

Does Household Income Matter?
An Examination of an After-school Program Targeting Resilience

by

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Certificate of Approval

This is to certify that the accompanying thesis by Kimberly Margaret Taylor has been accepted in partial fulfillment of the requirements for graduation with Honors in Psychology.

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Abstract

Resilience has widely been defined as the ability to thrive despite facing adversity, but debates regarding the operationalization of the term have abounded. Growing up in a low-income household increases an individual's likelihood of exposure to stressors linked to negative outcomes. Intervention programs aimed at increasing resilience may counteract these detrimental outcomes. Ungar (2016) argued that the protective factors, positive internal and external aspects of an individual's environment that help them cope with stress, that bolster resilience may change depending on an individual's level of risk. This study investigated the impact of an after-school program on resilience. The correlation between changes in academic achievement, an outcome-based measure of resilience, and changes in support from protective factors, a process-based measure of resilience, was examined to determine if both operationalizations were measuring the same construct. The moderating effect of household income on the relationship between changes in support from specific protective factors and academic achievement was investigated as an exploratory analysis of Ungar's (2016) argument. No significant changes in resilience were found. The two measures of resilience were not correlated. The overall moderation models for each protective factor were nonsignificant. However, there was a significant interaction between changes in support from the Family protective factor and academic achievement depending on household income. Also, positive changes in support from the Friend protective factor had a significant overall effect on positive changes in academic achievement. Limitations of the current study and areas for further research were examined considering these findings.

Keywords: resilience, household income, academic achievement, after-school programs

Introduction

In 2016, a staggering 41 percent of youth under the age of 18 lived in low-income families (defined as below 200 percent of the federal poverty threshold [FPT]), with 21 percent living below 100 percent of the FPT, according to a report by Koball & Jiang (2018). Growing up in poverty or a low-income household exposes children to considerable stressors and has been linked to negative behavioral, cognitive, developmental, and academic outcomes (Smokowski, 1998; Sattler & Gershoff, 2017; Buckner, Mezzacappa, & Beardslee, 2003). Despite facing substantial risk, some individuals can thrive and achieve positive adaptive outcomes (Zolkoski & Bullock, 2012). These individuals are considered resilient.

Resilience has been thrown around as a buzzword amongst researchers, educators, and the public, capturing the interest of individuals invested in improving outcomes for individuals from at risk populations. Intervention programs targeted at individuals who have experienced a variety of challenges have been shown to help increase resilience (Gartland et al., 2019) by bolstering protective factors, the positive aspects of an individual's self and environment that can be drawn on for support (Madsen & Abell, 2010). After-school programs, which act as an auxiliary intervention opportunity within the school context, can bolster resilience by providing additional opportunities for youth to develop supportive, trusting relationships with adults and peers (Williams, Bryan, Morrison, & Scott, 2017). Additionally, they can provide enriching experiences for youth, giving them the opportunity to develop skills and interests that they might not get to explore during the school day. To be most effective at increasing resilience, interventions need to be tailored to the populations targeted because, as Ungar (2016)

argues, the protective factors that help youth be resilient vary depending on their level of risk. More research is needed to determine which protective factors are most important for bolstering resilience in youth growing up in high risk environments such as low-income households. The main goal of this study is to explore this connection to provide research based evidence that designers of resilience focused interventions can use to tailor their programs to better meet the needs of the populations they are serving.

Defining and Operationalizing Resilience

Everyone will experience varying degrees of adversity at some point in their lives. The field of resilience research was born out of public interest into why some children thrived despite experiencing unfavorable conditions, at a time when concern was growing over the academic, behavioral, and developmental success of children (Masten & Coatsworth, 1998). Particularly, politicians, researchers, and the public, were concerned that rates of adverse experiences such as homelessness, teenage pregnancy, abuse, and poverty were putting children at considerable risk (Masten & Coatsworth, 1998). From a systematic review of resilience studies, Gartland et al. (2019) found that the negative consequences of being exposed to adversity include: emotional and behavioral problems, mental health disorders, speech and language problems, learning difficulties, physical disorders, and long-term detrimental impacts on health and well-being. Because the public viewed the development of a competent citizenry as imperative to the success of society, understanding the factors that contribute to successful outcomes despite risk was deemed a crucial focus by researchers (Masten & Coatsworth, 1998).

Debates around the definition, conceptualization, and operationalization of the term resilience have plagued this body of research since its beginning (Madsen & Abell,

2010). Masten, Best, and Garmezy (1990), for example, whose definition is cited quite extensively in the field, defined resilience as “the process of, capacity for, or outcome of successful adaptation despite challenging or threatening circumstances.” This definition encompasses numerous, divergent components, defining resilience simultaneously as a process, capacity, and outcome, exemplifying the range of definitions and operationalization that the term resilience encompasses. An evaluation of current research on resilience provides further evidence for the lack of definitional consistency in the operationalization of the term. A systematic review conducted by Gartland et al. (2019), found that in 30 studies of resilience in children, none used the same approach to identify which children were considered resilient.

Outcome based measure of resilience. One school of resilience research has focused on using adaptive outcomes to evaluate whether an individual has successfully adapted after experiencing adversity (Masten, 2014). In other words, this model focuses on identifying a specific challenge followed by a subsequent, measurable positive outcome to determine if an individual is resilient (Alvord & Grados, 2005).

Within this line of research, there is debate as to how successful adaptation should be measured (Alvord & Grados, 2005). Sattler and Gershoff (2018), for example, raised the question of whether successful adaptation should be defined as reaching competency (adaptive outcome level commensurate with an individual who has not faced adversity) or just as succeeding more than other individuals who have experienced adversity. Furthermore, some researchers have argued that successful adaptation must be measured in several outcome areas over time, introducing temporal and contextual elements into the definition of resilience (Cicchetti & Rogosch, 1997). Other researchers have

investigated how successful outcomes and adaptation may vary depending on cultural context (Ungar & Liebenberg, 2011).

A systematic review of resilience in children exposed to social adversity revealed that most studies relied on this framework to identify resilient individuals, but successful adaptation outcome variables varied significantly in each study leading to discrepancies in terms of which children were considered resilient (Gartland et al., 2019). For example, studies have used factors such as mental health (Halevi, Djaikovski, Vengorber, & Feldman, 2016), aggressive behavior (Poehlmann et al., 2013), or drug use (Anthony, 2008) as benchmarks for measures of resilience (see Gartland et al., 2019 for full review). Two studies included in Gartland et al.'s (2019) research used academic measures as the positive adaptive outcome. Since resilience is often context dependent, academic achievement might be a suitable indicator of positive adaptation in children within the school environment (Fletcher & Sarkar, 2013).

Process-based measure of resilience. Another definition of resilience is focused on the dynamic systems that allow individuals to overcome adversity (Gartland et al., 2019). Within this framework, the connection between risk and protective factors on positive adaptation is evaluated (Masten, 2014). Ungar and Liebenberg (2011), focused on a social-ecological model where resilience is defined not only by the characteristics that allow an individual to adapt successfully to challenges, but also the aspects of an individual's environment that help them adapt. Under this conceptualization, the definition of the term resilience may change depending on cultural context or the particular challenges an individual experiences (Ungar & Liebenberg, 2011). The capacity for resilience may include a combination of internal, personal strengths and

external or contextual protective factors (Zolkoski & Bullock, 2012). Protective factors are positive cognitive, emotional, environmental, social, and spiritual aspects of an individual's experience that allow them to be resilient (Hjemdal, 2007).

Within this framework, Ungar and Liebenberg (2011), developed the Child and Youth Resilience Measure-28 to create a measure of the protective factors that contribute to resilience. This measure includes questions about community, friends, family, education, self-value, religion, and self-awareness. Madsen and Abell (2010) developed another measure of resilience which falls under this framework, the Trauma Resilience Scale which includes factors such as optimism, spirituality, problem solving, and supportive relationships. Based on the various definitions of resilience that fall within this framework, Madsen & Abell (2010) argued that resilience can most clearly be measured after someone has adapted successfully despite adverse circumstances. In their view resilience should be measured indirectly by evaluating improvements in the existence and strength of protective factors and adaptive function over time (Madsen & Abell, 2010).

Protective Factors

Protective factors are positive factors that an individual has or that exist within their environment that allow them to be resilient (Hjemdal, 2007). These factors do not exist in isolation but rather interact dynamically with each other (Smokowski, 1998). Internal protective factors include self-value, self-regulation, hope, future goal setting, and supportive belief structures (Thompson & Klika, 2015). In their systematic review, Gartland et al. (2019) found that other individual protective factors including, emotional regulation, cognitive skills, empathy, and having a positive outlook were significantly associated with resilience.

External protective factors include positive relationships with friends, family, supportive adults and community members, as well as, having a supportive academic environment (Thompson & Klika, 2015). There is significant research into these contextual resilience factors and their impacts on resilience in a variety of cultural and temporal contexts (see Gartland et al., for review). For example, a study of South Asian British children found that friendship quality not quantity, was linked to resilience (Bartko & Eccles, 2003 as cited in Gartland et al., 2019). Another study that examined levels of parental warmth in children who were exposed to intimate partner violence found that parental warmth was associated with resilient outcomes (Graham-Bermann, Gruber, Howell, & Girz, 2009). In their systematic review, Gartland et al.'s (2019) found that having a united community and being connected to their cultural identity, particularly spiritual beliefs, was associated with resilience in children. Additionally, in relation to academic support and school as a protective factor, Gartland et al. (2019) found that having a secure school environment, supportive relationships with teachers, and achieving academically were all associated with resilient outcomes despite exposure to risk.

The internal (i.e. individual) and external (i.e. contextual) protective factors that bolster an individual's resilience may change depending on context. Ungar (2016) suggested that what a child needs to be resilient can change based on their level of risk and their current level of resilience. For example, Ungar (2016) proposed that youth who are at high risk and have low resilience are especially vulnerable and benefit from long-term interventions that emphasize first and foremost consistent attachment with adults at school and family and peer support, as well as, the development of coping skills.

Children in poverty face a unique set of challenges that put them at heightened risk.

Therefore, the protective factors that bolster their ability to be resilient may be different than those for children who are not experiencing similar levels of risk.

Poverty

Growing up in a low-income household is associated with exposure to serious adverse experiences both inside and outside the home. Outside their homes, youth that grow up in low-income neighborhoods are more likely to be exposed to drugs, violence, and other types of crime (Buckner, Mezzacappa, & Beardslee, 2003). Additionally, these youths have less access to community resources (e.g., parks and youth activities) compared to middle- or high-income youth (Buckner, Mezzacappa, & Beardslee, 2003). Within their households, poor youth are more likely to experience the negative effects of domestic violence, high levels of parental stress, parental unemployment, parental substance abuse, and mental health problems (Buckner, Mezzacappa, & Beardslee, 2003; Smokowski, 1998).

These adverse circumstances compound, which can lead to negative health, behavioral, emotional, and developmental outcomes (Sattler & Gershoff, 2017). Early on in development, poverty has been identified as a predictor of skill gaps that can emerge as early as nine months of age (Sattler & Gershoff, 2017). These gaps can persist throughout childhood and adolescents, as growing up in poverty has been shown to increase the risk of developing negative adaptive outcomes (Buckner, Mezzacappa & Beardslee, 2003).

The impacts of poverty on academic achievement. These negative adaptive outcomes can include detrimental impacts on academic achievement. Noguera and Wells (2011) described three main reasons for the impact of poverty on academic achievement

which include: limited access to academic and social support, increased exposure to conditions that negatively impact students' health, safety, and well-being, and limited ability for parents and schools to access social capital to improve school conditions. In a series of studies, the U.S. Department of Education found that both school and student poverty affected student achievement (Lacour & Tissington, 2011). Poorer academic achievement among youth in poverty can be seen in lower grades, scores on standardized tests, and level of educational attainment (Duncan & Brooks-Gunn, 1997, Haveman & Wolfe, 1995 as cited in Hair, Hanson, Wolfe, & Pollak, 2015). Lower academic achievement begins in childhood, results on a reading achievement assessment from data collected as part of the Early Childhood Longitudinal Study showed that "low-income students scored at about the 30th percentile" while "upper-income students score at about the 70th percentile" with middle-income students scoring somewhere in between (Rowan et al., 2004 as cited in Lacour & Tissington, 2011).

The negative impacts of poverty on academic achievement begin in childhood and can persist into adulthood (Reardon, 2011). For example, the matriculation rate into college is higher for students from high-income families compared with students from middle-income or low-income families (Williams, Bryan, Morrison, & Scott, 2017). The persistence of negative academic outcomes into adulthood is particularly concerning because it has been linked with outcomes such as lower wages and lifetime total income which can further perpetuate cycles of poverty (Restuccia & Urrutia, 2004, Duncan, Magnuson, Kalil, Ziol-Guest, 2012, as cited in Lacour & Tissington, 2011). Despite the considerable adversity some children face, whether it be specifically related to growing up in a low-income household or not, and the consequences this adversity can

have on outcomes like academic achievement, some children are high achieving. These children are considered resilient, or more specifically, academically resilient (Morales, 2008). The challenge for researchers is to determine what factors and processes allow resilient children in poverty to succeed despite the odds stacked against them.

What protective factors are important for youth in poverty? To determine whether certain protective factors might be particularly important for youth from low-income households, Williams et al. (2017) evaluated the perceptions of protective factors for high-achieving, low-income students. They found that four main factors contributed to academic achievement in low-income students: peer social capital (e.g., friendships with support peers with proacademic behaviors), supportive relationships with adults (e.g., particularly teachers), family and community resources (e.g., out-of-school learning opportunities, resilient role models, and multiple streams of motivation (e.g., career aspirations, encouraging words from others). Additionally, Williams et al., (2017) found that peer mentoring relationships where younger and older students support one another were effective in improving resilience. More generally, a secure school environment, good relationships with teachers, and academic engagement have been linked to resilient outcomes for children growing up in low-income households (Gartland et al., 2019).

Interventions

Intervention programs can help improve outcomes for students including those who grow up in an environment with high exposure to risk, such as in poverty. There are many different types of resilience interventions including individual, family, and social environment level interventions (see Zolkoski & Bullock, 2012 for review). The different focuses of these interventions change what method is used to target resilience, such as

reducing vulnerability and risk, increasing available resources, or mobilizing protective processes (Masten 1994, as cited in Smokowski, 1998). For resilience interventions to be most effective, they must occur at multiple levels, including individual, peer, school, family, and community within a child's environment (Richman, Bowen, & Woolley, 2004 as cited by Williams et al., 2017). Research has shown that investing in childhood interventions might be especially promising in terms of cost effectiveness, as a review by Gartland et al. (2019) has shown that it is economically more advantageous to have interventions begin during childhood than adulthood.

Schools are a natural place to intervene to help improve student resilience and academic achievement because students spend a significant portion of their day there. In schools, contextual protective factors can be bolstered through students developing supportive relationships with peers, having positive interactions with teachers, and having different opportunities to succeed (Zolkoski and Bullock, 2012).

After-school programs can also be an effective resilience intervention as they provide an additional opportunity for youth to form supportive relationships. In low-income families especially, access to after-school programs can be important as child care is often needed when parents are working (Buckner, Mezzacappa, & Beardslee, 2003). Mentoring relationships between younger and older students have been identified as important for low-income students (Williams et al., 2017), and after-school programs have students of different grade levels, providing a unique opportunity for students of different ages to get to know each other and support one another. Understanding the protective factors and the processes underlying the development of resilience in students experiencing different levels of risk is essential to help school teachers, counselors, and

experts who develop resilience interventions create programs that best help children adapt.

Current Study

In the spring of 2019, a pilot study was run with 69 elementary students who participated in an after-school program. Students took an 81-item resilience measure evaluating different sources of resilience in their lives including contextual protective factors such as family, friends, communities, school, the after-school program, as well as, individual protective factors such as feeling safe, trust, self-regulation, optimism and self-value. The objective of this pilot survey was twofold. First, to determine whether the after-school program contributed to increasing participant resilience and secondly, to evaluate whether a shorter measure of resilience could be developed. The results of the pilot study showed that feeling supported in the after-school program (having a high average score on prompts related to the after-school dimension), was related to elevated levels of overall resilience (average score across all 81 items). A shortened 27-item measure was developed, by selecting the questions within each factor that were most representative of responses in each category.

The purpose of the current study was to follow-up and expand upon the results of the pilot using the shortened measure. I first hypothesized that the results of pilot study would be replicated in the current study. Specifically, participation in the after-school program would contribute to increased resilience as measured by changes in average score across the new 27-item process-based resilience measure of participants from pre- to post-test.) Since resilience can be measured either as a process or as an outcome, I wanted to determine whether academic achievement, an outcome-based measure, was

correlated with the 27-item resilience measure, a process based resilience measure. I hypothesized that changes in academic achievement, an outcome-based measure of resilience, would be positively correlated with changes in resilience as measured by feelings of support from protective factors. Finally, to investigate Ungar's (2016) argument that level of risk can influence the importance of certain contextual and individual protective factors in bolstering resilience, I examined whether an individual's household income had an influence on how specific protective factors impacted changes in academic achievement. This research can help improve resilience interventions by providing guidance on which protective factors programs should be targeted, depending on the population they serve, to improve outcomes for students.

Method

Participants

A total of 74 first through fifth grade students, at three public elementary schools in a small town in Eastern Washington, participated in this study. The students were preparing to attend an after-school program aimed at students attending high-poverty, low-performing schools. All participants completed the pre-test 27-item process-based resilience measure. Twenty-one participants also completed the post-test after they stopped attending the program. Only the data from these 21 participants was included in the analysis.

Participants were between the ages of 6 and 11 ($M = 9.14$, $SD = 1.24$). School records identified 14 participants as female (66.7%) and 7 participants as male (33.3%). School records of federal race categories identified 85.7% of participants as White (Caucasian or Latino) and the remainder as either Black, African American or Asian.

71.4% of participants were identified on school records as being of Hispanic or Latino ethnicity and the remaining 28.6% as Not Hispanic or Latino. Household income was evaluated using school records of student eligibility for free- or reduced-priced lunch.

Measures

Resilience. Participants completed a 27-item process-based resilience measure (see Appendix for complete measure), reporting their feelings of support from contextual and individual protective factors. The measure was a shortened version of a previously piloted 81-item survey that combined items from Madsen's (2010) Trauma Resilience Scale, Ungar and Liebenberg's (2011) Child and Youth Resilience Measure-28, and questions developed by the research team. The reliability of the 27-item in the current study was high at ($\alpha = .886$). The measure included six individual factors (Self-Value, Self-Regulation, Goals, Problem Solving, Supportive Beliefs and Trust/Safety) and six contextual factors (Family, Friends, School, Activities, Community, and After-School). Individual resilience factors included prompts such as: *I stay in control if something bad happens; I care about myself; and No matter how bad I feel, it will get better.* Contextual resilience factors items included prompts such as: *When things go wrong, my family helps me; I have a friend who helps me when things are hard; and I feel I belong at my after-school program.*

For each prompt, participants were instructed to: "Choose the answer that represents how you feel about each statement." Participants responded to each item on a 5-point Likert scale (5 = *always*, 4 = *very often*, 3 = *at times*, 2 = *seldom*, 1 = *never*). To further clarify the values on the Likert scales, which was especially important for younger students, emoticons with either thumbs up and a smiling face, a neutral face, or thumbs

down and a frowning face were included to represent always, at times, and never, respectively, on the Likert scale.

Academic Achievement. Academic achievement was measured using an average of a student's *i-Ready* math and reading diagnostic assessment scores. *i-Ready* is an online assessment and individualized instruction program used throughout the school district as a supplement to the math and reading curriculum and for the administration of diagnostic assessments (see <https://www.curriculumassociates.com/products/i-ready> for more information). *i-Ready* diagnostic assessments are administered at standard times throughout the school year in the fall, winter, and spring. At each testing interval, within the span of several weeks, all students in the district take the *i-Ready* diagnostic appropriate for their grade level during the standard school day. Participant *i-Ready* scores were collected from an online database by the supervisor of this study. *i-Ready* scores were taken from the administration closest to when the participants took the pre-test (fall) and post-test (winter).

Family income level. Free- or reduced-price meal eligibility status was used to assign participants to three groups: free, reduced, or paid. Ten participants (47.6%) qualified for free lunch, eight participants (38.1%) qualified for reduced-priced lunch, and three participants (14.3%) did not qualify for free or reduced lunch. Free or reduced-price meal eligibility cut-offs are set by the U.S. Department of Agriculture each school year. Eligibility is determined by a combination of two factors: household income and household size. For example, for the 2019-2020 school year, a student from a four-member household with a combined annual income of \$47,638 would be eligible for free or reduced-price meals.

Excluding some extraneous circumstances, parents or guardians must apply for the program each school year in order to qualify for free- and reduced-priced meals. This may mean that there are some students who qualify for free or reduced-price meals and are from low-income households but do not get counted because their parents or guardians do not apply. However, this group is assumed to be small since the incentive to apply is high, the paperwork to do so is minimal, and enrollment is supported by the school administration. Free- or reduced-price meal eligibility information was collected by the study supervisor through the school district's online database of student information.

Procedures

Pre-test. All participants who were preparing to attend the after-school program were recruited to participate by the site-coordinator at each school. Parental consent forms were sent home to parents with the after-school program registration materials. Students were encouraged to return the consent form in a timely manner, and students were rewarded for its return whether or not their parent consented to their participation in the study. Study information sheets were read aloud to students with parental consent, and students affirmed that they would like to participate by writing their names on an assent form. Groups of 6-18 students completed the survey individually on computers guided by a main survey-proctor and 1-3 additional support staff. The main survey-proctor answered questions about the meaning of prompts. Support staff answered non-technical questions and supported behavior management. Each item of the process-based resilience measure was read aloud to students by the survey proctor as they followed along on the computer and indicated their responses.

After-school intervention program. Students participated in the 21st Century Community Learning Centers after-school program at three elementary school sites. The after-school program was offered each day after-school for an hour and a half. Not all students participated in the program every day. Snack and dinner were provided to all students who attended. Each site has a program coordinator that plans daily activities. Additionally, there are between three and four high school-aged staff mentors who help run the activities. Site coordinators and mentors are trained in quality practices to help foster supportive relationships with participants. The overall philosophy behind the after-school program is to provide youth with a supportive environment where they can develop inter- and intrapersonal skills through participation in fun, engaging activities that are different than those offered during the school day. Generally, the after-school programs have a rotating schedule of STEM, art, or creativity related activities that students can choose from although specific programming differs from site to site. Examples of activities offered include: coding, robotics, arts and crafts, cooking, and chess club. The number of participants on any given day at each site ranged from 20-35.

Post-test. Post-test consisted of administering the process-based resilience measure again. However, because students had already left the program, they had to be tested during the school day. Site coordinators completed the post-test with students by pulling them from class. They followed the same procedure of reading the assent form to students and having them write their name on it if they chose to participate. Then, the site coordinators read each prompt out loud to students as they followed along on the computer and indicated their responses. Site coordinators were present for the

administration of the pre-test and were instructed to conduct the post-test in as similar of conditions as the pre-test as possible.

Results

This study was comprised of two main components: the investigation of two hypotheses and an exploratory analysis. My first hypothesis was that resilience, using a process-based measure determined by self-reported feelings of support from protective factors, would increase from pre-test to post-test. My second hypothesis was that changes in academic achievement, an outcome-based measure of resilience, would be positively correlated with changes in the process-based measure of resilience. The exploratory analysis that I ran investigated Ungar's (2016) argument that certain protective factors might be more important for bolstering an individual's resilience depending on their level of risk.

A process-based operationalization of resilience was computed by averaging participants' scores on the 27-item process-based resilience measure. I ran a paired samples *t*-test to compare resilience before and after students participated in the after-school program. Resilience scores were not significantly different between pre-test ($M = 4.06, SD = .61$) and post-test ($M = 4.10, SD = .61$) for participants, $t(20) = -.29, p = .773, d = 0.07$ (Figure 1).

Change in academic achievement, an outcome based measure of resilience, was computed by averaging math and reading scores at both pre-test and post-test and then subtracting the post-test average from the pre-test average. Change in the process-based resilience measure was determined by subtracting an average score for feelings of support from all items on the 27-item resilience measure at post-test from average scores at pre-

test. For both measures, a positive change score indicated an increase in resilience. A Pearson correlation coefficient was computed to assess the relationship between the two measures of resilience in this study, change in academic achievement ($M = 10.45$, $SD = 9.83$) and change in the process-based resilience measure ($M = .04$, $SD = .68$). There was no significant relationship between the two measures $r = .08$, $N = 21$, $p = .373$. A scatterplot summarizes the results (Figure 2).

For the exploratory analysis of Ungar's (2016) argument, twelve moderation analyses were performed using Andrew F. Hayes' PROCESS procedure 3.4 function in SPSS. The outcome variable for each analysis was academic achievement. The predictor variable for each analysis was each protective factor from the process-based measure of resilience (ie. Self-Value, Family, Friends). The moderator variable was household income, a multicategorical variable with three groups: free, reduced, or paid lunch, determined by participant eligibility for free or reduced priced lunch. The overall moderation models produced by these analyses were not significant for any of the twelve protective factors (Table 1). Two factors, Family ($p = .076$) and Friends ($p = .098$), were approaching significance. In the Family model, the interaction between the Family factor and the free versus paid income groups was significant, $t = 2.16$, $b = 26.30$, $p = .048$ (Table 8 & Figure 3). For individuals in the paid lunch group, increases in support from the Friends factor corresponded to increases in academic achievement. For individuals in the free lunch group, increases in feelings of support from the Friends factor corresponded to decreases in academic achievement. For participants in the free lunch group, the relationship between academic achievement and feelings of support from the Friends factor. In the Friend model, the Friend factor had a significant overall effect on

change in academic achievement, $t = 2.54$, $b = 3.84$, $p = .023$ (Table 9 & Figure 4).

Greater positive changes in feelings of support from the Friends factor led to greater increases in Academic Achievement. The remainder of the moderation analyses did not produce significant results (Tables 2-13).

Discussion

Hypothesis 1: Changes in Process-Based Measure of Resilience

This study explored changes in resilience, the ability to thrive despite facing adverse circumstances, in children who participated in an after-school program aimed at supporting students from high-need, low-income households. To investigate the success of the program, in terms of increasing participant resilience, I examined changes in resilience, using a process-based measure, from when students joined the after-school program to when they exited the program. The process-based measure of resilience used participants' self-reported feelings of support from a combination of twelve contextual and individual protective factors. I found that while there was an increase in resilience from pre-test to post-test, the change was not significant. This finding was not consistent with my first hypothesis or evidence from literature that resilience would increase because of participation in an intervention, such as this after-school program, which provides participants with additional opportunities to form supportive relationships with peers and adults (Williams et al., 2017). These additional supports were expected to bolster an individual's ability to react positively in the face of adversity. This nonsignificant finding may suggest that participation in the after-school program may not act as a significant means of bolstering student resilience.

There may be several alternative explanations for this nonsignificant finding. One explanation could be that participants did not attend the after-school program long enough for their feelings of support from different protective factors to change. It may take several years instead of several months for increased support to register with children in a way that impacts their feelings of being supported.

Another explanation for this nonsignificant finding could be participant's limited ability to complete the measure accurately. While efforts were made to keep students engaged in the survey completion process and students were reminded of the importance of answering each prompt thoughtfully and accurately, it might have been difficult for some participants, especially younger ones, to be reflective about their feelings and communicate these feelings using a five-point Likert scale. The mean scores at pre-test and post-test were both high, 4.06 and 4.10, respectively. This ceiling effect may be caused by a participant's lack of ability to distinguish and communicate changes in their feelings of support using the scale provided.

An additional explanation for the nonsignificant result could be that the process-based measure of resilience used was too broad to capture changes in specific supportive factors that would have been more likely to be influenced by participation in the after-school program. In this study, the nature of the programming offered meant that it most likely targeted the After-School and Friends factors and might have some peripheral impact on the Trust/Safety and Self-Value factors. It is less likely that participation in the program would lead to changes in support from other protective factors such as Supportive Beliefs, Community, or Self-Regulation. Therefore, global changes in

resilience, calculated by average resilience scores across all factors, would not have captured as strongly changes related within specific factors.

Hypothesis 2: Correlation of Outcome- and Process-Based Measures of Resilience

Definitional debates within the field of resilience related research have led to significant discrepancies in how the term resilience has been operationalized (Alvord & Grados, 2005; Masten, 2014; Gartland et al., 2019). This study examined two operationalizations of the construct of resilience. The first, based on the existence of a dynamic system of protective factors, was measured through an individual's self-reported feelings of support from contextual and individual protective factors (Gartland et al., 2019). The second, academic achievement, was an outcome based measure of resilience (Masten, 2014). Academic achievement was measured using changes in participant scores on standardized math and reading tests. I examined whether academic achievement was correlated with the process-based resilience measure to determine whether these different operationalizations of resilience were capturing the same construct. I found that these two measures of resilience were not correlated which could indicate that these measures were not capturing the same construct.

While this finding is certainly characteristic of the problems that exist in the resilience research field in terms of lack of standardization of definition and operationalization of the term, there are some possible alternative explanations as to why the measures that I chose did not correlate. Academic achievement is an acceptable outcome-based resilience measure within the school context because it is thought to be a relevant indicator of positive adaptation (Fletcher & Sarkar, 2013). However, since the

after-school program in this study does not explicitly focus on improving skills that are directly applicable to increasing math and reading content knowledge, perhaps this measure of academic achievement did not capture more general changes in critical thinking skills that students gained as a result of participating in the program.

Additionally, similarly to my explanation of findings for my first hypothesis, perhaps the limited length of time from pre-test to post-test could explain the lack of corresponding differences between the two variables.

Hypothesis 3: Exploratory Analysis of Ungar's (2016) Argument

The final component of this study was an exploratory analysis investigating Ungar's (2016) argument that, depending on an individual's level of risk, certain protective factors might be more important than others for bolstering resilience. Each protective factor from the process-based measure of resilience was evaluated as a predictor of academic achievement. Since growing up in a low-income household is associated with elevated levels of risk, the mediating effect of each participant's level of risk, determined through their eligibility for either free, reduced, or full priced lunch was evaluated.

Overall, I found that the models for the relationships between changes in level of support from each protective factor and academic achievement were not significant. However, there were two significant findings within the Family and Friends factors which I investigated because the overall models for these factors were approaching significance. Firstly, I found that the effect of changes in family support on changes in academic achievement depended on whether students were in the free lunch or paid lunch group. For students in the paid lunch group, greater changes in support from family were

related to greater changes in academic achievement. For individuals in the free lunch group, increases in feelings of support from family were associated with decreases in academic achievement. This finding suggests that the Family factor might be particularly important for bolstering resilience in students from higher-income households. Secondly, I found that changes in feelings of support from friends led to corresponding changes in academic achievement. This suggests that support from friends might be particularly important in terms of bolstering academic achievement. These findings should be interpreted with caution because twelve analyses were run and the overall models for each analysis were insignificant. Running this many models means that the chances of falsely rejecting the null hypothesis is elevated.

My finding that support from family has a negative relationship with bolstering resilience in students from low-income households contradicts findings by Williams et al. (2017) that family is an important factor for increasing resilience in individuals from low-income households. My finding that positive changes in support from friends corresponds to positive changes in resilience across income groups is consistent with Williams et al. (2017) research that strong peer social capital (e.g., friendships with support peers with proacademic behaviors) and the presence of peer mentoring relationships where younger and older students support one another bolster resilience. However, my results did not support Williams et al.'s (2017) finding that support from friends would be particularly important for low-income individuals. Because the support of friends generally seems to contribute to increased resilience across groups, it might be a particularly important protective factor for people designing intervention programs to focus on.

Besides the tentative findings related to the impact of support from friends on resilience, results of the exploratory analysis were largely inconsistent with Ungar's (2016) argument and previous research. An explanation for this may lie in the way I chose to measure adversity. I chose free- or reduced-priced lunch eligibility to capture different levels of adversity because growing up in a low-income household is closely linked to experiencing adversity and it was also an easy way to collect income information about participants. It did not require administering a survey that could expose participants to potentially sensitive subjects. However, free- or reduced-priced lunch eligibility does not specifically quantify the amount or type of adversity a child might have experienced. It is possible that some participants in low-income households might not have or might not feel like they have faced significant adversity. Additionally, some participants from high-income households may have experienced adversity and this measure would not have captured that. This further points to the consequences of definitional debates in resilience research, specifically, what counts as adversity, one key element of the definition of resilience that has not been standardized (Cosco et al., 2017). Additionally, with the measure of adversity that I used, differentiation between the three groups themselves, free, reduced, and paid, does not necessarily correspond to a graduated scale in terms of adversity faced. This could be a potential problem in the application of my findings to an evaluation of Ungar's (2016) argument. Perhaps this measure was insufficient in distinguishing between levels of risk experienced by different participants.

Limitations

The limitations of this study stemmed primarily from the tradeoffs made between external and internal validity. The external validity of this study was bolstered by the fact that it was conducted in the “real-world”. This study involved participants in an after-school program, which meant that conditions were difficult to control. Some of these conditions included: participants attending the program for varying lengths of time, existence of external circumstances outside of participation in the program that might have impacted resilience, and variations between program structure at different sites. These conditions represented some of the factors that may have decreased the internal validity of my findings. Limited power, selective attrition, demand characteristics influencing participant responses, differences in programming between sites, and the lack of a control group to compare results to represent additional limitations of this study.

The most significant limitation of this study was that it was underpowered. Initially, pre-test surveys were collected from approximately 70 students, and post-tests were projected to be collected from about that same number in different phases as participants exited the program. However, due to a combination of irregularity in students joining and exiting the after-school program and school closures caused by social distancing measures put in place as a response to the COVID-19 pandemic, I was unable to collect data from about two-thirds of participants. Furthermore, while pre-tests were conducted in groups, site coordinators had to conduct post-test with participants individually as they left the program. These post-tests were given during the school day and were contingent on students being able to be pulled from their classroom. In some

cases, post-tests for participants were either delayed or not completed. Some students left their school before they could be surveyed again. Having low power is problematic because it means that the probability of falsely rejecting the null hypothesis is high. The effect size for the changes in resilience that I was trying to detect was very small ($d = .07$) so having a higher power would have been important to avoid a Type II error. Additionally, for the exploratory analysis conducted, I distinguished between three income groups. The 21 participants were not distributed evenly between these three groups. In the paid group, for example, there were only three participants. That is a small sample and typically five or more participants are needed to draw conclusions about differences between groups.

Selective attrition may have also contributed to my nonsignificant findings. For the present study, post-test results were only collected from participants who left the after-school program. Post-test results for participants who stayed in the after-school were not collected because data collection was halted unexpectedly. There may have been important differences among these groups that influenced my findings. Students who stayed in the after-school program were most likely to be those who were having a positive experience in the program. Those who the program was least effective for would have been more likely to leave. Therefore, results collected may have shown higher resilience levels than in the general population of students. The nature of attrition in the current study may have contributed to low changes in resilience from pre-test to post-test.

Demand characteristics may have influenced the participants' scores on the process-based resilience measure in the positive direction. The mean scores at both pre-

test and post-test were high, 4.06 and 4.10, respectively. Although students were reminded that their answers would remain anonymous and that it was important that they answer truthfully about their feelings, cues from peers and proctors may have made participants feel like they should answer more positively. Additionally, the survey was administered during the after-school program so if students generally felt supported during the program their scores might have been boosted to reflect how they felt in the moment versus how they generally feel supported in their life.

Another limitation that could impact the internal validity of this study was not having a control group to compare changes in resilience and academic achievement to. Especially for the first hypothesis, if results had been significant, it would have been unknown if positive or negative changes in resilience could be attributed to participation in the program or if process-based resilience or academic achievement would have increased regardless of participation in the program as the school year progressed.

The conditions at each of the three sites that students attended varied substantially which was another limitation of this study. The programming offered varied from site to site including the number of students attending and activities offered. Additionally, the composition of the peer group between sites varied. Students attended the program different numbers of days each week. Had the findings for changes in resilience been significant, it would have been difficult to determine what aspect of the program made it a resilience booster. This limitation could have made it difficult to generalize the results of the study in a way that could help other resilience focused intervention improve their programming.

Further Directions

For my first hypothesis, considering the alternative explanations for the nonsignificant finding described and the overall limitation of this study, although nonsignificant, the general positive trend in changes in process-based resilience was encouraging. There are several interesting avenues for further research that could be explored. Most importantly, this study should be replicated with more participants considering how underpowered the present study was. To combat potential issues that arose from the short time frame that this study was conducted in, further research could track resilience over a longer timeframe, several years instead of several months, to determine if changes in resilience emerge. Furthermore, I would recommend that a standardized timeline and method for collecting pre-test and post-test data be established to avoid the challenges that come with administering surveys outside of program hours. If the timeline for students exiting the program could be anticipated beforehand, although this may be quite difficult given the unpredictable nature of educational settings, the post-test could be administered in groups during the after-school program similarly to how the pre-test was administered. A control group of students who did not participate in the program could be incorporated in future studies to serve as a point of comparison for results. To mitigate potential problems caused by participants' limited abilities to communicate their feelings using a 5-point Likert scale, the process-based resilience measure could also be completed by an individual who knows each participant. This individual could be a parent, teacher, or the program site coordinator. They would rate the extent to which they believe each protective factor is present in a student's life. This

would provide an external assessment of each participant's resilience to validate participant responses.

The major conclusion that can be drawn from my second hypothesis is that establishing a standardized measure of resilience is crucial for the field moving forward. This finding highlights issues revealed by Gartland et al.'s (2019) systematic review of resilience studies in children. Gartland et al. (2019) found that out of 30 studies none operationalized resilience in the same way. Setting a standard operationalization for the term would allow results from different studies to be generalizable which would allow researchers to be able to see trends in changes in resilience over time. Not only is the term operationalized in different ways, but my findings suggest that each operationalization may be capturing a different construct. Resilience research is important because it allows researchers to help people by understanding how despite facing adverse circumstances, individuals can develop optimally. If the construct remains unstandardized, it will be difficult for researchers to understand how different interventions compare to one another in terms of their effectiveness in bolstering resilience.

Finally, the findings from the exploratory analysis conducted as a part of this study also provide potential areas for further research. The significant findings related to the Friends and Family factors could provide evidence for further research to focus on the Friends and Family factors in particular. While the findings for the exploratory analysis I ran were generally nonsignificant, this might have been due to the specific measure of adversity chosen. This study could be followed up with an additional component asking about the specific adversity participants have experienced to get a better idea of their

level of risk. Further research could evaluate Ungar's (2016) argument using different ways of measuring risk. Evaluating other risk variables that might influence the importance of various protective factors is important to ensure that evidence based research is available to help designers of resilience intervention programs develop programs in a way that are tailored to best meet the needs of the populations they are meant to be targeting.

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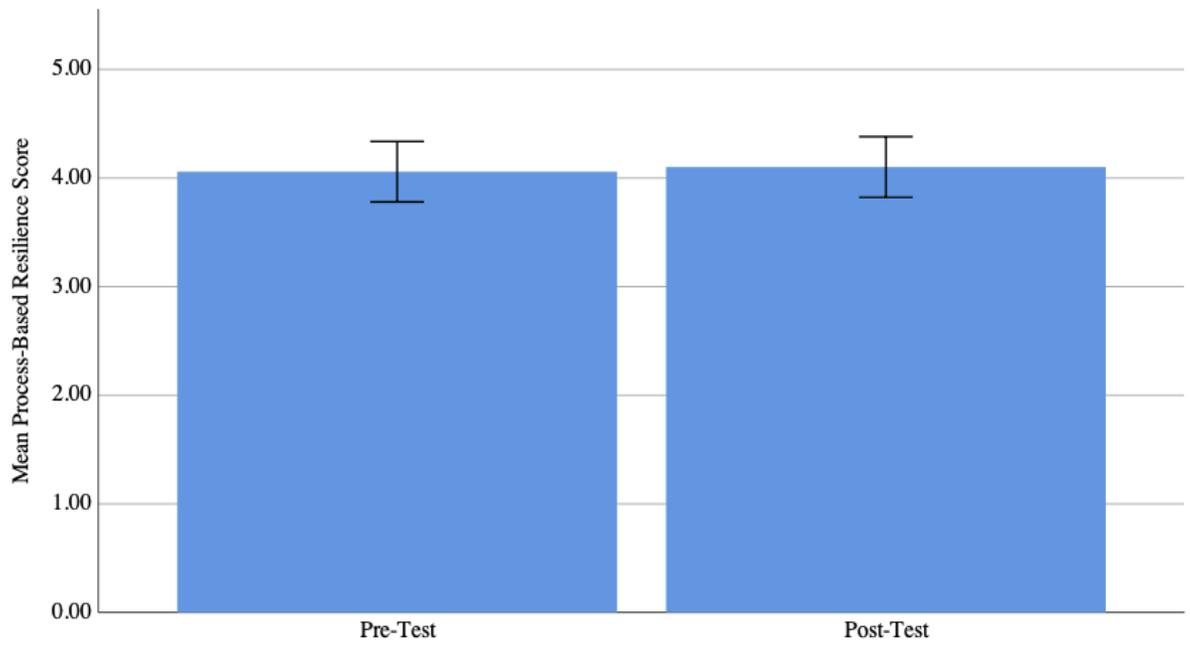


Figure 1. Change in process-based resilience measure score from pre-test to post-test.

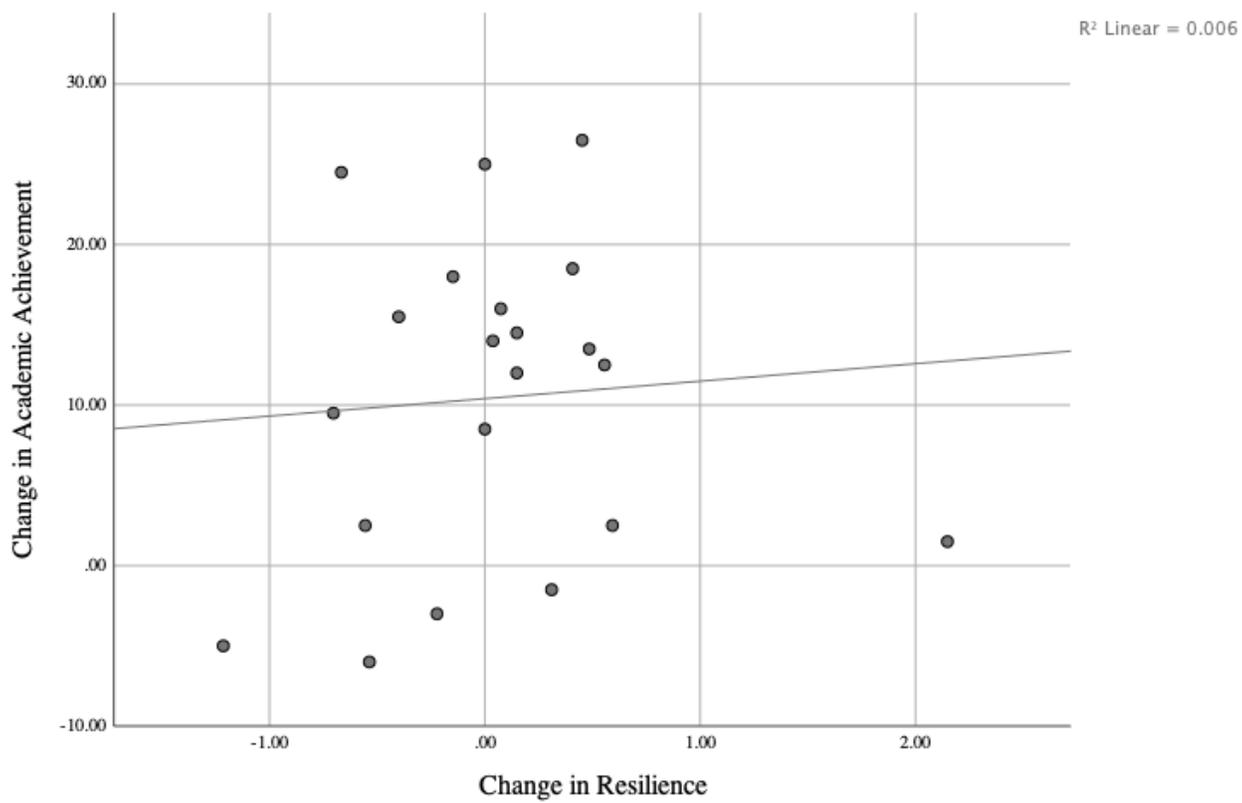


Figure 2. Correlation comparing change in resilience and change in academic achievement.

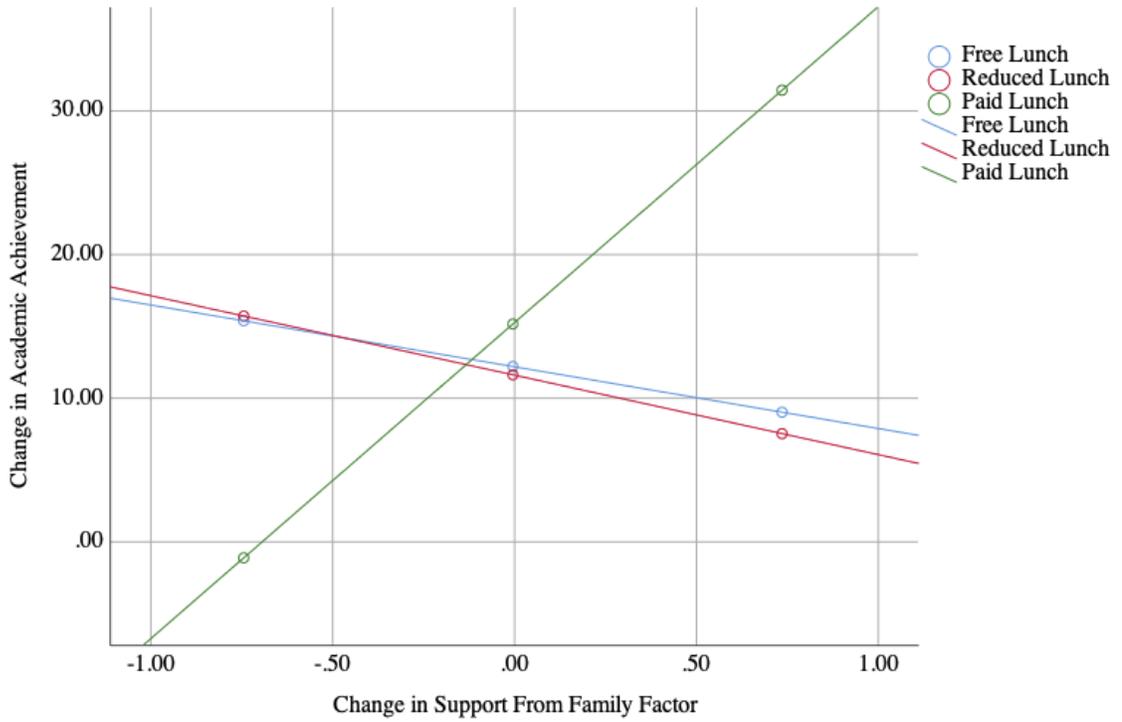


Figure 3. Interaction of Free vs. Paid lunch group on relationship between Family factors and academic achievement.

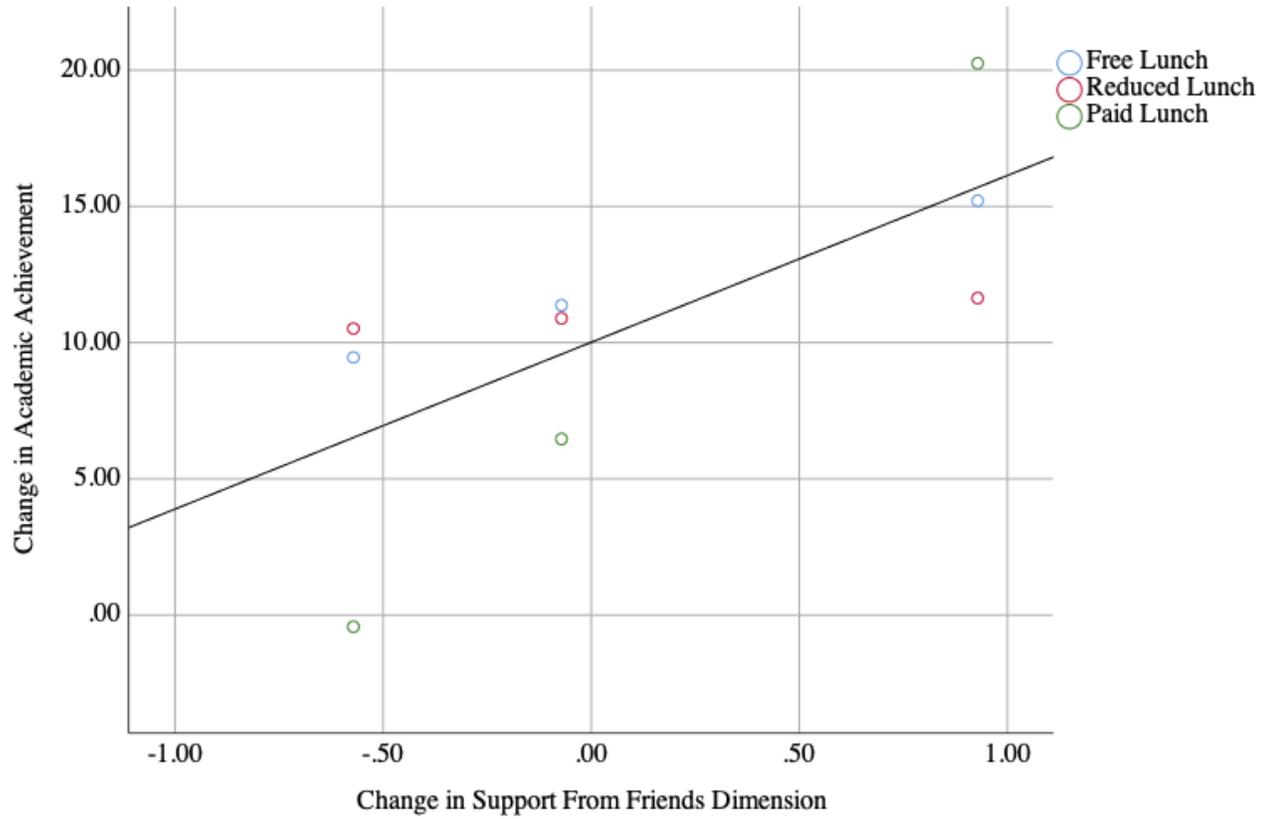


Figure 4. Main effect of relationship between Friends factor and academic achievement.

Table 1

*Regression Models for Moderation Analyses of Twelve Factors of Process Based**Resilience*

Factors	<i>F</i>	<i>p</i>	<i>R</i>	<i>R</i> ₂
Individual				
Self-Value	.26	.931	.28	.08
Self-Regulation	.59	.705	.41	.17
Goals	1.09	.407	.52	.27
Problem Solving	.64	.670	.42	.18
Trust/Safety	1.52	.243	.58	.34
Supportive Beliefs	1.13	.309	.55	.31
Contextual				
Family	2.52	.076*	.68	.46
Friends	2.29	.098*	.66	.43
School	1.01	.448	.50	.25
Activities	.57	.721	.40	.16
Community	.95	.479	.49	.24
After-school	.68	.645	.43	.19

* indicates *p* value approaching significance

Table 2

Household Income Moderation of Relationship Between Self-Value and Academic Achievement

	<i>Coefficient (b)</i>	<i>t</i>	<i>p</i>	<i>SE</i>
Self-Value	-.72	-.876	.376	4.49
Free vs. Reduced	-1.19	-.845	.399	5.99
Free vs. Paid	-4.47	-.835	.401	21.11
Interaction: Self-Value x Free vs. Reduced	1.23	.19	.855	6.64
Interaction: Self-Value x Free vs. Paid	5.71	.21	.835	27.08

Table 3

Household Income Moderation of Relationship Between Self-Regulation and Academic Achievement

	<i>Coefficient (b)</i>	<i>t</i>	<i>p</i>	<i>SE</i>
Self-Regulation	-.69	-.25	.807	2.77
Free vs. Reduced	-.68	-.13	.898	5.21
Free vs. Paid	-25.65	-1.58	.135	16.24
Interaction: Self-Regulation x Free vs. Reduced	2.91	.44	.663	6.55
Interaction: Self-Regulation x Free vs. Paid	38.22	-1.18	.257	38.22

Table 4

*Household Income Moderation of Relationship Between Goals and Academic**Achievement*

	<i>Coefficient (b)</i>	<i>t</i>	<i>p</i>	<i>SE</i>
Goals	-4.63	-1.72	.106	2.70
Free vs. Reduced	-3.82	-.75	.462	5.07
Free vs. Paid	-29.72	-1.43	.172	20.73
Interaction: Goals x Free vs. Reduced	3.72	.44	.664	8.39
Interaction: Goals x Free vs. Paid	-8.87	-.63	.5367	14.02

Table 5

*Household Income Moderation of Relationship Between Problem Solving and Academic**Achievement*

	<i>Coefficient (b)</i>	<i>t</i>	<i>p</i>	<i>SE</i>
Problem Solving	.39	.15	.882	2.57
Free vs. Reduced	.52	.10	.925	5.47
Free vs. Paid	-18.50	-1.63	.124	11.34
Interaction: Problem Solving x Free vs. Reduced	4.17	.54	.597	7.73
Interaction: Problem Solving x Free vs. Paid	-15.64	-1.21	.243	12.88

Table 6

Household Income Moderation of Relationship Between Trust/Safety and Academic Achievement

	<i>Coefficient (b)</i>	<i>t</i>	<i>p</i>	<i>SE</i>
Trust/Safety	3.33	1.41	.178	2.36
Free vs. Reduced	-.60	-.13	.895	4.46
Free vs. Paid	-8.45	-1.39	.186	6.10
Interaction: Trust/Safety x Free vs. Reduced	-8.32	-1.82	.088	4.56
Interaction: Trust/Safety x Free vs. Paid	7.92	1.02	.325	7.78

Table 7

Household Income Moderation of Relationship Between Supportive Beliefs and Academic Achievement

	<i>Coefficient (b)</i>	<i>t</i>	<i>p</i>	<i>SE</i>
Supportive Beliefs	-5.29	-1.60	.130	3.30
Free vs. Reduced	-3.30	-.71	.491	4.66
Free vs. Paid	2.73	.24	.817	11.63
Interaction: Supportive Beliefs x Free vs. Reduced	3.44	.88	.391	3.89
Interaction: Supportive Beliefs x Free vs. Paid	21.96	1.63	.123	13.45

Table 8
Household Income Moderation of Relationship Between Family and Academic

Achievement

	<i>Coefficient (b)</i>	<i>t</i>	<i>p</i>	<i>SE</i>
Family	-4.30	-1.46	.164	2.94
Free vs. Reduced	-.58	-.15	.885	3.98
Free vs. Paid	3.08	.38	.710	8.13
Interaction: Family x Free vs. Reduced	-1.23	-.32	.753	3.84
Interaction: Family x Free vs. Paid	26.30	2.16	.048*	12.13

* indicates $p < .05$

Table 9
Household Income Moderation of Relationship Between Friends and Academic

Achievement

	<i>Coefficient (b)</i>	<i>t</i>	<i>p</i>	<i>SE</i>
Friends	3.84	2.54	.023*	1.51
Free vs. Reduced	-.70	-.17	.865	4.06
Free vs. Paid	-4.20	-.71	.490	5.94
Interaction: Friends x Free vs. Reduced	-3.10	-.46	.651	6.70
Interaction: Friends x Free vs. Paid	9.95	1.23	.236	8.06

* indicates $p < .05$

Table 10

*Household Income Moderation of Relationship Between School and Academic**Achievement*

	<i>Coefficient (b)</i>	<i>t</i>	<i>p</i>	<i>SE</i>
School	-3.37	-1.03	.319	3.27
Free vs. Reduced	-.62	-.13	.897	4.74
Free vs. Paid	-27.33	-1.86	.082	14.68
Interaction: School x Free vs. Reduced	5.40	1.11	.286	4.88
Interaction: School x Free vs. Paid	38.87	1.60	.130	24.29

Table 11

Household Income of Relationship Between Activities and Academic Achievement

	<i>Coefficient (b)</i>	<i>t</i>	<i>p</i>	<i>SE</i>
Activities	-1.90	.83	.420	2.30
Free vs. Reduced	-1.62	-.32	.753	5.04
Free vs. Paid	-7.49	-1.09	.292	6.86
Interaction: Activities x Free vs. Reduced	-6.90	-1.15	.270	6.02
Interaction: Activities x Free vs. Paid	.60	.05	.964	12.95

Table 12

Household Income Moderation of Relationship Between Community and Academic Achievement

	<i>Coefficient (b)</i>	<i>t</i>	<i>p</i>	<i>SE</i>
Community	-.68	-.26	.796	2.58
Free vs. Reduced	-1.47	-.31	.762	4.77
Free vs. Paid	8.06	.63	.538	12.78
Interaction: Community x Free vs. Reduced	-4.17	-.78	.448	5.35
Interaction: Community x Free vs. Paid	18.43	1.49	.158	12.39

Table 13

Household Income Moderation of Relationship Between After-school and Academic Achievement

	<i>Coefficient (b)</i>	<i>t</i>	<i>p</i>	<i>SE</i>
After-school	-3.40	-.48	.636	7.05
Free vs. Reduced	-.92	-.19	.855	4.94
Free vs. Paid	-8.50	-1.25	.229	6.78
Interaction: After-school x Free vs. Reduced	6.30	.71	.486	8.83
Interaction: After-school x Free vs. Paid	9.83	1.12	.280	8.77

Appendix

27-Item Process-Based Resilience Measure of Feelings of Support from Protective Factors

Choose the answer that represents how you feel about each statement:



5=Always

4=Very Often



3=At Times

2= Seldom



1=Never

- Self-Value
 - I care about myself.
 - I can help out.
- Self-Regulation
 - I stay in control if something bad happens.
 - When I get upset, I can calm down.
 - I can talk about my feelings.
- Goals
 - No matter how bad I feel, it will get better.
 - I will grow up to have a happy life.
- Problem Solving
 - I think of ways to get out of a bad spot.
 - When hard things happen, I figure out a solution.
- Supportive Beliefs
 - I like to pray or meditate.
 - My beliefs give me comfort.
- Family
 - When things go wrong, my family helps me.
 - My parent helps me feel less afraid.
- Friends
 - I have a friend who helps me when things are hard.
 - A friend comforts me.
- School
 - At school, we help each other.
 - A teacher helps me when things go wrong.
- Activities
 - My activities help me feel good.
 - My team or group helps me.
- Community
 - Other than at home, I know an adult I can talk to about anything.

- My neighbors are there for me when things go wrong.
- After-school
 - At the after-school program, we help each other.
 - I feel I belong at my after-school program.
 - The adults at the after-school program keep me safe.
- Trust/Safety
 - If I am in trouble, I have people I can turn to who will help me.
 - I feel safe when I am with adults.
 - I can talk to my friends about sad and happy things.