified as Hispanic (1 = yes, 0 = no); parental education (ranging from 1 = grade school or less to 6 = graduate or professional degree); religious attendance in Grade 5 (0 = never to 4 = about once a week or more); and rebelliousness, which consisted of the mean of three items ($\alpha=0.69$): I like to see how much I can get away with; I ignore rules that get in my way; and I do the opposite of what people tell me, just to get them mad (1 = very false to 4 = very true). Finally, these covariates control for the possible confounding effects of variables

other than the CTC intervention that could influence youth behavioral outcomes. All covariates were grand-mean centered.

Missing Data²

Among the 4,407 students in the longitudinal panel, 26.5% were part of the accretion sample in Grade 6 and did not complete the survey in the first wave. Overall, 93.5% of the panel students participated in at least five of the six waves of data collection (93.2 % in the experimental sample and 94.6% in the control sample). A small percentage of students did not meet the validity screen and were excluded from analyses (0.7% in Grade 5 and 1.6% in Grade 10) because they reported being honest only “some of the time” or less, having used a fictitious drug, or having used two of three drugs on 40 or more occasions in the past month. If students met one of these criteria in a given year, their data were considered invalid and set to missing for that year. Item nonresponse was very low (<1%). Missing data were imputed to obtain unbiased estimates of model parameters and their standard errors, assuming that data are missing at random (Schafer & Graham, 2002). Using NORM version 2.03 (Schafer, 2000), 40 separate data sets including data from all six waves from grade 5 through grade 10 were imputed separately by intervention condition (Graham et al., 2006). To facilitate imputation, the number of variables in the imputation model was limited by imputing within protective factor domain (individual/peer, family, school, and community). Imputation models included student and community characteristics, protective factors within a domain across all 6 years, measures of smoking and delinquency items across all years, and community membership. Data from all waves provide more information for estimating the missing values (Graham, 2012). Imputed data

² Current analyses combined datasets from two separate imputation models. Protective factors and problem behaviors were imputed separately then added for analyses. I will be re-imputing all the variables in the same model before publishing this paper. The findings of this study are unlikely to change because of the low rate of missing data.

sets for each condition were combined and analyses were averaged across the 40 imputed datasets using Rubin's rules (Rubin, 1987).

Analysis

Analyses followed the four-step approach for establishing mediation suggested by Baron and Kenny (1986):

- Step 1: Show that the hypothesized causal variable is correlated with the outcome.
- Step 2: Show that the hypothesized causal variable is correlated with the mediator.
- Step 3: Show that the mediator affects the outcome variable.
- Step 4: Estimate Steps 3 and 4 in the same equation.

All steps were conducted in a multilevel framework to account for the variation among individuals nested in communities and the variation across communities nested in community matched-pairs. For steps 1, 3, and 4, generalized linear mixed models were estimated using a logit link transformation for the Bernoulli distributed smoking and delinquency variables. In the models predicting the effect of CTC on grade 10 delinquency and smoking prevalence, the respective pre-intervention delinquency and smoking variables were included as covariates. This is to ensure that the differences found between youth in control and experimental communities post-intervention are due to CTC and not other confounding variables. For step 2, to assess the effect of CTC on grade 8 levels of the continuous protective factor score, an ordinary least squares (OLS) hierarchical linear model was used. In this model, the pre-intervention protective factor score was included as a covariate. For step 4, the grade 8 protective factor score was included as a predictor of 10th grade smoking and delinquency in addition to the CTC effect to examine the degree to which the grade 8 protective factor score accounted for the effect of CTC on youth problem behaviors in grade 10. All models also included individual and community characteristics. Analyses were conducted using HLM version 6.08 (Raudenbush & Bryk, 2004).

Results

Step 1: Effects of Intervention Condition on Youth Delinquency and Smoking

Previous analyses showed (Hawkins et al., 2012) that controlling for individual-level and community-level characteristics as well as baseline rates of problem behaviors, CTC had a significant effect in reducing the prevalence of past year delinquency and past month smoking by grade 10. Youth in CTC communities had 17% lower odds of having committed any delinquency in the past year and 21% lower odd of having smoked cigarettes in the past month compared to youth in control communities (Table 3.1).

Step 2: Effects of Intervention Condition on Youth Protective Factors

Previous analyses (Kim et al., 2014) showed that youths in CTC communities compared to youth in control communities had significantly higher mean levels of the composite protective factor score in spring of grade 8 (Table 3.2).

Step 3: Effects of Youth Protective Factors on Youth Problem Behaviors

The direct effect of the composite protective factor score in grade 8 on the prevalence of delinquency and smoking in grade 10 was statistically significant. Youth who reported higher levels of the composite protective factor score in grade 8 had 67% lower odds of having committed any delinquency in the past year and 76% lower odds of having smoked cigarettes in the past month in grade 10 (Table 3.2).

Step 4: Mediated Effects of Intervention Condition on Youth Problem Behaviors

The direct effect of CTC on reducing the prevalence of smoking and delinquency in grade 10 was no longer statistically significant after accounting for the levels of the composite protective factor score in grade 8 (Table 3.1). Although CTC significantly reduced the odds of past year delinquency by 17%, this effect is reduced to 6% when the composite protective score is

included in the model, a 65% (11%/17%) decrease in the effect. That is, net of the effect of protective factors, CTC lowers the odds of past year delinquency by 6%, which is not statistically significant. Likewise, the effect of CTC on past month smoking is reduced from 21% to 6%, a 71% (15%/21%) decrease in the effect. However, higher levels of the composite protective factor score in grade 8 continued to significantly predict 67% lower odds of reporting any past year delinquency and 76% lower odds of reporting any past month smoking in grade 10. This could potentially suggest that the effect of CTC on youth delinquency and smoking is largely explained by its effect on protective factors.

Discussion

This paper examined whether the effects of CTC on reducing the prevalence of past month smoking and past year delinquency by grade 10 can be explained by its effect on protective factors by grade 8. The findings of this study suggest that the CTC system significantly reduced youth problem behaviors in grade 10 by strengthening protection in grade 8. This is consistent with CTC's theory of change (Hawkins, Catalano, & Associates, 1992) that suggests that the implementation of CTC will increase protective factors and reduce risk factors in order to prevent problem behaviors and promote positive behaviors.

Identifying the degree to which the enhancement of theoretically derived protective factors actually predicts better youth outcomes later in development is important both for establishing the causal role of these protective factors and for focusing preventive interventions on demonstrated causal factors in prosocial development (Orlando, Ellickson, McCaffey, & Longshore, 2005; MacKinnon, Taborga, & Morgan-Lopez, 2002). This is particularly important in the context of a universal prevention that targets all individuals with varying degrees of risk. Providing opportunities, skills, and recognition to all young people in the community should benefit both high and low risk youth: high risk youth by giving the tools to counter the potential negative effect of risk factors present in their lives; and low risk youth by promoting prosocial behaviors and not simply avoiding problem behaviors. Future studies should investigate how risk and protection interact with each other in affecting behavioral change.

This study has implications for prevention. An average of four protective factors from the community, school, peer, and individual domains measured in grade 8 predicted significantly lower rates of both delinquency and smoking behaviors in grade 10. This indicates that, as suggested by prevention scientists, common risk and protective factors predict the likelihood of

multiple problem behaviors (Coie et al., 1993; Catalano et al., 2002). The results of this study show that preventive interventions that seek to increase protective factors can produce positive effects across multiple problem behaviors. The present study focused on four protective factors found to be affected by the CTC intervention. Studies should investigate the role of aggregate levels of overall protection versus specific protective factors in affecting problem behaviors.

Some methodological issues must be noted. Although current analyses met the criteria for mediation suggested by Barron and Kenny (1986), due to the multilevel nature of the data with dichotomous outcomes, indirect effects were not calculated. Scholars in the field have suggested using multilevel structural equation modeling (MSEM) framework to estimate unbiased indirect effects (Preacher, Zyphur, & Zhang, 2010; Preacher & Kelley, 2011). However, given the complicated numerical integration that needs to be estimated and the limited development of software programs to assist in analyzing 3-level models (Muthén & Asparouhov, 2011; Rabe-Hesketh, Skrondal, & Pickles, 2004), current use of MSEM framework is limited (Preacher & Kelley, 2011). Instead of statistically testing for indirect effects, this paper made a theoretical argument that increasing protective factors among young people in an earlier developmental period would reduce the likelihood of their developing problem behaviors later on. In order to test this causal direction, I ensured temporal order from pre-intervention measures in grade 5, protective factors in grade 8, to problem behaviors in grade 10. Also, to test this theoretical argument, I estimated the most likely mediation of intervention effects: I chose both outcome and mediating measures that were significantly affected by CTC in previous studies. Although without the statistical test of indirect effects I cannot conclusively say that increased levels of protective factors significantly mediated the effect of CTC on reducing youth problem behaviors,

the findings of this study indicate that positively affecting the composite of four protective factors in grade 8 reduced problem behaviors of smoking and delinquency in grade 10.

Researchers have found relationships between risk exposure and problem behaviors and between protective factors and positive behaviors (Cleveland, Feinberg, Bontempo, & Greenberg, 2008; Lightfoot, Stein, Tevendale, & Preston, 2011; Turbin, Jessor, Costa, Dong, Zhang, & Wang, 2006; Office of the Surgeon General, 2001). The results of this study provide empirical evidence for strengths-based practice that seeks to build protection in order to prevent young people's behavioral health problems like smoking and delinquency.

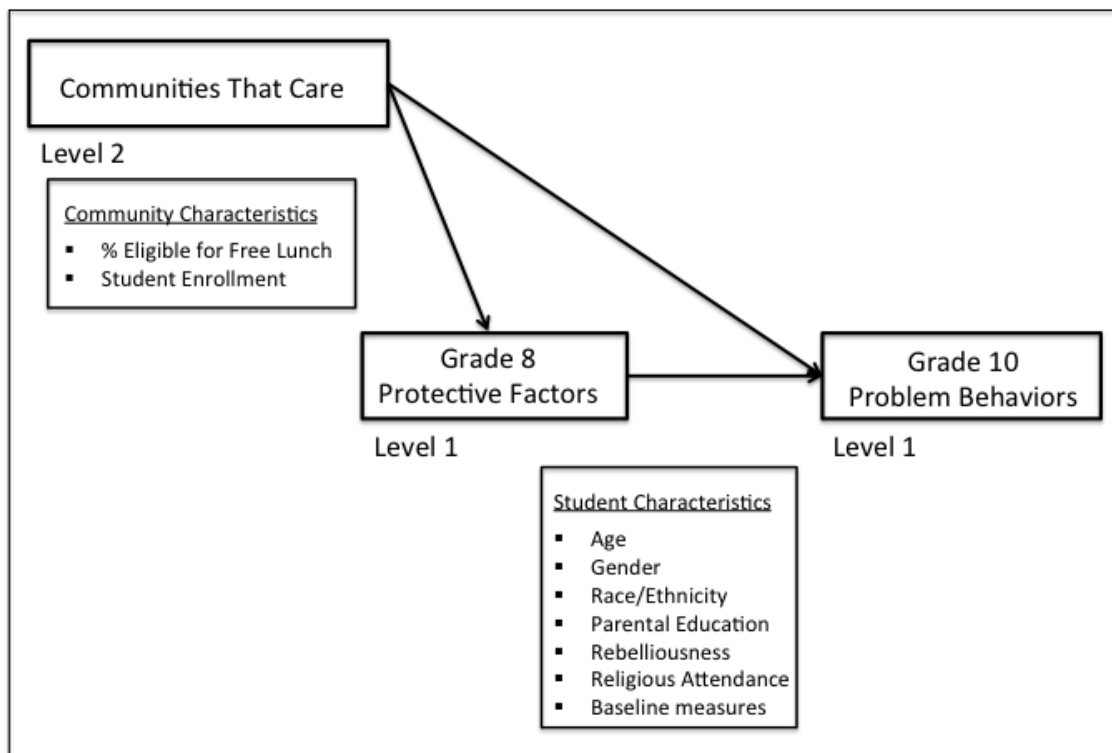


Figure 3.1. Mediation model of youth behavior change using Communities That Care

Table 3.1. Multilevel models predicting the effects of Communities That Care on delinquency and smoking by Grade 10

	Grade 10 Delinquency AOR (95% CI)				Grade 10 Smoking AOR (95% CI)			
	Model 1		Model 2		Model 1		Model 2	
	β (SE)	AOR (95% CI)	β (SE)	AOR (95% CI)	β (SE)	AOR (95% CI)	β (SE)	AOR (95% CI)
Intercept	-0.56 (0.11)***	0.57 (0.44, 0.73)***	-0.46 (0.16)	0.63 (0.44, 0.91)	-1.45 (0.18)***	0.24 (0.16, 0.35)***	-1.63 (0.17)***	0.20 (0.13, 0.29)***
Level 1 Covariates								
Age	0.04 (0.08)	1.04 (0.86, 1.26)	0.01 (0.09)	1.01 (0.83, 1.23)	0.12 (0.11)	1.13 (0.88, 1.44)	0.09 (0.11)	1.10 (0.85, 1.42)
Gender	0.39 (0.07)***	1.47 (1.26, 1.72)***	0.29 (0.07)***	1.34 (1.14, 1.57)***	-0.20 (0.09)*	0.82 (0.67, 1.00)*	-0.39 (0.09)***	0.68 (0.55, 0.84)***
Race/Ethnicity								
White	-0.28 (0.09)**	0.75 (0.62, 0.92)**	-0.23 (0.09)*	0.80 (0.65, 0.98)*	-0.09 (0.11)	0.91 (0.71, 1.17)	-0.010 (0.12)	0.99 (0.76, 1.29)
Hispanic	0.15 (0.11)	1.16 (0.91, 1.48)	0.08 (0.11)	1.08 (0.84, 1.39)	-0.25 (0.14)	0.78 (0.57, 1.08)	-0.37 (0.15)*	0.69 (0.49, 0.97)*
Parental Education	-0.09 (0.03)**	0.92 (0.86, 0.98)**	-0.03 (0.03)	0.97 (0.90, 1.04)	-0.17 (0.04)***	0.84 (0.77, 0.92)***	-0.11 (0.04)**	0.90 (0.82, 0.98)**
Grade 5								
Rebelliousness	0.43 (0.05)***	1.54 (1.36, 1.75)***	0.30 (0.06)***	1.34 (1.18, 1.53)***	0.46 (0.06)***	1.59 (1.39, 1.83)***	0.26 (0.06)***	1.30 (1.12, 1.50)***
Grade 5 Religious Attendance	-0.08 (0.04)	0.93 (0.85, 1.02)	-0.02 (0.04)	0.98 (0.89, 1.08)	-0.16 (0.06)	0.85 (0.75, 0.97)**	-0.11 (0.06)	0.90 (0.79, 1.03)
Grade 5 Past year Delinquency	0.72 (0.10)***	2.06 (1.64, 2.58)***	0.61 (0.10)***	1.85 (1.46, 2.33)***				
Grade 5 Past month Smoking					0.61 (0.39)	1.85 (0.76, 4.46)	0.42 (0.40)	1.52 (0.61, 3.75)
Level 1 Mediator								
Grade 8 Protective Factor			-1.11 (0.08)***	0.33 (0.28, 0.39)***			-1.42 (0.10)***	0.24 (0.19, 0.30)***
Level 2 Covariates								
Percent Free Lunch	-0.004 (0.004) 0.00003	1.00 (0.99, 1.01)	-0.005 (0.004) 0.00002	1.00 (0.99, 1.00)	-0.01 (0.007) 0.0001	0.99 (0.97, 1.00)	-0.02 (0.006)* 0.00007	0.98 (0.97, 1.00)* 1.00 (1.00, 1.00)
Student Enrollment	(0.00003)	1.00 (1.00, 1.00)	(0.00002)	1.00 (1.00, 1.00)	(0.0004)	1.00 (1.00, 1.00)	(0.00003)	1.00 (1.00, 1.00)
Level 2 Intervention Effect								
CTC v. Control	-0.19 (0.08)*	0.83 (0.69, 1.00)*	-0.06 (0.08)	0.94 (0.79, 1.11)	-0.23 (0.10)*	0.79 (0.64, 0.99)*	-0.06 (0.10)	0.94 (0.75, 1.19)

*p<0.05 **p<0.01 ***p<0.001; β =Beta Coefficient; SE=Standard Error; AOR=Adjusted Odds Ratio; CI=Confidence Interval

Table 3.2. Multilevel models of hypothesized relationships

Outcome	Intervention Effect		Relationship between G8 Protective Factors & G10 Behaviors			
	G8 Protective Factor		G10 Delinquency		G10 Smoking	
	β (SE)		β (SE)	AOR (95% CI)	β (SE)	AOR (95% CI)
Intercept	-0.20 (0.03)		-0.64 (0.10)***	-0.56 (0.11)***	0.19 (0.13, 0.27)***	
Level 1 Covariates						
Age	-0.03 (0.02)		0.01 (0.09)	0.83 (1.01, 1.23)	0.09 (0.11)	
Gender	-0.08 (0.02)***		0.29 (0.07)***	1.34 (1.14, 1.57)***	-0.39 (0.09)***	
Race/Ethnicity						
White	0.06 (0.02)**		-0.23 (0.09)*	0.79 (0.65, 0.98)*	-0.01 (0.12)	
Hispanic	-0.08 (0.03)**		0.08 (0.11)	1.09 (0.85, 1.40)	-0.37 (0.15)*	
Parental Education	0.05 (0.007)***		-0.03 (0.03)	0.97 (0.90, 1.04)	-0.11 (0.04)**	
Grade 5 Rebelliousness	-0.11 (0.01)***		0.29 (0.06)***	1.34 (1.18, 1.53)***	0.26 (0.06)***	
Grade 5 Religious Attendance	0.03 (0.009)**		-0.02 (0.04)	0.98 (0.89, 1.08)	-0.11 (0.06)	
Grade 5 Past year Delinquency			0.61 (0.10)***	1.85 (1.46, 2.33)***		
Grade 5 Past month Smoking					0.42 (0.40)	
Grade 5 Protective Factor	0.36 (0.02)***				1.52 (0.61, 3.77)	
Level 1 Mediator						
Grade 8 Protective Factor			-1.12 (0.08)***	0.33 (0.27, 0.39)***	-1.43 (0.10)***	
Level 2 Covariates						
Percent Free Lunch	-0.0005 (0.002)		-0.004 (0.004)	1.00 (0.99, 1.01)	-0.02 (0.007)*	
Student Enrollment	-0.000007 (0.00001)		0.00001 (0.00002)	1.00 (1.00, 1.00)	0.00007 (0.00004)	
Level 2 Intervention Effect						
CTC v. Control	0.10 (0.04)*					

*p<0.05 **p<0.01 ***p<0.001; β =Beta Coefficient; SE=Standard Error; AOR=Adjusted Odds Ratio; CI=Confidence Interval

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CONCLUSION

This dissertation examined the developmental changes across adolescence in protective factors specified in the social development model. It assessed whether the Communities That Care prevention strategy produced sustained improvements in these protective factors. Finally, the dissertation investigated the extent to which CTC-generated improvements in protective factors by the end of grade 8 explained reductions in delinquency and smoking in CTC communities compared to controls observed at the end of grade 10. The results of this dissertation contribute to the understanding of youth protective factors and have specific implications for strength-based community prevention strategies that seek to achieve healthy youth development by building protection.

First, strength-based prevention should start early. Given the drastic drop in the levels of protective factors observed from elementary through middle school, prevention efforts that target protective factors should start early to reduce the rates of decline during this time. An earlier study found evidence that Communities That Care (CTC) implemented in grade 5 significantly increased levels of protection among youth in grade 8 (Kim et al., 2014). The field of social work tends to focus more heavily on treating already existing problems (McCave & Rishel, 2011). Early prevention provides an opportunity for all young people to strengthen protection earlier in their lives and use these resources to either avoid or overcome potential problems later on.

Second, a greater systematic effort should be made to understand potential subgroup differences to improve prevention programming. Social workers work with diverse clients and are trained to provide individualized services. However, to what extent each client differs and how each service should vary is largely based on intuition (Gambrill, 2006; Rosen, 2003; Thyer & Myers, 2011). The findings of this dissertation provide information on the extent of possible

differences by gender and risk. Despite the lack of gender difference in the developmental trajectories of protective factors, significant differences were observed in the levels of protective factors where females reported higher levels of protective factors than males. Furthermore, the effect of CTC on increasing youth protective factors found in the earlier study (Kim et al., 2014) was sustained beyond the implementation phase for males but not for females. Among males, CTC had a more positive effect in increasing protective factors for those who were not identified as high risk. These differences suggest that prevention programming may have to be adapted based on gender and risk. However, in order for these adaptations to be effective, scholars and practitioners alike should be more systematic about identifying what the differences are and how these differences should be addressed (Castro, Barrera, & Martinez, 2004) rather than simply dismissing certain programs or arbitrarily making changes to evidence-based programs.

Third, protective factors matter. Although more studies have focused on risk than protection as a mechanism to reduce youth problem behaviors (Office of the Surgeon General, 2001; Cleveland, Feinberg, Bontempo, & Greenberg, 2008), findings of this dissertation suggest that increasing the levels of youth protective factors in grade 8 significantly predicted the reduction of delinquency and smoking in grade 10. Programs and policies that focus on positive social development among young people can potentially save billions of dollars spent on the juvenile justice system to address juvenile delinquency and substance abuse issues.

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- Zuckerman, M., & Kuhlman, D. M. (2000). Personality and risk-taking: Common biosocial factors. *Journal of Personality, 68*(6), 999-1029.

B. K. Elizabeth Kim
Curriculum Vitae
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EDUCATION

- PhD **University of Washington** December 2014
Dissertation: *Understanding Strengths: Developmental changes and effects of protective factors in a community-based prevention trial*
Dissertation Committee: J. David Hawkins (Chair), Sabrina Oesterle, Karl G. Hill, Peter Pecora, Alexes Harris
- MSW **University of Michigan** December 2010
Social Policy & Evaluation; Community Organization
Thesis: *"Listen to me!" Exploring the lives of homeless teen parents*
Advisor: Rosemary C. Sarri
- BA **University of California, Los Angeles** June 2008
Magna Cum Laude, Phi Beta Kappa
Interpersonal & Intercultural Communication Studies; Asian American Studies

PROFESSIONAL APPOINTMENT

- Postdoctoral Scholar University of California, Berkeley, School of Social Work
2015
Preceptor: Valerie B. Shapiro

RESEARCH INTERESTS

Community-based violence prevention, translational research, evidence-based practice, healthy youth development, strength-based research, juvenile justice, ethnic communities

PUBLICATIONS & PRESENTATIONS

Peer-Reviewed Journals

- Kim, B. K. E.**, Gloppen, K. M., Rhew, I. C., Oesterle, S., & Hawkins, J. D. (2014). Promoting protection community-wide: Effects of the Communities That Care Prevention System. *Prevention Science*, Advance online publication. doi: 10.1007/s11121-014-0524-9
- Gilman, A. B., Hill, K. G., **Kim, B. K. E.**, Nevell, A., Hawkins, J. D., & Farrington, D. P. (2014). Understanding the relationship between self-reported offending and official criminal charges across early adulthood. *Criminal Behavior and Mental Health*, 24(4), 229-240

Manuscripts Under Review

Kim, B. K. E., Oesterle, S., Catalano, R. F., & Hawkins, J. D. (R&R). Change in protective factors across adolescent development: Implications for a comprehensive community initiative. *Journal of Applied Developmental Psychology* (Invited to *Special Issue: Optimizing child and youth development through comprehensive community initiatives*).

Kim, B. K. E. Oesterle, S., & Hawkins, J. D. (R&R). Assessing sustained effect of Communities That Care on youth protective factors in grade 10. *Journal of Society for Social Work and Research* (In *Special Issue: Social Work Intervention Research*).

Manuscripts In Process

Kim, B. K. E., Gilman, A. B., Hill, K. G., & Hawkins, J. D. (in progress). Protective factors for violence. *Journal of Criminal Justice* (Invited to *Special Issue: Protective factors against violent offending: Results from prospective longitudinal studies*).

Logan-Greene, P., **Kim, B. K. E.,** Borja, S., Hernandez, I., & Nurius, P. S. (drafting). Heterogeneity among court-involved youth: Childhood adversity and pathways to offending. For *Children & Youth Service Review*.

Book Chapters

Kim, B. K. E., Gilman, A. B., & Hawkins, J. D. (in press). School- and community-based interventions during adolescence. In J. Morizot & L. Kazemian (Eds.), *The Development of Criminal and Antisocial Behavior: Theoretical Foundations and Practical Applications*. Springer.

Other Publications

Office of City Auditor (2014). *Seattle Youth Violence Prevention Initiative – Evaluability Assessment Final Report*. Seattle, WA.
http://www.seattle.gov/Documents/Departments/CityAuditor/auditreports/SYVPI-Published-Report-10_24_14.pdf

Washington State Department of Social and Health Services Juvenile Justice and Rehabilitation Administration (2013). *Be Part of the Change: Helping Youth Turn Their Lives Around*. Olympia, WA.

Presentations

Kim, B. K. E., Hawkins, J. D., & Oesterle, S. (Accepted for 2015, January). *The effects of Communities That Care on community-wide protection during the sustainability phase*. In V. B. Shapiro (Chair), *Longitudinal Analyses of Community-Level Interventions: Examining Impact on Residents, Coalition Members, and Youth over Time*. Symposium at the Society for Social Work Research, New Orleans, Louisiana.

Kim, B. K. E., Hawkins, J. D., Catalano, R. F., & Oesterle, S. (2014, May). *Examining developmental trajectories of protective factors*. In B. K. E. Kim (Chair), *Promoting healthy youth development: Examining protective factors and developmental assets*. Symposium at the Society for Prevention Research, Washington, DC.

- Kim, B. K. E.,** Gloppen, K. M., Rhew, I. C., Oesterle, S., & Hawkins, J. D. (2014, January). *Promoting protection community-wide: The effects of Communities That Care*. In J. D. Hawkins (Chair), *Building strengths through community-level interventions: Effects of Communities That Care on system and youth outcomes*. Symposium at the Society for Social Work Research, San Antonio, TX.
- Kim, B. K. E.,** Hill, K. G. (2014, January). *Patterns of child maltreatment experience: A latent class analysis*. Poster presentation at the Society for Social Work Research, San Antonio, TX.
- Logan-Greene, P., **Kim, B. K. E.,** Borja, S., Nurius, P. S., & Hernandez, I. (2014, January). *“ACEs”-informed subgroups among youth in the “Pipeline to Crime”: A latent class analysis*. In P. Logan-Greene (Chair), *Trauma, victimization and adverse experiences related to youth delinquency*. Symposium at the Society for Social Work Research, San Antonio, TX.
- Kim, B. K. E.** (2013, July). *Promoting protection community-wide: The effects of the Communities That Care prevention system*. Oral Presentation at the Juvenile Justice and Rehabilitation Administration, Olympia, WA.
- Kim, B. K. E.,** Gloppen, K. M., Rhew, I. C., Oesterle, S., & Hawkins, J. D. (2013, May). *Exploring protective factors: Did Communities That Care make a difference?* Poster presentation at the Society for Prevention Research Conference, San Francisco, CA.
- Logan-Green, P., Borja, S., Hernandez, I., **Kim, B. K. E.,** & Nurius, P. S. (2013, April). *Histories of trauma and social disadvantage in the juvenile justice system: A partnership between the courts and researchers*. Paper presentation at the Forensic Social Work Conference, Seattle, WA.

AWARDS, HONORS, GRANTS, & FELLOWSHIPS

Center for Statistics for Social Science Certificate	06/2014
Scott J. Briar Research for Effective Social Work Practice Award \$1,000	04/2014
University of Washington Graduate Student Travel Award \$300	01, 04/2014
Pre-doctoral Candidacy Exam Passed with Distinction	12/2013
Society for Prevention Research Student Poster Contest Winner http://www.preventionresearch.org/wp-content/uploads/2011/05/ECPNConnections_Winter2014.pdf	05/2013
Society for Prevention Research Early Career Travel Award \$300-\$500	05/2013, 2014
School of Social Work Doctoral Excellence Fund Award \$300	01, 04/2013, 2014
School of Social Work Doctoral Excellence Fund Award \$300	05/2010-12/2010
Merit-Based Scholarship \$2,000/semester	08/2009-12/2010
Child Welfare Scholarship \$20,000/yr	08/2009-12/2010
School of Social Work Merit Scholarship \$2,000/yr	06/2008
Phi Beta Kappa	06/2008
Departmental Honors in Communication Studies	01/2005-06/2008
Dean's Honors List	09/2004-06/2008
College of Letters & Science Honors	03/2007
Professor Harry H. L. Kitano Most Outstanding Undergraduate Essay	09/2006
Golden Key International Honors Society	09/2005
Alpha Lambda Delta & Phi Eta Sigma Honors Society	

RESEARCH EXPERIENCE

Social Development Research Group
Community Youth Development Study 09/2012-12/2014

Pre-doctoral Research Associate: Conducted longitudinal data analyses using multilevel modeling, growth modeling, and structural equation modeling to examine intervention and etiological questions from a community-randomized controlled trial

Social Development Research Group 09/2011-09/2012
Seattle Social Development Project 09/2014-12/2014

- Pre-doctoral Research Associate:*** Conducted longitudinal data analyses using path analysis and latent class analysis to examine types and consequences of child maltreatment experiences; Identify protective factors to youth violence across multiple developmental stages
01/2014-03/2014
- Scholarship of Social Work Teaching and Learning**
Pre-doctoral Research Associate: Provided curricular, administrative, and scholarly research support for BASW program director; Assessed student learning outcome, conducted literature reviews, and prepared manuscripts and presentations on the principles of teaching and learning
- Seattle Crime and Neighborhoods Study – Dept. of Sociology**
08/2012-12/2013
- Pre-doctoral Research Intern:*** Conducted qualitative interviews and social experiments in Seattle neighborhoods to examine the role of collective efficacy, social capital, and informal social control in neighborhood crime
- Pierce County Juvenile Court Project – School of Social Work**
10/2012-12/2013
- Pre-doctoral Research Associate:*** Conducted multivariate analysis using court administrative data to examine the role of adverse childhood experiences in youth delinquency trajectory among court-involved youth
- Institute for Social Research**
01/2010-04/2011
- Research Assistant:*** Supported research faculty in the Adult and Juvenile Justice Project by conducting literature reviews, cleaning administrative data, participating in local advocacy efforts, and conducting analysis to evaluate policy programs for juvenile offenders in local legal systems
- Independent Research Project – School of Social Work**
01/2010-12/2010
- Conducted ethnographic research using participatory observation and in-depth interviews at a homeless shelter for pregnant and parenting teens in Detroit, Michigan; Explored ways in which homeless teenage girls made sense of their own experiences
- Departmental Honors Research – Dept. of Communication Studies**
09/2007-06/2008
- Conducted case studies using in-depth interviews with young adult couples in different immigrant generations; Examined similarities and differences in their perception of culture, language, and communication

TEACHING INTERESTS & EXPERIENCE

Interests

Research methods, human behavior and the social environment, program evaluation, prevention science, evidence-based community practice, intergroup dialogue, juvenile justice

Experience

Prevention Science, Instructor	03/2014-06/2014
Elective course in the BASW program; Co-developed syllabus; Managed course instruction, guest speakers, assignments, and evaluation	
Research Base for Prevention Science, Invited Lecturer	03/2014
Required course for MSW Prevention Concentration; Delivered a lecture on “Effectiveness Trials and Dissemination”; Facilitated Q & A	
Child & Family Inequalities: Policy/Services Platform, Invited Lecturer	10/2013
Elective course for MSW Policy & Administration Concentration; Delivered a lecture on “Washington Juvenile Justice System and Reentry”	
Research Base for Prevention Science, Teaching Associate	01/2013-03/2013
Required course for MSW Prevention Concentration; Delivered a lecture; Managed course assignments; Co-facilitated class discussions	
Social Problems, Teaching Intern	09/2012-12/2012
Elective Sociology course for UW undergraduates; Delivered a lecture on “Alternatives to juvenile incarceration” to 280 students	
Prevention Science, Teaching Assistant	01/2012-03/2012
Elective course in the BASW program; Managed course assignments; Delivered a mini-lecture on APA style citation	
Cultural Factors in Interpersonal Communication, Reader	03/2008-06/2008
Elective Communication Studies course for UCLA advanced undergraduates; Managed course assignments; Co-drafted syllabus	
Dyadic Communication and Interpersonal Relationships, Reader	09/2007-12/2007
Elective Communication Studies course for UCLA advanced undergraduates; Managed course assignments; Co-drafted syllabus	
Undergraduate Academic Success, Section Leader	01/2007-03/2007
Elective Education course for UCLA freshmen; Co-facilitated weekly section; Developed syllabus; Managed course content and assignments	

PROFESSIONAL EXPERIENCE

MEF Associates

Youth Violence Consultant: Provided expert knowledge in youth violence prevention for the Seattle City Council as part of the evaluability assessment project of the Seattle Youth Violence Prevention Initiative 10/2013-6/2014

Department of Social and Health Services Juvenile Justice & Rehabilitation Administration (JR)

Reentry Community Outreach Consultant: Collaborated with Transition Liaisons, JR youth, and parole offices to develop family and community engagement strategies; Created templates for community brochures and family newsletters based on JR youth input 07/2013-10/2013

Mentoring Program Evaluation Consultant: Collaborated with JR research staff to create a logic model and sustainable evaluation strategies 10/2013-12/2013

Alternatives For Girls (AFG)

Grant Writing Team Assistant: Helped create a narrative for a successful OJJDP SAFE Start antiviolence grant; Reviewed, developed, and implemented data reports for grant requirements 09/2010-12/2010

Community Meeting Facilitator: Developed a program curriculum for weekly community meetings with shelter residents; Facilitated group discussions on sexual health and gender identity 05/2010-12/2010

Case Worker: Provided case management for shelter residents; Managed case conference notes and case plans in federal information systems 05/2010-12/2010

Street Outreach Worker: Provided food and emergency services for street workers around Detroit neighborhoods 05/2010-08/2010

Group Co-facilitator: Taught curriculum-based life skills to shelter residents (e.g., banking, job search, housing application); Helped facilitate after-school prevention curriculum for community youth 01/2010-05/2010

Project BRITE (Bruins Reforming Incarceration Through Education)

Mentor: Provided academic tutoring for incarcerated youth; Helped youth devise reentry plans and goals 12/2005-04/2006

PROFESSIONAL AFFILIATIONS & SERVICE

Professional Affiliations

National Association of Forensic Social Work 03/2013-Present

Society for Prevention Research 11/2012-Present

Society for Social Work Research 04/2012-Present

Service to Profession**Substance Use and Misuse**

Manuscript Reviewer

08/2013, 01/2014

Society for Prevention Research

Dissemination and Implementation Science Theme Review Committee

02/2014

Departmental Service**University of Washington School of Social Work**

First-year Doctoral Student Mentor

07/2013-06/2014

Social Justice Committee, Student Representative

09/2012-6/2013

Social Development Research Group Dissemination Committee

04/2012-6/2014

Student Speaker's Series Planning Committee

04/2012-04/2013

University of Michigan School of Social Work

International Social Work Student Association, President

03/2009-12/2010

Family Assessment Clinic, Korean-English Interpreter

09/2010-12/2010

Michigan Journal of Social Work and Social Welfare, Editor

03/2010-12/2010

New Student Orientation Program, Summer Facilitator

03/2010-09/2010

Community Service**Pierce County Juvenile Court**

Research Consultant

10/2012-07/2013

Korean Catholic Center

Youth Advisor

09/2002-6/2014

REFERENCES

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