

EFFECTS OF SECOND STEP CURRICULUM ON BEHAVIORAL AND ACADEMIC OUTCOMES IN 5TH AND 8TH GRADE STUDENTS: A LONGITUDINAL STUDY ON CHARACTER DEVELOPMENT

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Abstract: School-based programs designed to reduce problem behaviors, increase prosocial behaviors, and improve academic achievement have often been characterized as social-emotional learning or character development (education) programs. This longitudinal study investigated effects of such a program, called *Second Step*, on observed problem behaviors, observed prosocial behaviors, and school grades across 4 school semesters for 5th to 8th grade students. A sample of 5,189 from 35 schools (16 control and 19 treatment schools) in an open-enrollment charter school system participated. Results from a three-level longitudinal growth model analysis indicated that students in the treatment schools (with *Second Step* curriculum) attained higher school grades and exhibited fewer problem behaviors than students in the control schools across 4 school semesters. Students in the treatment schools also exhibited more prosocial behaviors, but this increase was marginally significant or approaching significance. The findings have implications for promoting a positive classroom or school climate that supports engagement and achievement.

Keywords: intervention/prevention, problem/risky/antisocial behaviors, prosocial behavior, classroom behavior/environment, academic achievement

Özet: Okullarda problemlı davranıřları azaltmak, gönüllü davranıřları ve başarıyı artırmak adına oluşturulan programlar genellikle sosyal-duygusal gelişim veya karakter gelişim programları olarak nitelendirilirler. Bu uzun dönemli çalışmada, *Second Step* isminde böyle bir programın 5. ve 8. Sınıf öğrencilerinin 4 okul dönemi boyunca okuldaki davranıřları ve başarıları üzerindeki etkileri incelenmiştir. Çalışmanın örneklemini açık kayıt yapılan bir sözleşmeli okul sisteminde bulunan 35 okuldan (16 kontrol ve 19 uygulama okulu) 5,189 öğrenci oluşturmaktadır. Üç-kademeli uzun zamanlı büyüme modelinden elde edilen sonuçlar uygulama okulundaki öğrencilerin kontrol okulundaki öğrencilere kıyasla dört okul dönemi boyunca daha az problemlı davranıř gösterdiklerini ve başarılarında daha fazla artış olduğunu göstermiştir. Uygulama okullarındaki öğrenciler aynı zamanda gönüllü davranıřlarda da artış kaydetmişlerdir, fakat bu artış kontrol okulları ile kıyaslandığında daha az bir anlamlı farklılık oluşturmuştur. Çalışmanın bulguları sorumluluk ve başarıyı destekleyen sınıf ve okul içi atmosferi artırma konusunda önemli işaretler barındırmaktadır.

Anahtar sözcükler: müdahale/önleme, problemlı/riskli/anti-sosyal davranıřlar, gönüllü davranıř, sınıf-içi davranıř/çevre, akademik başarı

1. Introduction

The school and learning environment for children and youth have undergone substantial transformations between the 20th and 21st centuries. An increase in bullying and aggressive or violent behaviors in American schools has been documented over the last 4 decades, including

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student-student and student-teacher assaults (U.S. Department of Health and Human Services, 1998; U.S. Department of Justice, 1999). Schools are powerful socializing institutions preparing children with the academic and social-emotional skills to participate in society, including coexisting and working with others in cooperative and prosocial ways in their local or global communities. Indeed, research suggests that social-emotional and academic competencies go hand-in-hand, although many schools have yet to integrate social-emotional learning (SEL) and academic learning into their curricula (Liew, 2012; Liew & McTigue, 2010). Furthermore, social-emotional and character development have been found to be viable steps in improving school culture and climate which helps narrow or close the achievement gap in high poverty schools (Elias, White, & Stepney, 2014). The present study examines the effects of a school-based program called *Second Step*, which has been characterized as a SEL or character development (education) program, on 5th to 8th grade students' prosocial and problematic school behaviors as well as school grades across 4 school semesters.

Historically, the primary institution responsible for children's moral and character development has been and still remains the family. While the family continues to be the first and oftentimes the most influential social institution for children, education is also highly influential in cultivating children's shared values, beliefs, knowledge, and skills of a community or society (Lippold, Greenberg, & Feinberg, 2011). One way that schools might support children's positive behaviors and positive classroom environments in schools is through character development initiatives.

School-based curricula or programs that target reducing students' problem behaviors while increasing students' prosocial behaviors have often been characterized as SEL or character development programs. By teaching students social-emotional skills that promote prosocial and socially responsible behaviors, SEL, or character development curricula, have been proposed as one approach to decrease problem behaviors and increase prosocial behaviors so that the school climate is safe and supportive (Cohen, 2006; Jennings & Greenberg, 2009). A large body of research has shown concurrent or short-term links between problem behaviors and academic achievement (e.g., Caprara, Barbaranelli, Pastorelli, Bandura, & Zimbardo, 2000; Hinshaw, 1992; Masten, et al., 2005; Malecki & Elliot, 2002). However, Caprara et al. (2000) found that prosocial behaviors (e.g., cooperation, sharing, and helping others) at 3rd grade predicted academic achievement 5 years later. Interestingly, aggression at 3rd grade had no relation to academic achievement although, 5 years later, parallel relations between (physical and verbal) aggression and achievement were found. Caprara et al. (2000)'s findings suggest that targeting both prosocial and aggressive behaviors can improve learning and achievement, and efforts to enhance prosocial behaviors appear to have enduring or long-term impact on achievement.

1.1. Theoretical Rationale

The present study is grounded in social information processing (SIP) theory and ecological systems theory. According to social information processing theory (e.g., Dodge, 1986; Dodge, Coie, & Lynam, 2006), the way a person encodes and interprets social cues in a situation will guide how the person reacts or responds to that situation. Arsenio and Lemerise (2001) proposed a SIP model that incorporates emotional processes and encodes emotional cues to explain why some children respond to peers in a given situation with prosocial behaviors or empathy while other children respond to the same peers or same situation with hostility and aggression. Studies have found links between SIP patterns and aggressive or prosocial behaviors (e.g., Mayeux & Cillessen,

2003; Nelson & Crick, 1999). Accordingly, SEL programs that teach emotion recognition, emotion expression or communication, and emotion regulation skills would allow children to better identify and understand social cues in ways that help them avoid making hostile attributions and reacting aggressively to socially ambiguous situations.

Bronfenbrenner's bioecological model (2005) emphasizes that human development must be understood within the interrelated environmental and societal influences on individuals (see Bronfenbrenner & Morris, 2006). The bioecological model of human development includes four defining properties or principal components that operate dynamically and interactively with one another; these are process, person, context and time. *Process* is the interaction between person and environment, which includes proximal processes that drive human change and development. *Person* refers to the characteristics which can shape the course or direction of proximal processes, and includes dispositions (e.g., temperament or personality traits) and resources (e.g., ability, knowledge, and skill) of parents, teachers, and others who participate in the life of the developing person on a relatively regular basis. *Context* refers to features of the environment that foster or interfere with the development of proximal processes. The environment is also conceptualized as nested systems that range from micro to macro. For example, a microsystem includes personal characteristics of people in the family, school, and community (e.g., parents, teachers, and mentors). *Time* refers to successive levels of micro-, meso-, and macro-time that describe ongoing episodes of proximal processes across varying time intervals. For this study, the school environment was the primary focus as potential influences on students' behavioral and academic outcomes across a period of 4 school semesters (approximately 2 years).

1.2. Character Development and School Outcomes

Character development curricula target personal characteristics in students, and the proximal processes or interactions that occur between students (peers), parents, teachers and other school or community members. Character development programs often aim to influence "academic motivation and aspirations, academic achievement, prosocial behavior, bonding to school, prosocial and democratic values, conflict-resolution skills, moral-reasoning maturity, responsibility, respect, self-efficacy, self-control, self-esteem, social skills, and trust in, and respect for teachers" (Was, Woltz & Drew, 2006: 151). These outcome measures may be broadly represented as school outcomes and classified broadly into students' school behaviors and achievement.

Studies on character development curricula that were implemented with fidelity have found positive effects on student behaviors, including reduction in problem or aggressive behaviors (Brooks & Kann, 1993; Frey, Nolen, Van Schoiack Edstrom, & Hirschstein, 2005; Holsen, Smith & Frey, 2008; Smokowski, Fraser, Day, Galinsky, & Bacallao, 2004). For example, Holtzapple et al. (2011) found that a school-based character development program that targeted students' relational and conflict management skills was effective in reducing discipline referrals and increasing observed prosocial behaviors for students from the intervention schools compared to those in the control schools.

In addition to helping reduce problematic behaviors, studies show that character development and SEL curricula were effective in promoting attitudinal and behavioral changes in students (e.g., Schonert-Reichl, Smith, Zaidman-Zait, & Hertzman, 2012). For instance, Battistich, Schaps, and

Wilson (2004) conducted a longitudinal study that examined the effects of an elementary school intervention, targeting the promotion of caring, supportive, and collaborative or cooperative relationships within the school, on middle school outcomes. Results suggest that students from schools that implemented the intervention program with high fidelity exhibited long-term benefits such as higher sense of school connectedness, less school misconduct, and higher test scores and school grades than students in the control schools (Battistich, Schaps, & Wilson, 2004). Other studies have found similar positive effects from character development or SEL programs, suggesting changes in proximal processes within the school environment foster a positive school climate for students' academic learning and achievement (Benninga, Berkowitz, Kuehn, & Smith, 2003; Berkowitz & Bier, 2005; Rhoades, Warren, Domitrovich, & Greenberg, 2011; Rosenblatt & Elias, 2008; Sherblom, Marshall, & Sherblom, 2006; Walberg, Zins, & Weisberg, 2004). Overall, studies suggest that children with high levels of social-emotional competencies perform better academically than those with low levels of social-emotional competencies (e.g., Bulotsky-Shearer, Fernandez, Dominguez, & Rouse, 2011; Pianta & McCoy, 1997).

1.3. *Second Step* on School Outcomes

The *Second Step* curriculum is considered a SEL and character development curriculum utilized to enhance children's social and emotional competence as well as prevent aggression and violence (Committee for Children, 1991, 1997). *Second Step* is a comprehensive, classroom-based curriculum aimed at inculcating skills in the areas of empathy, perspective taking, problem solving, self-control or self-regulation, and anger management or emotion regulation for preschool through 8th grade (Committee for Children, 1991, 1997). *Second Step* makes "extensive use of social learning theory" (as cited in Holsen et al., 2008: 73) and "social information-processing models of children's social behavior" (as cited in Holsen et al., 2008: 73).

Previous studies about the *Second Step* program have found mixed results on students' behaviors, which may partly be attributed to differences in measurement of school outcomes and differences in implementation of *Second Step*. For example, Grossman et al. (1997) found that the *Second Step* program was effective in decreasing observed physical aggression in 1st to 3rd graders, but no change was found in prosocial behaviors. In another study, a decrease in observed problem behaviors across an academic year was found for preschool and kindergarten children in classrooms with the *Second Step* curriculum, although this change was not found from teachers' ratings (McMahon, Washburn, Felix, Yakin, & Childrey, 2000). Another study on *Second Step* administered in nine schools (six elementary and three middle) and six comparison (control) schools (three elementary and three middle) utilized discipline referrals as a measurement tool and found that students in the intervention (*Second Step*) groups showed greater reductions in discipline referrals than those in comparison schools (Sprague, Walker, Golly, White, Myers, & Shannon, 2001). Another study found that students who participated in *Second Step* tend to self-report endorsing the use of relational and physical aggression less than students in the control group (Schojack Edstrom, Frey, & Beland, 2002). Using teachers' reports of student behaviors, Frey et al. (2005) found that elementary students in the *Second Step* program showed a decrease in problem behavior and an increase in prosocial behaviors compared to the control group. Several studies have found that *Second Step* increased prosocial behaviors but had no effect on aggressive behaviors (Cooke, Ford, Levine, Bourke, Newell, & Lapidus, 2007; Taub, 2002).

1.4. The Present Study

This study investigated if student participation in a school-based curriculum called *Second Step* reduces negative school behaviors and increases positive school behaviors compared to control schools across 4 academic semesters. Three primary research questions were addressed in this study. First, initial mean levels (i.e., baseline) in schooling outcomes (i.e., problem behaviors, prosocial behaviors, and school grades) between treatment and control schools, accounting for student demographic variables (i.e., gender, ethnicity, and socioeconomic status or SES) were compared to examine if schools are similar at the baseline. Second, the rate of change across 4 semesters in schooling outcomes were examined for treatment and control schools, accounting for student demographic variables. Third, the proportion of variance in the growth rate in schooling outcomes explained by the schools' *Second Step* participation status was examined.

2. Method

Institutional Review Board (IRB) approval was obtained prior to data collection. To address the research aims and questions, a quasi-experimental research design with non-equivalent groups was used. Schools were not randomly assigned, but self-selected into the treatment and control conditions. In the treatment condition, there were 19 schools that implemented the *Second Step* curriculum for four consecutive school semesters. In the control condition, there were 16 schools that did not implement the *Second Step* curriculum. Data was collected on school behaviors and school grades for students in both the treatment and control conditions.

2.1. Participants

The sample consisted of 5,189 students from 5th to 8th grades from a large open-enrollment charter school system in Texas. The percentage of female, Hispanic, and low socio-economic students were 49%, 48%, and 46%, respectively. Table 1 shows the descriptive statistics of the major study variables.

Table 1
Summary of descriptive statistics of study variables in level 1, 2, and 3 for the 1st sample

<u>Level-1 (repeated measures level) descriptive statistics</u>					
<u>Variable</u>	<u>N</u>	<u>M</u>	<u>SD</u>	<u>Minimum</u>	<u>Maximum</u>
GPA	20622	3.25	0.6	0	4
DPS	20622	28.66	31.08	0	357
PBRS	20622	28.11	27.34	0	303
TIME	20622	2.03	1.41	0	4
<u>Level-2 (student level) descriptive statistics</u>					
GENDER	5189	0.52		0 (49%)	1 (51%)
ETHNICITY	5189	0.5		0 (48%)	1 (52%)

SES	5189	0.95	0 (46%)	1 (54%)
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Level-3 (school level) descriptive statistics

SECSTEP	35	0.54	0 (46%)	1 (54%)
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Note. N: Sample Size. M: Mean. SD: Standard Deviation. GPA: Grand Point Average. DPS: Discipline point system to measure antisocial school behaviors. PBRS: Prosocial behavior rating system. TIME: The variable to measure five time points coded 0 as baseline time, and 4 the last time for the application. GENDER: 0 indicates female students, 1 indicates male students. ETHNICITY: 0 indicates Hispanic students, 1 indicates not Hispanic students. SES: 0 indicates Low socio-economic students, 1 indicates high socio-economic students. SECSTEP: The variable to measure school’s second step situation, which 0 indicates schools with no program and 1 indicates school with second step program.

2.2. Measures

Data was collected on students’ problem and prosocial school behaviors and academic achievement. School behaviors were observed and recorded by teachers, while academic achievement was indexed by students’ grade point averages (GPAs) as reported from official school records. Data collection began one semester prior to the implementation of the *Second Step* curriculum for all participants (in the treatment and control schools), and continued across 4 consecutive school semesters.

Table 2
Discipline point system (DPS)

Case	Point	Case	Point
Lack of materials	-2	Not dressing for gym class	-4
Not turning in assigned work or homework	-2	Vulgarity	-2
Not wearing student ID	-1	Not being in assigned location	-3
Inappropriate behavior towards an other	-3	Dress code violation	-3
Sleeping in class	-2	Talking back to teacher	-5
Running in hallway	-1	Gossiping/spreading tale	-3
Lack of cooperation	-2	Backpack in the classroom	-1
Leaning back in chair	-3	Monday envelope missing	-1
Antagonistic behavior	-2	Humming/singing/making noises	-3
Excessive talking	-3	Leaving the classroom without permission	-5
Inappropriate cafeteria behavior	-2	Leaving paper/trash on the floor	-2
Eating/drinking in class	-3	Being in the hallway without a pass	-1
Chewing gum	-3	Disturbing class	-3
Tapping	-2	Using profanity	-5

Horse playing	-3	Not attending tutorials	-3
Throwing things in class/hallways/cafeteria	-3	Disturbing an extra-curricular activity	-2

Problem and prosocial school behaviors. The charter school system required all teachers to use the *Discipline Point System (DPS)* ($a = .77$) and the *Prosocial Behavior Rating System (PBRs)* ($a = .65$) to observe and record data on students' problem and prosocial school behaviors. As shown above, Cronbach's alphas were calculated by using 3124 students' score on each item recorded throughout 2014 spring semester.

Table 3
Prosocial behavior rating system (PBRs)

<u>Case</u>	<u>Point</u>	<u>Case</u>	<u>Point</u>
Academic Improvement	3	Honesty	3
Active Participation	3	Donation to the school	3
All A's for a six-week period	3	Perfect Dress code	3
Behavioral Improvement	3	Perfect Hallway Behavior	2
Being a positive role model	3	Random act of Kindness	2
Going above the requirements of a project/assignment	2	Served After School Detention	5
Having all supplies during a random supply check	1	Served Saturday Detention	5
Helping a fellow student without being asked	2	Turning all work in on time for a three-week period	2
Helping Teacher without being asked	2	Volunteering in any school activities or events	3

Teachers and school staff were trained to use the DPS and PBRs, and then teachers were asked to inform parents and students about the DPS and PBRs. In addition, teachers provided parents with information on the status of students' school behaviors on a weekly basis. Teachers explained to all students so they understood which behaviors constituted problem and prosocial behaviors, along with the points and scoring that correspond to problem and prosocial behaviors (see Tables 2 and 3, respectively). For problem behaviors, teachers only assigned DPS points once for the same incident or behavior that occur in one class period.

Academic achievement. Students' academic achievement was indexed by grade point averages (GPA's) from school records between Spring 2012 and Spring 2014. For those participants who consented to release the recorded information, the requested information about the students' GPA scores for each semester were provided by their schools (see Table 1 for the means and SDs).

Demographic information. Demographic information on students was obtained from official school records, and included students' gender, ethnicity, and socioeconomic status (SES). Students' free- or reduced-lunch status was used as a proxy for SES.

2.3. Procedures

One semester prior to the implementation of the *Second Step* curriculum in any school (i.e., Spring 2012), students' scores on DPS, PBRS, and GPA were used as the initial (baseline) scores. In Fall 2012, the open enrollment charter school system recommended their schools to implement the *Second Step* curriculum as a way to help students gain social and emotional skills and promote character development. For 4 consecutive semesters (Fall 2012, Spring 2013, Fall 2013, and Spring 2014), 19 schools implemented the *Second Step* curriculum and 16 schools did not; data on DPS, PBRS, and GPA scores were collected at treatment and control schools.

2.4. Data Analysis

The data was evaluated by using both IBM SPSS statistical software and HLM 7 software. A three-level longitudinal growth model analysis was conducted to address research questions relevant to the effectiveness of the *Second Step* curriculum on students' academic and behavioral school outcomes.

2.5. The Models for the Study

The models used in the current study and the meanings were as follows:

Level-1:

$$Y_{ijk} = \pi_{0jk} + \pi_{1jk}*(TIME_{ijk}) + e_{ijk}$$

where i indexes repeated measures, j indexes students, and k indexes schools. Here we use semester Spring 2012 as the reference time point, so $TIME_{ijk}=0, 1, 2, 3, 4$ for semesters Spring 2012, Fall 2012, Spring 2013, Fall 2013, and Spring 2014 respectively.

This equation indicates that a student's outcome (Y_{ijk}) during a specific school semester in a specific school was modeled as the student's estimated initial status (i.e., π_{0jk}) plus the change over time, which is, the rate of change (π_{1jk}) times the time elapsed, plus an error.

Level-2:

$$\begin{aligned}\pi_{0jk} &= \beta_{00k} + \beta_{01k}*(GENDER_{jk}) + \beta_{02k}*(ETHNICITY_{jk}) + \beta_{03k}*(SES_{jk}) + r_{0jk} \\ \pi_{1jk} &= \beta_{10k} + \beta_{11k}*(GENDER_{jk}) + \beta_{12k}*(ETHNICITY_{jk}) + \beta_{13k}*(SES_{jk}) + r_{1jk}\end{aligned}$$

These two equations indicate that a student's estimated initial status and estimated rate of change on the outcome variable were further predicted by his GENDER, ETHNICITY, and SES. The coefficients β_{00k} and β_{10k} represent the mean initial status and rate of change respectively in school k , adjusted for students' gender, ethnicity, and SES.

Level-3:

$$\begin{aligned}\beta_{00k} &= \gamma_{000} + \gamma_{001}(\text{SECSTEP}_k) + u_{00k} \\ \beta_{01k} &= \gamma_{010} + u_{01k} \\ \beta_{02k} &= \gamma_{020} + u_{02k} \\ \beta_{03k} &= \gamma_{030} + u_{03k} \\ \beta_{10k} &= \gamma_{100} + \gamma_{101}(\text{SECSTEP}_k) + u_{10k} \\ \beta_{11k} &= \gamma_{110} \\ \beta_{12k} &= \gamma_{120} \\ \beta_{13k} &= \gamma_{130} + u_{13k}\end{aligned}$$

In the level-3 model, the adjusted mean initial status and mean rate of change on the outcome were further predicted by the school's *Second Step* participation (SECSTEP) status.

The three-level hierarchical linear growth model was tested using the three outcome variables respectively (i.e., GPA, DPS, and PBRs). It was noted that when DPS and PBRs were the outcome variables, some of the slopes in the level-2 model (i.e., β_{01k} , β_{02k} , β_{03k} and β_{13k}) did not vary randomly across schools, therefore they were constrained to be fixed.

Level-3 Model

$$\begin{aligned}\beta_{00k} &= \gamma_{000} + \gamma_{001}(\text{SECSTEP}_k) + u_{00k} \\ \beta_{01k} &= \gamma_{010} + u_{01k} \\ \beta_{02k} &= \gamma_{020} \\ \beta_{03k} &= \gamma_{030} \\ \beta_{10k} &= \gamma_{100} + \gamma_{101}(\text{SECSTEP}_k) + u_{10k} \\ \beta_{11k} &= \gamma_{110} \\ \beta_{12k} &= \gamma_{120} \\ \beta_{13k} &= \gamma_{130}\end{aligned}$$

The meaning of the model: A student's mean initial status and mean rate of change on problem school behaviors were further predicted by the school level predictor, *Second Step*.

3. Results

To investigate the effectiveness of *Second Step* curriculum on students' school outcomes, school achievement and behaviors by investigating the differences before the beginning of the curriculum and throughout the implementation, a three-level growth model in HLM software was conducted. Analyses were conducted to examine the differences between treatment and control schools on the initial levels of school outcomes and on the growth rates of school outcomes, as well as the predictive ability of *Second Step* curriculum to explain the variance in the growth rate of school outcomes in treatment schools.

3.1. Differences in the Initial Mean School Outcomes

Results show significant differences between treatment and control schools (with Hispanic, female, low SES students in non-*Second Step* schools as the reference group) on initial levels of problem school behaviors ($\gamma_{001} = 7.66$; see Table 4) after controlling for demographic variables.

Students in treatment schools had higher levels of problem behaviors at baseline than students in control schools. For prosocial school behaviors ($\gamma_{001} = -1.99$; see Table 5) and academic achievement ($\gamma_{001} = 0.035$, see Table 6), no differences were found between treatment and control schools.

Table 4
Final estimation of fixed effects for initial DPS and for rate of change in DPS

Fixed Effect	Coefficient	Standard Error	t-ratio	Approx. d.f.	p-value
For INTRCPT1, π_0					
For INTRCPT2, β_{00}					
INTRCPT3, γ_{000}	28.998***	1.740754	16.65	33	<0.001
SECSTEP, γ_{001}	7.6607	3.350369	2.287	33	0.029
For GENDER, β_{01}					
INTRCPT3, γ_{010}	10.774***	1.314969	8.194	34	<0.001
For ETHNICITY, β_{02}					
INTRCPT3, γ_{020}	-2.087*	1.046043	-1.996	5079	0.046
For SES, β_{03}					
INTRCPT3, γ_{030}	-3.057***	0.522826	-5.848	5079	<0.001
For TIME slope, π_1					
For INTRCPT2, β_{10}					
INTRCPT3, γ_{100}	-1.075*	0.518520	-2.074	33	0.046
SECSTEP, γ_{101}	-3.718***	1.031008	-3.607	33	0.001
For GENDER, β_{11}					
INTRCPT3, γ_{110}	-0.416	0.270814	-1.539	5079	0.124
For ETHNICITY, β_{12}					
INTRCPT3, γ_{120}	0.2300	0.313973	0.733	5079	0.464
For SES, β_{13}					
INTRCPT3, γ_{130}	0.0988	0.156834	0.630	5079	0.529

Note. * $p < .05$. ** $p < .01$. *** $p < .001$

3.2. Differences in the Growth Rate of School Outcomes

The average annual growth rate of problem school behavior and the prosocial school behavior of our reference baseline group (Hispanic, female, low SES students in control schools) are statistically significant ($\gamma_{100} = -1.075401$, $p = 0.046$) (see Table 4), and ($\gamma_{100} = 1.782338$, $p = 0.048$) (see Table 5), respectively, which shows that while the problem school behavior has decreased 1.07 per year, the prosocial school behavior has increased 1.78 per year. However, the average annual growth rate of achievement (GPA) of our reference baseline group (Hispanic, female, low SES students in control schools) is not statistically significant ($\gamma_{100} = 0.0091$, $p = 0.40$) (see Table 6), which shows that there has been no significant growth rate of achievement (GPA) of our reference baseline group per year.

Table 5
Final estimation of fixed effects for initial PBRS and for rate of change in PBRS

Fixed Effect	Coefficient	Standard Error	t-ratio	Approx. d.f.	p-value
For INTRCPT1, π_0					
For INTRCPT2, β_{00}					
INTRCPT3, γ_{000}	23.635***	3.649931	6.476	33	<0.001

<i>SECSTEP</i> , γ_{001}	-1.989	7.327388	-0.271	33	0.788
For GENDER, β_{01}					
INTRCPT3, γ_{010}	-1.365**	0.510331	-2.675	5113	0.007
For ETHNICITY, β_{02}					
INTRCPT3, γ_{020}	1.0781	0.595371	1.811	5113	0.070
For SES, β_{03}					
INTRCPT3, γ_{030}	0.1025	0.296048	0.346	5113	0.729
For TIME slope, π_1					
For INTRCPT2, β_{10}					
INTRCPT3, γ_{100}	1.7823*	0.868734	2.052	33	0.048
<i>SECSTEP</i> , γ_{101}	1.9112	1.744220	1.096	33	0.281
For GENDER, β_{11}					
INTRCPT3, γ_{110}	0.2878	0.187817	1.532	5113	0.125
For ETHNICITY, β_{12}					
INTRCPT3, γ_{120}	0.1774	0.219465	0.809	5113	0.419
For SES, β_{13}					
INTRCPT3, γ_{130}	0.0710	0.109086	0.652	5113	0.515

Note. * $p < .05$. ** $p < .01$. *** $p < .001$

When it comes to the differences in the growth rate of schools outcomes (school behaviors and achievement) between treatment schools and control schools after controlling for student demographics such as gender, ethnic background, SES background, the difference between treatment and control schools in the growth rate of problem school behaviors ($\gamma_{101} = -3.718942$) is also statistically significant, at $p < 0.01$ (see Table 4), which shows there is a statistically significant difference between treatment and control schools in terms of their growth in problem school behaviors. Students' growth rate of problem school behaviors in treatment schools was lower than students' growth rate of problem school behaviors in control schools after controlling for gender, ethnicity, and SES. That is, the reduction of problem school behaviors per year in treatment schools is greater than that in control schools.

Table 6

Final estimation of fixed effects for initial GPA and for rate of change in GPA

Fixed Effect	Coefficient	Standard Error	t-ratio	Approx. d.f.	p-value
For INTRCPT1, π_0					
For INTRCPT2, β_{00}					
INTRCPT3, γ_{000}	3.255***	0.025544	127.45	33	<0.001
<i>SECSTEP</i> , γ_{001}	0.035	0.045985	0.773	33	0.445
For GENDER, β_{01}					
INTRCPT3, γ_{010}	-0.129***	0.020020	-6.445	34	<0.001
For ETHNICITY, β_{02}					
INTRCPT3, γ_{020}	0.1560***	0.027833	5.607	34	<0.001
For SES, β_{03}					
INTRCPT3, γ_{030}	0.096***	0.014279	6.754	34	<0.001
For TIME slope, π_1					
For INTRCPT2, β_{10}					
INTRCPT3, γ_{100}	0.009	0.010641	0.853	33	0.400

<i>SECSTEP</i> , γ_{101}	0.035*	0.017110	2.059	33	0.047
For GENDER, β_{11}					
INTRCPT3, γ_{110}	-0.006	0.004547	-1.402	4977	0.161
For ETHNICITY, β_{12}					
INTRCPT3, γ_{120}	0.0041	0.005268	0.781	4977	0.435
For SES, β_{13}					
INTRCPT3, γ_{130}	-0.00*	0.003194	-2.503	34	0.017

Note. * $p < .05$. ** $p < .01$. *** $p < .001$

However, the difference between treatment and control schools in the growth rate of prosocial school behaviors ($\gamma_{101} = 1.911205$) is not statistically significant, at $p = 0.28$ (see Table 5). The result shows that students' growth rate of prosocial school behaviors in treatment schools was not significantly different than students' growth rate of prosocial school behaviors in control schools after controlling for gender, ethnicity, and SES.

The difference between treatment and control schools in the growth rate of achievement ($\gamma_{101} = 0.035230$) is statistically significant, at $p < 0.05$ (see Table 6), which shows there is a statistically significant difference between treatment and control schools in terms of their growth in achievement. Results show that students' growth rate of achievement in treatment schools was higher than students' growth rate of achievement in control schools after controlling for gender, ethnicity, and SES.

Given the signs of differences in the growth rate of school outcomes (school behaviors and achievement), it might be reasonable to affirm that students in treatment schools have displayed higher achievement and less negative schools behaviors than the students in control schools throughout 4 semesters from Fall 2012 to Fall 2014.

3.3. The Proportion of the Variance in the Growth Rate of School Outcomes Explained by School Second Step Status

Since *Second Step* participation status (SECSTEP) is a significant school-level predictor in the growth rate of both achievement and school problem behaviors, but not a significant school-level predictor in the growth rate of school prosocial behaviors, level-3 variance components (i.e., the variance of u_{10k}) on both GPA and problem school behaviors from the reduced (without *Second Step* variable) and the full (with *Second Step* variable) were used to learn predictive ability of schools' curricula status (SECSTEP) of the variance in the growth rate of school outcomes. . To be able to calculate the proportion of the variance in the growth rate of both GPA and problem school behaviors explained by school curricula status, Pseudo R^2 (Bryk & Raudenbush, 1992) was utilized by applying the following formula:

$R_1^2 = \frac{\sigma^2_{U10|M1} - \sigma^2_{U10|M2}}{\sigma^2_{U10|M1}}$, in which, $\sigma^2_{U10|M1}$, which is the variance components of random growth rate in the reduced model, and $\sigma^2_{U10|M2}$ is the variance components of random growth rate in the full model.

Table 7

Final estimation of level-3 variance components on DPS (Reduced Model)

Random Effect	Standard Deviation	Variance Component	d.f.	χ^2	p-value
INTRCPT1/INTRCPT2, u_{00}	10.36487	107.43043	34	520.17***	<0.001
INTRCPT1/ GENDER, u_{01}	5.51503	30.41556	34	105.65***	<0.001
TIME/INTRCPT2, u_{10}	3.49475	12.21330	34	690.27***	<0.001

Note. * $p < .05$. ** $p < .01$. *** $p < .001$

To calculate the predictive ability of schools' curricula status (SECSTEP) in the growth rate of school problem behaviors, the variance component on problem school behaviors associated with U_{10k} ($\sigma^2_{U10} = 12.21330$) (see Table 7) in the reduced model was subtracted from the variance component associated with U_{10k} ($\sigma^2_{U10} = 8.55756$) (see Table 8) in the full model, and divided the result by the variance component associated with U_{10k} ($\sigma^2_{U10} = 12.21330$) in the reduced model as follows:

$$R_1^2 = \frac{\sigma^2_{U10|M1} - \sigma^2_{U10|M2}}{\sigma^2_{U10|M1}} = \frac{12.21330 - 8.55756}{12.21330} = 0.30$$

Table 8

Final estimation of level-3 variance components on DPS (Full Model)

Random Effect	Standard Deviation	Variance Component	d.f.	χ^2	p-value
INTRCPT1/INTRCPT2, u_{00}	9.83189	96.66609	33	480.53***	<0.001
INTRCPT1/ GENDER, u_{01}	5.51667	30.43365	34	105.67***	<0.001
TIME/INTRCPT2, u_{10}	2.92533	8.55756	33	486.96***	<0.001

Note. * $p < .05$. ** $p < .01$. *** $p < .001$

The above calculation showed that the predictor schools' schools' curricula status (SECSTEP) explained 30 % of the variance in the growth rate of school problem behaviors throughout 4 semesters from Fall 2012 to Fall 2014.

Table 9

Final estimation of level-3 variance components on GPA (Reduced Model)

Random Effect	Standard Deviation	Variance Component	d.f.	χ^2	p-value
INTRCPT1/INTRCPT2, u_{00}	0.13965	0.01950	34	235.58***	<0.001
INTRCPT1/ GENDER, u_{01}	0.06552	0.00429	34	56.970**	0.008
INTRCPT1/ ETHNICITY, u_{02}	0.11720	0.01374	34	94.870***	<0.001
INTRCPT1/ SES, u_{03}	0.06029	0.00364	34	68.362***	<0.001
TIME/INTRCPT2, u_{10}	0.06603	0.00436	34	586.64***	<0.001
TIME/ SES, u_{13}	0.01055	0.00011	34	46.159	0.080

Note. * $p < .05$. ** $p < .01$. *** $p < .001$

To calculate the predictive ability of schools' curricula status (SECSTEP) in the growth rate of school achievement (GPA), the variance component on GPA in both reduced and full models were applied in the same formula as follows:

$$R_1^2 = \frac{\sigma^2_{U10|M1} - \sigma^2_{U10|M2}}{\sigma^2_{U10|M1}} = \frac{0.00436 - 0.00372}{0.00436} = 0.15$$

Table 10
Final estimation of level-3 variance components on GPA (Full Model)

Random Effect	Standard Deviation	Variance Component	d.f.	χ^2	p-value
INTRCPT1/INTRCPT2, u_{00}	0.13979	0.01954	33	238.95***	<0.001
INTRCPT1/ GENDER, u_{01}	0.06471	0.00419	34	56.942**	0.008
INTRCPT1/ ETHNICITY, u_{02}	0.11574	0.01339	34	94.853***	<0.001
INTRCPT1/ SES, u_{03}	0.06009	0.00361	34	68.350***	<0.001
TIME/INTRCPT2, u_{10}	0.06099	0.00372	33	494.57***	<0.001
TIME/ SES, u_{13}	0.01035	0.00011	34	46.16583	0.080

Note. * $p < .05$. ** $p < .01$. *** $p < .001$

The above calculation showed that the predictor schools' curricula status (SECSTEP) explained 15 % of the variance in the growth rate of school achievement (GPA) throughout 4 semesters from Fall 2012 to Fall 2014.

4. Discussion

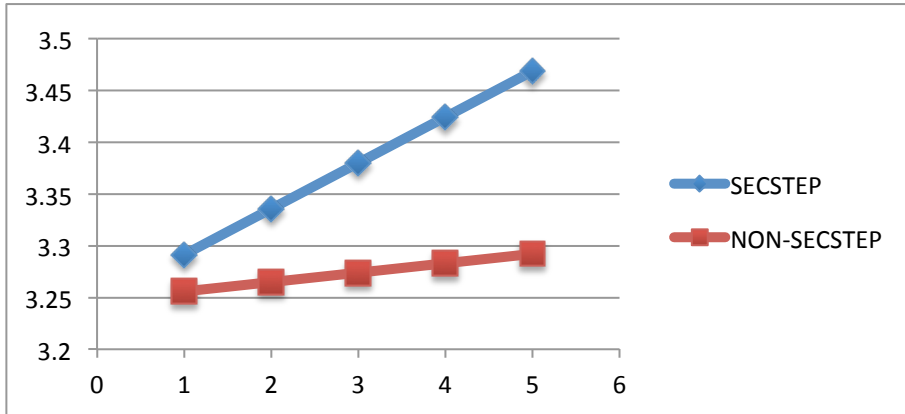
This study represents one of the first systematic efforts to examine the effect of *Second Step* curriculum on middle school students. Previous studies on the *Second Step* program generally focused on kindergarten and elementary school students, but fewer studies have focused on the social-emotional and character development needs of middle school students. Thus, this study addressed a gap in the literature by focusing on 5th to 8th graders who typically are becoming increasingly independent from their parents but may still require adult supervision and assistance.

4.1. Differences in the Initial Mean School Outcomes

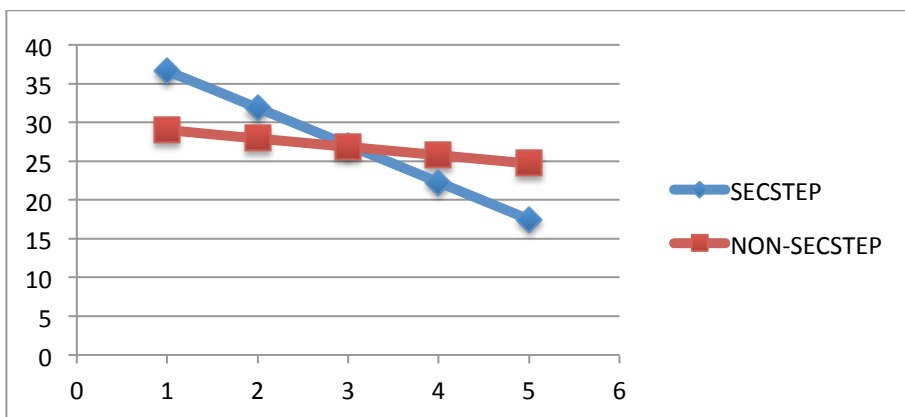
As expected, no significant differences were found between the treatment schools (i.e., schools that implemented in the *Second Step* program) and the control schools on initial school grades ($\gamma_{001} = 0.035$, $p = 0.45$) and initial prosocial school behaviors ($\gamma_{001} = -1.99$, $p = 0.79$), after controlling for gender, ethnicity, and SES. Unexpectedly, students in treatment schools were different in the initial problem school behaviors ($\gamma_{001} = 7.66$, $p < .05$) than students in control schools after controlling for gender, ethnicity, and SES. This suggests that students in treatment schools displayed more negative schools behaviors than students in the reference group at baseline, and might partly explain the motivation of the 19 schools in this study that decided to implement the *Second Step* curriculum as a potential way to improve school climate and reduce problem school behaviors (Brooks & Kann, 1993).

4.2. Differences in the Growth Rate of School Outcomes

Overall, study results show that the *Second Step* program improved students' school grades (GPAs) and reduced students' problem behaviors in the schools, but there were no effects on student's prosocial behaviors. More specifically, study results show that the growth rate of students' academic achievement (i.e., improved school grades) in treatment schools ($\gamma_{101} = 0.035$, $p < 0.05$) was higher than that of students in the control schools (see Figure 1).

Figure 1. *The difference in the growth rate of GPA*

Further, the growth rate of students' problem school behaviors in treatment schools ($\gamma_{101} = -3.72$, $p < 0.01$) was lower than that of students in the control schools, after controlling for gender, ethnicity, and SES (see figure 2). Although the literature shows that problem behaviors typically increase with age (Loeber, Farrington, Stouthamer-Loeber, & Van Kammen, 1998; Barriga, Doran, Newell, Morrison, Barbetti, & Robbins, 2002), the present findings on problem school behaviors suggest that the treatment, *Second Step*, counteracted that trend by helping reduce problem school behaviors in a longitudinal manner. However, no difference ($\gamma_{101} = 1.91$, $p = 0.28$) was found in the growth rate of prosocial school behaviors between treatment and control schools after controlling for gender, ethnicity, and SES (see figure 3). Study results are generally consistent with results from prior research (Brooks & Kann, 1993; Frey et al., 2005; Holsen, Smith & Frey, 2008; Sherblom et al., 2006; Smokowski et al., 2004); students in treatment schools displayed higher levels of academic achievement and fewer negative school behaviors than students in control schools across 4 consecutive school semesters.

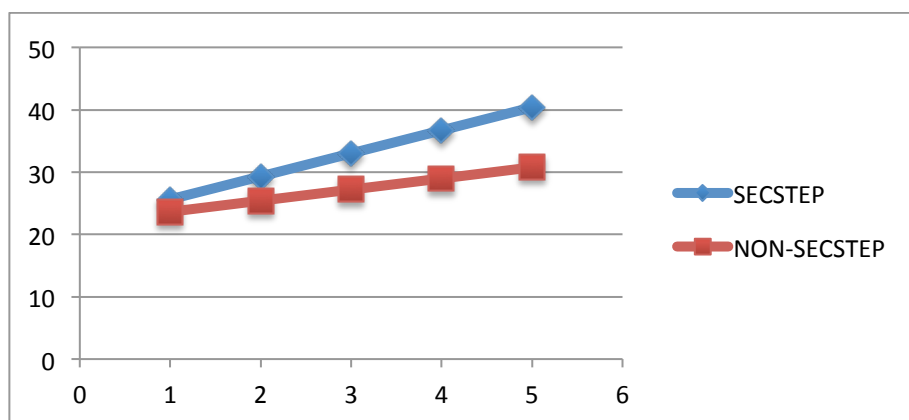
Figure 2. *The difference in the growth rate of DPS*

Study findings are also consistent with the notion that social-emotional and academic competencies go hand-in-hand (Liew, 2012; Liew & McTigue, 2010), and social-emotional and character development curricula such as *Second Step* teach students to create safe and supportive learning environments (Benninga, Berkowitz, Kuehn, & Smith, 2003; Berkowitz & Bier, 2005),

and to enhance the overall school quality such as student safety, coordinated team work, standards-based learning, quality student support, etc. (Snyder, Vuchinich, Acock, Washburn, & Flay, 2012).

While *Second Step* had positive effects on reducing problem behaviors and improving academic achievement, there were no effects found for prosocial behaviors, which is inconsistent with some previous studies (Cooke et al., 2007; Schick & Cierpka, 2005; Taub, 2002). But prior studies (e.g., Grossman et al., 1997) have also found no difference in prosocial behaviors between the treatment and control group. Importantly, the growth rate sign for prosocial behaviors changed from negative in the initial semester (Spring 2012) to positive, indicating that students in treatment schools displayed more prosocial school behaviors than students in control schools, although the increase was not statistically significant. That is, the increase of prosocial school behaviors in the control group was statistically significant ($\gamma_{100} = 1.78$, $p < 0.05$), and students in the control group increased in prosocial behaviors perhaps because of social-emotional maturity and development with age.

Figure 3. *The difference in the growth rate of PBRS*



However, students in the treatment group started off very low on prosocial behaviors and treatment may have brought them to a “typical” level on prosocial behaviors, which was somewhat comparable to students in the control group. One explanation for such mixed findings is that previous studies typically examined short-term effects of *Second Step* on prosocial behaviors, but this study examined longitudinal effects across 4 school semesters. Therefore, while *Second Step* might have increased students’ prosocial behaviors, such effects may not have been sustained into future semesters. Indeed, previous studies (Holsen, Smith & Frey, 2008; Schoiack-Edstrom et al., 2002) showed that *Second Step* curriculum was effective in improving prosocial school behaviors within a one-year period but long-term effects should not be expected without booster or supplemental curriculum.

It is also plausible that methodological differences in measuring students’ behaviors (e.g., parent ratings, teacher ratings, and behavior observations) could partly explain the inconsistent findings (Denham & Almeida, 1987). In this study, student behaviors were measured using an in-class behavior observation system by teachers to observe and record school behaviors throughout the school semester, rather than using a survey administered at a single time-point during a school

semester. In addition, the measurement system for prosocial school behaviors was not designed to record repeated occurrences of prosocial behaviors but only once a day; therefore, the measurement of prosocial behaviors systematically limited observations of increase or growth in prosocial behaviors. In addition, the Cronbach's alpha for *Prosocial Behavior Rating System* (PBRs), $\alpha = .65$, was somewhat low but adequate. Alternatively, the lack of effect of *Second Step* on increasing students' prosocial behaviors might also be explained by the fact that many schools tend to focus on curbing students' problem behaviors rather than focus on increasing students' empathy, compassion, and prosocial behaviors when schools are faced with tackling school-wide behavioral problems such as bullying and aggression.

4.3. Second Step and Change in School Outcomes

In examining the prediction of the growth rate of school behaviors and school grades from treatment or control condition, the level-3 variance components (u_{10}) on both GPA and problem school behaviors from both reduced (without SECSTEP variable) and full (with SECSTEP variable) were used because the differences in the growth rate of school prosocial behaviors was not significant. Results indicated that implementation of *Second Step* explained 15% of the variance in the change (increase) of academic achievement (GPA), and 30% of the variance in the change (decrease) of problem school behaviors across 4 school semesters from Fall 2012 to Fall 2014. It is interesting to note that *Second Step* explained greater percentage of variance in change for problem school behaviors relative to academic achievement (GPA). Such a pattern is expected given that the fundamental aim of *Second Step* curriculum is to make positive changes in children's behaviors. However, given that social-emotional and academic competencies are very much intertwined and co-developing (Liew, 2012; Liew & McTigue, 2010), programs such as *Second Step* generally have indirect effects on academic achievement through improving school climate (Benninga, Berkowitz, Kuehn, & Smith, 2003; Berkowitz & Bier, 2005; Sherblom et al., 2006). Thus, SEL and character development programs likely have dual benefits for students because of simultaneous benefits for students' school behaviors and academic achievement.

5. Limitations and Future Directions

This study had multiple strengths including the longitudinal design and the use of an in-class behavior observation system by teachers to record student behaviors. However, there are also study limitations. Because this study was conducted in natural settings, schools were not randomly assigned but selected themselves into the treatment and control conditions. While the lack of randomized control is a limitation, the natural or authentic setting of schools is a strength that allows greater generalizability of study findings. In addition, teacher variables were not included in the present study. Teacher variables including years of teaching, certification status, gender, and quality of teacher-student relationships could shed more light on how the *Second Step* curriculum benefited students' behavioral and academic outcomes. For example, teacher-student relationships and students' social-emotional competence (e.g., self-regulation skills) have interactive effects on students' achievement (Liew, Chen, & Hughes, 2010; also see Ladd & Burgess, 2001). In addition, qualitative or mixed method designs that utilize interviews and focus groups could deepen our understanding of parents', teachers', and students' perspectives on the value or experiential impact of SEL and character development curricula in schools.

6. Conclusion and Implications

In conclusion, the *Second Step* curriculum had impact on school outcomes as evidenced in the reduction of problem school behaviors and the improvement of academic achievement. That is, students in treatment schools displayed higher achievement and fewer negative school behaviors than the students in control schools across 4 school semesters. Treatment and control schools were highly similar, except that students in treatment schools were also inclined to display more negative school behaviors. Considering the potential concurrent and long-term positive impact of SEL and character development curriculum on students (e.g., Caprara et al., 2000), implementing programs such as *Second Step* in schools appears to be a worthwhile investment to improve school culture and climate to support school engagement, learning, and achievement especially for high-need or high-poverty schools (Elias, White, & Stepney, 2014; Sherblom et al., 2006).

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Appendix

Parental Monitoring Scale (PMS)

Q.1 I know what my child does during his or her free time.

Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q.2 I know whom my child has as friends during his or her free time.

Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q.3 I know what type of homework my children have.

Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q.4 I know what my children spend their money on.

Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q.5 I know when my children have an exam or paper due at school.

Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q.6 I know how my children do in different subjects at school.

Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q.7 I know where my children go when I am out of the home.

Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q.8 I know where my children go and what they do after school.

Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q.9 In the last month, I have had a time when I had no idea of where your children were at night.

Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>