



AN ABSTRACT OF THE DISSERTATION OF

Isaac J. Washburn for the degree of Doctor of Philosophy in Human Development and Family Studies presented on May 21, 2010.

Title: Evaluation of a Social-Emotional and Character Development Program

Abstract approved:

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The effects of a school-based social-emotional and character development program, *Positive Action*, on the developmental trajectory of character development was evaluated using data from three randomized trials. Results come from 1) 4-years of data from elementary children in 20 Hawai'i schools, 2) 3-years of data from elementary children in 14 schools in Chicago, and 3) 3-years of data from elementary children in 8 schools in a southeastern state. Random intercept, multilevel, growth curve analyses supported recent research on the trajectory of character development, in that students in both control and *Positive Action* schools reported a general decline in the number of behaviors associated with character they endorsed in all three trials.

However, the *Positive Action* intervention significantly reduced the declines in all three trials. Taken together, the three analyses give insight into the normative trajectory of behaviors associated with character and evidence for the effectiveness of *Positive Action* in helping children maintain a relatively beneficial, though declining, developmental trajectory. A further more in-depth analysis was run in Chicago, looking for multiple trajectories of character development and links to a distal outcome, as well as, the evaluation of *Positive Action*. The same scale of positive behaviors associated with character was used in connection to delinquent behavior to determine multiple trajectories of character development. These trajectories were also connected to delinquent behavior recorded at the end of the study. Results suggested that two distinct groups existed in the Chicago data, identified both by their intercept and slope on positive behavior, and also by their level of delinquent behavior at the end of the study. The effect of *Positive Action* was similar on both of these groups.

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Evaluation of a Social-Emotional and Character Development Program

by  
Isaac J. Washburn

A DISSERTATION

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Doctor of Philosophy dissertation of Isaac J. Washburn presented on May 21, 2010.

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Chair of the Department of Human Development and Family Sciences

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Dean of the Graduate School

I understand that my dissertation will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my dissertation to any reader upon request.

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Isaac J. Washburn, Author

## ACKNOWLEDGEMENTS

This work is truly the product of many people, with any mistakes my own. My committee guided and directed me throughout the process. I can truly say that my committee has become my colleagues and friends through this process. My family has been a constant source of reinforcement and encouragement. They are my reason for wanting to make the world a better place.

## CONTRIBUTION OF AUTHORS

As co-authors for both manuscripts in this dissertation, Alan Acock, Sam Vuchinich, Brian Flay, Frank Snyder, Ben Li, Peter Ji, Joseph Day, and David Dubois provided conceptual, methodological, and analytic advice for both manuscripts.

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## DEDICATION

This work is dedicated to my wife, Katrina Jensen Washburn. You are responsible for any good behavior I may find myself doing and if any good comes of my work in this world, everyone needs to know it really comes from your influence on me.

## Evaluation of a Social-Emotional and Character Development Program

## Introduction

The study of character covers multiple disciplines and is of central interest to theorists and prevention scientists. Positive psychologists are striving to define character development (Park, 2004). Catalano et al. (2004) and Lerner et al. (2005) have developed programs to encourage character in adolescents. Berkowitz and Bier (2004), as well as CASEL (2003), are seeking to apply the scientific method to better inform prevention programs and character education. Reviews containing literature on character are found in academic circles (Eisenberg, Fabes, & Spinrad, 2006; Lerner et al., 2005), applied circles (CASEL, 2003; Jacques S Benninga, Marvin W Berkowitz, Phyllis Kuehn, Karen Smith, 2006), and government circles (Ferber, Gaines, & Goodman; 2005). Currently some of the best work done on character development has been done in the field of prevention science.

Catalano et al. (2004) and Flay, (2002) have described the path from single-domain intervention programs (such as just in schools or just with families) focused on individual problem behaviors (e.g., tobacco use, violence), to multiple-domain prevention programs that focus on both problem behaviors as well as positive youth development. This movement from single-domain interventions to multi-domain prevention is consistent with the latest developmental (i.e. changing perceptions of adolescent development, Lerner et al. 2005) and health promotion/prevention theoretical thinking (Flay, 2000; Flay, Snyder, & Petraitis, 2009). In particular, we see an increased interest in social-emotional and character development (SECD; Elias, 2009) programs that focus on children's social, emotional, and character development;

and we see optimal development in these areas as providing the best protective factors against health-compromising and high-risk behaviors. Central to this claim is that SECD programs can do more than just give a one-time boost to the number of behaviors associated with character development, but that they can also change the social-emotional and character developmental trajectories of the children in their program. In this vein, two evaluations of the SECD program, *Positive Action*, will be presented after a more thorough review of the literature.

### *Literature Review*

The study of character in the United States was already of great interest by the 1920s (Rapalyea, 2009). The world of psychology was working through the issues of personality, and much attention was paid to whether character and temperament were distinct constructs (Allport, 1921; Filter, 1922; Jastrow, 1915). Character was delineated in several different ways, each either an attempt to differentiate it from personality or to link it to personality. Ultimately, the difficulties in trying to pull apart personality and character led to disinterest in studying character (Rapalyea, 2009), at least in the realm of basic research of psychology. This became particularly true as the focus of psychology zeroed in on personality, and character was left to philosophy (Allport, 1937). This was not, however, the end of interest in character. In fact character blossomed among those interested in developing interventions.

This beginning of the interest in character development interventions began with the work of Hartshorne and May (1928, 1929, 1930a, 1930b). In particular, the Institute of Social and Religious Research funded the work done starting in 1929 with

a focus on research in character and religious education. Hartshorne and May then focused on the teachable aspects of character as opposed to the personality side that Allport emphasized in 1921. This difference was important, as the basic research into character or moral reasoning was taken over by cognitive scientists, and the focus on character as behavior became the realm of character education (Rapalyea, 2009).

#### Current Fields of Character Study.

Although character is a word that is commonly thrown used public discourse, there has been some difficulty in arriving at a formal definition of character (Park, 2004). Part of the difficulty is the terminology that surrounds character, for example, the use of different terms for overlapping concepts: character or character strengths (see Park, 2004; Lerner et al., 2005; and Berkowitz & Bier, 2004), positive youth development (see Catalano et al., 2004; Flay, 2002; Lerner et al., 2005), and moral development (see Eisenberg & Morris, 2004; Kohlberg, Levine, & Hower, 1983). Despite all of the variation in terminology surrounding character development, one thing is certain; researchers in evaluation and prevention research are becoming increasingly interested in the application of character development programs, whatever they are called. This concern has created prevention and promotion interests under several different names: character education (see [www.character.org](http://www.character.org)), Social and Character Development (U.S. Department of Education), positive youth development (National Conference of State Legislatures) and social and emotional learning (see <http://www.casel.org>). The different interventions each have their own measures and criteria for effective interventions, as well as their own literature that

only occasionally overlaps. This uncertainty surrounding character development, and the evaluation of programs that seek to influence it, means that evaluators are often left to fend for themselves as they seek to provide evidence on the effectiveness of these programs.

The need to model the trajectories of character development has led to increased interest by prevention scientists in the developmental pathway of positive behaviors associated with character from childhood into adolescence. Lerner et al. (2005) covers what they see as inherent in the idea of positive youth development, which is roughly analogous to the view found in Catalano and colleagues (2004) and the impetus behind SECD programs. Lerner presents five Cs (competence, confidence, connection, character, and caring) that make up their larger concept of positive youth development and, even though Lerner et al. specify a component called character, others (i.e. Peterson, & Seligman, 2004) see the attributes involved in the other four C's as also being part of character. Lerner measured the five Cs in order to construct a single global measure of positive youth development. This global measure was tested using structural equation modeling with a second order factor (Lerner et al. 2005). Using this global measure, Lerner and colleagues (2008) found that the general developmental trend of positive youth development was negative; that is, youth endorsed fewer positive outcomes as they got older.

In 2006, Kokko and colleagues published results on the trajectories of positive social behavior in boys as reported by teachers. The authors were surprised that the boys were found to decline or, at best, stay stable in positive social behaviors into

adolescence. Nantel-Vivier and colleagues (2009) extended the age of observation with a cross-national comparison of boys from 10 to 15, with mother and teacher reports for a Canadian sample, and teacher and student reports for an Italian sample. Although differences existed between samples and by who reported (students, mothers, or teacher), similar results were observed. Kokko and colleagues suggested that, from middle childhood, a general downward trend in positive social behaviors exists. In 2007, Carlo and colleagues found strikingly similar results from high school student reports of their own behavior.

The above results were even more surprising given the influential review of positive social (prosocial) behavior and moral reasoning by Eisenberg and Morris (2004). They reviewed what was known about prosocial development at that time and drew two important conclusions. First, that, based on the increasing acquisition of cognitive tools, children should be increasing in behaviors associated with moral reasoning and prosocial development into and through adolescence. This was also tested against the literature, and the studies they reviewed (mainly cross-sectional) generally showed this increase of positive social behavior into and through adolescence. However, as reviewed above, four subsequent studies found results contrary to this using longitudinal data.

The results presented by Lerner et al. (2008), Kokko et al. (2006), Nantel-Vivier et al. (2009), and Carlo et al. (2007) all showed that behaviors associated with character decrease from middle childhood through the end of adolescence. The reasons given for this decline are underdeveloped or nonexistent, which is not

surprising given that the results are contrary to the results and theoretical model presented by Eisenberg et al. (2004), which is the foundation that each of these three studies started on. Phelps et al. (2009) discuss the decline in the 4H study headed up by Lerner, but simply state that they plan on watching it for a few more years. Kokko et al. and Nantel-Vivier et al. also simply suggested that more work is needed to understand the decline. Carlo et al. did give possible reasons for the decline, all of which focused on the environment surrounding boys in school. None of these studies tapped into the work done by Peterson and Seligman (2004) on enabling factors of 24 character strengths they identified (see table 1).

**Table 1. Character Strengths and Enabling Factors**

Character Strengths	Enabling Factors
creativity	domain-relevant skills; supportive mentors; extensive practice
curiosity	increased knowledge and awareness of knowledge gaps in areas that are personally meaningful and engaging
love of learning	increased knowledge; feelings of competence; availability of learning resources and skills for using them; positive feelings about a topic; supportive mentors
open-mindedness	age, education, sufficient time to make decisions
perspective	ongoing and active participation in life; successful resolution of life's crises and challenges; ego-resiliency
authenticity	age, parental role models, supportive social context
bravery	group cohesion (teamwork); emotional stability; appropriate role models
persistence	age, reward for effort, social support, task relevance, self regulations, intrinsic motivation
zest	physical and psychological health, good health habits, safety, social support for autonomy
kindness	empathy, social responsibility, agreeableness, positive mood, supportive childbearing practices

Table 1 Continued. Character Strengths and Enabling Factors

love	secure attachment with caretaker during infancy, sensitivity about the past of significant others, social support
social intelligence	unknown
fairness	familial emphasis on justice and equality, perspective-taking, general cognitive development
leadership	need for power (for helping others, though not for self-aggrandizement), self-confidence, propensity for risk taking, creativity, social intelligence, orientation toward nurturing others and being concerned for their progress (kindness).
teamwork	participation in extracurricular school activities, discussion of current events in school courses
forgiveness	empathy for transgressor, low rumination, apologies, close and committed relationship with transgressor
modesty	democratic parenting, identity development, secure relationship with others (love)
prudence	conscientiousness, ability to engage in means-ends thinking
self regulation	early ability to delay gratification, past exercise of self-control, self-monitoring
appreciation of beauty	familial or education emphasis on the appreciation of beauty
gratitude	age, hope, generosity, spirituality, empathy, humility, perspective-taking
hope	sense of safety during infancy, success, freedom from stress and trauma
humor	cheerfulness, playful mood, insight into the human condition, group norms for humor, joking relationships, adversity (sometimes)
spirituality	parental socialization, family cohesion, crisis (sometimes)

Note: Taken from Park & Peterson, 2008

Peterson and Seligman (2008) present twenty-four traits that they see as making up the strengths a person needs to have character. In doing so, they present indicators for each trait (except social intelligence) that they see as enabling people to develop that trait. This view of character is probably the most complete picture

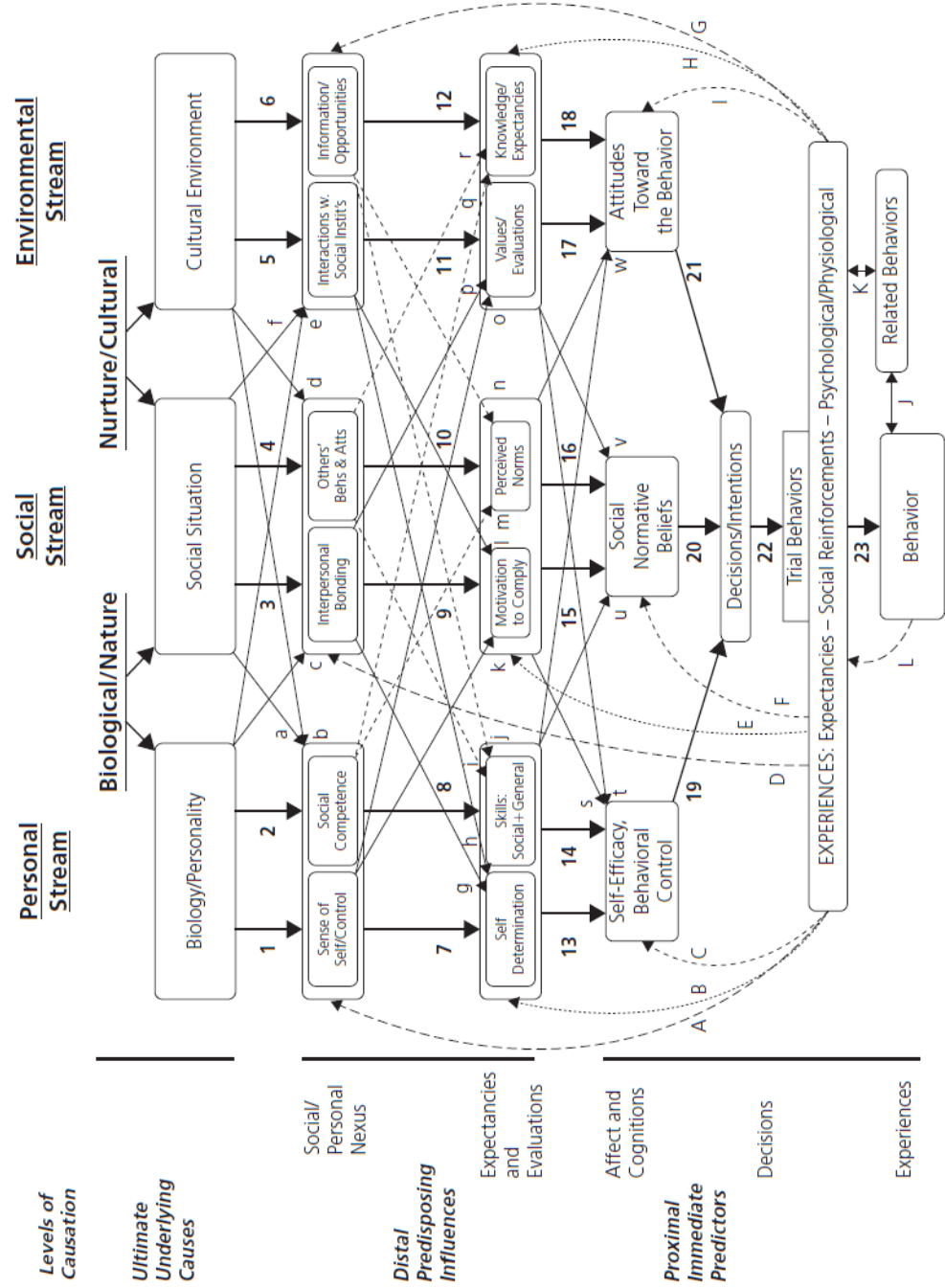
presented to date of the processes surrounding character development; but even this picture is incomplete. Peterson and Seligman readily admit that many of these enabling factors are interrelated and that similar processes lead to different strengths. Their list of traits and indicators of traits does not link traits or indicators in any fashion and so leaves a theoretical hole on how these traits work together to develop character. This gap is filled by the application of the Theory of Triadic Influence to the development of character.

The Theory of Triadic Influence (Flay, Snyder, & Petraitis, 2009) is a developmental theory that focuses particularly on integrating behavioral theories commonly used in the health sciences. The theory posits three interrelated streams of influence, each of which moves from ultimate influences of biology, social situation and cultural environment to proximal influences on behavior (see figure 1). The Theory of Triadic Influence is in the tradition of Bronfenbrenner's (1979, 1986, 2005) ecology systems theory and Dynamic Systems Theory (Smith, Thelen, 2003), with a particular focus on predicting behavior. This focus on predicting behavior is important here, as the outcome we are interested in is positive behaviors associated with character.

Character strengths gives us the factors we need to measure and the Theory of Triadic Influence gives a concrete way in which those factors should be related to each other and, ultimately, to the behaviors we are interested in. These two theories are combined in this paper through the work of Ji and colleagues (under review) and Flay and Allred (2010). Ji and co-authors uses the work of Peterson and Seligman (2004)

Figure 1. Visual Representation of the Triadic Theory of Influence

## THE THEORY OF TRIADIC INFLUENCE



along with Park (2004) and others current in the field of character measurement to develop the Student Character and Social Development Scale (SCDS).

This Measurement has been shown to be a strong two-factor model, with six first-order factors loading on a higher second-order factor. The measure was also developed with the *Positive Action* program in mind which, according to Flay and Allred (2010) has become strongly influenced by the Theory Triadic of Influence. Positive Action.

*Positive Action* was one of the programs evaluated under the Social and Character Development grants funded by the U.S. Department of Education in 2003. Grounded in a broad theory of self-concept (Purkey, 1984), *Positive Action* was developed and revised by educational psychologist Carol Gerber Allred from 1977 to the present, with frequent additions and revisions over the years. Most recently the application of the Theory of Triadic Influence (Flay, Snyder, & Petraitis, 2009) has moved *Positive Action* in the direction of characterization as a Social-Emotional and Character Development program (Flay & Allred, 2010). The combination of the work by Purkey and Flay et al. posits the *Positive Action* program's influence on character as being through the reinforcement of positive behaviors associated with character development. Children begin a cycle of reinforcement, where positive behaviors are connected to positive feelings about themselves, which in turn lead to more positive behaviors. More detailed descriptions of the *Positive Action* program is available at [www.positiveaction.net](http://www.positiveaction.net) and in the work of Flay, Allred, and Ordway (2001) and Flay & Allred (2010).

The *Positive Action* program has already been shown to be effective (Flay 1986) in enhancing academic achievement and school involvement, while reducing disciplinary referrals, substance use, risky sexual behavior and violence (Beets et al. 2009; Flay et al. 2001; Flay and Allred 2003; Li et al. under review, Snyder et al., 2010; Washburn, et al. under review). These evaluations are important, but they deal with only part of what *Positive Action* was developed to influence in children and adolescents, namely academic performance and unhealthy or risky behaviors. The effects of *Positive Action* on positive behaviors associated with character development are as yet unreported. This study will focus on evaluating the effects of the *Positive Action* program on the trajectory of positive behaviors associated with character. This paper will focus first, on a tradition multi-level growth model across diverse geographical sites to show the breadth of the generalizability of the program and second, a latent class growth mixture model in a single site to show the depth of the generalizability of the program.

### *Expectations*

The present study sought to provide new information to help reconcile the conflicting findings on whether positive behaviors associated with social-emotional and character development increase or decrease during middle childhood (ages 6 to 11 years). We also expected to gain a better understanding of the empirical processes that take place in the decline of positive behaviors associated with character. The present study, 1) extends the current literature on the developmental trajectory of positive

behaviors, and 2) tests whether a social-emotional and character development program, *Positive Action*, can influence that trajectory in a beneficial way.

#### Multi-level Growth Model in Three Randomized Trials.

Taken together with the work done by the Lerner and colleagues (2008) and the work done on prosocial behavior (Kokko et al. 2006, Nantel-Vivier et al. 2009, and Carlo et al. 2007), we expected to find decreasing reports of positive behaviors in the three randomized trials presented here. However, we also expected that children receiving the *Positive Action* program would have significantly mitigated declines in positive behavior (if not a reversal of the negative trajectory). This result was expected across trials, age, and gender.

#### Latent Class Growth Mixture Model in the Chicago Trial.

The previous work on Positive Youth Development (Lerner et al. 2008) and prosocial behavior (Kokko et al. 2006, Nantel-Vivier et al. 2009, and Carlo et al. 2007), suggests that multiple trajectories would be found and that the majority, if not all, of the trajectories would be declining. This was particularly expected, given that the sample of elementary students was at high risk (schools with high free lunch rates, drop out rates, etc.). Given the prior work done using latent class growth mixture modeling with randomized trials (Segawa et al. 2005), it was expected that the group with the lowest number positive behaviors associated with character at baseline would show the largest program effect, with smaller effects for other groups. We all also expected that children with lower numbers of behaviors at baseline, and steeper declining slopes, would have show more delinquent behaviors at the end of study.

Effects of a Social-Emotional and Character Development Program on the Trajectory  
of Behaviors Associated with Character Development: Findings from Three  
Randomized Trials.

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### Abstract

The effects of a school-based social-emotional and character development program, *Positive Action*, on the developmental trajectory of character-related behaviors was evaluated using data from three school-based randomized trials in elementary schools. Results come from 1) 4 years of data from students in 20 Hawai'i schools, 2) 3 years of data from students in 14 schools in Chicago and 3) 3 years of data from students in 8 schools in a southeastern state. Random intercept, multilevel, growth-curve analyses showed that students in both control and *Positive Action* schools exhibited a general decline in the number of positive behaviors associated with character that were endorsed. However, the *Positive Action* intervention significantly reduced these declines in all three trials. Taken together, these analyses 1) give insight into the normative trajectory of behaviors associated with character and 2) provide evidence for the effectiveness of *Positive Action* in helping children maintain a relatively beneficial developmental trajectory.

Key Words: School-based Intervention, Character, Randomized Trial, Trajectory of Behaviors

## Introduction

Catalano et al. (2004) described the movement over the last 30 years from single-domain prevention programs focused on individual problem behaviors (drugs, delinquency, sexuality) to multiple-domain intervention programs that focus on both problem behaviors and what Catalano et al. (2004) and Flay (2002) called positive youth development. This movement from single-domain prevention to multi-domain prevention is consistent with the latest theoretical thinking in developmental (Lerner et al. 2005) and health promotion/prevention (Flay, 2000; Flay, Snyder, & Petraitis, 2009) literatures. In particular, there has been an increased 1) interest in social-emotional and character development (SECD; Elias, 2009) programs that focus on a child's social, emotional, and character development and 2) recognition that optimal development in these areas may provide the best protective factors against health-compromising and high-risk behaviors. SECD programs claim they can do more than just give a one-time boost to the number of positive behaviors associated with character development; they also claim that they can change the trajectories of character development of children.

The study of character covers multiple domains and is of interest to both theorists and prevention scientists. Recent developments include efforts to define character development within the framework of positive psychology (Parks, 2004), encouragement of character development in adolescents (Catalano et al., 2004; Lerner et al., 2005) and applications of the scientific method to better inform prevention programs that include promotion of character education (Berkowitz & Bier, 2004;

CASEL, 2003). Reviews containing literature on character are found in several domains, including the academic (Eisenberg, Fabes, & Spinrad, 2006; Lerner et al., 2005), the applied (Benninga, Berkowitz, Kuehn, & Smith, 2006; CASEL, 2003), and the governmental (Catalano, Gavin & Markham, 2010; Ferber, Gaines, & Goodman; 2005).

These advances have stimulated increased interest among prevention scientists in the developmental pathway of positive behaviors associated with character from childhood into adolescence. The current research examines the developmental trajectory of positive behaviors from age 6 to 11. Previous theory and research are considered. The study reports the results of three randomized trials that test whether the *Positive Action* intervention can beneficially effect the development of positive behaviors related to character.

Eisenberg and Morris (2004) provided a review of what was known about prosocial development (a component of character development) at that time. Their main point was that, based on the increasing acquisition of cognitive tools, children should be increasing in behaviors associated with moral reasoning and prosocial development into and through adolescence. In general, the studies they reviewed (mainly cross-sectional) showed this increase of positive social behavior into and through adolescence. However, as described below, four subsequent studies using longitudinal data reported contrary results.

Kokko and colleagues (2006) examined the trajectories of positive social behavior among a sample of 1,025 boys as reported by teachers between the ages of 6

and 12. The authors were surprised that the boys were found to decline or, at best, stay stable in positive social behaviors into adolescence. Nantel-Vivier et al. (2009) extended the age of observation with a cross-national comparison of 1037 boys from 10 to 15, with mother and teacher reports of prosocial behaviors for a Canadian sample and teacher and student reports for an Italian sample. Although differences existed between samples and by who reported (students, mothers, or teacher), similar declines in trajectories were observed. In 2007, Carlo and colleagues found strikingly similar results from high school student self-reports of their positive social behavior assessed between grades 7 and 12 with a sample of about 657 youth.

Lerner and colleagues (2005) discussed what they saw as inherent in the idea of positive youth development, which is roughly analogous to the view found in Catalano and colleagues (2004) and the impetus behind SECD programs. Lerner and colleagues present five Cs (competence, confidence, connection, character, and caring) that make up their larger concept of positive youth development. Even though they specify a separate component called character, others (e.g., Peterson & Seligman, 2004) have viewed the attributes involved in the other four C's as also being part of character. Lerner and colleagues (2008) measured the five Cs in order to construct a single global measure of positive youth development. Using this global measure with a sample of 1912 youth assessed between 5<sup>th</sup> and 8<sup>th</sup> grade, they found that the general developmental trend was negative; that is, youth endorsed fewer positive outcomes as they got older.

The results of the preceding studies (Lerner et al., 2008; Kokko et al., 2006; Nantel-Vivier et al.; Carlo et al., 2007) all indicate a decline in positive behaviors associated with character from middle childhood through the end of adolescence. There has been little discussion of reasons for this decline in the literature. Phelps, Zimmerman, Warren, Jeličić, von Eye, and Lerner (2009) discussed the decline but state that they plan on watching it for a few more years in order to understand it better. Kokko et al. and Nantel-Vivier et al. suggested that more work is needed to understand the decline. Carlo et al. gave several possible reasons for the decline, all of which focused on the environment surrounding boys in school.

*Positive Action* is one widely implemented social and character development program for school-age youth. Grounded in a broad theory of self-concept (Purkey, 1984), *Positive Action* was developed and revised by educational psychologist Carol Gerber Allred from 1977 to the present, with frequent additions and revisions over the years based on formative and monitoring data. Most recently, the application of the Theory of Triadic Influence (Flay, Snyder, & Petraitis, 2009) has moved *Positive Action* in the direction of characterization as a Social-Emotional and Character Development program (Flay & Allred, 2010). The combination of the work by Purkey and Flay et al. posits the *Positive Action* program's influence on character as being through the reinforcement of positive behaviors associated with character development. Children begin a cycle of reinforcement in which positive thoughts lead to positive behaviors that generate positive feelings about self, which, in turn, lead to more positive thoughts and behaviors. More detailed descriptions of the *Positive*

*Action* program are available at [www.positiveaction.net](http://www.positiveaction.net) and in the work of Flay, Allred, and Ordway (2001) and Flay and Allred (2010). The *Positive Action* program has already been shown to be effective in enhancing academic achievement and school involvement, while reducing disciplinary referrals, substance use, risky sexual behavior and violence (Beets et al. 2009; Flay et al. 2001; Flay and Allred 2003; Li et al. under review, Snyder et al., 2010). However, the effects of *Positive Action* on character development are as yet unreported.

The goals of the present study are two-fold: 1) to provide new information that can help reconcile conflicting findings regarding normative changes in positive behaviors associated with social-emotional and character development during middle childhood (ages 6 to 11 years), and 2) examine the effects of *Positive Action* on behaviors associated with socio-emotional and character development. Based on the recent longitudinal studies reviewed above, we expected to find decreasing reports of positive behaviors in each of three randomized trials of the *Positive Action* program. However, we also expected that children receiving the *Positive Action* program would have significantly mitigated declines in positive behavior.

In the three different randomized trials, a global measure of positive behaviors associated with social-emotional and character development was collected across varying lengths of times. We present the method, results, and discussion for each trial separately, followed by a final conclusion. Random-intercept multilevel growth models were performed to establish the normative developmental trajectory of positive behavior in each of the three trials as well as to provide tests of the effectiveness of the

*Positive Action* program. Although a single model was hypothesized for all three sites, each site was run separately so that any differences in the linear model for each site might be explored without an overabundance of interactions.

### Hawai`i Trial

#### *Method*

The Hawai`i randomized trial of the *Positive Action* program took place in 20 public elementary schools on three islands in the unified Hawai`i school district that encompasses the entire state. Student self-reports of their behavior were collected at five time points, on each of two cohorts (first graders and second graders at the start of the project). Data were collected for baseline at the end of the academic school year in half of both the control and PA schools and at the beginning of the next school year in the others. The remaining 4 waves of data were collected at the next four springs. Data were collected by research, rather than school, staff. The teachers within each of the ten program schools received the *Positive Action* training from the program developer. Brief update trainings were repeated at the start of each subsequent year in the program schools. The teachers in the ten control schools received no *Positive Action* training and were asked to not implement the program.

The schools receiving the *Positive Action* program were randomly assigned from matched pairs based on a multivariate index of factors related to academic risk (c.f., Dent et al., 1993). This matching utilized the following school-level characteristics: proportion of students receiving free or reduced price lunches, percent stability of student enrollment, achievement scores on standardized tests, ethnic

distribution, student-teacher ratios, school size, and school-level problem behaviors such as suspensions (see Beets, et al. 2009, for details). There were no significant differences between *Positive Action* schools and control schools at baseline on any of the variables used to match schools (Beets, et al., 2009).

Students were asked a series of questions about their behaviors and feelings associated with those behaviors. For this analysis, only the behavioral questions were considered. The purpose of these items was to collect information on the positive behaviors associated with character. This idea is more fully developed by Ji et al. (under review) in the development of a Student Character and Social Development Scale (SCDS) using data from the Chicago trial. However, not all of the items that were ultimately accepted as part of the SCDS, were available across all three sites; in each site the positively worded items that tapped the conceptualization of character underlying the SCDS were identified and utilized in the present analyses (16 items for Hawai'i). Examples included "Do you work hard in school?" "Do you respect others?" and "Do you try to be the best you can be?"

The same 16 behavior items were asked of students across all waves of data collection in Hawai'i. However, the response options differed between years. In grades 1-3 the items had three response options: "*no*", "*sometimes*", and "*yes*". For grades 4 and 5 four response options were used: "*none of the time*", "*some of the time*", "*most of the time*", or "*all of the time*". To obtain consistent response options across time for the student reports, we coded the items as 1 if they answered *yes* for the three response-option scales, or *all of the time* for the four response-option scales.

The sum of these items was then transformed into a POMP (percent of maximum possible; Cohen, Cohen, Aiken & West, 1999) score so that student reports from the three studies would have the same range of 0-100. This transformation allows the results to be directly compared even with different numbers of items across sites and provides a global measure of positive behavior. An alpha was calculated for the dichotomized scale for each year; for the Hawai'i data, they were 0.74, 0.79, 0.83, 0.75 and 0.85 for waves 1-5, respectively.

We utilized a longitudinal growth-curve model with a random intercept at the student and school level. This model takes into account similarity of scores within children and within schools. Given our three-level model (observations nested in students nested in schools), two ICC values were obtained for student reports. One ICC is the proportion of variance due to schools and the other is the proportion of variance within children across time (see Table 1). As is typically the case, variance due to child (148.94; s.e. = 8.23) was much larger than variance due to school (4.433; s.e. = 2.15). However, the school ICC (see Table 1) was large enough to justify a three-level model of observations nested in children nested in schools.

The multilevel model adjusting for both individual- and school-level effects was estimated with Stata's `xtmixed` command using a full-information, maximum-likelihood estimator. Because age and gender each have been indicated to be important predictors of behavior at this age (Eisenberg, Fabes, & Spinrad, 2006), cohort and gender were included in the model. Our random intercept model can be expressed as

$$\begin{aligned}\hat{Y} = & \beta_0 + \beta_1(\text{condition}_k) + \beta_2(\text{gender}_{jk}) + \beta_3(\text{cohort}_{jk}) + \beta_4(\text{year}_{ijk}) + \beta_5(\text{year}_{ijk}^2) \\ & + \beta_6(\text{year}_{ijk} * \text{condition}_k) + \beta_7(\text{year}_{ijk}^2 * \text{condition}_k) + \zeta_k + \zeta_{jk} + \varepsilon_{ijk}\end{aligned}$$

where  $\hat{Y}$  is the estimated POMP score for each child and i represents an observation at wave i (waves 0-4), j represents a child, and k represents a school.  $\zeta_k$  represents the variance of the random intercept for each school or the deviation of the score for each school from the overall mean score as represented by the intercept,  $\beta_0$ , and  $\zeta_{jk}$  represents the variance of the random intercept for children in each school and the  $\varepsilon_{ijk}$  represents the residual at each wave (thus allowing transitory deviations at each wave from the predicted value of Y).

We hypothesized that  $\beta_1$  for condition, which represents the initial difference between the children in the program and control conditions (condition was coded 0 for control and 1 for *Positive Action*), would not be significant because of randomization. It is included to verify the randomization and to adjust for any possible baseline differences. We hypothesized that  $\beta_2$  would be significant and negative because boys were expected to report fewer positive behaviors and gender was coded as a 1 for boys and a 0 for girls (Eisenberg, Fabes, & Spinrad, 2006).  $\beta_3$  was expected to be significant and negative because children in the older cohort were expected to have fewer positive behaviors initially than children in the younger cohort and cohort was coded 0 or 1 for the younger or older cohort.  $\beta_4$  and  $\beta_5$  test for the normative trajectory of positive behaviors. We hypothesized that  $\beta_4$  would be significant; that is, we expected there to be a negative trajectory overall. We also included the quadratic term,

$\beta_5$ , to test whether the linear trajectory accelerated or leveled off significantly over time.

The inclusion of the interaction between  $\beta_6$ , (condition and year) and  $\beta_7$  (condition and the quadratic term) allow our models flexibility in estimating possible differences in linear and quadratic components of trajectories associated with whether a student was attending a school implementing the *Positive Action* program. Our study hypotheses predicted a positive interaction between year and condition as well as between year and condition squared (i.e., those children who were in the *Positive Action* condition would report greater increases in positive behaviors relative to the children in the control condition over time and the rate of this increase would grow over time).

Because some children changed schools, were sometimes absent for an administration of the questionnaire, or refused to answer selected items, there were missing data at all waves. For student reports of their own behavior, 1,544 students responded at the first wave, 2,116 at the second wave, 1,498 at the third wave, 1,493 at the fourth wave and 696 at the final wave. The sharp drop at the final wave was because 6 of the 20 schools (3 control and 3 *Positive Action*) did not contain sixth grade and the entire older cohort in those schools was lost to follow-up. We had a total of 7,347 observations from 2,646 children distributed over 20 schools, with an average of 2.8 waves of data for each student. To deal with missing data, full-information, maximum-likelihood estimation was used with the `xtmixed` command. Given that parents, not students, usually decide if a student is in a school or not, it is likely that

the missing at random assumption of full-information, maximum-likelihood estimation was met (Brown, et al. 2008; Olsen & Schafer, 2001).

### *Results*

The random intercept multilevel model of student reports of behavior had an overall Wald  $\chi^2 (7) = 1,227.18, p < .001$ . The variance at the school level and the individual level, as reported in Table 1, were both substantial and the likelihood ratio  $\chi^2$  for the multilevel model versus an OLS regression with 2 degrees of freedom was 669.84,  $p < .001$ . The Wald  $\chi^2$  test is similar to an overall model F-test and gives an idea of overall model fit. The likelihood ratio  $\chi^2$  supports the use of a multilevel model.

The main effect of condition (at baseline) was significant ( $B_1 = 3.73, p < 0.05$ ) (see Table 1). The significant baseline difference in reports of positive behavior is most likely an artifact of fitting a quadratic model, as the baseline differences in behavior were not different using a simple t-test ( $M_{\text{control}} = 67.57, M_{\text{PA}} = 68.07, t(1576) = -0.29, ns$ ). As hypothesized, boys reported significantly fewer positive behaviors than girls ( $B_2 = -8.14, p < 0.001$ ). The children from the older cohort also endorsed fewer positive behaviors ( $B_3 = -7.05, p < 0.001$ ). Contrary to our hypotheses, the main effect of year was not significant ( $B_4 = -0.00, p > 0.05$ ). The year squared term was significant and negative ( $B_5 = -1.72, p < 0.001$ ) indicating an accelerating decline in the endorsement of positive behaviors during elementary school.

Findings further revealed, as hypothesized, a significant interaction between year and condition ( $B_6 = -4.45, p < .05$ ) and between year square and condition ( $B_7 =$

1.48,  $p < .001$ ). The year by condition interaction is the slope of the curve at year zero, with the year square by condition interaction slowing that decline over time.

Table 1. Results for Multi-level Growth Model in Three Trials

Predictor	Hawai'i		Chicago		Southeastern State	
	B	t	B	t	B	t
Intercept	73.79	60.79***	75.27	36.27***	104.48	46.53***
Condition (PA= 1)	3.73	2.50*	-6.77	-2.46*	-2.18	-1.19
Gender (boy = 1)	-8.14	-12.18***	-7.06	-4.75***	-7.77	-11.89***
Cohort (older = 1)	-7.05	-10.46***	Na	Na	-4.51	-17.82***
Year	0.00	0.00	-12.36	-17.22***	-13.32	-6.60***
Year <sup>2</sup>	-1.72	-7.02***	Na	Na	1.69	3.43**
Year X condition	-4.45	-3.68**	4.62	4.63***	2.15	3.40**
Year <sup>2</sup> X condition	1.48	4.76***	Na	Na	Na	Na
Random Effects	Variance	S.E.	Variance	S.E.	Variance	S.E.
School	4.43	2.15	14.47	9.09	2.81	1.95
Individual	148.94	8.23	335.96	23.59	127.35	8.52
Residual	351.73	7.13	395.86	13.12	270.33	7.53
ICC (school level)	0.01		0.03		0.01	
ICC (scores)	0.29		0.43		0.34	
Mean Difference <sup>†</sup>	11.63		10.98		4.87	
Cohen's d	0.46		0.39		0.22	

<sup>†</sup>At final wave accounting for baseline differences

The baseline mean on the endorsement of positive behaviors in PA and control schools was a close match (68.07 and 67.57, respectively). By the fifth wave there had been a substantial reduction in the number of positive items the children in both sets of schools endorsed with sample means of 50.88 and 37.23 for the children in the

*Positive Action* and control schools, respectively. An estimate of the size of the program effect (a simple Cohen's  $d$  for the final wave controlling for baseline differences) was 0.46 (see table 1).

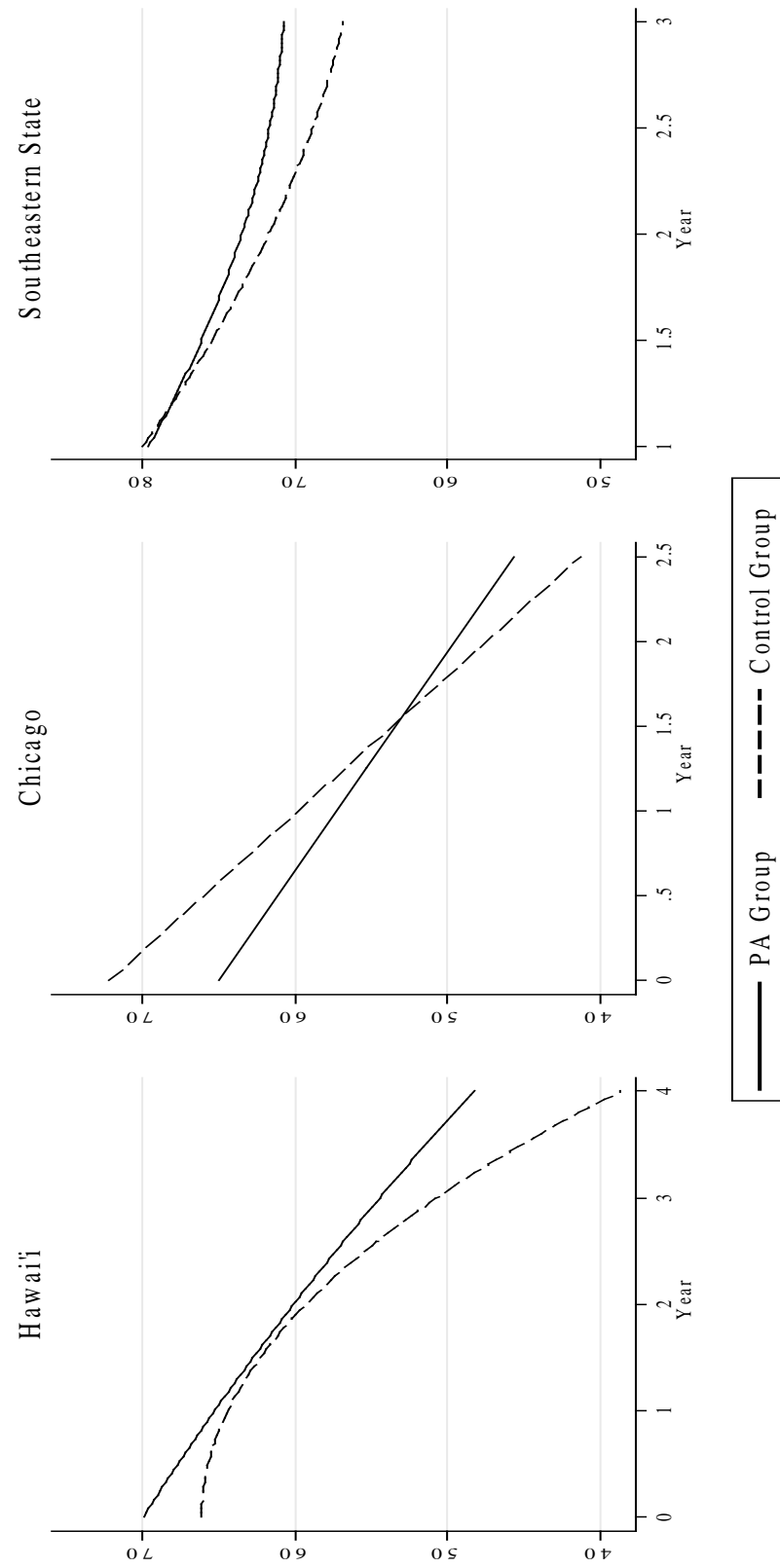
### *Discussion*

Figure 1 (first panel) shows these findings graphically. As hypothesized, the number of positive behaviors endorsed decreased from year to year and this decrease was partially mitigated by the significant positive effect of the *Positive Action* program. We also see that, even though the main effect of condition was significant, the accelerating decline of the control group, coupled with the effects of *Positive Action*, created a much larger gap by the end of the study. It appears that the effect of *Positive Action* here was to eliminate the acceleration in the decline of positive behaviors. This is best seen in the figure as the linear nature of the *Positive Action* line compared with the quadratic curve of the control line. Even with *Positive Action*, there was a steady decline with fewer positive behaviors expected each year.

The Hawai'i student reports of positive behaviors support the most current research on positive behaviors associated with character, namely that the prevalence of these behaviors falls as children enter adolescence (Kokko, Tremblay, et al. 2006; Carlo, Crockett, et al. 2007). They also show that a global measure of positive behaviors declines from 1st grade to 6th grade, extending backwards the work done by Lerner, et al. (2008) on older children. These data also provide new evidence for the effectiveness of *Positive Action*. In particular, results indicated that, in addition to

reducing health-compromising and high-risk behaviors (Beets et al., 2009), *Positive Action* also mitigates the decline of positive behaviors associated with character.

Figure 1. Estimated Trajectories for Behaviors By Condition For All Analyses.



## Chicago Trial

### *Methods*

A second matched-pair randomized study, conducted in 14 elementary schools in the Chicago Public School system, provided five data points across 3-years where data were collected from a single cohort: beginning and end of grades 3 and 4 and the end of grade 5. As in the Hawai`i trial, the teachers within each of the seven program schools received the *Positive Action* training from the program developer and brief update trainings were repeated at the start of each subsequent year. The teachers in the seven control schools received no *Positive Action* training and were asked not to implement the program. The schools in Chicago were matched and randomized in a similar fashion to those in the Hawai`i trial (Li et al., under review). As in Hawai`i there were no significant differences at baseline on any of the variables used for matching (Ji et al., 2008; Li et al., under review).

The same method of creating a global measure of positive behaviors using a POMP score was used as in the Hawai`i trial. A total of 28 behavior items were asked that included 12 items common to the Hawai`i trial, each with the same four response options: “*none of the time*”, “*some of the time*”, “*most of the time*”, or “*all of the time*”. Although the problem of different response options over time did not exist in Chicago as it did Hawai`i, and all items of the SCDS were present, to stay consistent across trials the 28 items were coded 1 for or “*all of the time*” and 0 otherwise. The 28 items were then summed and transformed into a POMP score. Alphas for the dichotomized scale were 0.91, 0.93, 0.94, 0.95 and 0.94 for waves 1-5, respectively.

We used the same multilevel growth model with the Chicago data as the Hawai'i data, but without the cohort variable (as only a single cohort was followed in Chicago).  $\beta_5$ , the year square parameter, and  $\beta_7$ , the year square by condition parameter, were not significant, and the model was rerun without the quadratic effects. A log-likelihood test showed that the model did not significantly degrade with the omission of these two parameters (Log-likelihood  $\chi^2(2) = 0.98, ns$ ).

As in Hawai'i, missing data were handled through use of full-information, maximum-likelihood estimation. Chicago had 593 students at the first wave of data collection, 557 at the second wave, 547 at the third wave, 512 at the fourth wave and 497 at the final wave. For the positive behaviors in Chicago, we had a total of 2,704 observations from 936 children distributed over 14 schools, with an average of 2.9 waves of data for each student. Since the data were collected annually in Hawai'i, but biannually in Chicago, the time variable for Chicago was changed to reflect the difference (0, 1, 2, 3, 4 years in Hawai'i, and 0, .5, 1, 1.5, 2.5 years in Chicago).

### *Results*

The results for positive behavior had an overall model Wald  $\chi^2(4) = 443.07, p < .001$ , supporting the overall significance of the model. The multilevel model also fit better than an OLS regression model,  $\chi^2(2) = 630.85, p < .001$ . Taken together, we have a multilevel model that reduces variation in the outcome and performs better than an OLS regression.

The main effect of condition was negative ( $B_1 = -6.77, p < .05$ ) indicating that, despite random assignment of schools, students in *Positive Action* schools started with

a lower POMP score at baseline than students in control schools. As hypothesized, boys reported significantly fewer positive behaviors than girls ( $B_2 = -7.06, p < 0.001$ ). The main effect of year was negative and significant ( $B_4 = -12.36, p < .001$ ), indicating the predicted general decline in positive behaviors. The year by condition interaction was significant and positive ( $B_6 = 4.62, p < 0.001$ ) as predicted as well, indicating a positive program effect.

Children in *Positive Action* schools had a mean score of 67.64 at baseline and children in control schools had a mean of 72.38. By the final wave of the study, children in control schools had a mean score of 42.23, and children in *Positive Action* schools had a higher mean of 46.08. An estimate of the size of the program effect (a simple Cohen's  $d$  at the final wave, controlling for baseline differences) was 0.39.

### *Discussion*

The children in Chicago *Positive Action* schools started on average lower than children in control schools but, over the course of the study, *Positive Action* children surpassed the control children and, at the end of the study, had a higher mean score than the control children, overall replicating the findings reported from the Hawai'i trial. We see in the bottom middle panel of Figure 1 that, as in Hawai'i, the student data showed that children had a negative trajectory of positive behaviors into the beginning of adolescence. The figure also shows the ability of *Positive Action* to change the trajectory substantially. Unlike in the Hawai'i trial, neither group was accelerating in their decline.

### *Methods*

The Southeastern state trial was conducted in 8 rural public elementary schools, with five age cohorts that ranged from children in kindergarten to fourth grade at wave 1. The data were collected at the end of each of three consecutive academic years. A limitation of the Southeastern state data was that the first measurement occurred at the end of the first year of implementation, so no direct baseline comparison was possible. Nonetheless, we can compare the trajectories of children in the *Positive Action* program for three years, from the end of the first year of intervention thru the end of the third year of intervention. The teachers within each of the four program schools received the *Positive Action* training from the program developer at the beginning of the project, but no follow-up trainings. The teachers in the four control schools received no *Positive Action* training and were asked not to implement the program.

The schools in the southeastern state were matched and randomized, but this was done by the school district, which has not released details of how they matched or randomized. We do have a set of baseline characteristics for the Southeastern state schools (school-level variables similar to those used in Chicago and Hawai'i trials) and Table 2 indicates that the control and *Positive Action* schools were not statistically different at the school level on any of the 7 variables tested. Unlike in the Hawai'i and Chicago trials, student data were collected by school district personnel rather than research staff.

Table 2. Baseline Equivalence for Schools in a Southeastern State

	<i>Control Schools</i>		<i>Positive Action Schools</i>		<i>p</i>
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	
Enrollment	532.50	147.15	543.25	113.60	0.91
Percent Free/Reduced Lunch	61.08	10.30	70.98	14.93	0.32
Percent Special Education Programs	5.40	1.64	4.58	0.97	0.42
Percent Limited English Proficiency	31.03	4.23	32.58	4.18	0.62
Average Daily Attendance Rate	97.33	1.78	96.93	2.31	0.79
Suspensions	0.18	0.13	0.10	0.20	0.55
Retentions	3.05	1.59	2.93	2.94	0.94

As in Chicago and Hawai`i, a set of items asking about frequency of positive behaviors associated with character were asked each year; 14 items were asked, including 12 items common across the other trials. In grades 2-4 the items had three response options: “no”, “sometimes”, and “yes”. For fifth grade, the items had four response options: “none of the time”, “some of the time”, “most of the time”, or “all of the time”. To allow comparison across time and consistent with the other trials, the items were dichotomized, summed and converted into a POMP score to provide a global measure of positive behavior. Alphas for the dichotomized scale were 0.71, 0.71, and 0.73, for waves 1-3, respectively.

The same initial multilevel model was utilized for the analysis of the data as in Hawai`i; however,  $\beta_7$  (Year<sup>2</sup> X condition interaction parameter) was not significant so the model was re-estimated without this interaction term. To test the effect of these

changes on model fit, a log-likelihood test was run and the model fit did not degrade significantly with the above omission (Log-likelihood  $\chi^2(2) = 0.23, p > .05$ ).

The Southeastern state trial had 1,652 students at the first wave, 1,944 students at the second wave, and 1,504 students at the third wave. There were a total of 5,100 observations distributed over 8 schools for 2,610 children with an average of 2.0 waves of data for each student. As in the other trials, full maximum-likelihood estimation was used to account for missing data. Because the data from this trial did not include a baseline measurement, any results reported for baseline are extrapolated by the model.

### *Results*

The results for positive behavior in the southeastern state had a significant overall model (Wald  $\chi^2(6) = 624.97, p < .001$ ). Again, the multilevel model fit better than an OLS regression model,  $\chi^2(2) = 317.63, p < .001$ .

Because students in the Southeastern state trial were first measured at the end of the first year, but not at the baseline, the intercept is an extrapolated value. The main effect of condition (at extrapolated baseline) was not significant ( $B_1 = -2.18, p > 0.05$ ). Boys reported significantly fewer positive behaviors than girls ( $B_2 = -7.77, p < 0.001$ ). The children from the older cohorts endorsed fewer positive behaviors ( $B_3 = -4.51, p < 0.001$ ). The year term was significant and in the hypothesized negative direction ( $B_4 = -13.32, p < 0.001$ ) and the year squared term was significant and positive ( $B_5 = 1.69, p < 0.01$ ), indicating a decelerating rate of decline in the endorsement of positive behaviors during elementary school. The interaction of year

by condition was, as hypothesized, positive and significant,  $B_6 = 2.15$ ,  $p < 0.01$ . This is the intervention effect, as the year square by condition interaction was not included in the final model.

At the end of the first year, our proxy for the baseline mean, reported levels of positive behavior were similar for children in the control and *Positive Action* schools (77.83 and 77.51, respectively). At the end of the study (third wave), the mean number of positive behaviors reported by children in the control schools dropped to 69.89 compared to 74.23 in the *Positive Action* schools. An estimate of the size of the program effect, Cohen's  $d$  at the final wave, controlling for baseline differences, was 0.22.

### *Discussion*

The mitigation of the decline in endorsement of positive behaviors by students in the Southeastern state trial is illustrated in the lower right panel of Figure 1 and is consistent with the results from Hawai'i and Chicago. We also have a replication of the decline in positive behaviors over time. The students in this trial started at much higher levels than in either Hawai'i or Chicago and saw decreasing declines across time. Although this trial is not as methodologically strong as the other two, the greater number of cohorts and the replication of results strengthen both the arguments that behaviors decline into adolescence and that *Positive Action* mitigates this decline.

### Conclusion

Even though each trial had its own racial and socioeconomic demographics, students in each trial responded similarly to the *Positive Action* program. In each case,

the children in *Positive Action* schools showed smaller declines compared with children in control schools. Thus, the *Positive Action* program prevented a significant reduction in positive behaviors.

Overall, the normative declining developmental trajectories that we found are consistent with those found by Lerner (2008) with his global measure of positive behavior, and the literature on pro-social behavior (Carlo, Crockett, et al. 2007; Kokko, Tremblay, et al. 2006; Nantel-Vivier et al. 2009). Given that each of these trials focused on schools in high risk areas (i.e. poverty), it is possible that the declines we found were driven by a combination of exposure to high-risk conditions and a lack of access to protective resources (i.e. positive role models, opportunities for constructive interactions, emotional support) as suggested (Carlo et al., 2007). Developmental theory (e.g., Bronfenbrenner, & Morris, 2006; Wiesner, Capaldi, & Patterson, 2007) generally acknowledges the impact of environments in shaping behaviors. This does not, however, mean that the more cognitive-centered theory presented by Eisenberg et al. (2006) is incorrect; it may be that the lack of resources in these areas overpowers any gains through cognitive development. More work on this hypothesis is needed.

Future research also should examine other possible causes of the variability in developmental trajectories for positive behaviors found in this and other studies. The present study showed that the *Positive Action* intervention beneficially influenced the trajectories in diverse contexts. Further work should consider other factors that may shape the levels and slopes of positive behavior. In addition it would be important to

determine if there are subpopulations of children who respond differently to the intervention utilizing growth-mixture modeling to consider variation in developmental trajectories in the context of evaluating interventions such as *Positive Action* (Segawa et al., 2005).

The combination of three trials in three geographically dispersed school districts, each with diverse populations of students, provides strong evidence that the *Positive Action* program significantly reduced the normative decrease in positive behaviors associated with character as children develop from age 6 to 11 years. The demographic and cultural differences between the Hawai'i trial, the urban setting of the Chicago trial, and the more rural southeastern state trial could account for observed differences in levels and slopes of positive behaviors associated with character. Such differences in trajectories are common in the available literature on the normative trajectories of positive behaviors (Carlo, Crockett, et al. 2007; Kokko, Tremblay, et al. 2006; Nantel-Vivier et al. 2009), but analysis of reasons for the differences is beyond the scope of this paper.

There was variation in the implementation of the intervention that may have influenced its effects. Teachers in all three trials received initial training, but the Southeastern state teachers did not receive the subsequent annual refresher training. Program effects were still evident (though smaller) in the Southeastern state, suggesting that this program's fidelity may depend, to some extent, on the consistent retraining of school staff by program staff. However, all schools that began the trial

were included in the analysis regardless of level of implementation, following intent-to-treat criteria at the school level.

Overall, this research shows the effectiveness of *Positive Action* in mitigating the decrease in self-reported positive behaviors. This study adds to the literature on preventive interventions that actively support the development of positive behavior and character. Past reports of the beneficial effects of *Positive Action* have shown effects on school-level variables, such as academic achievement (Flay, Allred, & Ordway, 2001; Flay & Allred, 2003; Snyder et al., 2010) and negative behavioral outcomes (Beets et al., 2009; Li et al., under review). However, the theoretical basis (Flay & Allred, 2010) and day-to-day protocol of the intervention focuses on promoting positive attitudes and behaviors. The reduction in negative behaviors and improvement in academic achievement is considered as a result of more positive individual development. It is clear that this approach is effective. But to better understand and demonstrate the mechanism of these beneficial effects it is essential to show that the intervention influences the development of positive behavior. This report partially fills that gap by showing the effects of *Positive Action* on positive behaviors related to character development. Further research is needed to clarify the role of positive behavior as a potential mediator for the effects of this intervention on negative outcomes and academic achievement. Nevertheless, this study provides new insights on preventive interventions that apply a comprehensive approach that includes the development of positive cognitive, emotional and behavioral characteristic in school-aged children.

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Effects of a Social-Emotional and Character Development Program on Multiple Trajectories of Behaviors Associated with Character Development: A Growth Mixture Model.

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### Abstract

Using the Chicago Randomized Trial for the evaluation of *Positive Action*, multiple trajectories of character development with links to a distal outcome were tested for using latent class growth mixture modeling. A measure of character was given to students at 5 time points over 3-years of elementary children in 14 schools in the Chicago School District. A latent class growth mixture model was used to look for subpopulations of growth trajectories. These trajectories were also connected to delinquent behavior recorded at the end of the study. Results suggested that two distinct groups existed in the Chicago data, identified both by their intercept and slope on positive behavior and by their delinquent behavior at the end of the study. The effect of *Positive Action* was similar for both of these two groups.

Key Words: Character Development, Positive Action, Latent Class Growth Mixture Modeling

## Introduction

The empirical evidence for multiple trajectories of social emotional and character development is steadily growing. This evidence comes from a multitude of areas. Lerner (2008) in his study of positive youth development has found evidence for multiple trajectories that adolescents are following. In the area of prosocial development, several authors (Kokko et al, 2006; Nantel-Vivier et al., 2009) have found multiple trajectories across late childhood and through adolescents. There has also been research connecting social emotional and character development to more distal outcomes (Elias 2006; Ciarrochi, Heaven, & Davies 2007). The research into the effect of interventions on these trajectories is also growing (CASEL 2003; Fraser et al. 2009). However, in large part, these three research paths (multiple trajectories, connections to other outcomes, and intervention) have been largely independent. In some cases the melding of two of these three research questions has been observed (e.g. multiple trajectories and intervention; Lerner, 2008), but the authors are not aware of work on the connection of all three research questions (multiple trajectories of character development, character development's connection to distal outcomes, and the effects of intervention on character development). The application of latent class growth mixture modeling holds the potential for allowing for the combination of all three research questions.

Latent class growth mixture modeling is the combination of traditional latent growth modeling with latent class analysis (Muthén, 2002). This combination allows for the empirical testing for multiple trajectories of social emotional and character

development. Muthén has provided examples of both adding distal outcomes predicted by class membership and testing the effects of randomized trial interventions on multiple trajectories. This paper seeks to combine the three research questions and evaluate the effect of the *Positive Action* program on the multiple developmental trajectories of positive behaviors associated with character and how the distal outcome of delinquent behavior is affected by these trajectories.

In 2006, Kokko et al. published data on the trajectories of positive social behavior in boys as reported by teachers. The authors were surprised that the boys were found to decline or, at best, stay stable in positive social behaviors into adolescence. Nantel-Vivier et al. (2009) extended the age of observation with a cross-national comparison of boys from 10 to 15, with mother and teacher reports for a Canadian sample, and teacher and student reports for an Italian sample. Although differences existed between samples and by who reported (students, mothers, or teacher), similar declines in trajectories were observed. Kokko et al. suggested that from middle childhood a general downward trend in positive social behaviors exists. In both cases, even with the general trend similar for all classes, the idea of multiple trajectories was supported.

Lerner et al. (2005) discussed what they see as inherent in the idea of positive youth development, which is roughly analogous to the view found in Catalano et al. (2004) and the impetus behind SECD programs. Lerner presents five Cs (competence, confidence, connection, character, and caring) that make up their larger concept of positive youth development. Even though Lerner et al. specify a separate component

called character, others (i.e. Peterson, & Seligman, 2004) see the attributes involved in the other four C's as also being part of character. Lerner measured the five Cs in order to construct a single global measure of positive youth development. Using this global measure Lerner et al. (2008) found that the general trend of positive youth development was negative; that is, youth endorsed fewer positive behaviors as they got older. They also reported that several different trajectories existed, and that one of them did actually increase.

The results presented by Lerner et al. (2008), Kokko et al. (2006), and Nantel-Vivier et al. (2009) all showed that behaviors associated with character generally decrease from middle childhood through the end of adolescence. The reasons given for this decline are simple or nonexistent, which is not surprising given that the results are contrary to the theoretical model presented by Eisenberg et al. (2006) (the foundation of Kokko et al., 2006; and Nantel-Vivier et al., 2009). Phelps, Zimmerman, Warren, Jeličić, von Eye, and Lerner (2009) discussed the decline, but simply stated that they plan on watching it for a few more years. Kokko et al. and Nantel-Vivier et al. simply suggested that more work is needed to understand the decline. Carlo et al. (2007) gave possible reasons for the decline, all of which focussed on the environment surrounding boys in school. Although not directly interested in multiple trajectories of positive behavior, Carlo et al. also found a decline in behaviors and felt that the environmental pressures on adolescents is the main reason.

In addition to work on the multiple trajectories of character development, researchers have been linking character development to a variety of distal outcomes.

Ciarrochi, Heaven, and Davies (2007) connected several different aspects of character (Peterson and Seligman, 2004) to academic outcomes and emotional well-being in a purely developmental context. Elias, (2006) presented a similar argument, with a focus on how a social and emotional learning program can facilitate the connection. Fraser, Guo, Ellis, Day, Li, Wike, and Farmer (2009) present results from the Competence Support Project and the effect of the program on a variety of behavioral outcomes. In addition to these specific examples, the collective work of CASEL and the Character Education Partnership give numerous examples of connecting the effects of SECD programs to a multitude of outcomes. However, as far as the authors can find, this is the first study to connect a distal outcome to multiple trajectories of character development while evaluating an intervention program.

*Positive Action* is one of the programs evaluated under the Social and Character Development grants funded by the U.S. Department of Education in 2003. Grounded in a broad theory of self-concept (Purkey, 1984), *Positive Action* was developed and revised by educational psychologist Carol Gerber Allred from 1977 to the present, with frequent additions and revisions over the years based on formative and monitoring data. Most recently the application of the Theory of Triadic Influence (Flay, Snyder, & Petraitis, 2009) has moved *Positive Action* in the direction of characterization as a Social-Emotional and Character Development program (Flay & Allred, 2010). The combination of the work by Purkey and Flay et al. posits the *Positive Action* program's influence on character as being through the reinforcement of positive behaviors associated with character development.

Children begin a cycle of reinforcement, where positive reinforcement of positive behavior leads to positive feelings about self that lead to positive thoughts that generate more positive behaviors. More detailed descriptions of the *Positive Action* program are available at [www.positiveaction.net](http://www.positiveaction.net) and in the work of Flay, Allred, and Ordway (2001) and Flay & Allred (2010). The *Positive Action* program has already been shown to be effective (as defined in Flay 1986, updated Flay et al., 2005) in reducing the decline in positive behaviors (Washburn et al., under review), enhancing academic achievement and school involvement (Snyder et al., 2010), and reducing disciplinary referrals, substance use, risky sexual behavior and violence (Beets et al. 2009; Flay et al. 2001; Flay and Allred 2003; Li et al. under review).

### Methods

A matched-pair randomized study in 14 elementary schools in the Chicago Public School system provided five data points across 3 academic years where data were collected from a single cohort: beginning and end of grades 3 and 4, and the end of grade 5. The teachers within each of the seven program schools received the *Positive Action* training from the program developer and brief update trainings were repeated at the start of each subsequent year. The teachers in the seven control schools received no *Positive Action* training and were asked not to implement the program.

The schools receiving the *Positive Action* program were randomly assigned from matched pairs based on a multivariate indicator of factors related to academic risk (c.f., Dent et al., 1993). This matching utilized the following school-level characteristics: proportion of students receiving free or reduced price lunches, percent

stability of student enrollment, achievement scores on standardized tests, ethnic distribution, student-teacher ratios, school size, and school-level problem behaviors such as suspensions (for more information see Li, et al. under review). There were no significant differences between *Positive Action* schools and control schools at baseline on any of the variables used to match schools (Li et al., under review).

Students were asked a series of questions about their behaviors and feelings associated with those behaviors. For this analysis, only the behavioral questions were considered. The purpose of these items was to collect information on the positive behaviors associated with character. This idea is more fully developed by Ji et al. (under review) in the development of a Student Character and Social Development Scale (SCDS) using the same data used here. Examples include “Do you work hard in school?” “Do you respect others?” and “Do you try to be the best you can be?”

A total of 28 behavior items were asked, each with the same four response options: “*none of the time*”, “*some of the time*”, “*most of the time*”, or “*all of the time*”. We wanted to test whether this was truly part of the child’s behavior repertoire, so the items were dichotomized with 1 meaning “*all of the time*” and 0 being the three other responses. The 28 items were then summed and transformed into a POMP (percent of maximum possible; Cohen, Cohen, Aiken & West, 1999) score. The POMP score allows for easy interpretation of intercept and percentage change over time. Alphas for the dichotomized scale were 0.91, 0.93, 0.94, 0.95 and 0.94 for waves 1-5, respectively.

In addition to the 28 items of the SCDS, 11 items were asked that come from the Youth Risk Behavior Survey (Centers For Disease Control, 2004). The 11 items asked about the frequency of behaviors dealing with delinquent behavior. Examples include “Have you ever smoked a cigarette (or used some other form of tobacco)?”, “Have you ever drank alcohol (beer, wine or liquor)?”, “Have you ever carried a knife or razor to use to hurt someone?”, and “Have you ever been a member of a gang?”. These items were dichotomized to reflect whether a student had ever done the behavior (1 equals having done the behavior at least once, 0 equals never having done the behavior). The additional covariates of gender, age and race were also recorded for inclusion in the model.

A total of 593 students provided data at the first wave of data collection, 557 at the second wave, 547 at the third wave, 512 at the fourth wave and 497 at the final wave. For the positive behaviors, we had a total of 2,696 observations from 930 children distributed over 14 schools, with an average of 2.9 waves of data out of 5 for each student. The delinquent behaviors measure was only asked at the final wave, so only 497 students have data for that measure. Given the large amount of missing data, and concern about meeting the Missing at Random (MAR) assumption necessary for use of the LCGM model in Mplus, multiple imputation was run on the data. Before the imputation, a series of analyses were run to determine the best models to predict the positive behaviors and delinquent behaviors as well as missingness. The auxiliary variables used in the multiple imputation ranged from questions about peer, parent, and teacher relationship to questions about safety of the neighborhood and school to

information about the child's caregiver. A total of 20 imputations were run on the data, resulting in 20 replications for any analysis in Mplus.

### *Analysis*

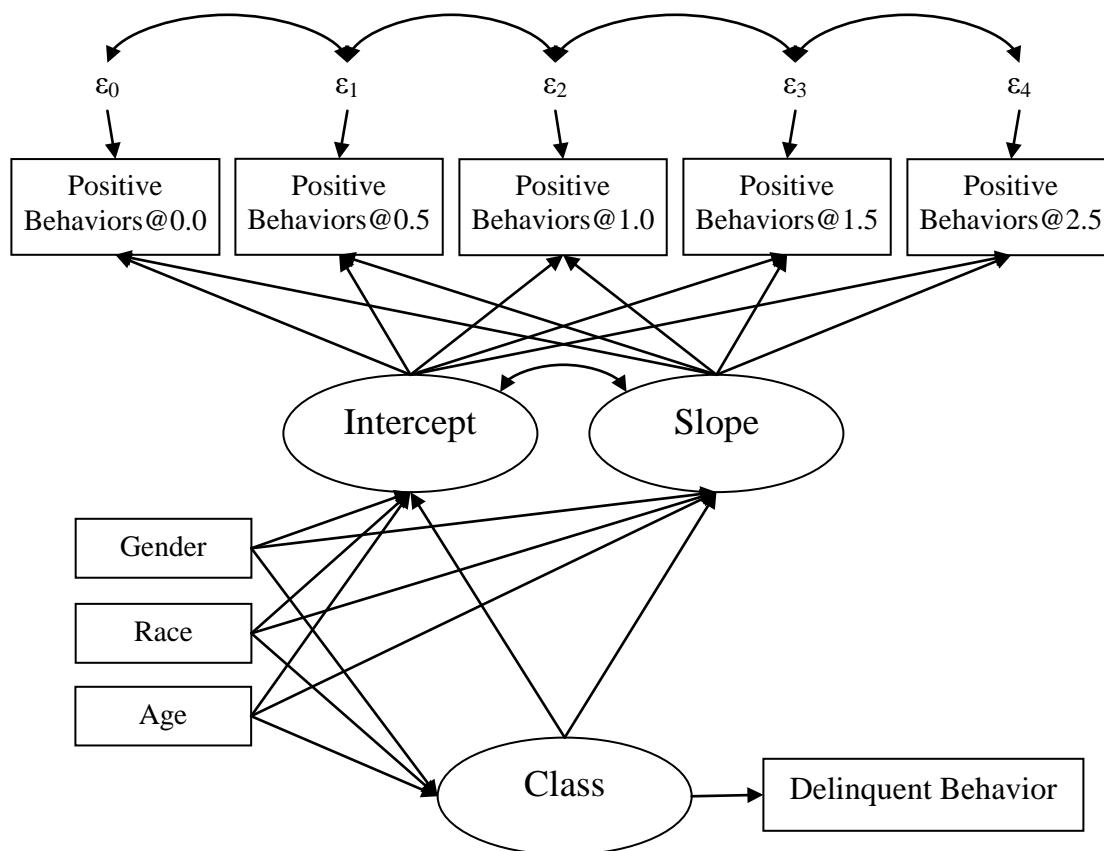
In following the analysis as described by Segawa et al. (2005) and Muthén (2002), we first ran the model without condition for both the control and treatment groups separately. This provides information on the two randomized groups and whether condition causes different classification to happen (e.g. number of classes, different proportions in the classes). This step is important, as any dramatic differences in classification between the control group and the treatment group could lead to difficulties in interpreting the effect of condition on the intercept and slope when the control and treatment group are combined.

Two to five-class solutions, excluding the effect of condition, were run for both the control and treatment groups separately (see figure 1). The best class solution was then selected using the Bayesian Information Criterion (BIC) and entropy along with appropriate substantive interpretation. This process allowed the two groups to be compared on BIC, entropy and substantive interpretation before the introduction of condition to look for any problem areas. Given that the nested nature of the data, a sandwich estimator for the standard errors were used to account for the dependence of children within schools. Previous work has reported the low ICCs for this data at the school level (Washburn et al. under review), so it is possible that this clustering was not necessary (Preacher et al., in press). A model without clustering was run, but substantive changes in parameter estimates occurred leading to the retention of the

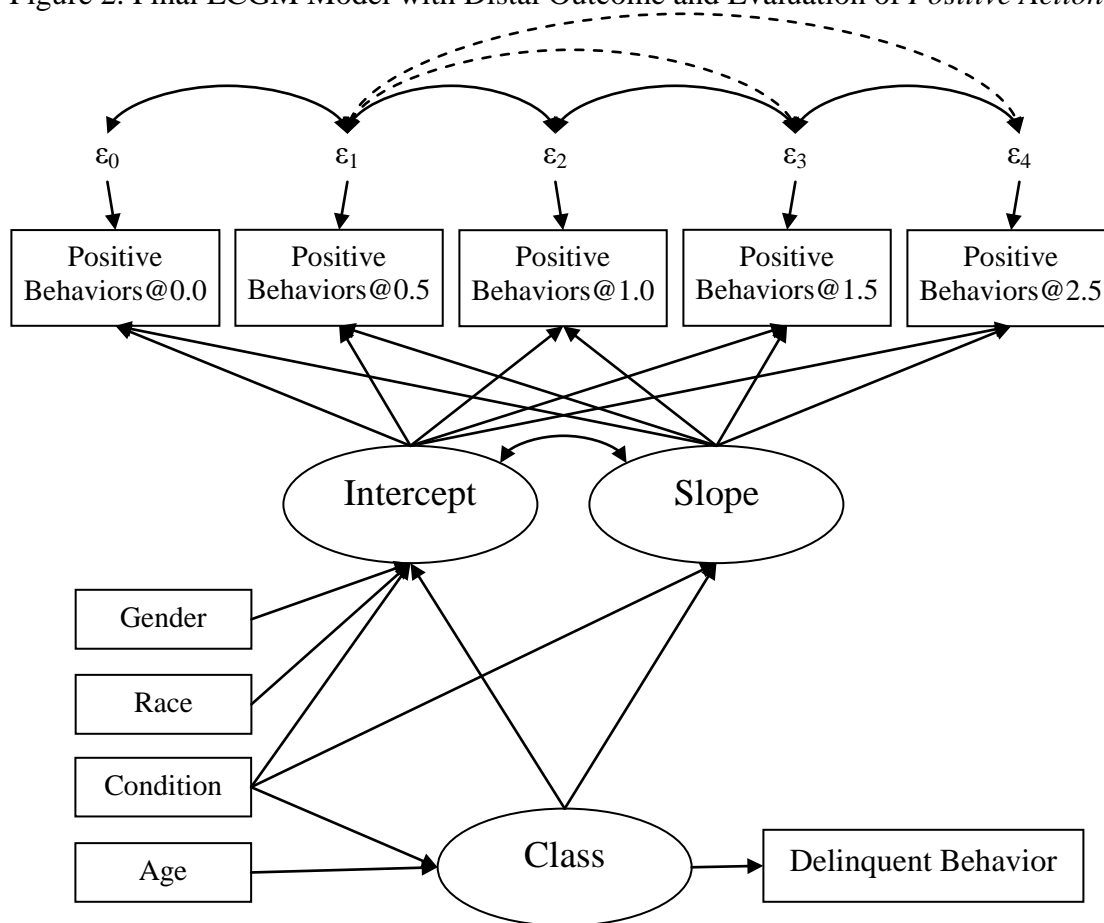
clustering for the analysis of the control and treatment groups separately and the final analysis combining the control and treatment groups.

Assuming that both the control and treatment groups show similar classification, the groups will be combined and 2 to 5-class solutions will be run on the two groups combined. Although substantive interpretation was important for the separate control and treatment group analyses, it is even more important for the analysis of the two groups combined and given the potential for small sample size within specific classes, the hypothesized model was modified for the two combined groups analysis. The model was modified to remove non-significant paths (except the path from condition to class, which is hypothesized to be non-significant) and add correlations between the residuals to deal with slight nonlinear growth in the model (Stoolmiller, Gerrard, Sargent, Worth, & Gibbons, 2010) (see figure 2). The autocorrelation already in the model (figure 1) did not adequately account for a slight plateau at wave 2 and 3. The extra autocorrelation added to the model (figure 2) showcased the similar connections of the second and third wave with later waves.

This model was then compared to the original models for each of the two to five-class solutions to verify that 1) the log likelihood ratio test was not significant, and 2) the model improved according to the BIC and entropy. Figure 1 represents the models tested for the control and treatment group separately, and figure 2 represents the final model used for the combined group. I present the results of the analysis for the groups separately focusing on classification, then I present solutions for the two groups combined with a focus on the model results of the best solution.

Figure 1. LCGM Model with Distal Outcome and Evaluation of *Positive Action*

Note: The lines from gender, race, condition, and age to the intercept and slope are all allowed to be different by class.

Figure 2. Final LCGM Model with Distal Outcome and Evaluation of *Positive Action*

Note: Dashed lines were added to the hypothesized model. Paths from Gender and Race to the Slope and Class were dropped in the final model. Paths from Age to the Intercept and Slope were both dropped in the final model.

### Control and Treatment Group Separate Analyses

In table 1 are the BIC and entropy for the control and treatment group one to five-class solutions. We see from table 2 that the two-class solution has the lowest BIC and the highest entropy for both groups. The inclusion of the once class solution supports the use of latent class growth mixture modeling as the 2-class solution improves on the one-class solution for both the control and treatment groups.

Table 1. Bayesian Information Criterion and Entropy for Both Separate Analyses

	Control Students			Treatment Students		
	Bayesian (BIC)			Bayesian (BIC)		
	Mean	SD	Entropy	Mean	SD	Entropy
1 Class	22851.901	94.972	--	24662.942	71.496	--
2 Classes	22810.800	95.248	0.827	24626.582	73.911	0.874
3 Classes	22871.519	97.073	0.646	24691.745	76.522	0.730
4 Classes	22936.390	92.314	0.700	24762.379	75.688	0.801
5 Classes	23012.541	92.923	0.694	24842.029	78.779	0.678

If we continue on to figure 2 and 3, we see that we have a normative group and a deviant group in the two class solution for both the control and treatment groups. The remaining class solutions seem to divide up the normative group piece by piece until there are five uniformly sized groups in the 5-class solution.

Table 2. Control-Count and Proportions of Latent Classes

[illegible]

Table 3. Treatment-Count and Proportions of Latent Classes

Latent Classes	2 Class Solution		3 Class Solution		4 Class Solution		5 Class Solution	
	Count	Proportion	Count	Proportion	Count	Proportion	Count	Proportion
1	398	0.82552	156	0.32355	168	0.34782	104	0.21639
2	84	0.17448	235	0.48651	99	0.20622	112	0.23185
3	--	--	92	0.18994	130	0.26961	115	0.23807
4	--	--	--	--	85	0.17635	78	0.16089
5	--	--	--	--	--	--	74	0.1528

Looking at table 4 and 5, we see that the substantive interpretation for both models is very similar. The normative group has a higher intercept and slightly larger negative slope than the deviant group for both groups. The normative group (with a higher intercept on positive behavior) also has a lower mean value of delinquent behavior at the final wave of the study. The subsequent class solutions simply make greater differentiation at the intercept and delinquent behavior at the final wave. The combination of the BIC, Entropy, similar proportions, and similar substitutive all pointed toward similar classification for both groups suggests that no problems with condition and classification will exist in the analysis of the two groups combined. The problem with classification will be more formally addressed now in the analysis of the combined groups.

Table 4. Results for Two-Class Solution-Control Group

	Latent Class 1-n=309			Latent Class 2-n=139		
	Est.	S.E.	<i>p</i>	Est.	S.E.	<i>p</i>
Intercept	67.904	4.580	0.000	59.645	7.655	0.000
Slope	-7.762	1.925	0.000	-10.008	3.313	0.000
Delinquent Behavior	1.788	1.011	0.339	3.524	1.160	0.039

Table 5. Results for Two-Class Solution-Treatment Group

	Latent Class 1-n=398			Latent Class 2-n=84		
	Est.	S.E.	<i>p</i>	Est.	S.E.	<i>p</i>
Intercept	62.269	4.580	0.000	50.194	7.655	0.000
Slope	-7.110	1.925	0.000	-6.055	3.313	0.068
Delinquent Behavior	0.729	1.011	0.471	4.720	1.160	0.000

### Control and Treatment Combined Group Analysis

The combined group analysis for the 1 to 5-class solutions information criterion is in table 6. As in the separate group analyses the 2-class solution is the best according the BIC and entropy. In the two-class solution we had a measure of entropy of 0.836, suggesting adequate amount clarity in the groups. In the two class solution we have a normative group of 781 students and a deviant group of 149 students (see table 7). The remaining class solutions made class distinctions that were slight differences between the two-class solution in intercept, slope, and delinquent behavior.

Table 6. Combined-Information Criterion and Entropy

	Bayesian (BIC)		Entropy
	Mean	Std Dev	
1 Class	49010.153	125.145	--
2 Classes	47215.025	129.413	0.836
3 Classes	47226.223	132.354	0.773
4 Classes	47275.973	133.596	0.609
5 Classes	47313.881	131.434	0.710

Table 7. Combined-Count and Proportions of Latent Classes

[illegible]

The effect of condition on class membership (table 8) was non-significant ( $B = -0.467, p > 0.05$ ), confirming that any effect of condition on slope is not because of classification issues with randomizing the schools. At the same time we see that age does predict class membership significantly ( $B = 0.932, p < 0.001$ ), with an odds ratio of 2.540. Both gender and race were removed from the model because of non-significance.

Table 8. Logistic Regression Predicting Membership of Class 2

	Estimate	S.E.	P-Value	OR
Age	0.932	0.244	0.000***	2.540
Condition	-0.467	0.433	0.281	0.627
Intercepts	-1.193	0.370	0.001**	--

In comparing the two classes we see that the intercept of the first class is equal to 52.645 ( $p < 0.001$ ) (see table 9), with the intercept in the second class equal to 70.762 ( $p < 0.001$ ). We see that the effect of gender on the intercept was similar and positive in both classes, with the effect non-significant in the first class ( $B = 4.678, p > 0.05$ ) and significant in the second ( $B = 4.884, p > 0.01$ ). The effect of condition on the intercept was also similar but negative, with the effect non-significant in the first class ( $B = -7.574, p > 0.05$ ) and significant in the second ( $B = -7.644, p > 0.01$ ). The effect of race on the intercept varies between the two classes. The first class has the other category of race (not White, Latino, or African American) as having the highest intercept ( $B = 2.033, p > 0.05$ ), but not significantly different from African American students. Both White students ( $B = -14.355, p < 0.05$ ) and Latino students ( $B = -32.068, p < 0.001$ ) had significantly lower intercepts than the African American students. The second class has the other category of race (not White, Latino, or

African American) as having the highest intercept ( $B = 3.579, p > 0.05$ ), but not significantly different from African American students. Both White students ( $B = -4.069, p > 0.05$ ) and Latino students ( $B = -7.725, p < 0.01$ ) had lower intercepts than the African American students, but only Latino students had significantly lower intercepts. To test whether or not these differences were significant between models, a log likelihood ratio test was run. The test was found to be significant ( $\chi^2(5) = 23.046, p < 0.001$ ), suggesting that the differences between class are significant.

The difference in slopes is smaller than the differences in the intercept, with the first class ( $B = -10.249, p < 0.001$ ) having a slightly higher slope than the second class ( $B = -9.483, p < 0.001$ ). Looking to the effect of condition on the slope (the important parameter in testing a program effect), we see that in the first class we have an effect of 3.447 ( $p > 0.05$ ), and in the second class we have an effect of 3.736 ( $p < 0.05$ ). We also see that in the first class we have an average endorsement of 4.660 ( $p < 0.001$ ) delinquent behaviors out of 11, with only an average endorsement of 0.611 ( $p < 0.001$ ) delinquent behaviors out of 11 in the second class. This difference was found to be significant through a log likelihood test ( $\chi^2(1) = 187.576, p < 0.001$ ) of this model and a model that constrains the means to the same, at the same time, all of the information criterion and entropy showed the model with unequal means for delinquent behavior was better.

Table 9. Results of Latent Class Growth Mixture Model for Combined Group

Regression	Latent Class 1			Latent Class 2		
	Estimate	S.E.	P-Value	Estimate	S.E.	P-Value
Intercept on Girl	4.678	6.902	0.498	4.884	1.516	0.001**
Intercept on Condition	-7.574	8.375	0.366	-7.644	2.526	0.002**
Intercept on White	-14.355	5.993	0.017*	-4.069	3.022	0.178
Intercept on Latino	-32.068	8.896	0.000***	-7.725	2.322	0.001**
Intercept on Other	2.033	6.202	0.743	3.579	2.020	0.076
Slope on Condition	3.447	3.468	0.320	3.736	1.633	0.022*
Residual Correlations						
Slope with Intercept	0.131	0.986	0.894	0.131	0.207	0.527
Pomp@0.0 with Pomp@0.5	0.225	0.083	0.007**	0.225	0.061	0.000***
Pomp@0.5 with Pomp@1.0	0.257	0.047	0.000***	0.257	0.030	0.000***
Pomp@0.5 with Pomp@1.5	0.216	0.053	0.000***	0.216	0.038	0.000***
Pomp@0.5 with Pomp@2.5	0.158	0.064	0.014*	0.158	0.043	0.000***
Pomp@1.0 with Pomp@1.5	0.242	0.062	0.000***	0.242	0.050	0.000***
Pomp@1.5 with Pomp@2.5	0.131	0.986	0.894	0.131	0.207	0.527
Means						
Delinquent Behavior	4.660	0.363	0.000***	0.611	0.155	0.000***
Intercept	52.645	5.404	0.000***	70.762	2.182	0.000***
Slope	-10.249	2.251	0.000***	-9.483	1.214	0.000***

Note: \* p<0.05, \*\* p<0.01, \*\*\*p<0.001

### Discussion

The final model supports the current literature on multiple trajectories, with two distinct groups found in the randomized trial. Similar to the other multiple trajectory papers (Lerner et al., 2008; Kokko et al, 2006; and Nantel-Vivier et al., 2009), this analysis found only classes that showed declines in behavior over time. At the same time, in support of the classes we found, we found that the children that started higher in positive behaviors and had shallower slopes, and endorsed fewer delinquent behaviors at the end of the study. It is interesting that only age predicted

class membership, with children of higher age for their grade being more likely to be in the deviant class with a lower intercept and higher delinquent behavior at the end of the study. Being that this is age within grade, it is possible that this is acting as a proxy for poor academic achievement and problem behaviors; as children who are older within a grade are more likely to have been held back a grade for those reasons. It is important to note here that neither gender or race predicted class membership, and as such boys, girls, and students of different racial backgrounds were just as likely to be in each class. So even though race was a strong predictor of the intercept in both classes, and the effects of race on intercept was strikingly different in both classes (see figure 3), race does not predict a student being more likely to be in the deviant group.

It is also important to note that the effect of the treatment on the slope of behavior was virtually identical in both classes, with the small sample size in the deviant class being the likely reason for the non-significant result. This suggests that *Positive Action* is benefiting both classes in a similar fashion. This can clearly be seen in figure 4. The solid lines are the *Positive Action* children in both classes, with the dashed lines being the estimated trajectory for the control children. The triangles representing the normative class (class 2 in results) and the diamonds representing the deviant group (class 1 in the results). Even though there are obvious class differences in the intercept, the slopes are very similar, with the deviant class falling slightly faster. The treatment effect is also very similar in both classes. In both classes, the *Positive Action* children start lower and end higher; mirroring the results from the simple multi-level growth model found by Washburn and colleagues (under review).

The major limitation of this study is the small number of clusters that is lowering our power. It is possible that with a larger number of clusters the standard errors for the deviant class would have been larger, resulting in significance for the condition by time interaction..

Future work should look at possible connections between condition and delinquent behavior and check for any mediation effects with the slope of the trajectory of positive behaviors associated with character. It would also be helpful to explore more what predicts class membership, allowing for a better understanding of why some children have significantly higher intercepts and slightly lower slopes.

Figure 3. Trajectory of Positive Behavior for Two-class Solution by Race

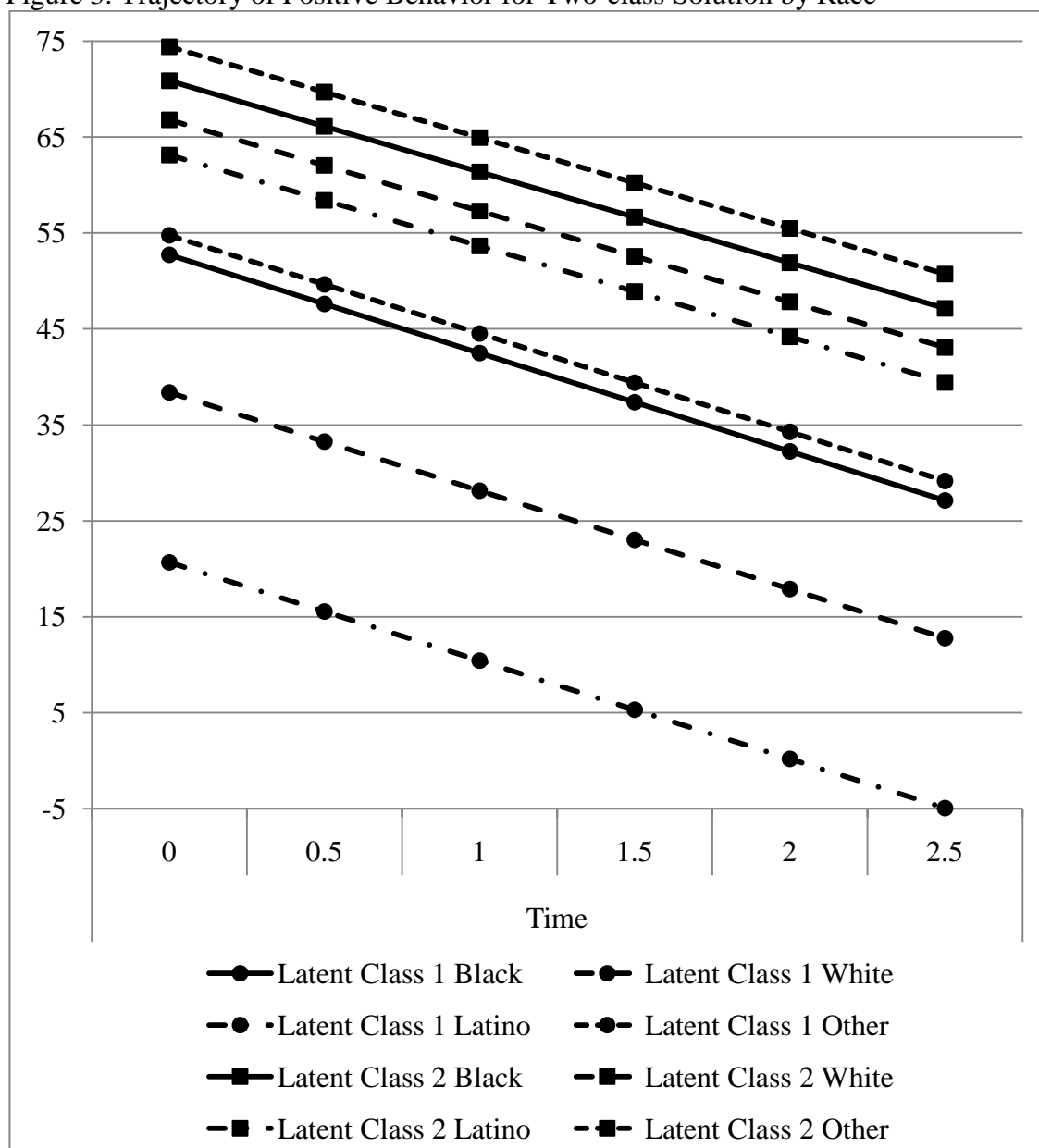
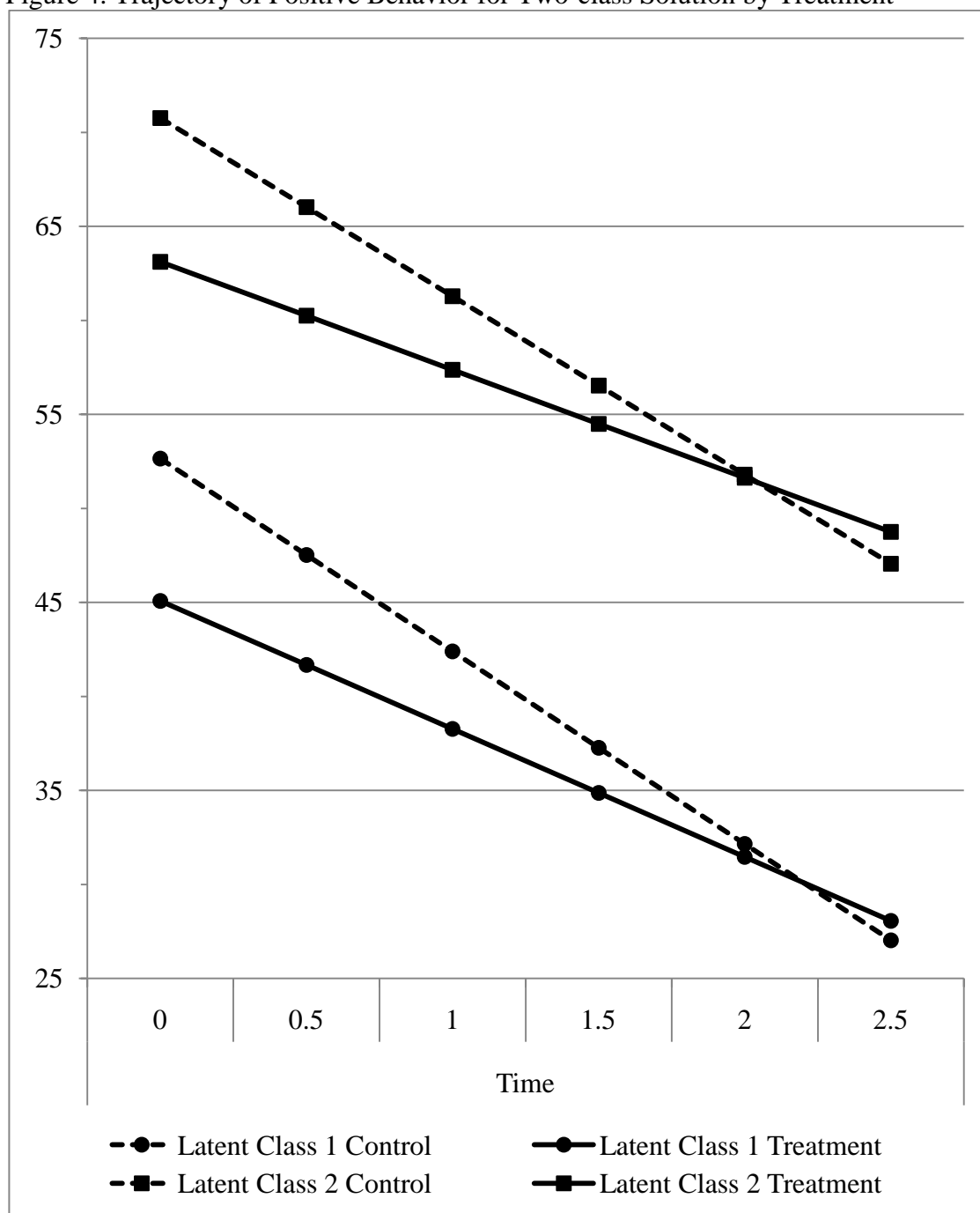


Figure 4. Trajectory of Positive Behavior for Two-class Solution by Treatment



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## Conclusion

The study of character development and its implications for prevention programs is becoming increasingly common in both the developmental literature as well as the prevention science literature. This is building off of almost a centuries worth of interest in character by the academic community (whether it was called character, moral reasoning, prosocial behavior, social skills, positive youth development, social and emotional learning, etc.). Interestingly enough, most of the attention has been on defining character, or hypothesizing how it develops (with a focus on adults, (Kohlberg, Levine, & Hower, 1983), not on empirical studies of how character develops. This could be in large part because the data and analytical tools necessary have only come into common use in the last decade. This surge in longitudinal analytical tools, including multiple-level growth modeling and latent class growth mixture modeling, means that the development of behaviors associated with character can be studied empirically now.

This has been especially true in the field of prevention science, where the randomized multiple-level growth model is becoming common in determining the effects of a program. This model controls for clustering and allows long-term effects of programs for different groups to be determined. The increased emphasis on long-term effects is in part what drives the acceptance of this methodology. Gone are the days where a simple cross-section analysis is sufficient as evidence for the widespread adoption of a program. The ability of a program to fundamentally change the

direction people take in life is becoming more and more the standard of good programs, short term boosts are not enough.

The field of character development is expanding and the empirical studies of the development of character are coming from a multitude of sources. The Positive Youth Development movement is reinforcing at federal, state, and local levels the importance of building up positive attitudes, beliefs, and behaviors among adolescents, not just preventing certain types of behavior. This approach is increasingly being shown as effective in changing for the better how character develops in adolescents, as well as preventing delinquent and risky behavior. At the same time the work done in cognitive research on moral reasoning and prosocial behavior is giving us a better understanding of how many of the behaviors associated with character come from changes in the cognitive abilities of children and adolescents. Developmental psychology in general is also adding to our understanding of the acquisition of social skills, and the development of a moral identity and the context in which they develop. Positive psychology is enhancing our understanding of the multidimensional nature of character and, combined with the Theory of Triadic Influence, provides a framework for integrating diverse literatures. With this framework, we can move forward and use these ideas to evaluate social-emotional and character development programs.

*Summary of results for 1<sup>st</sup> paper*

The effect of *Positive Action* on the trajectory of elementary students was tested across three different randomized trials using a multi-level random intercept growth model, with similar results in each trial. The program successfully mitigates

the decline in behaviors associated with character in all three trials. The developmental decline in positive behaviors was also observed in all three trials, supporting recent work suggesting that these behaviors fall from early childhood into adolescence. The different patterns of decline across the three trials suggest that, with more information about the students, multiple trajectories could be observed and predicted within a single population of students.

#### *Summary of results from 2<sup>nd</sup> paper*

Building off of the first paper, multiple trajectories with the Chicago trial were evaluated using latent class growth mixture modeling. Two distinct subpopulations were found. The groups were identified mainly by differences in intercept and the distal outcome of delinquent behavior. In the combined group, the effect of *Positive Action* on the slope of character development was nearly the same, suggesting the reach of *Positive Action* to both children with high and low levels of behaviors associated with character.

#### *Connections between two papers*

The two evaluations of *Positive Action* presented in this dissertation provide a depth and breadth that, as far as the author can find, is uncommon in the field of prevention science and evaluation. Both papers utilized advanced analytical tools combined with strong designs to show the generalizability of effects of the program across three different locations in the United States and within a single population allowing for multiple trajectories. First, and most important, is the that the *Positive Action* program was found to successfully change the developmental trajectories of

elementary students in three different locations in the United States, and that these changes were still observable when multiple trajectories were allowed for in the Chicago randomized trial. The change in trajectory is important, as it is fundamentally what SECD programs present themselves as doing.

Looking specifically at the Theory of Triadic Influence, we see that *Positive Action* attempts to increase the positive influences in a child's life, while at the same time, teaching them the skills they need to make the best decisions possible about their behavior. The results of these two papers suggest that this process is working. The different geographical locations of Hawai'i, Chicago and a rural school district in a southeastern state show the adaptability of the program in producing effects in all three locations. This is particularly interesting since each location presented a different set of demographic characteristics. The program had similar effects among schools across the islands of Hawai'i (which covered both rural and urban schools) with a mix of racial and ethnic groups, to urban Chicago with large African American and Latino groups, to a rural Southeastern State with a large African American majority. *Positive Action* has shown itself to be able to adapt effectively and retain similar program effects.

At the same time, the increasing acknowledgement that not all children follow the same trajectory in the development of character forces us to look at the possibility that *Positive Action* is effecting only a single subpopulation and is not reaching all children in the same way. This follows in the same vein as the ability of the program to adapt across wide geographical and demographical differences; can the program

reach all children regardless of their specific characteristics? The latent class growth mixture model addresses this and adds to knowledge about the adaptability of the program. *Positive Action* not only generalizes across the country, but within a single population of students as well. The effect of *Positive Action* on the slope of character development is nearly identical in both subpopulations in the Chicago trial. This suggests that *Positive Action* is reaching all of the children within the schools it is implemented, regardless of their original trajectory in the development of character. This is the first program to show this; prior uses of growth mixture class analyses found that programs were effective only for high-risk groups of students (Muthen et al, 2002; Segawa, et. al., 2005).

#### *Future Directions*

How this change in trajectories caused by *Positive Action* effects other outcomes (delinquent or risking behavior) is of importance, suggesting a mediation analysis. It would also be important to test whether movement between different trajectories of character development is possible and whether *Positive Action* can influence that movement between trajectories.

In terms of character development, more attention needs to be spent on what predicts class membership. This paper showed that age within grade predicts class membership, but school, family, and other child centered variables need to be identified that can predict class membership. There is still much that can be done in linking the developmental context of character to the ability of interventions to influence that development.

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