Universitat Autònoma de Barcelona

Social hierarchies and effects on depression and aggression in adolescents

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International PhD Dissertation

Social Hierarchies and Effects on Depression and Aggression in Adolescents

Doctoral Dissertation

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PhD Dissertation Title:

Social Hierarchies and Effects on Depression and Aggression in Adolescents

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"The greatest country, the richest country, is not that which has the most capitalists, monopolists, immense grabbings, vast fortunes, with its sad, sad soil of extreme, degrading, damming poverty, but the land in which there are the most homesteads, freeholds - where wealth does not show such contrasts high and low, where all men have enough – a modest living – and no man is made possessor beyond the same and beautiful necessities."

-Walt Whitman

To Flav, Zoë and Daphne

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GENERAL FORMAT

This dissertation is presented as an investigation project based on the development of four separate studies. One of the four studies has been published as a manuscript in the *Journal of Community Psychology* (journal indexed in the Journal Citation Reports, sections Psychology, Multidisciplinary; Public, Environmental & Occupational Health (Social Science); Social Work), and the other three have been sent to be considered for publication. All work has been supervised by Dr. Lawrence Wissow at the University of Washington in Seattle, Washington, and Dr. Carl Latkin at the Johns Hopkins Bloomberg School of Public Health in Baltimore, Maryland. The research was solely conducted at the Johns Hopkins Hospital and satellite ambulatory clinics.

Below are the references for this dissertation's four articles, in the order they will be referred to throughout the document. As per the Universitat Autònoma de Barcelona's recommendations, the published article is included in the main text, and the unpublished articles are included in the appendices as they were submitted for publication to the last journal. The bibliography for each of the articles is listed after the article in the reference format of the journal to which it was last submitted. A separate section of references in the American Psychological Association (APA) format included in the overall introduction, methods, results, and discussion is presented at the end of the main document.

Study 1#: Vidal C, & Latkin C. (2020) Perceived family and individual social status and its association with depression and suicidality in an adolescent clinical sample. *J Community Psychol*,;48:2504–2516.

Study #2: Vidal, C., Wissow. "Adolescents' responses and coping strategies in the face of social inequities: a qualitative study"*(submitted).*

Study #3: Vidal, C., Latkin, C. "Perceived sense of control and aggression in a sample of American adolescents: the role of school and neighborhood contextual factors" *(submitted).*

Study #4: Vidal, C., Jun, H-J., Latkin, C. "The Effects of Perceived Control and Status, and Neighborhood and School Environment on Adolescent Depression and Suicidal Thoughts and Behaviors: a Structural Equation Modelling Approach" *(submitted).*

ABREVIATIONS

ADHD	Attention Deficit Hyperactivity Disorder
ODD	Oppositional Defiant Disorder
OECD	Organization for Economic Co-operation and Development
OR	Odds Ratio
PICS	Perceived Income in Childhood Scale
PRD	Perceived Relative Deprivation
RD	Relative Deprivation
RPQ	Reactive-Proactive Aggression Questionnaire
SES	Socio-Economic Status
SSS	Subjective Social Status
U.S.	United States

PREFACE

Population-based interventions, from vaccination to lead poisoning prevention, have saved many lives and spared many others from morbidity. A study (Woolf et al., 2007) using mortality data from 1996 through 2002 from the National Center for Health Statistics examined the number of deaths that would have been avoided if the mortality rates among adults with inadequate education had been the same as those among college-educated adults. The study's findings showed an 8:1 ratio of the number of lives potentially saved by improved education versus those saved by medical advances. The authors suggested that addressing societal factors would lead to a greater improvement in public health than focusing on medical solutions, and that society's focus on medical interventions "puts lives at risk" (Woolf et al., 2007, page 682).

The social determinants of health continue to have a major role in the cause of and impact on disease, including mental health disorders. Yet, the recommended therapeutic mental health interventions in the clinical setting tend to focus on the individual's temperament and symptoms with limited incorporation of contextual factors that may have a broader effect on the patient's clinical presentation and illness trajectory. For an expansion of new, potentially effective interventions, there needs to be a better understanding of how these social aspects affect mental health.

An aspect of the social environment that encompasses psychosocial stressors and social disadvantage and impacts mental health is *social rank*.

This research project examines the effects of social rank on the most frequent presentations to mental health services among adolescents: depression, suicidal thoughts and behaviors, and aggressive behaviors.

My motivation to pursue this line of research is the realization that psychiatric practice often overlooks environmental factors that are key to the mental health of children and adolescents, and that our interventions, modeled on adult systems of care, often have a limited effect on the mental health of adolescents. It is my hope that this research will contribute to a better understanding of how social factors related to social rank impact mental health in adolescents, and that it will help to implement new interventions with a broader and deeper reach.

This study project aims to examine if differences in the perception of inequality have an impact on the mental health of adolescents. The study specifically looks at depression and aggression since prior research has linked them to loss of social status in animals and humans. This research generates new hypotheses which can help expand the role of psychiatry as not only a discipline with the mere objective of treating mental disorders, but also of improving the overall mental health and wellbeing of wider populations. The goal of intervening on perceived social status to prevent poor social and health outcomes is not to have people learn to acquiesce to inequality, but instead to be aware of its effects on self-concept so that it is not internalized. This research project can help inform the care provided by school counselors, psychologists, pediatricians, child and adolescent psychiatrists, and other health care providers.

GENERAL ABSTRACT

Previous research has suggested that depression and aggression can result from loss of social status in animals and humans (Adler et al., 2000; Edwards & Kravitz, 1997). The purpose of this research project was to understand better the effects of social rank on the mental health of adolescents, specifically by studying the associations between measures of rank such as subjective social status, sense of control, and perceived childhood income inequality, with depressive symptoms, suicidal thoughts and behaviors, and aggression in a clinical sample of predominantly Black adolescents from an urban area in the United States.

The aims of this research project were: 1- To analyze the association between social rank and depressive symptoms and aggression in a clinical sample of adolescents; 2- To determine the mechanisms by which social rank affects mood and aggression in adolescents; and 3- To determine the impact of social rank on psychological well-being from a developmental perspective. The hypothesis is that adolescents with lower perceived social rank or sense of control will present more symptoms of depression, more suicidal thoughts and behaviors, and more aggression when adjusting for other variables.

This research project consisted of a mixed methods research study (Palinkas et al., 2011) with the purpose of acquiring a more comprehensive understanding of the topics, corroborating the results with different methods, and comparing multiple system levels. The study comprised 2 phases: *Phase 1:* Qualitative data collection was conducted with in-depth interviews with 23 adolescents following a phenomenological method of design and analysis. The interviews were

completed until information saturation was reached. *Phase 2:* Quantitative data collection was conducted using a cross-sectional survey. One hundred and ninety-seven (n=197) adolescents completed a survey in order to complement the in-depth interviews. The design of the survey was based on the findings from phase 1. The qualitative data were analyzed by thematic analysis using the software ATLAS. The quantitative data analyses were conducted through descriptive analysis of the variables and logistic and linear regressions using the statistical package SPSS. Confirmatory factor analyses and structural equation modeling were conducted with the program Mplus.

The results of these series of studies showed positive associations between low perceived social status and depression and suicidal ideation, and positive associations between low sense of control and aggression in a sample of adolescents recruited in clinical urban settings, suggesting that perceived social rank and sense of control as experienced by adolescents can have effects on mental health at that early age. Additionally, as early as in adolescence, we observed individuals using coping skills to attempt to manage reactions related to their social rank.

These research findings could have implications for individual and group therapy interventions, given that the interpretations that adolescents make of their social environment can be included in therapeutic work. These results could also have public health implications, as interventions at the population level could attenuate the effects of inequality or decrease inequalities, and prevent the internalization of inequalities in youth.

KEY WORDS:

Social hierarchies

Social rank

Subjective social status

Depression

Aggresion

Adolescents

1. GENERAL INTRODUCTION:

1.1. Socio-Economic Status (SES) and Health

There is a widely documented and accepted association between SES and health, with a gradient showing that the higher SES, the better health at all stages regardless of where one is in the SES spectrum (Marmot et al., 1984). This gradient suggests that where a person stands in the social hierarchy matters even when their basic needs are met, meaning that it is not poverty alone that affects one's health, but being poorer than others, at all levels of wealth. Most researchers agree that the major mediators of the relationship between SES and health are psychosocial factors. This argument is supported by the findings that the diseases that are most sensitive to stress (heart disease, diabetes, psychiatric disorders, and metabolic syndrome) have the strongest SES gradients (Wilkinson, 1999).

Research has also shown that subjective beliefs about one's social status can be more strongly related to overall health than objective measures (Adler & Stewart, 2010; McLaughlin et al., 2012), which may not be able to capture subtle aspects of social status. In studies of adults, perceived social rank changes with social context and is frequently constructed by measures of income, education, and occupation. However, in today's rapidly changing social environments, less is known about how adolescents place themselves in the social hierarchy. There is still much to understand about the processes by which social rank and inequality affect mental health in children and adolescents in order to develop appropriate and effective interventions.

1.2. Health and Income Inequality

There is a well-established relationship between absolute income and health (Deaton, 2003), and growing research on the relationship between income inequality and mental health. The *relative income hypothesis* (Wilkinson, 1996; Runciman, 1996) posits that income distribution rather than absolute income matters most in terms of health outcomes. This hypothesis has been used to describe two different types of measures: (i) Income inequality and (ii) Relative Deprivation (RD).

Income inequality is the unequal distribution of resources within a specific population. In addition to the impact of poverty on health, the impact of income inequality on health has been shown in studies comparing different countries' health outcomes and their level of income inequality, as well as studying smaller geographical areas and individual level indicators (Pickett et al., 2006; Pickett, & Wilkinson, 2007; Pickett, & Wilkinson, 2010; Pabayo et al., 2014; Bouffard & Dube, 2013; Ladin et al., 2010). Wilkinson and Pickett (2007) expanded the study of the association of income inequality to social outcomes other than health, showing an impact of income inequality on social factors including violence, social capital, hostility and racism, low educational performance in school children, the proportion of imprisoned population, drug overdose mortality, and low social mobility. Similar results have been replicated in cultures across the world (Chiavegatto Filho et al., 2013; Kuo & Chiang, 2013).

In contrast, other studies have not supported this hypothesis, with income inequality only having an effect in larger regional levels and not at the neighborhood level, possibly due to the insufficient

socioeconomic contrast within neighborhoods (Astell-Burt & Feng, 2015; Drukker et al., 2004; Fone et al., 2013; Kearns et al., 2013).

Finally, some research has found a positive association only in certain segments of the population (Bechtel et al., 2012) such as affluent individuals (Weich et al., 2001) or women in poverty (Kahn et al., 2000). We do not know if inconsistencies in study findings are due to measurement, the role of perceived status, or other factors that may buffer the impact of income inequality.

To control for the cultural effects that may confound the association between income inequality and health, Wildman (2003) examined income inequality over time in Great Britain instead of making comparisons across countries. He found that subjective financial status is an important determinant and contributor of income-related health inequalities. Several studies conducted in the United States (U.S.) using national databases (Zimmerman, & Bell, 2006; Eibner et al., 2004) have shown similar results.

RD refers to the experience of having less in comparison to a reference group (Wickham, Shryane, et al., 2014), and higher RD has been hypothesized to be associated with poorer social and health outcomes (Wilkinson & Pickett, 2009). One explanation for these poorer outcomes when being presented with greater RD (Deaton, 2001) is that the human brain may be wired to adapt to hunter-gatherer societies, which were more egalitarian than the types of society that later came with agriculture, and has not adapted to today's unequal societies, which are inherently more stressful due to lack of perceived control and the power dynamic that they engender.

The effects of inequality on mental health are well-known, complex, and multifactorial. Inequality could impact mental health in different ways: (i) it can be a cause of stress in itself (both perceived and direct) through processes such as conflict, helplessness, loss of control, and stigmatization, (ii) it can promote unhealthy behaviors and, (iii) it can cause one's self-evaluation and those of others to be negative.

While most of the literature points to an effect of inequality at a societal level on all health outcomes, and specifically on mental health, there is a need for a better understanding of the individual processes involved in the association between inequality and mental health, specifically among children and adolescents.

1.3. The evolution of inequality

As explained by Nobel Prize winner, Angus Deaton (2013), humans have been shaped by their experience having spent nearly all of their history living in hunting and gathering societies. Our minds and bodies have evolved to adapt to those types of societies. Because these societies tended to be nomadic and did not store food, wealth accumulation was non-existent, and the culture did not encourage hierarchies, or leaders or rulers with power over others. Furthermore, ladder-climbers and those wanting to distinguish themselves from others were often ridiculed or killed (Erdal & Whiten, 1996). The inability to store food and the instability of the environment promoted sharing and exchanging within the group. Over time, those individuals and groups who were better at sharing succeeded and survived, and we evolved into "a species with a hardwired believe in sharing" as well as "deep seated beliefs in fairness." (Deaton, 2003, page 76, lines 17-18). While

these hunter-gathering societies were not ideal, with unpoliced internal violence and violence with other groups, they were more equal societies.

As foraging food became more difficult to gather, a change to farming and agriculture (Boserup, 1965) took place, with settled agriculture allowing for food storage, property ownership, and the development of towns and a ruling class, which lead for the first time to inequality within communities. This system persisted for the past 10,000 years with many recent social structure changes taking place within the past 250 years. These more recent changes have not contributed to a decrease in social inequalities. In sum, as humans, we are biologically wired to share and live in equal societies. Attempting to adjust to today's unequal societies could go against our own nature and be a cause of stress and health problems, including mental health problems (Deaton, 2003).

1.4. Stress in social hierarchies

Social animals are known to experience stress in social hierarchies (Sapolsky, 1996). Stress is an external challenge to the individual's homeostasis. Stressors can be physical or psychological, such as the anticipation of a challenge (Sapolsky, 2005). Both physical and psychosocial stressors activate the neural and endocrine systems and inhibit other systems to allow us to respond to the stressor. Initial activation happens by the stimulation of the sympathetic nervous system with the release of epinephrine (adrenaline) and norepinephrine (noradrenaline) from the adrenal glands. Minutes later, glucocorticoids are released from the adrenal glands following an endocrine cascade that starts in the hypothalamus. While these adaptations are necessary and positive to survive the

initial stressor, they can be pathogenic if they are chronic and the individual does not have a chance to return to a state of homeostasis, potentially damaging all body systems (Sapolsky, 2004).

Previous animal studies have shown that the use of physical force to impose social status in primates causes stress and poorer health outcomes in those primates of lower hierarchical status as compared to those of higher status (Sapolski, 2005). These animal studies have demonstrated that social rank has an impact on the homeostasis of primates and that excessive and chronic activation of the stress-response, with significant changes in levels of glucocorticoids, as it occurs in primates that are lower in the social rank, can have deleterious effects on health. These studies have also shown differences by primate species and structure of the hierarchy, with those who are higher in the status hierarchy in unstable societies, and those who are subordinates in stable societies presenting more stress than those of lower status in unstable societies or those who are dominant primates in stable societies (Sapolsky, 2005).

Humans use social rank judgments as a mechanism to assess their social status in their group of reference. In our sophisticated social species, the stress response can be activated by psychological or social stressors that are usually unpredictable, where the receptor of the stressor has a low sense of control, lacks outlets for frustration, has low social support, or makes an interpretation of the stressor that worsens the stress response (Sapolski, 2004). Chronic social stress affects the Hypothalamus Pituitary Adrenal (HPA) axis (Abbott et al., 2003), which may facilitate depression and other medical conditions. Studies in human environments such as the workplace have confirmed the health benefits of being higher versus lower in social rank in humans (Sherman, 2012). In youth, similar findings suggest changes in cortisol level varying by gender and position

depending on the area in which youth compare themselves to their peers. For example, in a study conducted in Scotish schools (West et al., 2010), girls with lower academic scores and high peer ranking both presented higher morning cortisol levels, whereas among boys, low ranking in sports was associated with higher cortisol levels. Meanwhile, SES, which has traditionally been used as a measure of social rank in adults, had no effect on the students' cortisol levels. These findings suggest that status relationships with stress are complex and dependent on the individual's age and environment.

The difference between the environment in non-human primates and the very complex environments which humans navigate make for situations where a person could be higher up in social status in one environment and lower in social status in another (Sapolski, 2004). Understanding the effects of social status in humans requires examining not only their relationships with complex and diverse environments, but also their stage of development.

1.5. Social Status Identity in Adolescence

The key developmental task of adolescence is identity formation, and adolescence is the period of development of a stable sense of identity (Erikson, 1993). Adolescence is also a period of an increased ability for abstract thinking, which leads to a better understanding and growing awareness of how one is perceived by others and of phenomena such as one's standing in the social hierarchy (Harter, 1990; Sebastian et al., 2008). Beliefs about one's social status can be understood as comparable to other elements of identity such as gender and ethnicity (Goodman et al., 2007). Extensive research on racial identity and social expectations in children as young as elementary

school age (Rowley et al., 2008) has shown how their social interactions affect academic anxiety and levels of intrinsic motivation (Gillen-O'Neel et al., 2011).

The concept of the self as a social product, first introduced by Cooley (1902) as the "looking glass self," explains self-construction as a "result of the social process whereby we learn to see ourselves as others see us" (Yeung & Martin, 2003, page 843). During adolescence, perceptions of peer groups become especially important (Steinberg & Silverberg, 1986), and feelings of acceptance or rejection can affect mood (Sebastian et al., 2010). Those with a greater tendency to look at others to appraise their self-worth, or those who perceive themselves to be of lower social rank, or who navigate highly competitive environments may be even more vulnerable to negative affect due to such comparisons. In contemporary society, there is an expansion of the number of possible social reference groups during adolescence, which makes it a critical period for *status-based identity*, a concept that describes the meaning that people attach to their SES "from moment to moment in real time" (Destin et al., 2017, pp 271). Changes in cognitive style during adolescence facilitate the formation of status-based identity by evolving from a more concrete and less flexible view of the social world in early adolescence to one that is more abstract and adaptable to changes in perspective in late adolescence (Harter, 1990; Johnson & Johnson, 1996; Sebastian et al., 2008; Tanti et al., 2011).

As early as in 1978, Rosenberg and Pearlin (1978) conducted a study to explore differences in self-esteem (a symptom considered in the diagnosis of depression) as a function of social status and age. They found no association of social status and self-esteem among pre-adolescents, a modest relationship among adolescents, and a solid relationship among adults, who are more conscious of

economic inequality, suggesting developmental differences in the assessment of social rank depending on age, and pointing to the growing importance of social rank in adolescence as compared to earlier stages of development. More recent research confirms that the points of reference for comparing social status differ in adolescents and adults (Sweeting & Hunt, 2014).

1.6. Social Hierarchies and Mental health

While there is a well-known relationship between perceived social rank and mental health, most research is focused on general populations, and less is known about clinical populations. One weakness with most studies conducted in mental health is that they control for SES in order to examine the individuals' characteristics instead of examining factors related to social status that might make people vulnerable to poor mental health. In this research project, the most common presentations to mental health services (depression, suicide thoughts and behaviors, and aggression) are examined from the lens of social rank.

1.6.1. Depression and Suicide

Over the past two decades, there has been an increase in adolescent depression (Mojtabai et al., 2016) and suicide (Miron et al., 2019) in industrialized countries, and suicide continues to be the second leading cause of death among 10 to 24-year-olds in the U.S. (Curtin & Heron 2019). Physical, psychological, and environmental factors such as familial and social influences have all been associated with depression (Mojtabai et al., 2016) and suicide (Evans et al., 2004) in adolescents. However, the effects of the stress caused by social hierarchies on depression and

suicidal thoughts and behaviors have been less studied, and their understanding is vital in a growing environment of income inequality (Phillips, 2002) and opportunities for social comparisons with the expansion of social media use (Blease, 2015).

Evolutionary psychology theories have explained depression through the lense of social rank. The Social competition or *Social Rank Theory of depression* (Price et al., 1994) posits that depression is a strategy to accept defeat and retreat as a response to competitive situations with more dominant peers, and a means to inhibit aggressive reactions. In contemporary society, this dominance would be determined by prestige. Similarly, the *Social Risk Hypothesis of depression* (Allen & Badcock, 2003, 2006) proposes that depression would be an adaptive response to a threat situation, reducing expectations of success and sending signals of relative low value to others when in an environment of others who have higher status. Although depression as a response may be adaptive in certain situations, it is highly non-adaptive in other situations or as a long-term strategy.

Regarding suicide, theories such as the *Interpersonal theory of suicide* (Joiner, 2005) and the three-step theory (Klonsky & May, 2015) consider suicide ideation and the progression to action culminating in a suicide attempt as two separate processes. The *Integrated Motivational-Volitional Model of Suicidal Behavior* (O'Connor, 2011), based on a diathesis-stress framework, takes into consideration this ideation-to-action framework and includes a pre-motivational, a motivational, and a volitional phase (O'Connor, 2011; O'Connor et al., 2016). Background factors such as life events, genetics, and deprivation would constitute the pre-motivational phase, and moderators would facilitate the transition from defeat to entrapment in the motivational phase, with a volitional phase consisting of factors that influence the likelihood that someone will act (e.g., impulsivity,

exposure to suicide, and capability for suicide). Stress, social status, and belongingness fit prominently into these theories. Wetherall et al. (2019) have proposed social comparisons as a social rank element that would represent a pre-motivational factor that makes the individual more likely to interpret life circumstances in a way that they feel defeated or entrapped. Another model that includes self-appraisals as an influence on suicidal thoughts and behaviors is the *Schematic Appraisals Model of Suicide* (Johnson et al., 2008). This model posits that situations and self-appraisals (especially appraising a situation as defeating and entrapping) modify suicide risk (Johnson et al., 2010).

Suicide is often the endpoint of the concurrence of multiple factors ranging from biological to psychological to socio-cultural (Hawton et al., 2012). However, psychosocial adversity may have a bigger role than other factors, given the rapid rise in prevalence that genetic changes cannot explain. A study conducted in China (Zhang et al., 2011) compared characteristics of people who had completed suicide with living controls by interviewing family members. The authors found that RD, along with individual characteristics such as lack of coping skills and unrealized aspirations, was associated with suicide even after controlling for mental illness, showing that social status, along with one's ability to cope with social status related stress were more important suicide risk factors than mental illness.

While there is extensive literature on the association between subjective social status (SSS) and depression in adults and adolescents (Goodman et al., 2001; Quon & McGrath, 2014) largely supporting a positive association between SSS and depression, there is limited research on SSS and suicidal thoughts and behaviors in general (Goodman et al., 2017), and specifically among

adolescent populations (Jeon et al., 2013). The existing research on SSS and suicide thoughts and behaviors points to an association between the perception of lower rank in the individual and a higher risk of suicide attempts and behaviors.

1.6.2. Aggression

Aggressive behaviors are a common presentation to mental health services among children and adolescents in the U.S., with approximately 5 to 10% of children between the ages of 8 and 16 years presenting aggressive and other disruptive behaviors (Hill, 2002). Aggression tends to peak in preschool and decrease as self-regulation improves (Connor, 2002; Tremblay, 2010). However, in some children, aggressive behaviors persist and can lead to negative outcomes in adulthood, including low SES, unemployment, criminal behavior, and social isolation (Buchmann et al., 2014).

Aggressive behaviors are present in most animal species, and have a role in survival, sexual selection, and group cohesion (Georgiev et al., 2013). Prior research shows an equal contribution of genetic and environmental factors on aggression (Tuvlad & Baker, 2011). Aggression is the manifestation of a combination of predisposing factors such as the individual's schemas about the world, the individual's learned social behavior, and precipitating circumstances.

In his work, *The Status Syndrome "How Social Standing Affects Our Health and Longevity,"* Marmot emphasized sense of control and autonomy as the central factors causing health disparities associated with social class (Marmot, 2004). A person's sense of control in domains

such as the work setting, finances, and contributions to community welfare is inversely associated with the level of stress (Cohen et al., 2016) and allostatic load (i.e., cardio-vascular functioning, measures of stress hormones, heart rate, and inflammation) (Seeman et. al, 2014). Perceived sense of control has also been linked to social inequalities and health outcomes (Wilkinson & Pickett, 2009).

Given certain contextual factors, psychological factors such as perceived sense of control can have an impact on aggression. Theories of social rank propose that when confronted with a threat or perceived threat, there is an escalating behavior towards subordinates and a de-escalating behavior towards superiors. This hypothesis has been confirmed in humans in the workplace (Fournier et al., 2002).

Low social class as measured by low income and education has been associated with increased levels of aggression (McFarlin et al., 2001; Barefoot et al., 1991), and perceived lower social class is also associated with higher levels of aggression (Greitemeyer & Sagioglou, 2016). Low perceived sense of control has also been associated with aggression in adolescents (Guo et al., 2016). The mechanisms by which low sense of control increases aggression may involve the perception of threat, such as in facial expressions (Hall, 2006), or an increase in perceived threats in the person's life (Sullivan et al., 2010). Social status loss is a perceived threat and individuals who have few alternative resources may use aggression with the purpose of increasing their social status.

1.6.3. Why Study Depression and Aggression in the Context of Social Status?

Social rank theory (Stevens & Price, 2016) posits that affiliative and ranking structures are at the core of many psychological disorders, and submit signals to dominant individuals that subordinate individuals are not a threat in the social hierarchy. As explained earlier with the *Social Rank Theory of depression* (Price et al., 1994), the *Social Risk Hypothesis of depression* (Allen & Badcock, 2003, 2006), and studies on aggression and perceived threat (Hall, 2006; Sullivan et al., 2010), it appears that when under stressful circumstances related to a threat of status loss, the reactions are either to avoid the stressor and retreat, which in its most pathological form would manifest in depressive symptoms, or confront the threat, which in its most extreme form would manifest in aggressive behaviors.

Additionally, because depressive symptoms, suicidal thoughts and behaviors, and outward aggression are highly frequent forms of presentation to mental health services in U.S. youth, I focused this research project on these two areas of symptoms and behaviors. The purpose of this research is to study the social rank situations in which adolescents find themselves from an ethological perspective.

1.7. Subjective Social Rank and Mental Health Measures

As shown by previous research and as stated above, beyond the impact of poverty and income inequality on health, psychological processes such as one's assessment and perception of their social rank may have more of an impact on health and specifically on mental health.

Several measures of subjective social rank have been explored in the literature to assess the effect of social rank on health. The most notable ones, included in the studies used in this research project are subjective social status, sense of control, and perceived relative deprivation.

1.7.1. Perceived Relative Deprivation (RD) and mental health:

A decrease of 25% in RD has been shown to decrease the probability of mental health disorders by 9.5% (Eibner et al., 2004), and a person's relative income compared to others within a similar social comparison group is more predictive of mental health outcomes than their absolute level of income (Hounkpatin et al., 2016).

The Perceived Inequality in Childhood Scale (Wickham et al., 2013) was developed as a tool to retrospectively measure deprivation in childhood relative to childhood peers and the wider society, quality of family relationships, and perceived family social capital. The scale is designed for adults to report on their experiences in childhood. Recent research using this scale has shown a positive association between higher relative deprivation and specific mental health symptoms such as psychotic symptoms in the form of paranoid ideation (Wickham, Taylor et al., 2014).

1.7.2. Subjective Social Status (SSS) and mental health:

There is a distinction made between Socio-Economic Status (SES) and Subjective Social Status (SSS). SES refers to the "social standing or class of an individual or group" and "it is often measured as a combination of education, income, and occupation" (American Psychological

Association, 2021). SSS is the person's "subjective beliefs about their social status" (Operario et al., 2004). SSS appears to be more strongly and consistently associated with health outcomes than objective measures of social standing like SES (Adler et al., 2000). This stronger association may be due to one's perception of social status being able to capture subtle aspects of social status (Operario et al., 2004).

When the relationship between SES and mental health has been studied in adolescents, the associations between social status and mental health have been found to be more directly the result of SSS than absolute SES (McLaughlin et al., 2012). Again, those who perceive themselves to be lower in the social hierarchy compared to the group of reference are more likely to suffer from poorer mental health outcomes (Wilkinson, 1999; Marmot, 2006). SSS, or the subjective experience of being higher or lower in the social status hierarchy, has been extensively studied with the MacArthur SSS ladder (Adler & Stewart, 2010). A youth version of this scale has been validated in adolescents (Goodman et al., 2001). Using the youth version of the MacArthur SSS ladder, SSS has been positively associated with depression (Goodman et al., 2001) and risk behaviors such as substance abuse in adolescents (Sweeting, & Hunt, 2015).

Possible psychological mechanisms that contribute to SSS's effects on certain domains of depression, such as self-esteem (Rosenberg & Pearlin, 1978), have been explained by the *social comparison process theory* (Festinger, 1954). According to this theory, people who make social comparisons will be happier if they perceive themselves to be better off than their comparison group, as this would improve their self-esteem. The frequency of upward comparisons (status

comparisons people make with others that are viewed as better off) can have a negative impact on mood and anxiety (Butzer, & Kuiper, 2006).

1.7.3. Perceived Sense of Control and Mental Health:

One's SSS and health gradient are associated with their degree of autonomy or sense of control (Marmot, 2004). The concept of sense of control has been studied in the workplace environment in adults and to a lesser degree in other settings (Chandola et al., 2004; Marmot, 2004). Less is known about the effects of low sense of control on adolescents.

There is some evidence of mediating effects of perceived control in the association between depression and risk factors such as parental rejection (Magaro & Weisz, 2006), academic achievement (Moè, 2015), and maternal depressive symptoms (River et al., 2018), in children and adolescents, suggesting the value of further research in this area.

It is likely that sense of control is a combination of a personality *trait* component (Wolfle & List 2004), and a more malleable *state* component that shifts with context and age (Sirignano & Lachman 1985), with the contextual component being likely more predictive of mental health problems such as depressive symptoms when both components are considered simultaneously (Keeton et al., 2008). This dynamic calls for a better understanding of the construct of sense of control at different age periods and in different environments and its effects on mental health among youth.

1.8. Coping with stress:

Exposure to high inequitable environments may cause chronic stress and poor mental health (Patel et al., 2018). Stress is the product of a transaction between an individual's psychological and biological systems and the complex environment surrounding that individual (Lazarus, 1966; Lazarus & Folkman, 1984). Depending on the individual's cognitive appraisal of their resources to cope with the stressor, individuals will adopt different coping styles (Folkman & Lazarus, 1980; Lazarus & Folkman, 1984). When individuals assess not having the resources to be able to manage the stressor, they will adopt *emotion-focused* coping strategies such as focusing on positive aspects of their situation (Lazarus & Folkman, 1987), or using wishful or avoidant thinking, versus when the individuals assess that they have the resources to manage the situation and use more *problem-focused* coping (e.g., take the necessary steps to solve the problem).

Transactional theory (Lazarus, 1999) proposes that a behavior or strategy is never effective in every situation the individual encounters, and that using the same coping behaviors for every situation can actually be more harmful than beneficial (Bonanno & Burton, 2013). In this line of thought, *coping flexibility* is the individual's ability to modify coping behavior depending on the stressful situation (Kato, 2012), and is considered key in the ability to cope with psychological distress. *Coping flexibility* allows the individual to discontinue an ineffective coping strategy in order to use a new and more effective coping strategy. Being sensitive to feedback about the efficacy of one's coping strategies and able to adapt and engage in new alternative and more effective coping strategies has been associated with fewer depressive symptoms (Kato, 2015).

Prior research has shown that depressed individuals tend to be less flexible in their choice of coping strategies than those less likely to be depressed (Caldwell et al., 2013). The more coping flexibility, the better the psychological functioning and health of the individual are expected to be (Lazarus, 1999; Folkman & Moskowtiz, 2004; Rozanski & Kubzansky, 2005; Bonanno & Burton, 2013; Cheng et al., 2014).

In the case of inequalities, it is possible that youth who present a low perceived social status or sense of control in adolescence evolve to use coping strategies that may have worked to adapt to the stressful situation of relative deprivation and low social status, but may not be effective to cope with situations they encounter as adults or as the youth themselves navigate other environments that are not as stressful as the ones that required the initially used coping strategies. Those adolescents with more cognitive flexibility may be able to adapt to different situations more easily. Further research is needed to better understand how one's ability to adjust one's coping strategy contributes to greater resilience in the face of chronic stressors, such as economic deprivation or income inequality, and leads to better health outcomes.

1.9. Gaps in the literature.

While there is growing literature on the effects of social rank on adolescents' overall health, the literature on social rank and mental health symptoms is limited, and even more so in clinical samples and samples of minority youth. Additionally, more research is needed to understand better the differences in status identity formation in adolescence versus adulthood.

Finally, further investigation is needed to understand better the coping skills used by youth to manage differences in social rank, which are becoming more pronounced in an environment with growing inequalities and more opportunities to be aware of those inequalities via social media and with globalization. It is also important to understand how these findings can be applied to specific interventions, either those delivered in traditional clinical settings or as new clinical and public health interventions.

1.10. Significance and Aims

When studying causes for mental health disorders, the current diagnostic model focuses on symptoms and biological pathways, sometimes paying less attention to societal stressors (Woolf et al., 2007). As shown by the increased numbers of depression (Mojtabai et al., 2016) and suicidal thoughts and behaviors (Miron et al., 2019) in American youth, epidemiological numbers are not showing a return in investment from the over focus on medical causes and relative neglect of societal causes of disease. Increased income inequality has been associated with worse mental health outcomes across cultures and across large geographical areas. It could be, as previous authors have suggested, that the data that links the increase in income inequality and mental health problems reflect an "over-psychiatrization of everyday life" or that the standard questionnaires used are not valid across different cultures (Summerfield, 2011), but these questions on the causes of poor mental health can only be elucidated through a closer look at the individuals who respond to these surveys.

The findings to date are variable, with very few longitudinal studies that would explain causation. There is a need for more local studies that can describe neighborhood and community characteristics as well as take into consideration cultural differences. There is also a need for qualitative studies that can potentially explain the pathways in which inequality has an impact on mental health. Finally, there is a need for studies that focus on the impact of these measures directly on children and adolescents using data collected from them and not only through their caretakers.

The aims of this research project are: (i)- to analyze the association between social rank and depressive symptoms and aggression in a clinical sample of adolescents. (ii)- To determine the mechanisms by which social rank affects mood and aggression in adolescents; and (iii)- To determine the impact of social rank from a developmental perspective.

This research project consists of a mixed methods study with the purpose of acquiring a more comprehensive and nuanced understanding of the topic, corroborate the results with different methods, and compare multiple levels in the system. The study consists of 2 phases: (i) phase 1, including qualitative data collection consisting of in-depth interviews with 23 adolescents following a phenomenological method of analysis; (ii) phase 2, including quantitative data collection consisting of a cross-sectional survey completed by 197 participants.

The main hypothesis of the current project is that adolescents with lower perceived social rank will present more symptoms of depression and higher levels of suicidal thoughts and behaviors and aggression even after adjusting for other variables.

Four (4) studies were conducted to examine the aims of this research project. Aim (1), to analyze the association between perceived social rank and sense of control and depressive symptoms, suicidal ideation, and aggression in a clinical sample of adolescents. For this aim, we studied the association between SSS and depression, suicidal thoughts and behaviors (Study 1, Section 6), the association between sense of control and aggression (Study 3, Appendix II), and the associations between sense of control, SSS, individual and environmental stressors and depression and suicidal ideation (Study 4, Appendix III). Aims (2), to determine the mechanisms by which perceived social rank affects mood and aggression in adolescents; and (3), to determine the impact of social rank from a developmental perspective were studied conducting qualitative interviews and exploratory qualitative analysis (Study 2, Appendix I).

2. GENERAL METHODS:

2.1. Setting: An urban sample in the U.S.

This research project focuses on a population largely constituted by black female adolescents in Baltimore City, Maryland and surrounding counties. Baltimore has a median income of $40,803, with the lowest median income by neighborhood being $13,478 and the highest neighborhood median income being $107,668. Eighteen percent (18%) of the total population and 33.4% of the children in Baltimore live below the poverty line (Baltimore Neighborhood Indicators Alliance, BNIA, 2018).

One measure to assess income inequality is the Gini Coefficient. This coefficient ranges from 0 to 1, with 0 representing societies with perfect equality and 1 representing societies with maximum inequality (Deaton, 2001; Yitzhaki, 1979). Baltimore City and its surrounding area have lower levels of income inequality than the U.S. average, with a Gini Index of 0.445 (Weinberg, 2011). Yet, this area's levels of income inequality are still higher than the levels of inequality of most European and many Asian and African countries. Income inequality has increased since the 1980s in most Organization for Economic Co-operation and Development (OECD)'s countries, with the U.S. having had one of the highest increases in income inequality (OECD, 2014).

There is a state of decay in U.S. urban areas like Baltimore that has negatively impacted residents' health over seven decades. However, the Rockefeller Institute (Montiel et al., 2004) compared the most populated metropolitan areas in the U.S. between the years 1970 and 2004 looking at "Intercity Hardship," an index that included data on unemployment rates, educational attainment, poverty levels, and crowded housing, and noted a relative improvement in the majority of the country's metropolitan areas across those three decades. A later report (Wright & Montiel, 2007) found that those areas with higher disparity between the central city and the suburban area presented less improvement in Intercity Hardship. The authors concluded that the growing disparity between the inner city and the rest of the metropolitan areas does not benefit either one.

Socially and racially segregated neighborhoods in the U.S. often lack the transportation, tax base, and job availability to secure accessible employment. Children in these neighborhoods also have poor access to healthy foods, good schools, and health providers. Children growing in substandard conditions in the inner cities are deprived of basic human rights such as security and education

(The United Nations, 1948, art. 21.3). Children living in deprived neighborhoods and families may also be psychologically impacted by the differences in income between their neighborhoods and the neighborhoods of others who are better positioned in SES.

2.2. Procedure:

Studies 1, 3, and 4 were based on data collected through a survey administered to adolescents and their parents in outpatient pediatric primary and mental health clinics.

Participants were adolescents recruited in outpatient primary care offices and mental health centers. Recruiting sites (3 pediatricians' offices, a community mental health clinic, and a psychiatric day hospital) were chosen to include a wide variety of participants reflecting the city's racial and socio-economic diversity. Medical staff asked adolescents and their parents about their willingness to participate in the study and referred those interested to the research team that then explained the study. Parents and adolescents were told that the study consisted of interviews about how adolescents perceive themselves in respect to the rest of society. A survey consisting of demographics, and scales including measures of depression, aggression and social rank measures (see list of dependent and independent variables for more detail) was administered to participants who assented and parents who consented for participation. The survey was administered by a trained research assistant or myself. The study project was approved by the University's IRB (see appendices IV and V for informed consents in English and Spanish, respectively).

For the qualitative study, the same recruiting centers were included following *maximum variation sampling* (Creswell, 2007) to include participants reflecting racial and socio-economic diversity. Face-to-face in-depth interviews were conducted. The materials used included a semi-structured guide with open-ended questions inquiring about the adolescent's environment and the social comparisons they made (See Appendices IV and V for the English and Spanish versions of the in-depth interview guide, respectively), as well as their perception of relative deprivation with an adapted scale of perceived relative deprivation (See Appendices IX, X, and XI for the rationale for adaptation, English version of the adapted scale, and Spanish version of the adapted scale, respectively). Interviews were audio-recorded and transcribed by two research assistants. Numbers were assigned to the interviewees in order to protect their anonymity. Participants received a $25 gift card.

2.3. Participants:

Inclusion criteria for both the qualitative study and the survey were: 1) age 12 through 18 years of age, 2) able to speak and read English and/or Spanish, and 3) being accompanied by a parent or guardian who could provide consent.

The survey sample included 197 participants ages 12-18 (M age= 14.58; SD= 1.54). Within the sample, 73 (37.1%) identified as male and 124 (62.9%) as female, 47 (23.9%) as white, while a majority identified as belonging to a minority, with most (124, 62.9%) identifying as black, and 26 (13.2%) mixed or other race (Hispanic, Asian).

The qualitative study sample consisted of adolescent girls (n= 13) and boys (n=10) recruited through fliers and referrals from outpatient health care providers. The participants were males (n= 10) males and females (n= 13), of diverse racial background (15 Black, 5 White, and 3 of other races and ethnicities, including Asian or Hispanic) who lived in an urban area (n=16) more than a suburban area (n=7). Out of the 23 participants, 8 belonged to a family with an annual household income of less than $35,000, 6 had annual household incomes between $35,000 and $120,000, and only 3 had an annual household income of more than $120,000.

2.4. Measures:

2.4.1. Outcome variables:

The *Patient Health Questionnaire Adolescent Version* (PHQ-9-A) was used to measure ***Depressive Symptoms*** (Johnson et al., 2002). The PHQ-9-A assesses depressive symptoms based on DSM-IV diagnostic criteria. The responses are on a 4-point scale ranging from 0 ("not at all") to 3 ("nearly every day"). Scores were computed as a sum of the 9 items with an overall score ranging from 0-27. The corresponding severity categories are defined as *no depression* (PHQ-9 scores 0–4), *mild* (PRQ-9 scores 5–9), *moderate* (PHQ-9 scores 10–14), *moderately severe* (PHQ-9 scores 15–19), and *severe* (PHQ-9 scores higher than 20) (Kroenke et al., 2001).

Two questions were used to assess ***Suicidal Thoughts and Behaviors***. Suicidal Ideation was measured by asking participants, "*Has there been a time in the past month when you have had*

serious thoughts about ending your life?" The responses were "yes" or "no." A history of suicide attempts was measured by asking participants, "*Have you ever, in your whole life, tried to kill yourself or made a suicide attempt?*" with response options of "yes" or "no."

Proactive and Reactive Aggression were measured with the *Reactive-Proactive Aggression Questionnaire* (RPQ) (Raine et al., 2006). The RPQ consists of 23 questions related to aggression (12 items for proactive aggression and 11 items for reactive aggression). The questions reflected physical (i.e., had fights with others to show who was on top) or verbal (i.e., yelled at others when they have annoyed you) aggression, and included the motivation and situational context for the aggressive behavior (i.e., become angry or mad when you don't get your way). Participants were asked to rate each question by frequency of the behavior (0= never, 1=sometimes, 2=often). An average and median of the total number of responses for proactive and for reactive aggression were calculated. Those above the median were classified as having "high" proactive or reactive aggression, and those at or below the median were classified as having "low" proactive or reactive aggression.

2.4.2. Independent variables:

Socio-Demographic Measures included age upon interview, sex at birth (0= male; 1= female), and self-identified race (0=white, 1= black, 2= other races or mixed race). These variables were abstracted from the medical record.

Parental Education and Employment and Household Income were self-report measures and were asked to the consenting adult who accompanied the adolescent. **Parental Employment** was gathered by asking whether the father and mother were employed with a "yes" or "no" response. **Parental Education** was determined by asking what was the highest level of education that the mother and the father had completed. The response options were: 1- 8th grade or less, 2- high school or GED, 3- some college, 4- college graduate, and 5- graduate studies. For **Household Income**, the consenting guardian was asked: "What is your annual household income (in dollars per year?" The response options were: 1- Less than $14,000, 2- between $14,001 and $34,000, 3- between $34,001 and $70,000, 4- between $70,001 and $120,000, 5- between $120,001 and $160,000, and 6- more than $160,000. The standardized z-scores of parental employment, education, and household income were added to create a variable named Socio-Economic Status (SES), with higher scores reflecting higher family SES, as computed in Xu and colleagues (2019). This calculation is based on findings that show that the majority of approaches to measure SES include some degree of quantification of family income, parental level of education, and parental occupational status (Bradley & Corwyn, 2002).

Family and Childhood Mental Health Variables. The participants were asked to report a ***Family History of Mental Illness*** (i.e., depression, anxiety, schizophrenia, bipolar disorder). ***Early Adversity*** was computed with variables extracted from the medical chart related to exposure to substances in-utero and pregnancy problems or birth complications.

Subjective Social Status (SSS) was assessed with The *MacArthur Scale of Subjective Social Status - Youth Version* (Goodman et al., 2007). The scale consists of two ladders with 10 steps

each. Participants were presented with both ladders (see appendix VIII). The participants marked where they felt they were located in the ladder from 1 to 10, with higher numbers representing a higher status of their family in American society (SSS family vs society) in the first ladder, and of themselves in the school (SSS individual vs school) in the second ladder. The score was the number representing the step marked by the participant in each one of the ladders. These two variables were used as independent continuous variables.

Perceived Relative Deprivation was measured with an adapted version of the *Perceived Inequality in Childhood Scale* (Wickham et al., 2013). This scale consists of 16 items measuring deprivation relative to childhood peers and the wider society, quality of family relationships and perceived family social capital, retrospectively. We adapted the questions to the present tense and American culture and used American English versus British English terms (see Appendix IX for the adaptation process, and Appendices X and XI for the English and Spanish modified versions, respectively). Given that the scale has not been validated in the population represented by this sample and for purposes of describing overall perceived relative wealth in this sample, we focused on 2 scale items: 1- "In comparison to others in your school and neighborhood, as a whole, do you feel that your family is well below average, below average, of average, above or well above average in wealth?," and 2- "In comparison to other families in the country, as a whole, do you feel that your family is "well below average, below average, of average, above or well above average in wealth?." For the purpose of simplification, we presented the responses in 3 categories (below, average or above average wealth).

Overall Sense of Control (OSOC) (Jose & Weir, 2013): The OSOC is a 17-item questionnaire that measures perceived sense of control. The items consist of statements related to having control over one's own life (i.e.: "I am in control of my life" or "I make enough effort to reach my goals") or lacking control over own's life (i.e.: "I lose control over myself" or "I am unable to make changes to get control over my life). An average of the items for positive perceived sense of control and the negative items for lack of control was calculated, where higher scores represented a higher overall perceived sense of control.

Negative Neighborhood Scale (Hadley-Ives et al., 2000): This scale asked participants, "In the past 6 months, how much of the following has occurred in your neighborhood (none=0, some=1, a lot=2)?" for a list of adverse events, including drug dealing, shooting, murders, abandoned buildings, homeless people in street, prostitution, business closing, bad schools, and graffiti and/or vandalism. Responses were added, and a total number was calculated, with higher numbers corresponding to a more negative neighborhood environment.

Negative School Scale (Hadley-Ives et al., 2000): This scale asked participants, "In the past 6 months, how much of the following has occurred in your school (none=0, some=1, a lot=2)?" for a list of adverse events, including drug dealing, shooting or knifings, teachers inured by students, school equipment damaged, and anger/stress. Responses were added, and a total number was calculated, with higher numbers corresponding to a more negative school environment.

Number of Traumas*:* To assess prior exposure to traumatic events, we used 14 questions with language based on part 1 of the University of California, Los Angeles (UCLA) Reaction Index

Scale (Steinberg et al., 2004). The questions included traumatic events related to environmental disasters, accidents, domestic and community violence, physical and sexual abuse, and death of a loved one. Participants were asked to respond "yes" if they had ever experienced the listed traumatic event, and "no" if they had not experienced it. The positive answers were tallied for a total number of traumatic events experienced by the participant by the time of the survey's administration.

Attention Deficit Hyperactivity Disorder (ADHD): Presence (1) or absence (0) of an ADHD diagnosis was collected from the chart review. The diagnosis was made by two physicians, with at least one board certified child and adolescent psychiatrist and/or pediatrician.

Oppositional Defiant Disorder (ODD): Presence (1) or absence (0) of ODD diagnosis was collected from the chart review. The diagnosis was made by two physicians, with at least one board certified child and adolescent psychiatrist and/or pediatrics.

2.5. Data Analysis:

2.5.1. Quantitative Data:

Analysis of survey data was conducted as follows: Descriptive analyses explored the characteristics of the sample, the variables of interest, and the distribution of the study variables using SPSS software version 24 (IBM, 2016). Mplus version 7.31 (Muthén & Muthén, 2014) was used for confirmatory factor analysis (CFA) and structural equation modeling (SEM).

Descriptive analyses looking at frequencies and means were conducted to observe all independent and dependent variables. Chi-Squares were calculated for categorical variables and t-tests for continuous variables to examine the differences between groups based on age and gender. Pearson parametric tests were used to assess correlations among all variables.

Multivariate linear regression analyses were used to assess the outcome variable of the total depression score in the PHQ-9. Logistic regression was used to assess the outcome variables of suicide ideation in the past month, any suicide attempts in the past, and proactive and reactive aggression. There were less than 5% of missing data in all variables included in the analysis, except for the PHQ-9 variable (with 10.6% missing data). The most missing data was for father employment (21.8% missing data) and father education (20.3% missing data). Missing values were calculated with linear interpolation.

SEM was used in study 4 to identify whether a theoretical model could be applied to the observed data by testing the relations of all variables and underlying constructs simultaneously (Kline, 2016). SEM was conducted in a two-step approach (Anderson & Gerbing, 1988), with an initial assessment of the measurement model to identify the factor structure of independent variables. Individual items with significant factor loadings were retained in the final CFA to obtain a well-fitting parsimonious model (Hair et al., 2010).

All SEM analyses were conducted using weighted least squares mean and variance adjusted estimator due to categorical observed variables (e.g., binary or ordinal). Two standardization options were used simultaneously to obtain standardized parameter estimates and standard errors

of continuous and binary covariates (Muthén & Muthén, 2012). Goodness of fit was assessed by multiple-fit indices (Kline, 2016; Hu & Bentler, 1999).

2.5.2. Qualitative Data:

Study 2 was based on data collected through in-depth interviews with adolescents. Additionally, adolescents completed the PHQ-9-A (Johnson et al., 2002). We used a score of 11 as cut off for major depression (Richardson et al., 2010).

We used ATLAS (Scientific Software Development GmbH, Berlin) to facilitate coding. Following the phenomenological method (Moustakas, 1995), *significant statements* that pertained to the lived experienced of constructing SSS were coded into *meanings* (Table 3).

Those meanings were then clustered into *themes*, which represented underlying cognitions common to most of the adolescents. *Verification* to contrast the findings with external sources involved literature searches, comparison with the interviewer's field notes, and identification of negative cases (Meadows & Morse, 2005).

Lastly, the findings were validated and any new data that emerged was included in the final description. Interview transcripts were reviewed. The analysis process took place in parallel with the interviewing process. The interviews were conducted until information saturation was reached.

Validation involved having three undergraduate students review and compare codes of six interviews. A working version of the results was shared with adolescents in the last two interviews and their additions were included in the final description.

3. GENERAL RESULTS:

3.1. Study 1: "Perceived Family and Individual Social Status and its association with depression and suicidality in an adolescent clinical sample."

The goal of study 1 (See Section 6) was to examine the associations between adolescent SSS and mental health in this clinical sample primarily constituted by urban adolescents belonging to minority groups. Most of the previous research on SSS had been conducted in adults, and the research conducted on adolescents was more limited, focusing on populations of diverse SES and race, and not on clinical populations. Additionally, the literature had focused on depression as an outcome variable, with little research on suicidal thoughts and behaviors. We sought to contribute to the literature by focusing this research in a clinical and largely urban minority U.S. population of adolescents, and exploring both depression and suicidality.

Study 1 explored both SSS of the adolescent's family when comparing to the larger society and the SSS of the adolescent when comparing to the school, and their respective associations to depression and suicidal thoughts and behaviors. We found that the lower the adolescent's perceived social status of their family (in comparison to the rest of society) and of themselves (in comparison to their school), the higher the rates of depression and suicidal thoughts and behaviors.

These associations were significant even when controlling for SES, confirming that prior findings in adults and heterogeneous non-clinical populations also applied to this sample of minority adolescents from an urban area recruited in clinical settings. We also found that older adolescents were more likely to have a lower perceived social status both in the school and in the larger society than younger adolescents. We suggested that as individuals age, their social environment expands, and the opportunities for comparison increase, which can bring their assessment of their social status closer to the average.

Another interesting finding was that the SSS of the family within the larger society and the SSS of the adolescent within the school were not strongly correlated, suggesting that the two SSS ladders measure different aspects of social rank.

3.2. Study 2: "Adolescents' responses and coping strategies in the face of social inequities: a qualitative study"

The goal of study 2 was to examine the processes related to social status involved in a clinical sample of adolescents in the United States (U.S.). The purpose of this study was to contribute to the knowledge on social rank and depression in adolescents by studying the role of relative deprivation and social status in adolescents. We sought to achieve this goal by exploring the processes, responses, and coping strategies adolescents use when assessing their social status. Specifically, we sought to understand how adolescents attempt to manage emotions stemming from assessing their social status.

The data from 23 in-depth interviews with adolescents ages 12 to 17 recruited in outpatient clinics, most of whom were Black, female and lived in an urban area, and the majority of whom their parents reported to be of lower or middle household income, showed that depressed adolescents were more likely to see themselves as below average wealth when compared to the rest of the country, but that this was not the case when they compared themselves to their community. Although the short survey accompanying the interviews was not statistically powered to detect these differences among the groups of depressed and non-depressed adolescents, they were still significant in this small sample.

The interviews showed 4 emergent themes related to social rank in this sample. The adolescents reported appraising their *(1) environment* by observing physical aspects such as the state of their neighborhoods and social aspects like the ability of their peers to participate in activities. Adolescents used *(2) social comparisons* to gauge their status, and these comparisons were made by using various dimensions of comparisons that went beyond the traditional dimensions used in adults (e.g., income, occupation, and education). For example, in this sample, personal values, perceived popularity, and physical appearance were notable dimensions of comparison that have not been shown to be as relevant in the adult literature on status. Yet, financial status was still a relevant point of comparison in this group of adolescents.

Many adolescents also reported *(3) feelings* of lack of control over their situation, and anxiety or discouragement about the future. Regarding the applicability of this study to clinical practice, a key finding was that some adolescents found the discussion about status helpful as they were able to understand external reasons for their situation instead of internalizing them.

Finally, adolescents used a series of *(4) coping* strategies, the majority of which involved a degree of avoidance and denial, focusing on the positives, and numbing and rationalization. A few adolescents were able to create a plan with steps to change their situation, and many discussed environmental or societal changes that could take place to ease the experience of inequality.

A working model with significant statements and themes (Appendix XII) and a proposed model for future research (Appendix XIII) are presented, with a more detailed analysis of the statements in Study 2 (Appendix I).

Based on these findings, we designed a survey that included measures for several of the themes raised by the adolescents during the interviews, such as SSS, sense of control, and environmental factors (such as traumatic events, neighborhood environment, and school environment). The rest of the studies (1, 3, and 4) in this dissertation are based on data collected with this survey.

3.3. Study 3 "Perceived sense of control and aggression in a sample of American adolescents: the role of school and neighborhood contextual factors."

While associations of social rank and depression have been previously studied (Goodman et al., 2001), little is known about the associations of social rank and aggression in adolescents (Guo et al., 2016). Sense of control has been associated with social rank as documented by Marmot (2004) in his Book *"The Status Syndrome"* where he explains that one of the keys of poorer health outcomes in those of lower social status and one of the explanations of the health gradient is the lost autonomy and control as individuals are lower in the SES ladder.

The aim of study 3 was to explore the role of perceived sense of control on aggression in this sample of urban adolescents, taking into consideration individual bio-psychological factors and contextual factors such as school and neighborhood environment. A prior study with Asian adolescents showed an association between low perceived sense of control and aggression (Guo et al., 2016). In this study, we include clinical diagnoses such as Attention-Deficit Hyperactivity Disorder (ADHD) and Depression, and environmental factors (neighborhood and school environment) to control for other causes of aggression in examining the association between sense of control and aggression.

In Study 3, we explored associations between social rank and aggression by focusing on sense of control. The associations between risk factors associated with aggression varied depending on whether we focused on reactive or proactive aggression. There was an association between perceived sense of control, race, ADHD, trauma history, and school and neighborhood negative environments with both reactive and proactive aggression. Yet, Depression and SES were only associated with reactive aggression and not with proactive aggression in this sample.

There was an association between a negative school environment and aggression, and between neighborhood problems and both proactive and reactive aggression. These environmental associations were stronger than the adolescent's sense of control, suggesting that environmental interventions may be a more efficient way to decrease aggression in adolescents in urban areas than focusing solely on psycholgocial aspects of aggression.

3.4. Study 4 "The Effects of Perceived Control and Status, and Neighborhood and School Environment on Adolescent Depression and Suicidal Thoughts and Behaviors: a Structural Equation Modelling Approach"

We explored SSS and depression and suicidal thoughts and behaviors in Study 1; the mechanisms of assessment of one's social rank and the coping mechanisms used to manage feelings and thoughts related to this assessment in Study 2; and perceived sense of control and aggression in Study 3.

In Study 4, we aimed to expand the examination of social rank and depression and suicide associations by exploring both sense of control and SSS, in addition to risk factors for depression and suicide in early life such as early adversity, a family history of mental illness, and a diagnosis of ADHD that could potentially predispose the individual to depression due to low-self-esteem or suicidal behaviors due to impulsivity. We also explored environmental factors such as neighborhood and school environment documented to be important for aggression in prior research and in Study 3, but that had not been explored along with social rank measures in depression and suicide.

The purpose of this last study was to examine a combination of individual and environmental factors that could be a cause of various forms of stress, due to early insults or predispositions, the current interpretation of one's social status as measured by SSS and sense of control, and stressors

in the environment of the adolescent to understand which of those factors is more important among adolescents from an urban setting in the U.S.

We examined the relationships among measures of social rank, such as perceived sense of control and SSS, early adversity, and environmental factors associated with school and neighborhood climate, and depression and suicidal thoughts and behaviors to better understand the significant associations between proxy measures of stress (either by early life stress, interpretation of one's social rank, and environmental stress) and depression and suicide. We did so by conducting Factor and SEM analyses. We confirmed two factors, a perceived control and status factor and an environmental risk related factor. These results are important as they show that measures of social rank like sense of control and SSS can be used together as a measure of social rank in studies of depression and suicidal thoughts and behaviors in adolescents from an urban area.

The findings also showed that a higher social rank measurement (the higher the sense of control and the perceived social status) is associated with lower symptoms of depression and suicidal thoughts and behaviors.

Another interesting finding was that a history of traumatic experiences was highly associated with suicidal thoughts and behaviors but not with depression in this sample. Additionally, when entering all these individual-centered and environment-centered variables in the model, environmental stress variables had less of a role in the association with depression and suicide than social rank variables.

In the following discussion section, I provide a summary of the results of the studies conducted in this research project and a discussion of the limitations and recommendations for future research, as well as the clinical and public health implications of this research.

4. GENERAL DISCUSSION:

Previous studies have shown that objective measures of social status like SES (Marmot et al., 1984) and RD (Hounkpatin et al., 2016; Wilkinson, & Pickett, 2009) are associated with health outcomes, but that this association is even stronger between measures of subjective social rank, such as PRD (Wickham, Shryane, et al., 2014) and SSS (Adler et al., 2000) and health outcomes. There is also a clear association between subjective social rank and depression in adults (Adler et al., 2000). However, fewer studies have explored the associations between these measures of subjective social rank and mental health in adolescents (Goodman et al., 2007; Fuzhen et al., 2019).

Furthermore, prior research suggests that adults tend to construct their sense of social rank by making an average assessment of income, education, and occupation. However, research in adolescents had shown that considering the environments in which adolescents make their social rank assessments (e.g., schools versus workplace) and the measures of social rank they use (e.g., popularity among peers or sports ability, versus income, occupation, and education level in adults) might be important for health outcomes (Sweeting & Hunt, 2014; Sweeting et al., 2010).

Finally, research has generally left unexplored the study of coping mechanisms that adolescents use once they assess their social rank. Understanding these coping skills is important not only to help design meaningful interventions, but also because it may help us to understand how in this

vital period of development, some adolescents may adopt coping skills to effectively manage states of distress due to feelings related to social rank. In the absence of coping flexibility, these same coping skills may not work in other settings or circumstances that may present in the future when the adolescents become adults, conditioning future behaviors and health outcomes.

This research project attempted to explore social rank and mental health in adolescents. Participants were recruited from outpatient clinics in a U.S. urban area with high levels of youth poverty and an environment presenting notable income inequality as compared to other developed countries, although not as significant when compared to other areas in the U.S. (Weinberg, 2011). This sample consisted largely of Black American adolescents, which allowed the examination of issues of social rank in a previously understudied population.

The overall goal of this study project was to better understand the associations of social rank and mental health disorders in adolescents from relatively deprived areas of the U.S. The disorders studied included depression, suicidal thoughts and behaviors, and aggression.

The aims of this research project were: 1- To analyze the association between perceived social rank and depressive symptoms and aggression in a clinical sample of adolescents. 2- To determine the mechanisms by which perceived social rank affects mood and aggression in adolescents, and 3- To determine the impact of social rank from a developmental perspective by exploring these aspects of social rank in a sample of adolescents. The central hypothesis of the study was that adolescents with lower percevied social rank would present more symptoms of depression and

higher levels of suicidal thoughts and behaviors, and higher levels of aggression when adjusting for other variables.

4.1. Summary and Discussion of Results:

To this end, 4 studies were conducted examining associations of social rank and mental health in two clinical samples of adolescents; one sample consisting of 23 participants with whom we conducted in-depth interviews, and a second one consisting of 197 participants who were administered a cross-sectional survey.

Study 1 explored both SSS of the adolescent's family when comparing to the larger society and the SSS of the adolescent when comparing to the school and their respective associations to depression and suicidal thoughts and behaviors. The findings showed a positive association between adolescent's perceived social status (both of the family in comparison to the rest of society and of themselves in comparison to their school), and rates of depression and suicidal thoughts and behaviors, with significant associations even when controlling for SES. While these findings had been presented in the literature for adults and/or heterogeneous non-clinical populations, the study confirmed this association in a largely black clinical urban sample of adolescents and examined the associations between SSS and suicidal thoughts and behaviors, as opposed to only examining depression.

Another observation of this study was that older adolescents had lower perceived social status both in the school and in the larger society than younger adolescents. This finding is similar to what

was suggested in the qualitative study and previous research and could be explained by the broader opportunities for comparison that occur when the individual's social environment expands. This expansion is more likely to occur during life transitions. For example, children are exposed to a smaller number of peers who also tend to be similar in their SES when they are in elementary school than when they move to middle school and high school, and this change can be even greater when entering college.

Finally, the SSS of the family within the larger society and the SSS of the adolescent within the school were not strongly correlated. This finding suggests that the two ladders of SSS measure different aspects of social rank, with the ladder comparing the family to the larger society likely measuring aspects of social rank that may be more similar to those measured with SES (e.g., housing, material possessions, income) and the ladder comparing the adolescent to the school possibly measuring different aspects from those present in measures of SES, such as those dimensions that are more specific to the individual or valued in their immediate environment. Future research should include longitudinal studies tracking changes in perceived social status by age and setting, with an expansion of existing research that examines differences in status by dimension of comparison.

Findings from Study 2 (the qualitative study) showed that depressed adolescents were more likely to see themselves as below average wealth when compared to the rest of the country, than when they compared themselves to their community. This finding could be due to neighborhoods being more homogeneous than the larger population that adolescents have access to through traditional

media or social media. The study also highlights the importance of studying factors that lead to this assessment and how to buffer potential negative comparisons.

The media's role was manifest when, during the interviews, some of the adolescents mentioned celebrities as a reference group with whom they made social comparisons. These findings suggested differences in social rank depending on the reference group of comparison. When comparing with a larger group (their family compared to the rest of society) adolescents may include groups of reference of much higher wealth and overall higher social status, as well as those of lower status. The social comparisons with groups of lower and higher social status would normalize their own status that would tend to trend to the average, if indeed the comparisons were made in both directions. However, social media and celebrities tend to portray a one sided and generally positive characterization of the individuals with whom adolescents compared themselves, which would explain the lower ranking they gave themselves when comparing to the rest of society.

The emergent themes resulting from the interviews (appraisal of the physical and social environment, used of social comparisons to gauge one's status, feelings and thoughts related to their social status, and coping mechanisms to deal with reactions to their assessment of their social status) revealed that the adolescents used multiple dimensions of comparison that differed from those found in the literature for adults (e.g.: income, occupation and education) and that those dimensions of comparison were more relevant for the environments in which adolescents traditionally navigate (e.g., schools). While not oblivious to the needs for monetary income, most adolescents interviewed focused on other aspects of their lives, such as popularity in school and

academic performance, as previous research in adolescents has shown (Sweeting et al. 2011; Vannatta et al., 2009). While financial deprivation was important in causing distress when there was objective poverty, most of the stress was generated by differences in relative rank perceived when comparing upward with peers. Social comparisons were a key element in the processes involved in social rank formation and coping. There is extensive research on social comparisons, and newer research focuses on the effects of social media on depression (Vogel et al., 2014) and eating disorders (Lewallen & Behm-Morawitz, 2016) through social comparisons. More research is needed to create interventions or provide evidence-based recommendations on the use of social media.

However, those adolescents of lower SES naturally focused on income more than those whose families did not have immediate income needs. Thus, when conducting studies with adolescents, it is important to consider factors such as income and factors beyond family income, given that the adolescents' day to day life in schools or in virtual social settings, where they are constructing their social identity, is crowded with opportunities for assessing one's social rank. This finding is also of vital importance for adolescents with depression and low self-esteem who may focus on dimensions in which they feel they are of lower status than others. Additionally, those adolescents with low self-esteem may also make comparisons with others of higher status. Differences in the values of the environment may also influence the focus of the social comparisons. An example would be a female adolescent who excels in academics, but was not popular among her peers in school because she is not involved in sports. In this case, a school environment or culture that exclusively reinforces sports and not academics can contribute to this adolescent's perception of her status as lower than those around her. On the other hand, a male

adolescent struggling with academics in the school environment may need other venues to gain self-esteem.

Adolescents also reported feelings of lack of control over their situation, and many felt discouraged or anxious about the future. The tension in adolescence is between a sense of autonomy while still being dependent on caregivers. In that sense, one would understand that all adolescents may feel a lower sense of control than independent adults. Parenting styles that give more choice may help ease this low sense of control, especially since this is *perceived* sense of control. Similarly, school environments that provide choice as opposed to rigid rules and sometimes arbitrary expectations would be beneficial to allow for a higher sense of control among adolescents.

An unexpected finding during the interviews was that some adolescents of lower SES reported finding the process of the interview helpful as they were able to break down the processes of social comparison and status formation they undertook, while processing the role of the environment and social systems in their personal circumstances. Some openly expressed feeling a sense of relief as they understood there were systemic reasons for their and their families' circumstances. This finding suggests that openly discussing issues related to social status with adolescents during mental health visits could potentially prevent them from internalizing negative feelings about themselves, associated with being of a lower SES status. Perhaps empowering youth to also understand that their social situation is due in part to structural issues can help address racism.

In our sample, most of the adolescents coped with any negative feelings that arose from their social status assessment by using a certain degree of avoidance and denial; others focused on the positive aspects of their lives; and others used numbing or rationalization. Only two of the participants in our sample used religious coping, which seemed to be helpful for them. Some participants were able to create a plan with steps to change their situation, which was interpreted as a productive way of coping, if it did not distract from the main goal of education.

Many discussed environmental or societal changes that could take place to ease the experience of inequality, and these included the use of uniforms to prevent the use of clothing as a tool for social comparisons that may put those of lower SES at disadvantage, or a less obvious division by academic performance, as the gifted and talented classes, advanced classes and regular classes were differentiated early on and assigned a certain identity regarding academic abilities to the adolescents.

Study 3 explored associations between social rank and aggression by focusing on sense of control. The findings showed an association between perceived sense of control, race, ADHD, trauma history, and school and neighborhood negative environments with both reactive and proactive aggression. The negative association of low sense of control with aggression in this sample of urban adolescents corroborated previous research findings on sense of control and aggression in Asian adolescents (Guo et al., 2016). In this study, we expanded the understanding of this association to U.S. urban adolescents, and we saw an association between sense of control and both reactive and proactive aggression. Also, consistent with prior studies (Espelage et al., 2014), there was an association between measures of environmental stress such as a negative

school environment and aggression, and between neighborhood problems and both proactive and reactive aggression.

In this study, the associations with aggression were stronger for the neighborhood and the school environment than for sense of control. This finding suggests that for aggression, environmental interventions may be a more efficient way to decrease aggression in adolescents in urban areas than modifying their perception of control, which may still be an important focus. It was noted as well that prior experiments have shown differences in the perception of aggressive cues, with those with lower sense of control perceiving aggressive cues when confronted with neutral stimuli. Finding ways to increase the sense of control of adolescents, as suggested earlier, by providing opportunities for choice, as well as improving environments to decrease the level of stress in the environment and the traumatic events experienced by the adolescent could potentially reduce aggressive behaviors.

The study showed the importance of breaking down aggression, which is a heterogenic concept, into reactive and proactive aggression, to understand better the risk factors associated with each type of aggression, and the importance of sense of control for both reactive and proactive aggression. An explanation for this relationship, which has been documented in other samples, is that one's perception of aggressive cues depends on the individual's sense of control.

Finally, study 4 examined the associations among measures of social rank, such as perceived sense of control and SSS, early adversity, and environmental factors associated with school and neighborhood climate, and depression and suicidal thoughts and behaviors. The purpose was to

understand better the significant associations between early stress measures, interpretation of one's social rank, and environmental stress related to the school and the neighborhood. We also sought to examine how these measures were associated with depression and suicidal thoughts. Two factors, one being measures of social rank (perceived control and SSS) and the other one being an environmental risk related factor (school and neighborhood environment).

These results are important as they show that social measures like sense of control and SSS factor together in depression and suicidal thoughts among adolescents from an urban area. The findings also showed that the higher this social rank factor (the higher the sense of control and the perceived social status), the lower the symptoms of depression and suicidal thoughts and behaviors. Additionally, when entering all these individual and environmental variables in the model, environmental stress variables had less of a role in depression and suicide than subjective social rank variables. We believe that this association could potentially be due to the environment having more long-term effects on individuals' mental health that may not have been captured in a youth sample, whereas the perception of one's social status in the social hierarchy is already associated with depression and suicidality in youth.

4.2. Contribution to the Literature:

This research project contributes to the literature in several ways. It enhances our understanding of the mechanisms involved in social rank and mental health presentations by synthesizing data related to the lived experience of adolescents with clinical presentations recruited in an urban area.

It also corroborates prior research findings on social rank measures such as SSS and depression and expands it to study SSS and suicidal thoughts and behaviors.

This study also supports prior research findings looking at sense of control and aggression and expands them to an urban majority Black population. Finally, this research explores different variables of stress and social rank in a model to understand better the impact of each of the variables in their effect on depression and suicidal thoughts, finding that subjective social rank is more strongly associated with depression and suicidal thoughts and behaviors than other variables of stress and environment. The studies also provide guidance on future critical research and targets and pathways for intervention to improve adolescents' mental health.

4.3. Limitations:

Adolescents in the qualitative phase of the study (Study 2) were prompted with questions related to perceived deprivation, which has a narrower focus on wealth. Yet, their responses in the initial interviews were observed to be broader in the sense that they communicated a concern with global social status that went beyond wealth and poverty and included aspects like popularity and peer acceptance, consistent with the different ways adolescents and adults perceive social status. This qualitative study did not address other influences on mood or social comparisons such as biological predisposition, trauma exposure, or perceived discrimination. A larger, quantitative study using standardized tools could help understand factors that lead to the type, intensity, and group of reference for the social comparisons that adolescents make.

The survey was cross-sectional, and therefore, causal associations cannot be established. This design could in part explain the association of social rank with depression. While it may be that perceiving oneself to be of low social rank affects depression, it could also be that those who tend to be depressed rank themselves as lower in social rank. Longitudinal studies examining long-term effects and variation of one's sense of status and control would help determine causal relationships. All the measures were self-report and therefore open to recall and social desirability biases. This was a relatively small sample with a high proportion of Black adolescents and females, and therefore, the sample was not representative of the general population, and the results cannot be generalized more broadly. We did not use a psychometrically validated measure of suicidal ideation and attempts.

The adolescents also completed self-reports of aggression, which may have been influenced by social desirability bias, given that aggression can have negative connotations in society. We did not have objective measures of aggression. However, the survey allowed us to look at aggression motivations. This attribute is important because proactive and reactive aggression cannot always be differentiated behaviorally, but the motivations for the behavior make it easier to distinguish them.

Additionally, we did not use objective data on community crime and only used data reported by the adolescent on school and neighborhood negative environment. Yet, these data have the advantage of recording the adolescent's experience of violence rather than what may occur in the community but that the adolescent may not have experienced or witnessed.

The measures of SES (including household income, and parental education, and employment) were reported by the parents. However, while they may be biased, they provided a second reporter so that we could compare SES measures reported by the parent and the adolescents' perception of their status.

Finally, the chances of a bidirectional relationship with depression and suicidal thoughts may be higher for those variables than they are for the environmental variables. As explained earlier, people who are depressed may feel they have a lower social status and lower sense of control, and those who see themselves as lower in the social hierarchies may also tend to feel more depressed. While the same could be said about the environmental variables, these questions elicited more objectivity as they are not focused on the respondents but on their environment.

4.4. Clinical and Public Health Implications:

This study project revealed the importance of neighborhood and school environment and culture in the adolescents' assessment of their social rank position. As the primary gatherers of students of diverse backgrounds, schools have an important role in mitigating the effects of stress related to social hierarchies. Starting with education, teaching and discussing issues related to social rank, social comparisons, poverty, and citizenship may help collective groups of adolescents understand and address the effects of inequality on health. Additionally, creating more inclusive and less segregated environments, with less racial and socio-economic segregation, but also, with less segregation by academic ability, as well as creating a school environment that promotes and values a wide variety of strengths and skills so that every adolescent can find a space to belong could

create school environments more able to buffer social inequities. To that end, investment in public systems to ensure diversity and modification of the segregated funding of schools in the U.S. would be beneficial. Furthermore, practices like free lunches should continue to be a role of public schools, with an effort to not stigmatize those who need free lunches. The use of uniforms or aid for clothing without stigmatization of those who needed it could also help to equalize school environments. Finally, while separating classes into different academic degrees can have educational benefits, those should be carefully balanced with the emotional consequences. Attempting to offer more challenging curriculums to those ready for them without creating academic hierarchies would be beneficial, as to not contribute to definitions of identity as a more academically or less academically capable adolescent, given that this labeling can potentially be internalized at a key time in identity formation.

The study shows that because adolescents engage in social comparisons using multiple dimensions, expanded options for adolescents to be successful or of higher status in at least one area of their life may help with their self-esteem. Some urban areas in America have a dearth of activities for children unable to pay for private sports clubs or music opportunities, among others. The importance of expanding resources in schools serving lower income students should be focused on not only providing high-quality education comparable to other schools but also offering broadening opportunities to engage in activities outside of academics. In that sense, some school systems are currently punishing students who perform poorly in academics by not allowing them to be part of a sports team. Exercise has many benefits for mental health, including preventing mood problems, channeling aggression and relevant to this topic, providing an additional opportunity for higher perceived social ranking for adolescents who may not be successful in other

areas of their lives, but excel in sports. Given the scarcity of resources in certain urban areas, affordable extracurricular programs for children and adolescents programs are often cut. Opportunities for adolescents of lower SES to engage in diverse activities can offer them alternative environments to test their abilities and gain self-esteem.

As shown in this research, sense of control is key in mental health wellbeing in adolescents. Giving adolescents choices in their families by using more collaborative problem-solving and authoritative, as opposed to authoritarian parenting styles, can have benefits of helping adolescents gain developmentally appropriate autonomy. Whenever possible, giving choice in the school setting could be beneficial.

Additionally, due to the rise in social media use among youth and the complexity of the virtual social environment, it is important to educate adolescents and younger children on safe and healthy approaches to social media to prevent excessive upward social comparisons that can influence mood. It is also important to advise adolescents on limiting social media use until they are able to consume social media more critically.

Nearly all adolescents in the US are connected to the internet (Pew Review Center, 2015), and young people spend an average of 7 hours daily on electronic media (Rideout et al., 2010). Social media amplifies the opportunities of adolescents to explore other social environments and compare their social status to that of others. Some researchers have pointed to social media as one of the causes contributing to the rise in adolescent depression and suicide (Twenge et al., 2018; McCrae et al., 2017). Social comparisons on social media are associated with depressive

symptoms, regardless of frequency of technology use and prior depressive symptoms (Niu et al., 2018), especially among females and less popular adolescents (Nesi & Prinstein, 2015). Other researchers have found that increase in use of highly visual social media sites such as Instagram (Marengo et al., 2018) predict internalizing symptoms and body image concerns.

There are significant associations between social comparisons made via social media and depression (Feinstein et al., 2013; Krasnova et al., 2013; Nesi & Prinstein, 2015), especially among individuals with low self-esteem (Buunk & Gibbons, 2007). The widespread use of social media, the tendency of individuals to share more positive depictions of themselves on social media (Subrahmanyam & Greenfield, 2008), and the existing social media related objective opportunities for comparisons through "likes" and "comments" (Steers et al., 2014) may increase the risks for opportunities for social comparisons. While this may contribute to depression, it is also an avenue for intervention through social media literacy interventions. Social media sites should also take this opportunity to deliver positive messages or change the systems to be less damaging to younger users.

In the clinical setting, measures of social rank are not commonly used in mental health assessments. Given the simplicity and accessibility of these measures, and their potential to capture associations with depression, suicidal thoughts and behaviors, and aggression, consideration should be taken to include them as part of the mental health visit. Additionally, in general pediatric settings, the absence of psychiatric jargon in measures like the SSS ladder could serve as a less stigmatizing screening tool when full screening measures are not a possibility. As noted in the response of the adolescents during the in-depth interviews, including and discussing issues of

social rank during therapy sessions can potentially ease the guilt and improve the self-esteem of adolescents who have lived in deprived environments from an early age, when a more egocentric view of the world would have made these thoughts and feelings of responsibility for their situation persist into their adolescent years.

Finally, and most important, environmental interventions to improve environments in neighborhoods and communities and policies to decrease inequality will have the strongest effect by targeting larger populations. While social rank is a reality in social animals, and while as humans, we can expect status problems to appear at all levels of wealth, we also have the ability to mitigate these effects not only by teaching coping skills, but also by creating more equal environments and societies whenever possible.

Most importantly, while hierarchies are a part of the structure of our current human societies, or of our human nature as primates, we have the ability to minimize the effects of these hierarchies on people's health. A societal model that assumes inequalities as a normal part of their existence or even ignores them as one of the main causes of health disparities is damaging, especially because these approaches to inequalities may contribute to youth internalizing them.

As with the obesity epidemic, in which obesity stigma (Puhl et al., 2010) has increased by emphasizing the view that obesity is a personal responsibility matter and deemphasizing socio-economic influences (Finkelstein et al., 2005) of obesity that are out of the control of the individual, negatively impacting physical and psychological health outcomes, similar dynamics often happen with poor or poorer people, where the blame is placed on them as opposed to on the

larger socio-economic factors that condition their situation. As youth grow up in a society with the highest levels of inequality in decades, it is key that we make these inequalities a part of the discussion and educate the population about their effects. In order to do that, it is important that we include this discussion not only in our mental health interventions, but in all public health policies and that we expand public health.

In 2008, the Secretary of State for Health in the United Kingdom asked Professor Sir Marmot to chair a review to propose effective evidence-based strategies to reduce health inequalities in England. The final report, "Fair Society Healthy Lives" (Marmot et al., 2010), reaffirms that reducing health inequalities is a matter of social justice, that the existing social gradient in health results from social inequalities, and that "action on health inequalities requires action across all the social determinants of health," that actions need to be universal, and that they will benefit society in many ways. The report also emphasizes that wellbeing, sustainability, and fair distribution of wealth and not economic growth are the most important measures of a country's success.

Finally, the report explains that policy objectives should be led by central and local governments, national health services, and the private sector and community groups, and that decision making should be shared with communities at the local level. Six policy objectives are mentioned as necessary to reduce health inequalities, and they include: 1- giving every child the best possible start in life, 2- enable people of all ages to maximize their potential and have control over their lives, 3- create fair and good employment for all, 4- ensure a healthy standard of living for all, 5- develop sustainable and healthy communities, and 6-strengthen the role of disease prevention.

5. CONCLUSIONS

This study aimed to see the effects of inequality in adolescents by exploring perceived social rank in a sample of largely urban minority adolescents. The findings point to a critical role of social comparisons in the construction of one's perceived social rank, and to developmental differences in the formation of social identity, with adolescents giving more weight to those dimensions valued in their environment. The findings also confirm associations between perceived social rank and depressive symptoms, suicidal thoughts, and aggression in adolescents. Future studies should involve longitudinal research to study causality. Implications of these findings are discussed with potential recommendations to mitigate the effects of inequality in families, schools, clinical settings, and the larger society.

STUDY 1: "Perceived Family and Individual Social Status and its association with depression and suicidality in an adolescent clinical sample"

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RESEARCH ARTICLE

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Perceived family and individual social status and its association with depression and suicidality in an adolescent clinical sample

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Abstract

There is a well-documented association between subjective social status (SSS) and depression among adults. Yet, the research on SSS and suicidal thoughts and behaviors among adolescent minority populations is limited. The aim of this study was to examine the relationship between the adolescent's SSS and mental health in an adolescent sample. A total of 197 adolescents ages 12 to 18 years (*M* age = 14.58; *SD* = 1.54) and their parents were recruited in urban outpatient clinics. Sociodemographics and measures of depression, suicidal thoughts and behaviors, and SSS were collected in a cross-sectional survey and through chart review. Univariate and multivariate analyses were conducted to calculate statistical associations with depression and suicidal thoughts and behaviors. Significant negative associations were found between SSS and depression, suicidal ideation, and prior suicidal attempts, independent of socioeconomic status. Consideration should be given to assessing measures of social rank to appraise risk in adolescent outpatient clinical settings.

KEYWORDS
adolescents, depression, social rank, subjective social status, suicidality

ABSTRACT

There is a well-documented association between subjective social status (SSS) and depression among adults. Yet, the research on SSS and suicidal thoughts and behaviors among adolescent minority populations is limited. The aim of this study was to examine the relationship between the adolescent's SSS and mental health in an adolescent sample. A total of 197 adolescents ages 12 to 18 years (M age= 14.58; SD= 1.54) and their parents were recruited in urban outpatient clinics. Socio-demographics and measures of depression, suicidal thoughts and behaviors, and SSS were collected in a cross-sectional survey and through chart review. Univariate and multivariate analyses were conducted to calculate statistical associations with depression and suicidal thoughts and behaviors. Significant negative associations were found between SSS and depression, suicidal ideation, and prior suicidal attempts, independent of SES. Consideration should be given to assessing measures of social rank to appraise risk in adolescent outpatient clinical settings.

INTRODUCTION

Adolescent depression and suicide have been on the rise in industrialized countries over the past two decades. The prevalence of major depressive episodes increased from 8.7% to 11.3% between 2005 and 2014 (Mojtabai, Olfson, & Han, 2016). Suicide continues to be the second leading cause of death among adolescents (CDC, 2019), with a recent trend of an increase of black youth suicide (Lindsey, Sheftall, Xiao, & Joe, 2019). Additionally, suicide rates appear to be increasing in young girls, narrowing the gender gap in adolescents (Glenn, & Nock, 2014). Yet, only 1 in 8 adolescents who self-harm present to a hospital (Madge et al., 2007; Hawton, Rodham, Evans, & Weatherall, 2002). Distinct groups of suicidal youth have been identified, including those with lifelong psychosocial and behavioral problems, those with a major psychiatric disorder, and those where the suicidal process occurs as an acute reaction to life stressors (Fortune, Steward, Yadac, & Hawton, 2007), suggesting that suicide and depression can present independently. Suicide is often the endpoint of the concurrence of multiple factors that range from genetic and biological, to psychiatric and psychological to socio-cultural (Hawton, Saunders, & O'Connor, 2012). However, psychosocial adversity may have a bigger role than other factors, given the rapid rise in prevalence that cannot be explained by genetic changes.

One of the most studied social causes of depression and suicide is socio-economic status (SES). SES has been linked to depression (Patel et al., 2010) and suicidal ideation (McMillian et al., 2010), with more disadvantaged populations at higher risk. Yet, mounting evidence suggests a stronger association between these mental health outcomes and the subjective, rather than objective, social rank position both in adults *(*Adler & Stewart, 2010) and adolescents

(Goodman, Huang, Schafer-Kalkhoff, & Adler, 2007). Subjective social status (SSS), or the subjective experience of being higher or lower in the social status hierarchy, seems to encompass psychological measures that are not included in the assessments that consider only objective SES. Furthermore, a person's relative income compared to others within a similar social comparison group rather than the absolute level of income is more predictive of mental health outcomes (Hounkpatin, Wood, & Dunn, 2016). In adolescents, domains other than income and education may be a cause of stronger social comparisons and subsequent health outcome associations (Sweeting & Hunt, 2014), making the role of SSS distinct from that of adults.

Social rank judgments are the mechanism by which individuals assess their social status in a group. Social animals are known to experience stress in social hierarchies (Sapolsky, 1996). Chronic social stress can affect the Hypothalamus Pituitary Adrenal (HPA) axis (Abbott et al., 2003), which may facilitate depression and other medical conditions. A number of evolutionary psychology theories explain depression through social rank. The Social competition or *Social Rank Theory of depression* (Price, Sloman, Gardner, Gilbert, & Rohde, 1994) posits that depression is a strategy to accept defeat and retreat from agonistic social encounters with more dominant peers. According to this theory, low mood and submissive behavior are responses to defeating competitive situations, and a means to inhibit aggressive reactions by communicating a status of "no threat" and facilitating acceptance of the situation. In contemporary society, this dominance would be determined by prestige. Perceiving to be outnumbered by individuals of high status may trigger depressive thoughts and behaviors. The *Social Risk Hypothesis of depression* (Allen & Badcock, 2003, 2006) proposes that depression would be an adaptive response to a threat situation, reducing expectations of success and sending signals of relative

low value to others when in an environment of others who have higher status. Blease (2015) proposes these theories are relevant in the current context when opportunities for comparison have exponentially expanded with the use of social media. Other researchers have also emphasized the relevance of SSS in modern society where social media offers multiple triggering cues of status comparison because of the abundance of signs of "high status" (Feinstein et al., 2013).

A new generation of theories of suicide, such as the Interpersonal theory of suicide (Joiner 2005) and the three-step theory (Klonsky & May, 2015) consider suicide ideation and the progression to action culminating in a suicide attempt as two separate processes. In this study, we follow this perspective by studying risk factors associated with both suicide ideation and suicide attempts. A model that takes into consideration this ideation-to-action framework is the Integrated Motivational-Volitional Model of Suicidal Behavior (O'Connor, 2011). This tripartite model is based on a diathesis-stress framework and includes 3 phases: pre-motivational, motivational, and volitional (O'Connor, 2011; O'Connor, Cleare, Eschle, Wetherall & Kirtley, 2016). Background factors such as life events, genetics, and deprivation antecede a motivational phase, where moderators facilitate the transition from defeat to entrapment, leading to a volitional phase, consisting of factors that influence the likelihood that someone will act (i.e., impulsivity, exposure to suicide, and capability for suicide). Wetherall et al. (2019) have proposed social comparisons as a social rank factor that would represent a pre-motivational factor that makes the individual more likely to interpret life circumstances in a way that they feel defeated or entrapped. Another model that includes self-appraisals as an influence on suicidal thoughts and behaviors is the Schematic Appraisals Model of Suicide (Johnson, Gooding, & Tarrier, 2008).

This model posits that situations and self-appraisals (especially appraising a situation as defeating and entrapping) modifies suicidal risk (Johnson, Gooding, Wood, & Tarrier, 2010). A systematic review of literature on self-perceptions of social rank and depressive symptoms and suicide risk, which focused on studies of adults (Wetherall, Robb, & O'Connor, 2019), found evidence that perceiving oneself as of lower social rank was consistently associated with depressive symptoms in adults, with more limited evidence of a similar association between low social rank perception and suicidal thoughts and behaviors. The strength of the relationship weakened when considering other psychological variables. While the majority of the studies were cross-sectional, there was evidence for a bidirectional association, as shown by studies that documented an association with social status as an outcome variable and depression as an independent variable. The effects of social status among adolescents have been inconsistent (Currie et al., 2008). A recent meta-analysis, focused on the association of SSS and health outcomes in adolescence, confirmed a relationship between SSS and health outcomes (Quon & McGrath, 2014) with the strongest effect sizes found in studies with mental health outcomes. However, none of the studies specifically examined suicidal thoughts and behaviors, and these studies did not examine racial, ethnic, or cultural factors.

While there is extensive literature on the association between SSS and depression in adults, there is limited research on SSS and suicidal thoughts and behaviors in general, and specifically among adolescent minority populations. The aim of this study was to examine the association between depression and suicidal thoughts and behaviors and SSS of the adolescent's family in society and the adolescent's SSS in the school, in a sample of adolescents recruited in urban clinical settings, the majority of whom were black.

METHODS

Procedure:

Participants were adolescents recruited in outpatient primary care offices and mental health centers. Medical staff asked adolescents and their parents about their willingness to participate in the study and referred those interested to the research team that then explained the study. Parents and adolescents were told that the study consisted of interviews about how adolescents perceive themselves in respect to the rest of society. Participants who gave assent, and whose parents gave consent to participate, were administered a survey by a trained research assistant or the primary author. The study was approved by the University's IRB.

Participants:

Inclusion criteria were: 1) age 12 through 18 years of age, 2) able to speak and read English and/or Spanish, and 3) being accompanied by a parent or guardian who could provide consent. The sample included 197 participants ages 12-18 (M age= 14.58; SD= 1.54). Within the sample, 73 (37.1%) identified as male and 124 (62.9%) as female, 47 (23.9%) as white, while a majority identified as belonging to a minority, with most (124, 62.9%) identifying as black, and 26 (13.2%) mixed or other race (Hispanic, Asian).

Measures:

Outcome variable:

Patient Health Questionnaire (PHQ-9) Adolescent Version was used to screen for depression (Johnson, Harris, Spitzer, & Williams, 2002). The PHQ-9-A assesses depressive symptoms based DSM-IV diagnostic criteria: low mood, anhedonia, trouble with sleep and appetite, lack of energy, trouble concentrating, psychomotor retardation, and suicidal ideation. The responses are on a 4-point scale ranging from 0 ("not at all") to 3 ("nearly every day"). Scores were computed as a sum of the 9 items with an overall score that can range from 0-27. The corresponding severity categories are defined as *no depression* (PHQ-9 scores 0–4), *mild* (PRQ-9 scores 5–9), *moderate* (PHQ-9 scores 10–14), *moderately severe* (PHQ-9 scores 15–19), and *severe* (PHQ-9 scores higher than 20) (Kroenke, Spitzer, & Williams, 2001). We used the total score in the total PHQ-9 score as a dependent variable.

Two questions were used to assess suicidal thoughts and behaviors. Suicidal Ideation was measured by asking participants, "Has there been a time in the past month when you have had serious thoughts about ending your life?" The responses were "yes" or "no." A history of suicide attempts was measured by asking participants, "Have you ever, in your whole life, tried to kill yourself or made a suicide attempt?" with response options of "yes" or "no."

Independent variables:

Socio-demographic measures included Age upon interview, Sex at birth (0= male; 1= female), and self-identified race (0=white, 1= black, 2= other races or mixed race). These variables were abstracted from the medical record.

Parental education and employment and household income were self-report measures and were asked to the consenting adult who accompanied the adolescent. Parental employment was gathered by asking whether the father and mother were employed with a "yes" or "no" response. Parental education was determined by asking what was the highest level of education that the mother and the father had completed. The response options were: 8th grade or less, high school or GED, some college, college graduate, and graduate studies. For household income, the consenting guardian was asked: "What is your annual household income (in dollars per year?." The response options were: Less than $14,000, between $14,001 and $34,000, between $34,001 and $70,000, between $70,001 and $120,000, between $120,001 and $160,000, and more than $160,000. The standardized z-scores of parental employment, education, and household income were added to create a variable named Socio-Economic Status (SES), with higher scores reflecting higher family SES, as computed in Xu, Cui, Xing, and Parkinson (2019). This calculation is based on findings that show that the majority of approaches to measure SES include some degree of quantification of family income, parental level of education, and parental occupational status (Bradley & Corwyn, 2002).

SSS was assessed with The MacArthur Scale of Subjective Social Status - Youth Version (Goodman et al., 2007). The scale consists of two ladders with 10 steps each. Participants were presented with both ladders and asked the following:

*"Imagine that this ladder pictures how **American society** is set up. At the top of the ladder are the people who are the best off- they have the most money, the highest amount of schooling, and the jobs that bring the most respect. At the bottom of the ladder are people who are the worst off- they have the least money, little to no education, no jobs or jobs that no one wants or respects. Now think about your family. Please, tell us where you think your family would be on this ladder. Fill in the circle that best represents where **your family** would be on this ladder.*
*Now assume that the ladder is a way of picturing **your school**. At the top of the ladder are the people in your school with the most respect, the highest grades, and the highest standing. At the bottom are the people who no one respects, no one wants to hang around with, and have the worst grades. Where would you place yourself on this ladder? Fill in the circle that best represents where **you** would be on this ladder.*

The score was presented as a ladder with 10 steps. The participants marked where they fell they were located in the ladder from 1 to 10, with higher numbers representing a higher status of their family in American society (SSS family vs society) in the first ladder, and of themselves in the school (SSS individual vs school) in the second ladder. These two variables were used as independent continuous variables.

Statistical Analyses:

Descriptive analyses looking at frequencies and means were conducted to observe all independent and dependent variables. Chi-Squares were calculated for categorical variables and t-tests for continuous variables to examine the differences between groups based on age and gender. Pearson parametric tests were used to assess correlations among all variables.

Multivariate linear regression analyses were used to assess the outcome variable of the total depression score in the PHQ-9. Logistic regression was used to assess the outcome variables of suicide ideation in the past month and any suicide attempts in the past. There were less than 5% of missing data in all variables included in the analysis, except for the PHQ9 variable (with 10.6% missing data). The most missing data was for the variables father employment (21.8% missing data) and father education (20.3% missing data). Missing values were calculated with linear interpolation.

Results:

Sample Characteristics:

The mean score in the PHQ-9 scale was 8.60 (SD=7.04). About one third (n= 65, 33%) of the sample reported having had thoughts of wanting to die in the last month, and 59 (29.9%) reported having attempted suicide in their lifetime. The majority of the fathers (168, 85.3%) and mothers (150, 76.1%) were employed. Most fathers had a high school level of education (78, 39.6%), and only 12 (6.1%) had less than a high school level of education. Approximately the same proportion of fathers had some college education (n= 38, 19.3%), were college graduates (n=39, 19.8%) or had enrolled in graduate studies (n=30, 15.2%). The mother's level of education was similarly distributed among high school graduates or GED level of education (n=46, 23.4%), some college (n=56, 28.4%), college graduates (n=45, 22.8%), and graduate studies (n=40, 20.3%), with only a minority having an 8^{th} grade level or less education (n=10, 5.1%). The majority of the sample (n=139, 70.7%) reported having annual household incomes

between $14,001 and $120,000, followed by 32 (16%) with a household income over $120,000 and only 26 (13.2%) with a household income of less than $14,000.

The mean score for depression was significantly higher among females (X=9.51, SD=7.23) than males (X=7.05, SD=6.46) (t= -2.39, p=0.017). Those participants 15 years or older had a higher mean depression score (X=9.95, SD=7.43) than those 14 or younger (X=7.21, SD=6.36) (t=-2.78, P=0.006). While females had a lower score than males for the mean SSS of the family compared to the rest of society (family vs society) and the individual compared to their own school (individual vs school), the difference was not statistically significant. Younger participants had a statistically significant higher score in SSS family vs society as compared to older participants (t=2.23, p=0.027), whereas while the score for SSS individual vs school was also higher in the younger age group, the difference was not statistically significant. The mean score for SSS family vs society was 6.23 (SD=1.55) slightly lower than the SSS individual vs school (See table 1).

Table 1. Sample Characteristics

	All Sample (N=197)
	X (SD)
Subjective SES (Family)	6.23 (1.554)
Subjective SES (Person)	6.45 (2.165)
SES	0 (3.01661)

	Depression X (SD)	t (p)	SS1 Ladder	t (p)	SS2 Ladder	t (p)
Male	7.05 (6.462)	-2.397* (0.017)	6.34 (1.445)	0.807 (0.420)	6.84 (2.063)	1.935 (0.054)
Female	9.51 (7.232)		6.16 (1.616)		6.22 (2.200)	
≤14 years old	7.21 (6.362)	-2.776**	6.47 (1.601)	2.232*	6.60 (2.227)	0.982 (0.327)
≥15 years old	9.95 (7.428)	(0.006)	5.99 (1.474)	(0.027)	6.30 (2.105)	

*p≤0.05; **p≤0.01; ***p≤0.001; [a] counts; [b] percentages

Correlations:

Significant correlations were found between SSS family vs society and depression score (r= -0.153; p= 0.032), suicidal ideation in the past month (r=-0.165; p= 0.021), and ever attempting suicide (r=-0.181; p= 0.011). SSS individual vs school was significantly negatively correlated with depression score (r= -0.167; p= 0.019), suicidal ideation in the past month (r=-0.188; p= 0.008), and ever attempting suicide (r=-0.146; p= 0.040). Age (r= 0.141; p= 0.048) and sex at birth (0.169, p= 0.017) were positively correlated with depression, but not with suicidal thoughts and behaviors. SES was positively correlated with SSS family vs society (0.160; p= 0.025). Age was also significantly negatively correlated with SSS family vs society (0.144; p= 0.043). As expected, there was collinearity ($r \geq 0.20$) between measures of depression, suicide ideation and

suicide attempts, as well as between SSS of of the family in society and SSS of oneself in the school.

In the logistic regression models, SSS family vs society was significantly negatively associated with suicidal ideation in the past month (OR= 0.789; p= 0.022) and with prior history of suicide attempts in a lifetime (OR=0.763; p= 0.012). SSS individual vs school was negatively associated with suicidal ideation in the past month (OR=0.830; p= 0.009) and with ever attempting suicide in the past (OR= 0.864; p= 0.042).

Multivariate analyses:

The associations for SSS family vs society and depression (B=-0.742; p=0.024) with an R^2 (Sig.) = 0.028 (0.064), suicidal ideation in the past month (OR= 0.774, p=0.016), and ever attempting suicide (OR=0.760, p=0.012) remained significant when controlling for SES. The same was true for the associations between SSS individual vs school and depression (B= -0.540, p=0.020) with an R^2 (Sig.) = 0.029 (0.056), suicidal ideation in the past month (OR= 0.831; p= 0.010), and ever attempting suicide (OR= 0.863; p= 0.042). When controlling for age, sex at birth, and race, SSS individual vs school and depression (B= -0.460, p= 0.045) with an R^2 = 0.081(p= 0.006), suicidal ideation in the past month (OR= 0.840; p=0.018), and SSS family vs society and suicidal ideation in the past month (OR= 0.762; p= 0.014) and ever attempting suicide (OR= 0.770; p=0.020) remained significantly associated. SSS of the individual in the school, controlling for

all co-variates, did not differ greatly from the other two models and was marginally significant (OR= 0.868; p=0.056) (see tables 2, 3, & 4).

Table 2. Hierarchical Regression Analyses with Depression (Total PHQ9 Score) as an Outcome Variable

	SS1 as IV								
Variable	B (Sig.)	SE	β	B (Sig.)	SE	β	B (Sig)	SE	β
SSLadder 1	-0.692*(0.032)	0.321	-0.153	-0.742* (0.024)	0.325	-0.164	-0.625 (0.054)	0.322	-0.138
SES				0.159	0.167	0.068	0.056	0.179	0.024
Age							0.500	0.324	0.109
Sex At Birth							1.987	1.025	0.137
Black Race							-1.901	1.105	-0.131
R^2 (Sig.)	0.023* (0.032)			0.028 (0.064)			0.079** (0.007)		
Adjusted R^2	0.018			0.018			0.055		

	SS2 as IV								
Variable	B (Sig.)	SE	β	B (Sig.)	SE	β	B (Sig)	SE	β
SSLadder 2	-0.544** (0.019)	0.230	-0.167	-0.540* (0.020)	0.230	-0.166	-0.460* (0.045)	0.228	-0.142
SES				0.086	0.165	0.037	-0.004	0.177	0.002
Age							0.583	0.321	0.127
Sex At Birth							1.774	1.033	0.122
Black Race							-1.887	1.104	0.130
R^2 (Sig.)	0.028* (0.019)			0.029 (0.056)			0.081** (0.006)		
Adjusted R^2	0.023			0.019			0.057		

Table 3. Logistic Regression Analyses with Serious Thoughts of Ending Life in the last month as an Outcome Variable

	Subjective Social Status (Family in Society)			Subjective Social Status (Self in School)		
Variable	**Model 1**	**Model 2**	**Model 3**	**Model 1**	**Model 2**	**Model 3**
	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]
SSS	0.789 [0.644-	0.774 [0.628-	0.762 [0.614-	0.830 [0.721-	0.831 [0.722-	0.840 [0.727-
SES	0.967]*	0.954]*	0.947]*	0.955]**	0.956]**	0.970]*
Age		1.053 [0.950-	1.017 [0.909-		1.024 [0.927-	0.990 [0.888-
		1.168]	1.138]		1.132]	1.104]
			0.991 [0.808-			1.024 [0.838-
			1.217]			1.253]
Sex At Birth (*ref = males)*			1.270 [0.662-			1.171 [0.608-
			2.435]			2.254]
Race (*ref = white)*						
Black			0.455 [0.211-			0.508 [0.236-
			0.979]*			1.091]
Mixed or Others			0.547 [0.198-			0.720 [0.261-
			1.514]			1.984]
-2 Log Likelihood	244.353	243.384	238.502	242.880	242.655	239.143
Cox & Snell R^2	0.028	0.032	0.056	0.035	0.036	0.053
Negelkerke R^2	0.038	0.045	0.078	0.048	0.050	0.074
Homer & Lemeshow χ^2 (p)	3.445 (0.486)	9.634 (0.292)	11.920 (0.155)	3.602 (0.730)	12.423 (0.133)	2.620 (0.956)

Table 4. Logistic Regression Analyses with ever attempting suicide in the past as an Outcome Variable.

Variable	Subjective Social Status (Family in Society)			Subjective Social Status (Self in School)		
	Model 1	**Model 2**	**Model 3**	**Model 1**	**Model 2**	**Model 3**
	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]
SSS	0.763 [0.618-	0.760 [0.612-	0.770 [0.619-	0.864 [0.750-	0.863 [0.749-	0.868 [0.751-1.003]
SES	0.943]*	0.942]*	0.960]*	0.995]*	0.994]*	(p=0.056)
Age		1.013 [0.912-	1.001 [0.893-		0.986 [0.891-	0.976 [0.878-1.086]
		1.127]	1.123]		1.092]	1.114 [0.908-1.367]
			1.082 [0.879-			
			1.333]			
Sex At Birth (*ref = males)*			0.770 [0.346-			1.300 [0.664-2.546]
			1.711]			
Race (*ref = white)*						
Black			0.770 [0.346-			0.843 [0.372-1.912]
			1.711]			
Mixed or Others			0.969 [0.343-			1.236 [0.437-3.494]
			2.737]			
-2 Log Likelihood	233.838	233.776	231.530	236.334	236.263	233.611
Cox & Snell R^2	0.033	0.034	0.045	0.021	0.021	0.034
Negelkerke R^2	0.047	0.048	0.063	0.030	0.030	0.049
Homer & Lemeshow χ^2 (p)	6.649 (0.156)	14.256 (0.075)	9.854 (0.275)	5.848 (0.440)	10.013 (0.264)	15.992 (0.042)

Discussion:

This study aimed to examine the association between depression, suicidal thoughts and suicidal behaviors and adolescent SSS, exploring both SSS of the adolescent's family in society and SSS of the adolescent in the school, in a sample of largely black adolescents recruited in clinical urban settings. As expected, we found negative associations between SSS of the adolescent's family when compared to the rest of society and depression, suicidal thoughts and suicidal behaviors, as well as negative associations of the adolescent's SSS when comparing to their school peers and depression, and suicidal thoughts and behaviors. These findings support previous extensive research showing that the higher perceived rank of one's family in society and of oneself among school peers, the less likely the person is to be depressed and present suicidal thoughts and behaviors, even when controlling for SES.

This sample was a clinical sample with high levels of psychopathology. The average score in the PHQ-9 was 8, which falls within the range of mild depression (Kroenke et al., 2001). Additionally, one-third of the sample reported thoughts of wanting to die within the past month, and one third reported having attempted suicide in their lifetime. These are higher rates compared to the general population (Lindsey et al., 2019). The majority of the sample were females and black. These characteristics make this sample unique, as most studies assessing SSS have been adult populations, mostly white or Latino, with lower levels of psychopathology (Wetherall et al., 2019).

As expected, age was positively correlated with depression. Older age was also associated with lower levels of both SSS when comparing one's family to the rest of society and when comparing oneself to the rest of the school. This finding is in line with the results of a longitudinal epidemiological study with a British cohort that showed robust correlations between subjective family status and indicators of health such as depression and substance abuse controlling for SES appearing in late adolescence (Rivenbark et al., 2020). Similar findings of decreased SSS with age were found in American adolescents (Goodman et al., 2007; Amir, Valeggia, Srinivasan, Sugiyama, & Dunham, 2019). It is possible that as adolescents grow up and transition to larger schools or have more access to widening their social environment, through social media use or other activities, they also have more opportunities for comparing themselves with others, ranking themselves in more diverse environments as opposed to the more homogeneous circles they navigate when younger. A lower sense of status has been associated with an undervalued sense of self or low self-esteem, which is a hallmark symptom of depression (Kraus & Wand, 2014).

As found in previous studies (Wetherall et al., 2019), an objective measure of SES encompassing parental education, parental employment, and household income, was less predictive of depression, suicidal ideation, and suicidal attempts than SSS. This supports previous findings that suggest that social ranking involves psychological domains than are not measured by objective assessments (Goodman et al., 2007).

Surprisingly, SSS when comparing the family to the rest of society and SSS when comparing the self to the rest of the school were not strongly correlated. This finding indicates that these two ladders measure different domains. SES was more strongly associated with SSS of the family when compared to the rest of society than SSS of the self comparing to the rest of the school. As previous research has shown, the comparisons in school may be varied and range from clothes, to popularity, to grades (Sweeting & Hunt, 2014), while when comparing their families to the rest of society the individual may be using similar or correlated comparison dimensions (such as quality of housing) that we use for SES. Additionally, previous research has shown differences in the strength of association between the two dimensions of SSS depending on gender, with women being more oriented towards community rather than society level comparisons when assessing their social rank (Michelson et al., 2016).

The overall score of SSS was lower when comparing one's family to the general society than when comparing oneself to the rest of the school. This may be a reflection of schools being more homogeneous in social class and ranking, while having more diverse groups of reference in the general society. It may be that the schools are in neighborhoods with social class consistent with that of the adolescent, and/or that the study participants have a more idealized and upper-class perceptions of society based on media portrayals. Overall, comparing SSS of the family to the rest of society was more strongly associated with suicidal thoughts and behaviors and less with depression, whereas the comparison of oneself to the school was more associated with measures of depression. Both scales were associated with suicidal thoughts in the past month. The association of SSS of the family when compared to the rest of society and suicidal thoughts and behaviors suggests a role of media as a potentially important factor for suicide.

In our sample, female sex was also associated with higher levels of depression, but not with higher levels of suicidal thoughts or behaviors. We did not find associations between race and depression or suicidal attempts. However, we did find an association between being of black race and thoughts of wanting to die in the last month when controlling for all other variables, including SSS of the family versus society. This significant association was not found when SSS of the individual versus the school was included in the model.

Thoughts of suicide have been associated with feelings of entrapment and defeat (O'Connor, Rasmussen, Hawton, 2012), and to feelings related to lack of sense of control, which are associated with being lower in the social hierarchy (Marmot, 2004). Among challenges to prevent suicide in adolescents, experts have mentioned improving prediction of suicide risk and protecting against the effects of societal challenges such as economic recessions on mental health (Hawton, Saunders, & O'Connor, 2012). Prevention of suicide can be enhanced with universal interventions aimed at all youth and targeted interventions for youth at high risk for suicide (Hawton et al., 2012). Social rank can provide an understanding of the mechanisms by which new media affect suicidal thoughts and behaviors (Twenge, Joiner, Rogers, & Martin, 2018) and a mechanism to measure distress in a non-stigmatizing manner in non-clinical settings.

This study had several limitations. The study was cross-sectional, and therefore, causal associations cannot be established. The measures of SES were reported by the parents. However, while they may be biased, they provided a second reporter so that we could compare SES measures reported by the parent and the adolescents' perception of their status. All the measures were self-report and therefore open to recall and social desirability biases.

This was a relatively small sample with a high proportion of black adolescents and females, and therefore, the sample was not representative of the general population, and the results cannot be generalized more broadly. Finally, we did not use a psychometrically validated measure of suicidal ideation and attempts.

These findings help to validate the use of measures of social rank in clinical settings, which are currently not common practice. Because of its easy administration and absence of mental health jargon, the SSS ladder can be a less stigmatizing screening measure than traditional measures of mental health in outpatient or community settings.

Conclusions:

Our findings show that the inverse association between SSS of the family in society and the individual in the school and depression remains among a primarily black, female, clinical sample of American adolescents. SSS was also associated with suicidal ideation and prior suicidal attempts in a lifetime. The associations between SSS and depression and suicidal thoughts and behaviors were stronger than the associations of SES and depression and suicidal thoughts and behaviors. Consideration should be given to using measures of social rank to assess risk in outpatient primary care and outpatient mental health treatment settings.

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Appendix I: Study 2. *"Adolescents' responses and coping strategies in the face of social inequities: a qualitative study"*

Abstract:

There has been an increase in the prevalence of adolescent depression in recent decades. Some causal hypotheses for this increase implicate changes in the awareness of relative social status, possibly exacerbated by an increased economic divide and expanded opportunities for social comparisons through digital media. The purpose of this study was to explore the processes, responses and coping strategies adolescents use when assessing their social status. In this qualitative study, we conducted face-to-face, voice-recorded interviews with 23 female (13) and male (10) participants ages 12 to 17 from the United States between February and September of 2016. The qualitative analysis revealed 4 themes consistent with the transactional theory of stress: 1- *environmental inputs* as contributors to adolescents' perceived social status; 2- variations in the frequency and processes of making *social comparisons*; 3- *thoughts and feelings* involved when assessing one's social status; and 4- *coping strategies* and societal opportunities for intervention. We discuss the mechanisms by which adolescents use social comparisons to gauge their social status and how they use coping mechanisms such as cognitive restructuring when negative feelings arise from being aware of their social rank. These findings point to the potential benefits of including aspects related to social rank in individual therapeutic interventions in addition to societal level interventions to reduce the psychological impact of inequality.

Key words:

Adolescence

Coping Skills

Depression

Qualitative research

Social comparison

Social inequalities

Social status

Title:

"Adolescents' responses and coping strategies in the face of social inequities: a qualitative study"

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Search Words: Social Status, Relative Deprivation, Social Comparisons, Adolescents, Mental Health, Depression

Word Number: 3,960

Tables: 3

Introduction

One in five adolescents experience emotional distress, with depression being among the most common formally diagnosed disorders (Knopf et al., 2008). The incidence of adolescent depression (Mojtabai et al., 2016) and suicide (CDC, 2018) has increased over the past four decades. One hypothesis for this increase implicates adolescents' negative assessments of their social status, driven by increased income inequality and the role of social media in amplifying opportunities to make social comparisons (Steers et al., 2014; Twenge et al., 2018).

Individual deprivation and poverty are known stressors that constitute risk factors for depression (Lorant, et al., 2007) and suicidal ideation (Gilman et al., 2013). One's position in the social hierarchy, either by considering relative deprivation (or the "experience of a negative discrepancy between legitimate expectations and present actualities") (Schaefer, 2008, p. 69) or Subjective Social Status (SSS) (the perception of one's position in the social ladder), has also been associated with health outcomes (Marmot et al., 1991, 2010; Adler & Stewart, 2010; McLaughlin et al., 2012), including depression in adolescents (Goodman et al., 2001).

While adults in "Western" societies mainly construct their sense of social status by averaging assessments of their relative income, education and occupation (Adler et al., 2000), the process differs for adolescents (Sweeting et al., 2010; Sweeting & Hunt, 2014; Vannatta et al., 2009) as they move in distinct social environments, such as schools (Sweeting & Hunt, 2014).

While there is growing literature on the effects of the stress related to social hierarchies in adolescents, less is known about the ways in which adolescents cope with these differences in status, an area of interest in a society with growing inequalities (Phillips, 2002). According to the transactional model of stress and coping (Lazarus, 1966; Lazarus & Folkman, 1984), stress is the product of a transaction between a person's psychological and biological systems and their complex environment. After an individual makes a cognitive appraisal of the available resources to cope with a stressor, he or she will adopt emotion-focused coping strategies such as focusing on the positives and wishful or avoidant thinking, or a problem-focused coping strategy (e.g.: making a plan to solve the problem) (Folkman & Lazarus, 1980; Lazarus & Folkman, 1984; Lazarus & Folkman, 1987).

An individual's style of coping and coping flexibility, or ability to modify coping behavior depending on the stressful situation (Kato, 2012), are key in determining the individual's ability to manage psychological distress, and results in better psychological functioning and health (Lazarus, 1999; Folkman & Moskowtiz, 2004; Rozanski et al., 2005; Bonanno & Burton, 2013; Cheng et al., 2014).

The goal of this study was to contribute to the treatment of adolescent depression by exploring its relationship to relative deprivation and social status in a clinical sample of adolescents in the United States (U.S.). Specifically, we sought to understand how adolescents attempt to manage emotions steaming from assessing their social status.

Methods

Study participants resided in Baltimore**,** Maryland, and its surrounding suburbs. Maryland has the highest median household income in the United States and has relatively less income inequality than the majority of states (Sommeiller et al., 2016). Yet, 13.2% of Maryland's children lived below the poverty line in 2016 (DHHS, 2018). *In* Baltimore, 33.3% of children were living below the poverty line, with rates of poverty among neighborhoods ranging from 0.1% to 65.3% *in* 2016 (BNIA, 2018). There are marked contrasts in income between the city and the surrounding suburbs and among neighborhoods within the city, in addition to an accelerating process of gentrification (Governing, 2017).

The study sample consisted of adolescent girls (n= 13) and boys (n=10) recruited through fliers and referrals from outpatient health care providers. Recruiting sites (3 pediatricians' offices, a community mental health clinic, and a psychiatric day hospital) were chosen following *maximum variation sampling* (Creswell, 2007) to include a wide variety of participants reflecting the city's racial and socio-economic diversity. Inclusion criteria were: 1) age 12 through 17 years of age, 2) able to speak and read English and/or Spanish, and 3) being accompanied by a parent or guardian who could provide consent. Medical staff asked adolescents and their parents about their willingness to participate in the study and referred those interested to the research team who then explained the study. Parents and adolescents were told that the study consisted of interviews about how adolescents perceive themselves in respect to the rest of society.

Face-to-face in-depth interviews were conducted by the first author in English and/or Spanish between February 2016 and September 2016. The materials used included a semi-structured guide with open-ended questions inquiring about the adolescent's environment, the social comparisons they made, and their perception of relative deprivation (Table 1). Interviews were audio-recorded and transcribed by two research assistants. Numbers were assigned to the interviewees in order to protect their anonymity. The interviews lasted between 12.5 and 40.3 minutes, with an average of 28.3 minutes. Participants received a $25 gift card.

Table 1: In-depth Interview Question Guide

QUESTIONS
Explain what you consider to be your "community"
Describe your family, neighborhood and city
List the things would you change about your environment (the way your residence/neighborhood/city looks, the things those places have or don't have)
If you could change one thing about how you are in relationship to other people in your school, neighborhood, city or country, what would you change?
Which opinion matters most to you, that of the people in your school or the people in your neighborhood?
Do you ever compare yourself to other people on social media sites (like Facebook, Instagram, tweeter), other media (people on TV, YouTube, celebrities)?
Have you or your family struggled financially to buy things you needed or wanted? List what types of things you needed or wanted. How did it impact you to not be able to buy those things?
When you compare your and your family's wealth to other people's, who do you compare yourself to the most? Please, explain why
When you compare your and your family's wealth to that of other people around you, what sort of things do you pay attention to? Please list
If you see yourself in a worse situation financially than other people around you, how does that make you feel?

Adolescents completed a screening tool for depression, the Patient Health Questionnaire-9, Adolescent Version (PHQ-9) (Johnson et al., 2002). We used a score of 11 as cut off for major depression (Richardson et al., 2010). We also used two adapted items of the Perceived Inequality in Childhood Scale (Wickham et al., 2014), a validated measure of deprivation relative to childhood peers and the wider society, adapting the questions to the present tense: 1- "In comparison to *others in your school and neighborhood*, as a whole, do you feel that your family is well below average, below average, average, above, or well above average in wealth?;" and 2- "In comparison to *other families in the country*, as a whole, do you feel that your family is "well below average, below average, average, above, or well above average in wealth?" Based on the distribution, we present the responses in 3 categories (below, average, or above average wealth). Additionally, the parent or guardian reported their annual household income (Table 2).

Table 2: Count of Perceived Wealth compared to the community and country by age, gender, race, residency location, household income and depression.

	N	***Perceived Wealth Compared to the Community***			***Perceived Wealth Compared to the Country***		
		Below Average	***Average***	***Above Average***	***Below Average***	***Average***	***Above Average***
Total Sample	*23*	*2*	*14*	*7*	*6*	*12*	*5*
Gender							
Male	*10*	*0*	*5*	*5*	*2*	*4*	*4*
Female	*13*	*2*	*9*	*2*	*4*	*8*	*1*
Race							
African-American	*15*	*2*	*10*	*3*	*6*	*7*	*2*
Caucasian	*5*	*0*	*3*	*2*	*0*	*4*	*1*
Others (Hispanic, Asian)	*3*	*0*	*1*	*2*	*0*	*1*	*2*
Residency Location							
Urban	*16*	*2*	*10*	*4*	*5*	*8*	*3*
Suburban	*7*	*0*	*4*	*3*	*1*	*4*	*2*
Household Income (Annual $)							
< 35,000	*8*	*1*	*5*	*2*	*2*	*4*	*2*
35,001-120K	*6*	*0*	*4*	*2*	*1*	*4*	*1*
120,001-160K	*3*	*0*	*1*	*2*	*0*	*2*	*1*
Depression*							
No	*12*	*0*	*8*	*4*	*1*	*7*	*4*
Yes	*10*	*2*	*6*	*2*	*5*	*5*	*0*

*$p<0.05$

This study was approved by the Institutional Review Board of the University's School of Medicine. Parents provided written consent and the adolescents provided assent.

We used ATLAS (Scientific Software Development GmbH, Berlin) to facilitate coding. Following the phenomenological method (Moustakas, 1995), *significant statements* that pertained to the lived experienced of constructing SSS were coded into *meanings* (Table 3).

Table 3: Selected examples of significant statements and their related formulated meanings.

Significant statement	*Formulated meanings*	Themes
We really need work done on the houses around in the area in general. This is where i can go into what we need. We need the streets paved, we need curfews, we need the blinkers on the stop lights. We need the houses to be done, because those are houses that people can live in and stop being on the streets that i see. We need clean-up crews to pick up the trash every so often, because there is a lot of trash. I mean, if we do that, then my neighborhood would really be pretty. [17, black, female]	*Physical environment*	*Contributions of environmental inputs to adolescent's appraisal of their own sense of social status*
In school, it's more like, you are there to learn, but …you are still [like] focusing on what you look like, and your appearance, and your grades, and comparing yourself to everybody else. Your clothes…your environment, like where you grew and stuff. And then outside of school, you are just like, there is a whole range of people. You don't really think about it. [13, white, female]	*Comparisons with school peers*	*Variations in the frequency and processes of making social comparisons*
"My mom's side of the family, one of my cousins tried to go to college but she couldn't get enough money and i felt really bad like i wanted to do something but i don't have the money to do that."[15, white, girl]	*Awareness of inequalitiy*	*Feelings and thoughts involved when assessing one's social status*
"I first start i wish i had or my family more money, wish we could go out more, wish we had these nice cars. I wish had buildings named after ourselves. I wish we could do all the things that they [celebrities] do. But then i also look at the positives, they are not really a tight knit family as we are. We all know each other, we are always around each other. Even we don't have our own tv show, we deserved one because it would make a funny story, because we fuss and fight and when we fuss and fight its funny [17, black, female]	*Focusing on the positives*	*Coping strategies and societal opportunities for intervention*

Those meanings were then clustered into *themes*, which represented underlying cognitions common to most of the adolescents. *Verification* to contrast the findings with external sources involved literature searches, comparison with the interviewer's field notes, and identification of negative cases (Meadows & Morse, 2005).

Lastly, the findings were validated and any new data that emerged was included in the final description. Interview transcripts were reviewed and discussed by both authors. The analysis process took place in parallel with the interviewing process.

The interviews were conducted until information saturation was reached. *Validation* involved having three undergraduate students review and compare codes of six interviews. A working version of the results was shared with adolescents in the last two interviews and their additions were included in the final description.

Findings

Participants:

The average age of the 23 participants was 15.3 years (SD=1.4). Fifteen (15) were Black, 5 were White, 2 were Hispanic and 1 was Asian. All were students in middle or high school.

Sixteen (16) adolescents lived in Baltimore City and 7 in its suburbs. Six (8) had families with an annual income below $35,000, 6 had an income between $35,001 and $120,000, and 3 had annual household incomes above $120,000. Six (6) participants' parents did not report income, and there was no significant correlation between income and perception of wealth, with some of the adolescents of lower income families viewing themselves as above average wealth compared to both their community and the country. Income was correlated with place of residence, with lower incomes associated with urban versus suburban residence ($r=0.722$; $p=0.001$).

Ten of 22 adolescents completing the PHQ-9 scored 11 or above (positive screen for major depression), and 4 scored between 9 and 10. Depressed adolescents were more likely to see themselves as below average for wealth in comparison to the rest of the country ($\chi^2 = 6.87$; $p=0.032$).

Emergent themes

Four themes emerged from the significant statements gathered from the adolescents. Examples of statements linked to the themes are presented in Table 3 and in the text with the age, ethnicity, and gender of the adolescent. The co-authors discussed the 4 emerging major themes: 1- contributions of *environmental inputs* to adolescent's perceived social status; 2- variations in the frequency and processes of making *social comparisons*; 3- thoughts and feelings involved when assessing one's social status; 4- *coping strategies* and societal opportunities for intervention.

1- Environmental inputs as contributors to adolescents' perceived social status:

When constructing their sense of social status, adolescents appraised multiple social and physical environments. They gathered information from their neighborhood's characteristics such as the presence of public transit or green spaces, the levels of violence, and trash and housing conditions to inform their social status.

> "You can tell where the inner-city Baltimore where I live is, and where south Baltimore begins, or west Baltimore where I am at. Or East and North Baltimore. You can tell where one part ends and one part begins with that section, they are that different." *[17, Black, female]*

Schools also provided opportunities for adolescents to gauge their family's relative wealth. The adolescents were able to imply economic status by their own or others students' ability to participate in activities that required a fee, or to buy clothes, lunch, and newer video games. They were also aware of their peers' different access to educational or career-related opportunities.

One of the adolescents who attended a public school in a wealthy neighborhood noted that some of her peers had opportunities to which she did not have access, such as "where someone would be able to go out and meet Senators." *[16, White, female]*.

2- Variations in the frequency and processes of making social comparisons:

Adolescents made social comparisons to assess their social status with varied frequency and intensity. Some adolescents made comparisons but did not feel those influenced their mood or thinking, while others felt that comparisons generated negative feelings like envy, or lead to conflict and thus avoided them. Some adolescents avoided making social comparisons with a potentially negative emotional impact.

> I feel as though you shouldn't compare yourself because if you compare yourself a lot you find to either make yourself feel bad or…and you act out, you act differently because of that, and you also envy the other person… *[15, Black, male]*

Adolescents who did make comparisons based them on varied personal characteristics that went beyond their financial status and material possessions (phones, clothes), and included physical appearance, involvement in activities, perceived popularity (i.e.: number of "likes" on social media sites) and ability (i.e.: academics, sports, and internet skills), and on personal values (i.e.: the imperative to be nice to others).

> It doesn't always have to be grade-wise. Because there are some people who have way lower grades than me, but I respect them, almost as much as other people respect me as a person…because I feel like they are more socially well off. *[13, White, male]*

Despite this, relative economic status was a frequently cited marker of social status. However, it was less frequently mentioned as an issue in and of itself (that those with less money were inferior in social status) than the concern that lower income limited one's social possibilities by impeding acquisition of items that signified membership in the reference group (school supplies or clothes that their peers would admire) or participation in certain group activities (field trips).

> "I wish, you know, we had the money for it, so I could go on the field trip, 'cause I know it's probably gonna be fun, or like when people would talk about the field trip I would just like get upset because I'm just like 'my mom can't afford it and I wish I had somebody that could at least help her to pay for the trip." *[14, Black, female]*

3- Thoughts and feelings involved when assessing one's social status:

Adolescents experienced positive and negative thoughts and feelings when assessing their social status. Positive thoughts and feelings included feeling thankful for having a relatively higher perceived social status, and feeling 'special.' Negative thoughts and feelings included anger, jealousy, shame, anxiety about the future, discouragement, guilt over having more than others, and sense of unfairness. These thoughts and feelings were most frequently generated by a sense of having low social status coupled with a lack of perceived control over one's situation. For example, one of the adolescents said, "no matter how hard I work, there are certain things that aren't going to happen and I can't just work really hard and a lot of it's luck and you know…*who* you know." *[16, White, female]*. These negative thoughts and feelings also could occur when the adolescents were surrounded by peers who they believed were of lower social status:

> There are those…you know…better, more popular, better looking kids that you, like at my school, they are richer and they have a lot more stuff…and then there're the less fortunate kids, who like, I feel really bad [for]. *[13, White, female]*

Some adolescents from financially deprived backgrounds often expressed a sense of urgency to earn money and experienced school as an obstacle to their short-term goal of improving their family's current social status. Some families explicitly asked adolescents to provide financial support but other times adolescents simply sensed the need to make monetary contributions and this affected their sense of worth "because I am not able to do what I have to do to provide. So it makes me feel weak...and I feel like people will look down on me and stuff." *[15, Black, female]*

4- Coping strategies and societal opportunities for intervention:

During the interviews, some adolescents' affect improved when they reflected on the systemic reasons that caused their families to be financially deprived or when they could see solutions to their situation. Other adolescents found it helpful to openly discuss social comparisons and SSS.

> It makes me feel pretty good because then I am just like ok, it's not either our faults, it's just probably because you know, we probably missed a pay day or something, or you know, work was just not going right, so it's just like we can work towards fixing it. *[14, AA, girl]*

Additionally, the adolescents identified several coping strategies they used to manage the feelings resulting from the assessment of their social status. Denial and avoidance were frequently used strategies. Some adolescents discussed specifically avoiding relationships where social comparisons might be too intense, competitive, or judgmental.

> My school is like girl majority…so they are very judgmental. And girls like drama and stuff so I try like to keep my distance, so I try not to do too much 'cause that'll cause judging and judging will cause drama and drama cause fighting and of course that causes a lot more. *[15, Black, female]*

When adolescents felt unable to make changes that they felt could change or lessen the impact of their perceived low status, they used emotion-based coping strategies such as focusing on the positives.

> Moneywise, we are of average wealth, but when it comes to love, we have an abundance. … I know friends with a lot of money, wealthy and everything, but they don't have the love wealth that we have as a family. *[17, Black, female]*

Other strategies such as numbing, rationalizing, or blaming others could be more socially isolating. One of the adolescents blamed her mother for her financial status "because…she is the parent" and "she needs to find the way" *[17, Black, female]*. Finding shortcomings in others was also a way to buffer negative feelings:

> Sometimes I'm really critical and I'm like "why do they spend so much, even if you have the money to spend so much money on like a hat, why would you?!" But then of course there is always a pain of jealousy where is like 'oh I wish I could have that much that I can just blow on random things…Some of it is me trying to rationalize like it doesn't matter but then it does. *[16, White, female]*

Yet, adolescents also described problem-focused strategies such as working to change their relative position. One of the adolescents associated past low mood and anxiety with her family's financial circumstances, but these symptoms improved once she was allowed to have a job, giving her a sense of agency.

> Now I know that I can help her [my mother] because, well, she finally let us get jobs and my brother has his job, and I am going to be starting a job soon. *[14, Black, female]*

In addition to the above-mentioned individual cognitive differences among adolescents, some adolescents suggested ways in which their school environment could minimize social differences. Some suggestions included requiring school uniforms, and integrating students from different academic levels, races and socio-economic status in the same classroom.

> I really honestly prefer the uniform so you don't really worry about keeping up with today's trend. You know, worry about what people are saying about you, because everybody is wearing the same thing. *[17, Black, female]*

Discussion

The purpose of this study was to explore the processes, responses and coping strategies adolescents use when assessing their social status. We found that adolescents assess environmental inputs to construct their social status while also make social comparisons that vary in frequency and intensity.

Consistent with Festinger's (1954) social comparison process theory, which proposes that humans constantly self-evaluate by comparing themselves to others, and in line with previous research (Sánchez et al., 2011), adolescents used these social comparisons to gauge their social identity and status. The dimensions in which adolescents compared themselves to others varied by individual and by social context, though school was the context that emerged as the most salient among the participants in this study. This appraisal of the environmental and other individuals generated thoughts and feelings that, when negative, led to the use of coping strategies.

Consistent with previous research on both downward and upward comparisons (Wills, 1981), social comparisons in our sample triggered positive and negative feelings, but negative feelings were generally associated to perceiving oneself to be relatively low in status (Adler & Stewart, 2010). Previous evidence has shown a link between social comparisons, negative affect (Lyubomirsky & Ross, 1997), and destructive emotions and behaviors, especially when comparisons are frequent (White et al., 2006).

However, some of the adolescents in our sample expressed positive thoughts and feelings regardless of whether they assessed themselves to be of higher or lower social status, describing a motivation to improve their social situation when comparing themselves to their peers.

In line with the transactional stress model (Lazarus & Folkman, 1987), adolescents mentioned strategies that included emotion-focused coping (avoidance, denial, emphasizing the positive) and to a lesser degree, problem-solving coping (e.g.: making a plan of action). Adolescents also used cognitive restructuring strategies, such as focusing on aspects they could control. However, many adolescents used coping mechanisms that could lead to negative outcomes and social isolation, such as rationalization, criticism, and numbing.

Unlike adults, adolescents' ability to change their environment is limited as they were generally unable to work, and/or change schools or neighborhoods. Learned coping strategies during adolescence can have health implications in an individual's life and condition future behaviors. For example, those adolescents experiencing more stress may become less cognitively flexible, using coping behaviors that may have worked in the past for every situation that arises in the future, which can be more harmful than beneficial (Bonanno & Burton, 2013). Prior research has shown that individuals with depression tend to be less flexible in their choice of coping strategies (Caldwell et al., 2013) than those individuals less likely to be depressed. Research is needed to better understand how one's ability to learn and adopt coping strategies contributes to greater resilience in the face of chronic stressors, such as economic deprivation or income inequality.

While nearly half of our sample consisted of clinically depressed adolescents and those who screened positive on the PHQ-9 were more likely to consider themselves as less wealthy than their peers, similar themes related to social status were found among participants regardless of their level of depression, supporting the notion that social rank assessments are universal. Yet, our study was small and future quantitative studies will be needed to elucidate if there are differences in themes of comparison in adolescents who are depressed.

Our findings point to the need to bring issues of social status to the forefront in therapy. Existing therapies such as Cognitive Behavioral Therapy (i.e.: selective abstraction or mental filter) (Beck, 2011); Interpersonal Therapy for Adolescents (i.e.: social problem-solving skills) (Mufson et al., 2004) and Dialectical Behavioral Therapy (i.e.: emotional regulation skills) (Miller et al., 2007) already include interventions that reinforce the coping skills described by our participants. Adolescents who are more successful in navigating differences in social status may already be implementing these strategies for emotional regulation. These strategies can continue to be taught in therapeutic or school settings to help navigate new and more complex social contexts such as increasing income inequality (Phillips, 2002) and social media use (Steers et al., 2014; Twenge et al., 2018). In addition to facilitating positive coping mechanisms at the individual level, interventions to reduce inequality through national and community level through policy and community interventions (e.g.: health care coverage and education access, building social networks and reducing social isolation) could help ease the stress of inequality in adolescents (Patel et al., 2018).

Furthermore, it is important to prioritize the integration of adolescents of different skills and attributes in the school community as well as include social media literacy as part of the school curriculum to buffer the effects of social inequities observed by adolescents in their in-person and virtual interactions.

Finally, prior research has found an association between depression and social comparisons that adolescents make through social media (Nesi & Prinstein's, 2015). Specifically, negative social comparisons mediate the association between social media use and depression (Niu et al., 2018). Because of the explosion of social media and internet communication, understanding processes of social comparison, social status and coping with inequalities have become relevant in the prevention of depressive symptoms.

This study had several limitations. Adolescents in this study were prompted with questions related to perceived deprivation, which has a narrower focus on wealth. Yet, their responses in the initial interviews were observed to be broader in the sense that they communicated a concern with global social status that went beyond wealth and poverty and included aspects like popularity and peer acceptance, consistent with the different ways adolescents and adults perceive social status. Our study did not address other influences on mood or social comparisons such as biological predisposition, trauma exposure, or perceived discrimination. A larger study using standardized tools could help understand the characteristics of the individuals associated with types, intensity and group of reference of the social comparisons adolescents make.

In conclusion, adolescents vary in the frequency and types of social comparisons they make to assess their social status and use coping strategies to change negative feelings associated with the assessment of their social status after making social comparisons; some of these strategies are adaptive but some lead to negative cognitions and behaviors. While some therapies for adolescent mood problems implicitly include attention to social comparisons and their consequences, real increases in disparities and increases in opportunities to make comparisons on social media suggest that interventions should be adapted more formally to consider perceived social status in assessments and treatment. Research is also needed to understand how families, schools, and communities can buffer social status differences that may affect education, depression and violence.

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Appendix II: Study 3. *"Perceived sense of control and aggression in a sample of American adolescents: the role of school and neighborhood contextual factors"*

Title:

Perceived sense of control and aggression in a sample of American adolescents: the role of school and neighborhood contextual factors.

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Abstract:

Aggression is common among adolescents and the result of genetic, psychological and environmental influences. This study examined the role of perceived sense of control on aggression in adolescents, considering socio-demographic, psychopathological, and neighborhood and school environmental factors. A cross-sectional survey was administered to a clinical sample of 197 adolescent patients ages 12 to 18 and their parents. A series of models were tested with logistic regression analyses. Perceived sense of control was associated with reactive aggression when controlling for socio-demographics, but not when controlling for psychopathological and contextual factors, while this association remained significant with proactive aggression when controlling for all variables. Interventions to decrease aggression in adolescents may be most beneficial when targeting both individual and environmental factors.

Keywords:

Adolescent

Aggression

Sense of control

School environment

Neighborhood environment

Introduction:

Aggressive behaviors are common in youth. According to the Youth Risk Behavior Surveillance national survey, close to one in four adolescents in grades 9th through 12th has been in one or more fights in the last 12 months (Centers for Disease Control and Prevention, 2017).

Aggression has a role in survival, sexual selection, and group cohesion (Georgiev et al, 2013). In children and adolescents, aggression can have immediate positive effects, such as feeling in control and defending oneself or others, but it can also have negative effects on social relationships (Waltes, Chiocchetti and Freitag, 2016; Reef et al, 2011). Aggression tends to peak at age 3 and decrease as emotional and behavioral self-regulation improve (Tremblay, 2010). However, in some children, aggressive behaviors persist and can lead to negative outcomes in adulthood. These negative outcomes range from low socio-economic status (SES) and unemployment to criminal behavior and social isolation (Buchmann et al, 2014).

Adolescent aggression is a heterogeneous construct (Raine et al, 2006). Previous research has found differences between reactive and proactive aggression. *Reactive aggression* is fear-induced, charged with irritable and hostile affect, and thought to be linked to information-processing and executive function deficits (Crick and Dodge, 1996). Individuals with reactive aggression are hypervigilant to threatening stimuli and tend to respond to frustrating situations or provocations

(Crick and Dodge, 1996). Reactive aggression also tends to be associated with depression and anxiety.

On the other hand, *proactive aggression* is deliberate and organized (Crick and Dodge, 1996) and driven by the anticipation of reward (Stadler et al, 2010). It is associated with conduct and antisocial personality disorders (Tuvblad et al, 2009). Individuals with proactive aggression tend to have lower peer status ratings (Brown et al, 1996) and experience more social adversity (Ishikawa et al, 2001).

Aggressive behaviors manifest as a combination of predisposing individual factors related to social cognition (such as the individual's schemas about the word and social behavior scripts) and precipitating situations. Social cognitions are primarily acquired through observation. Because of this, those individuals exposed to repeated interpersonal violence may acquire social cognitions that promote aggression into adulthood.

Additionally, situations that are perceived as hostile can prime aggressive scripts (Dodge et al, 2015). Neighborhood and school problems can influence the child's experience of threatening and dangerous conditions, affecting their emotions and behaviors (Wandersman and Nation, 1998). In environments in which aggression is endemic, youth will experience less negative emotions when thinking about violent scripts (Johnson et al, 2015). Neighborhood disadvantage also plays a significant role in the development of aggressive behavior (Karriker-Jaffeet al, 2013).

Prior evidence from twin and adoptions studies shows an equal contribution of genetic factors and the environment on aggression, with a variance explained by 50% of environmental and 50% of genetic factors (Tuvlad and Baker, 2011).

Well-known risk factors for aggression include individual factors such as the presence of Attention Deficit Hyperactivity Disorder (ADHD) symptoms (King and Waschbusch, 2010), deficits of executive functioning (Lynam and Henry, 2001), and depression (Wolff and Ollendick, 2006). Other risk factors include perinatal influences coupled with an adverse family environment (Raine, 2002) and psychosocial adversity such as poverty and family mental illness (Pitzer et al, 2010). More subtle psychological factors like a low perceived sense of control have also been associated with aggression (Guo, Egan and Zhang, 2016). The mechanisms by which low perceived sense of control increases aggression may involve the generation of an aggressive defensive reaction to the perception of threat even with neutral facial expressions (Hall, 2006) or an increase in the perception of hazards in a person's life (Sullivan, Landau and Rothschild, 2010).

In this study, we explored the role of overall sense of control on aggression in adolescents, taking into consideration individual bio-psychological factors and contextual factors such as school and neighborhood environment. We hypothesize that those adolescents with a low overall sense of control will have higher levels of aggression with different effects in reactive and proactive aggression. We expect individual factors related to impulsivity (i.e., ADHD diagnosis), and environmental factors such as a negative school and/or neighborhood environment to be associated with increased aggression.

Methods:

Procedure:

Participants were adolescents recruited in outpatient primary care and mental health outpatient centers. Medical staff asked participants if they were willing to participate in the study and referred those interested to the research team for study information and consent. Those participants who consented to participate were administered a survey by the team. A review of charts was conducted simultaneously to complement information related to diagnoses of the participants. The study was approved by the University's IRB.

Participants:

Inclusion criteria were: 1) age 12 through 18 years of age, 2) able to speak and read English and/or Spanish, and 3) being accompanied by a parent or guardian who could provide consent.

Measures:

Outcome variables:

Proactive and Reactive Aggression were the outcome variables in this study, measured with the Reactive-Proactive Aggression Questionnaire (RPQ) (Raine et al, 2006). The RPQ consists of 23 questions related to aggression (12 items for proactive aggression and 11 items for reactive aggression).

The questions reflected physical (i.e., Had fights with others to show who was on top) or verbal (i.e., yelled at others when they have annoyed you) aggression, and included the motivation and situational context for the aggressive behavior (i.e., become angry or mad when you don't get your way). Participants were asked to rate each question by frequency of the behavior (0= never, 1=sometimes, 2=often). An average and median of the total number of responses for proactive and for reactive aggression were calculated. Those above the median were classified as having "high" proactive or reactive aggression, and those at or below the median were classified as having "low" proactive or reactive aggression.

Independent variables:

Socio-demographic measures included age upon interview, sex at birth (0= male; 1= female), and self-identified race (0=white, 1= black, 2= other races or mixed race). These variables were abstracted from the medical record.

Socio-Economic Status (SES) was calculated using standardized z-scores of parental employment, education, and household income. Higher scores reflected higher family SES (Bradley and Corwyn, 2002). Parental education and employment and household income were self-report measures and were asked to the consenting adult who accompanied the adolescent. Parental employment was gathered by asking whether the father and mother were employed. Parental education was determined by asking for the highest level of education that the mother and the father had completed. The response options were: 8^{th} grade or less, high school or GED, some college, college graduate, and graduate studies.

For household income, the consenting guardian was asked: "What is your annual household income (in dollars per year)?" The response options were: Less than $14,000, between $14,001 and $34,000, between $34,001 and $70,000, between $70,001 and $120,000, between $120,001 and $160,000, and more than $160,000.

Overall Sense of Control (OSOC) (Jose and Weir, 2013): OSOC measured perceived sense of control with a 17-item questionnaire consisting of statements related to having control over one's own life (i.e.: "I am in control of my life" or "I make enough effort to reach my goals") or lacking control over own's life (i.e.: "I lose control over myself" or "I am unable to make changes to get control over my life"). An average of the items for positive overall sense of control and the negative items for lack of control was calculated, where higher scores represented a higher overall sense of control.

Negative Neighborhood Scale (Hadley-Ives et al, 2000): This scale asked participants, "In the past 6 months, how much of the following has occurred in your neighborhood (none=0, some=1, a lot=2)? A list of adverse events, including drug dealing, shooting, murders, abandoned buildings, homeless people in street, prostitution, business closing, bad schools, and graffiti and/or vandalism. Responses were added, and a total number was calculated, with higher numbers corresponding to a more negative neighborhood environment.

Negative School Scale (Hadley-Ives et al, 2000): This scale asked participants, "In the past 6 months, how much of the following has occurred in your school (none=0, some=1, a lot=2)? A list of adverse events, including drug dealing, shooting or knifings, teachers inured by students, school

equipment damaged, and anger/stressed. Responses were added, and a total number was calculated, with higher numbers corresponding to a more negative school environment.

Number of traumas: We used 14 questions using language based on part 1 of the UCLA Reaction Index Scale (Steinberg et al, 2004) to assess prior exposure to traumatic events. The questions included traumatic events related to environmental disasters, accidents, domestic and community violence, physical and sexual abuse, and death of a loved one. Participants were asked to respond "yes" if they had ever experienced the listed traumatic event, and "no" if they had not experienced it. The positive answers were tallied for a total number of traumatic events experienced by the participant at the time of the survey.

Depression: We measured depression using the Patient Health Questionnaire (PHQ-9) Adolescent Version (Johnson et al, 2002). The PHQ-9-A assesses depressive symptoms based DSM-IV diagnostic criteria: low mood, anhedonia, trouble with sleep and appetite, lack of energy, trouble concentrating, psychomotor retardation, and suicidal ideation. The responses are on a 4-point scale ranging from 0 ("not at all") to 3 ("nearly every day"). Scores were computed as a sum of the 9 items with an overall score that can range from 0-27. We used the total score in the total PHQ-9 score as an independent variable.

Attention Deficit Hyperactivity Disorder (ADHD) and *Oppositional Defiant Disorder (ODD)*: Presence (1) or absence (0) of ADHD and/or ODD was collected from the chart review. The diagnoses were made by two physicians, with at least one board certified child and adolescent psychiatrist and/or pediatrics.

Statistical Analyses:

Descriptive analyses looking at frequencies and means were conducted to observe all independent and dependent variables. Chi-Squares were calculated for categorical variables and t-tests for continuous variables to examine the differences between groups based on age and sex at birth. Pearson parametric tests were used to assess correlations among all variables. Logistic regression analyses were used to assess the outcome variable, low or high levels of aggression. Missing values were calculated with linear interpolation.

Results:

Sample Characteristics:

The sample included 197 participants ages 12-18 (M= 14.58; SD= 1.54). The majority of our participants were females (n=124, 62.9%) versus males (n=73, 37.1%). The majority of participants were of black race (n=124, 62.9%), 47 (23.9%) were white, and the rest (n=26, 13.2%) were of other races or mixed race (Hispanic, Asian). Fathers (168, 85.3%) and mothers (150, 76.1%) were primarily employed and had at least a high school level of education (78, 39.6% of fathers), (n=46, 23.4% of mothers). With the rest having a higher than high school level of education. Most participants belonged to families with household incomes between $14,001 and $120,000 (n=139, 70.7%), followed by 32 (16%) with a household income over $120,000 and only 26 (13.2%) with a household income of less than $14,000. About one third (n=57, 28.9%) had been diagnosed with ADHD, and 14 (7.1%) had been diagnosed with ODD.

The majority of the participants (n= 101, 51.3%) presented low levels of reactive aggression, with the rest (n=96, 48.7%) presenting high levels. About the same number of participants presented low (n=107, 54.3%) versus high levels (n=90, 45.7%) of proactive aggression (see table 1 & 2 for details).

Table 1: Descriptive and Univariate analyses: Sex, Race, ADHD, and ODD diagnoses in the total sample and by reactive and proactive aggression (low and high).

	Total Sample	Reactive Aggression			Proactive Aggression		
	N (%)	Low N (%)	High N (%)	χ^2 (p)	Low N (%)	High N (%)	χ^2 (p)
Sex at Birth							
Male	73 (37.1)	36 (49.3)	37 (50.7)	0.177 (0.674)	32 (43.8)	41 (56.2)	5.132 (0.023)
Female	124 (62.9)	65 (52.4)	59 (47.6)		75 (60.5)	49 (39.5)	
Race							
White	47 (23.9)	31 (66.0)	16 (34.0)	6.861 (0.032)	34 (72.3)	13 (27.7)	8.423 (0.015)
Black	124 (62.9)	55 (44.4)	69 (55.6)		59 (47.6)	65 (52.4)	
Others	26 (13.2)	15 (57.7)	11 (42.3)		14 (53.8)	12 (46.2)	
ADHD							
No	140 (71.1)	81 (57.9)	59 (42.1)	8.406 (0.004)	83 (59.3)	57 (40.7)	4.819 (0.028)
Yes	57 (28.9)	20 (35.1)	37 (64.9)		24 (42.1)	33 (57.9)	
ODD							
No	183 (92.9)	97 (53.0)	86 (47.0)	3.108 (0.078)	100 (54.6)	83 (45.4)	0.113 (0.737)
Yes	14 (7.1)	4 (28.6)	10 (71.4)		7 (50.0)	7 (50.0)	

*p≤0.05; **p≤0.01; ***p≤0.001

Table 2: Mean comparisons by average sense of control, age, depression, school environment and neighborhood environment, SES, and number of traumas.

	Reactive Aggression				Proactive Aggression			
		Mean (SD)	t-test	p		Mean (SD)	t-test	p
Average sense of control	Low	3.9016 (0.70608)	2.129	0.035	Low	3.9197 (0.70437)	2.679	0.008
	High	3.6896 (0.69010)			High	3.6539 (0.68090)		
Age	Low	14.58 (1.551)	0.004	0.997	Low	14.65 (1.573)	0.700	0.485
	High	14.58 (1.533)			High	14.50 (1.501)		
Depression	Low	7.62 (6.832)	-2.004	0.046	Low	7.86 (6.786)	-1.618	0.107
	High	9.62 (7.148)			High	9.48 (7.272)		
School Environment	Low	2.35 (1.746)	-3.681	0.000	Low	2.36 (1.677)	-3.867	0.000
	High	3.36 (2.099)			High	3.42 (2.172)		
Neighborhood Environment	Low	3.73 (4.107)	-2.954	0.004	Low	3.83 (4.059)	-2.822	0.005
	High	5.77 (5.507)			High	5.79 (5.647)		
SES	Low	0.65 (2.912)	3.172	0.002	Low	0.12 (3.070)	0.627	0.531
	High	-0.68 (2.988)			High	-0.15 (2.962)		
Number of traumas	Low	1.45 (1.653)	-2.597	0.010	Low	1.44 (1.507)	-2.868	0.005
	High	2.10 (1.878)			High	2.16 (2.019)		

Correlations:

A significantly negative correlation was found between reactive aggression and perceived sense of control (r= -0.168) and SES (r= -0.198). Significant positive correlations were found between reactive aggression and number of traumas (r= 0.198), school (r=0.256) and neighborhood (r=0.186) negative environments, depression (r=0.143) and ADHD (r=0.207). A significant negative correlation was found between proactive aggression and perceived sense of control (r= -0.204), sex (r= -0.161), and race (r= -0.153). Significant positive correlations were found between proactive aggression and the number of traumas (r= 0.175), and school (r=0.261) negative

environment. Proactive aggression was also significantly and positively associated with ADHD (r=0.156) (see table 3).

Table 3: Spearman Correlation Matrix including Proactive and Reactive Aggression, Average Sense of Control, Age, sex, Race, SES, Number of Traumas, School and Neighborhood Environment, Depression and ADHD.

	1	2	3	4	5	6	7	8	9	10	11	12	13
Aggression Reactive	1												
Aggression Proactive	0.472***	1											
Sense of Control	-0.168*	-0.204**	1										
Age	0.005	-0.057	-0.026	1									
Sex	-0.030	-0.161*	-0.085	0.125	1								
Race	0.097	-0.153*	0.113	0	0.016	1							
SES	-0.198**	-0.072	-0.072	-0.052	-0.066	-0.132	1						
Number of Traumas	0.198**	0.175*	-0.134	-0.080	-0.051	0.044	-0.107	1					
School Environ	0.256***	0.261***	-0.157*	-0.008	0.010	0.045	-0.075	0.288***	1				
Neigh Environ	0.186**	0.139	-0.017	0.039	-0.035	0.024	0.303***	0.318***	0.380***	1			
Depression	0.143*	0.116	-0.521***	0.137	0.174*	-0.054	0.042	0.174*	0.072	0.009	1		
ADHD	0.207**	0.156*	-0.224**	-0.159*	-0.09	-0.054	-0.120	0.028	0.048	0.042	0.101	1	
ODD	0.126	0.024	-0.075	-0.012	-0.156*	-0.044	-0.049	0.158*	0.030	0.066	0.086	0.036***	1

*p≤0.05; **p≤0.01; ***p≤0.001

Univariate Analyses:

Significant differences were found in reactive aggression with a larger percentage of black adolescents in the high level of reactive aggression group when compared to the other racial groups (white or "other" or mixed) [χ^2 =6.861 (p=0.032)]. The same statistically significant differences were found in proactive aggression by race, with a larger percentage of black adolescents [χ^2 =8.423 (p= 0.015)] presenting high levels of proactive aggression compared to the other groups (white and "other" and mixed races).

There were statistically significant differences in sex at birth in the group of proactive aggression, with a higher percentage of males than females in the group with high levels of proactive aggression [χ^2 = 5.132 (p=0.023)]. Carrying a diagnosis of ADHD was also a predictor of higher levels of reactive [χ2= 8.406 (p=0.004)] and proactive [χ^2 =4.819 (0.028)] aggression (see Table 1).

Higher levels of reactive aggression were associated with a lower mean perceived sense of control (t= 2.129; p=0.035). Higher levels of reactive aggression were also associated with a higher mean depression score (-2.004; p=0.046), negative school environment (t= -3.681; p=0.000) and negative neighborhood environment (-2.954; p=0.004). Low reactive aggression was associated with a higher mean SES (t= 3.172; p=0.002). Higher reactive aggression was also associated with a higher mean average number of traumas (t=-2.597; p=0.010).

Higher levels of proactive aggression were significantly associated with a lower mean average perceived of sense of control (t= 2.679, p=0.008). Higher proactive aggression was significantly associated with a more negative school environment (t= -3.968; p= 0.000), a more negative neighborhood environment (t= -2.822; p= 0.005), and a higher number of traumas (t= -2.868; p=0.005) (see Table 2).

Multivariate analyses:

Only those variables who showed significant associations with aggression in the univariate analysis were included in the multivariate analyses. Therefore, ODD was not included in the multivariate analyses. Additionally, those variables that presented a high correlation with co-variates were not included to avoid multicollinearity. Number of traumas was highly correlated to school and neighborhood environment, and SES was highly correlated with neighborhood environment. In order to explore the effects of environment, we chose to remove the number of traumas and SES variables.

Logistic regression showed a significant association between perceived sense of control and reactive aggression [OR =0.557 (CI= 0.362-0.859)], controlling for age, sex at birth, race, and SES (model 1; table 4). The association was no longer significant after controlling for Depression, ADHD, and school or/and neighborhood environment (models 2, 3, and 4; table 4). Only race, ADHD, and school and neighborhood environment remained significantly associated with reactive aggression when controlling for all the variables mentioned above.

Table 4: Logistic Regression Analysis with proactive and reactive aggression (outcome variables) and independent variables of perceived sense of control, age, gender, race, Depression, ADHD, and School and Neighborhood Environment.

Reactive Aggression				
	Model 1	Model 2	Model 3	Model 4
Overall Sense of Control	0.557 (0.362-0.859)**	0.804 (0.479-1.350)	0.710 (0.428-1.176)	0.781 (0.463-1.318)
Age	0.992 (0.821-1.200)	1.019 (0.831-1.250)	0.990 (0.808-1.213)	1.004 (0.816-1.234)
Gender *(ref= male)*	0.863 (0.468-1.589)	0.849 (0.444-1.622)	0.901 (0.473-1.714)	0.871 (0.454-1.672)
Race *(ref=white)*				
Black	2.956 (1.420-6.155)*	3.050 (1.410-6.598)**	2.840 (1.322-6.103)**	2.917 (1.340-6.354)**
Others	1.582 (0.576-4.350)	1.490 (0.506-4.386)	1.633 (0.572-4.664)	1.529 (0.519-4.500)
Depression		1.036 (0.984-1.091)	1.036 (0.985-1.090)	1.037 (0.985-1.092)
ADHD *(ref= no)*		2.376 (1.170-4.827)*	2.207 (1.094-4.451)*	2.287 (1.119-4.675)*
School Environment		1.307 (1.106-1.545)**		1.250 (1.046-1.495)*
Neighborhood Environment			1.083 (1.015-1.155)*	1.049 (0.977-1.126)
-2 Log	258.590	239.705	244.287	237.957
Cox & Snell R Square	0.070	0.155	0.136	0.163
Nagelkerke R Square	0.094	0.207	0.181	0.217
Chi-Square (Sig)	9.449 (p=0.306)	9.259 (p=0.321)	4.058 (p=0.852)	4.370 (p=0.822)
Proactive Aggression				
	Model 1	Model 2	Model 3	Model 4
Perceived Sense of Control	0.448 (0.283-0.709)**	0.568 (0.332-0.972)*	0.511 (0.302—0.865)*	0.552 (0.321-0.948)*
Age	0.939 (0.772-1.143)	0.943 (0.763-1.165)	0.921 (0.748-1.134)	0.929 (0.751-1.150)
Gender *(ref= male)*	0.452 (0.239-0.853)*	0.417 (0.213-0.816)*	0.449 (0.232-0.871)*	0.423 (0.216-0.831)*
Race *(ref=white)*				
Black	3.848 (1.750-8.459)**	4.015 (1.764-9.139)**	3.695 (1.638-8.337)**	3.880 (1.693-8.895)**
Others	2.895 (1.002-8.366)*	2.837 (0.928-8.672)	3.053 (1.027-9.077)*	2.938 (0.960-8.986)
Depression		1.025 (0.973-1.080)	1.026 (0.974-1.080)	1.026 (0.973-1.081)

ADHD *(ref= no)*		1.583 (0.774-3.239)	1.460 (0.718-2.968)	1.514 (0.734-3.123)
School Environment		1.330 (1.124-1.574)**		1.273 (1.062-1.525) **
Neighborhood Environment			1.085 (1.017-1.157)*	1.046 (0.973-1.123)
-2 Log	221.020	230.503	236.225	229.004
Cox & Snell R Square	0.116	0.188	0.165	0.195
Nagelkerke R Square	0.163	0.252	0.220	0.260
Chi-Square (Sig)	11.612 (p=0.169)	10.476 (p=233)	8.249 (p=0.410)	13.700 (p=0.090)

*p≤0.05; **p≤0.01; ***p≤0.001; [a] Unweighted counts; [b] Weighted percentages

There was a significant association between perceived sense of control and proactive aggression [OR= 0.483 (CI=0.302-0.774)], controlling for age, sex at birth, race, and SES (model 1; table 4). The association remained significant after controlling for school and neighborhood environment, Depression, and ADHD (models 2, 3, and 4). Sex at birth [OR=0.423 (CI=0.216-0.831), Black Race [OR=3.880 (CI=1.693-8.895) and school environment [OR= 1.273 (CI=1.062-1.525)] remained significantly associated with proactive aggression when controlling for all other co-variates.

Discussion

This study showed commonalities and differences in the risk factors associated with reactive and proactive aggression in a sample of adolescents, supporting the well-known heterogeneity of aggressive behaviors.

We found an association between perceived sense of control, race, ADHD, trauma history, and school and neighborhood negative environments with both reactive and proactive aggression. However, Depression and SES were only associated with reactive aggression and not with proactive aggression in this sample. Likewise, sex at birth was associated with proactive aggression but not with reactive aggression.

The results of this study are consistent with previous findings showing associations between low perceived sense of control and aggressive behaviors in adolescents (Guo et al, 2016). Perceived sense of control has also been linked to social inequalities (Wilkinson and Pickett, 2009) and health outcomes throughout the life course (Lachman et al, 2011). Traumatic experiences were also associated with both types of aggression, consistent with research in psychiatric populations showing and association of both types of aggression with childhood trauma (Dodge et al, 1997).

The association between psychological trauma and aggressive behaviors in adolescents is thought to be unidirectional, with trauma being thought to be the cause of aggression (Thompson and Farrell, 2019) as opposed to this being a reciprocal relationship. A possible mechanism linking trauma and aggression has been hypothesized to be the anger related to rejection (Mozley, Modrowski and Kerig, 2018). The alteration of arousal processes during trauma can also affect the ability to develop essential information processes needed to have a sense of control. This process restricts the child's ability to develop the cognitive schema needed to deal with interpersonal interactions in adaptive ways, which can lead to aggression (Burgess et al, 1991). Another mechanism inducing aggression is thought to be the misperception of aggressive cues. A previous

experiment examining perceived sense of control and aggressive versus neutral cues found that a lower sense of control lead to an increase in adolescents' aggression while a higher sense of control was protective when exposed to aggressive cues (Guo, et al, 2016).

ADHD was found to be more strongly associated with reactive aggression, remaining associated when controlling for all other variables in the model. This finding is consistent with previous research that shows that reactive aggression is more associated with ADHD than proactive aggression (Dodge et al, 1997). Recent evidence shows a gene-environment interaction involving the serotonin transporter promoter gene (5HTTLPR) and childhood adversity on ADHD and violent behavior (Retz and Rösler, 2009). Those with more impulsive aggression have lower serotoninergic activity, as measured by the levels of serotonin metabolites in the cerebrospinal fluid, than those with non-impulsive aggression (Linnoila et al, 1983).

Additionally, differences in sex at birth, with male sex having higher associations with proactive aggression, point to the well-known differing presentations of distress between males and females. Physical aggression and other externalizing behaviors tend to be lower in girls and women with ADHD, while rates of depression and anxiety may be higher (Rucklidge, 2010).

Finally, we examined the effects of the social environment beyond the family, looking at school and neighborhood environments. We found associations of a negative school environment with aggression. The effects of a negative school environment on aggression and reduced feelings of safety are well known (Goldweber, Waasdorp and Bradshaw, 2013; Espelage, Polanin and Low,

2014). Yet, neighborhood problems were associated with adolescent-reported reactive and proactive aggression. This finding is in contrast with previous research linking neighborhood problems with proactive aggressive behaviors only (Fite et al, 2016).

The association between neighborhood problems and aggression is consistent with the social learning theory (Bandura, 1973) that posits that high problem neighborhoods provide a model for the use of aggressive behavior to achieve one's goals and may contribute to the development of proactive aggression (Card and Little, 2007). Neighborhood crime has been associated with levels of aggression at the individual level due to failed mechanisms of informal social control (Sampson et al, 1997).

Furthermore, the social disorganization theory (Sampson et al, 1997) highlights the inability of a community to address its problems due to overwhelming negative structural forces and the subsequent degradation of sense of community. This theory and other theories related to neighborhood disorganization, such as collective efficacy (Jain et al, 2010) suggest that the structural characteristics of risky neighborhoods reduce the ability of residents to establish norms and values and maintain effective social control, which results in increased violence (Chang et al, 2015).

A number of studies support these theories for explaining how neighborhood-level crime affects individual behavior (Caetano, Ramisetty-Mikler and Harris, 2010; Pinchevsky and Wright, 2012; Sampson et al, 1997). Another mechanism involved is the normalization of violent behavior

(Raghavan et al, 2006). Social norms theory describes situations in which individuals perceive the attitudes and/or behaviors of the community to be different from their own causing individuals to change their behavior (Bercowitz, 2003) to approximate the misperceived norm (Prentice and Miller, 1993). Epigenetic changes are another hypothesized mechanism by which the environment (in this case, the neighborhood and school environments) affects biological mechanisms (Waltes et al, 2016).

Limitations:

This study had several limitations. The adolescents completed self-reports of aggression, which may have been influenced by social desirability bias, given that aggression can have negative connotations in society. We did not have objective measures of aggression. However, the self-report survey questions allowed us to look at motivation. This attribute is important because proactive and reactive aggression cannot always be differentiated behaviorally, but the motivation for the behavior makes it easier to distinguish them.

Additionally, we did not use objective data on community crime and only used data reported by the adolescent on school and neighborhood negative environment. Yet, these data have the advantage of recording the adolescent's experience of violence rather than what may occur in the community but that the adolescent may not have experienced or witnessed. Finally, this was a cross-sectional study and as such, causal relationships cannot be drawn between the variables.

Conclusions:

This study showed that low perceived sense of control was associated with aggression, but environmental factors such as negative neighborhood environments had stronger associations with aggression. These risk factors vary in the influence they exert on reactive and proactive aggression, reinforcing the known heterogeneity of the disorder. Interventions to decrease levels of aggression in adolescents may be most beneficial when targeting both individual and environmental factors.

The study included constructs reflecting individual predisposing factors and environmental influences in aggression, with a particular focus on perceived sense of control. Individual and family interventions focused on giving adolescents a sense of control may help reduce aggression. Violence prevention efforts should include screening for psychological trauma. Additionally, interventions that go beyond the traditional health education curriculum to modify the school environment can improve youth's health, in particular aggressive behaviors (Kellam et al, 2011). These types of potentially beneficial interventions range from creating a stronger sense of community, improving relationships between staff and students, and modifying the physical environment (Bonnell et al, 2013). Finally, therapeutic interventions focused on reframing experiences of violence in children and adolescents can potentially contribute to changing social norms and decreasing aggression. More studies testing these types of interventions are needed.

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Appendix III. Study 4. *"The Effects of Perceived Control and Status, and Neighborhood and School Environment on Adolescent Depression and Suicidal Thoughts and Behaviors: a Structural Equation Modelling Approach"*

Title:

The Effects of Perceived Control and Status, and Neighborhood and School Environment on Adolescent Depression and Suicidal Thoughts and Behaviors: a Structural Equation Modelling Approach

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ABSTRACT

Depression and suicide constitute major public health problems and their prevalence continues to increase among adolescents in the United States (U.S). Little is known about the association between factors related to social hierarchies and depression and suicide ideation in adolescents. The present study examined the relationships among family/childhood mental health, overall sense of control and subjective social status (SSS), environmental factors, and depression and suicidal thoughts in a clinical population of urban adolescents. A cross-sectional survey was administered to 197 adolescents ages 12 and 18 who were primarily Black (63%) and female (63%), recruited in outpatient clinics in the U.S. Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM) analyses were conducted. A revised two-factor CFA model (perceived control and SSS factor, and environmental factor) yielded an excellent fit. SEM showed that the perceived control and status factor was negatively associated with both depression and suicidal ideation. Among all significant path coefficients, the largest effect was found for the perceived control and SSS factor on suicidal ideation. These findings point to the importance of preventive interventions for coping with social hierarchies to prevent depression and suicide.

Keywords:

Depression, Suicide ideation, Adolescence, Sense of Control, Subjective Social Status, school and neighborhood environment, Structural Equation Modeling

1. Introduction

The United States (U.S.) has seen a surge in depression diagnoses[1] and suicidal behaviors[2] among adolescents over the past two decades. Yet, few adolescents who self-harm in the community present to medical services,[3,4] making the identification of risk factors for suicide, including depression and suicidal thoughts, key in designing interventions to prevent suicide.

The causes of the rise in depression and suicide are unclear. Extensive research supports the involvement of physical, psychological, and environmental factors such as familial and social influences both in depression[1] and suicide.[5] However, less is known about the effects of the stress caused by social hierarchies on depression and suicidal thoughts in adolescents, which matters in a growing environment of income inequality[6] and opportunities for social comparisons with the expansion of social media use.[7]

1.1. Subjective Social Status (SSS) and Overall Sense of Control and their Association with Mental Health

Perceiving oneself as of lower social status is consistently associated with a higher risk for depressive symptoms in adults, with more limited evidence of a similar association between low SSS and suicidal thoughts and behaviors.[8] In adolescents, a recent meta-analysis confirmed an association between SSS and health outcomes[9] with the strongest effect sizes found in studies with

mental health outcomes. Less research has specifically examined the relationship between SSS, and suicidal thoughts and behaviors in adolescents.[10]

Marmot (2004)[11] noted that a person's SSS and health gradient are both associated with the person's degree of autonomy or sense of control. Sense of control is a heterogeneous construct and has been conceptualized as locus of control,[12] learned helplessness ,[13] and self-efficacy[14] among others.[15] More recently, sense of control has been understood as a combination of attributional styles and self-efficacy,[16] and learned helplessness and desire for control.[17] Previous studies have also revealed an association between a low sense of control and childhood depression.[18,19] It is likely that sense of control is a combination of a personality component[20] and a more malleable component that shifts with context and age,[21] the latter being more predictive of depression.[22] This dynamic calls for a better understanding of the association between sense of control and depression and suicide at different age periods and settings.

1.2. Role of neighborhood and school environment on mental health

Research on the risk factors associated with depression has generally focused on individual-level factors, such as female gender, exposure to stressful events, child abuse, and family history.[23-26] More recently, studies have focused on neighborhood factors[27-30] and aspects of the school environment, such as safety[31,32] as potentially affecting health outcomes. In schools, students who feel safe tend to exhibit lower levels of depressive symptoms.[33] In the case of neighborhood factors, perceived (rather than actual) neighborhood characteristics are more strongly associated with mental health.[34] Signs of potential danger in the neighborhood (i.e., graffiti, drug use and drug

dealing, and violence) have been associated with mental health outcomes,[35] and this association has been maintained in longitudinal studies showing that perceptions of neighborhood disorder predict symptoms of depression at a 9-month follow up interview, even after controlling for baseline depression.[36] Lack of control has been hypothesized as an explanation for why some neighborhood factors are stressful.[37]

1.3. Combined effects of individual and environmental factors on health outcomes

Whitehead et al. (2016)[38] note three levels in which control or autonomy affects health disparities. These levels include: *the micro-level (or personal) level*, in which people in lower ranks of society experience lower actual and perceived control over their destiny, causing chronic stress that leads to poorer health outcomes and negative behavioral responses ranging from substance abuse to ineffective coping, low self-efficacy or esteem,[37] and metabolic disturbances;[39] *the meso (or community) level*, focused on the social and built environments, that can act as a chronic stressor, damaging health over time; and *macro and societal level* theories that include the various levels of exclusion and discrimination of certain sections of society and can lead to low status and control of these groups. These levels interact, influencing health outcomes,[41] which highlighs the importance of considering multilevel factors associated with health outcomes.

The mechanisms by which these individual and environmental multilevel factors affect health are proposed by Cohen et al. (2016)[41] in a stage model of stress and disease. This model posits that environmental demands or stressful life events and perceived stress lead to negative emotional

responses, which activates both biological systems of stress and negative coping mechanisms, ultimately leading to physiological changes and disease onset and progression.

Following these models of stress-related to social rank and health outcomes, we sought to examine multilevel risk factors associated with depression and suicidal thoughts in an adolescent clinical sample recruited in urban clinics. The aim of this study was to explore overall sense of control and subjective social status (SSS), environmental stressors, and predisposing factors such as a family history of mental illness, adversity in early life, and Attention Deficit Hyperactivity Disorder (ADHD) and their associations with depression and suicidal thoughts in a clinical largely urban sample of adolescents.

2. Methods

2.1. Procedures and participants

The data were collected from adolescents in outpatient primary care and mental health outpatient centers between February and September of 2016 in an Eastern U.S. city. The cross-sectional survey administered via paper assessed respondents' reports of mental health (e.g., depression, suicidal ideation) and biopsychosocial factors (e.g., family history of mental illness, early adversity, sense of control, SSS, school/neighborhood environments). Potential participants referred by medical staff were provided information regarding the purpose of the study and were given an option to provide consent and participate in the survey or quit the survey. Parents of

assenting adolescents provided written consent. Research staff oversaw the completion of the survey in the waiting room or in a conference room provided by the clinics. Chart review was also conducted to obtain diagnosis-related information of the participants. This study only included adolescents 1) ages between 12 and 18, 2) being able to speak and read English and/or Spanish, and 3) being accompanied by a parent or guardian who could provide consent. Based on previous studies on sample size requirements for SEM,[42] a sample of 180 participants is sufficient (estimated power > 0.80), but we aimed to recruit more to account for potential (20%) incomplete data. Of 205 potential participants, the final data analytic sample for the present study included 197 cases of adolescents who met all inclusion criteria. The study was approved by the University's Institutional Review Board (IRB) where this study was conducted.

2.2. Measures

2.2.1. Outcome variables: Depression and suicidal ideation

The participants reported their symptoms of depression during the last two weeks on the Patient Health Questionnaire - Adolescent Version (PHQ-A)[43] that used the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM–IV)[44] diagnostic criteria to assess depressive symptomatology (i.e., low mood, anhedonia, trouble with sleep and appetite, lack of energy, trouble concentrating, psychomotor retardation, and suicidal ideation). Adequate internal consistency and validity have been identified in previous research,[45] and the Cronbach's alpha of this scale was 0.90 in the present study. For the main analysis, PHQ-A, measured with a 4-point Likert type scale (0 = not at all to 3 = nearly every day), was summed into a single variable with

an overall score ranging from 0–27. Higher scores indicate more severe depression. For the main analyses, the variable depression was dichotomized with scores 10 or above indicating the presence of moderate to severe depressive symptoms.[46] An additional item, "Has there been a time in the *past month* when you have had serious thoughts about ending your life?" was used to evaluate recent suicidal thoughts.[43]

2.2.2. Independent variables

Family and Childhood Mental Health Variables. The participants were asked to report a *family history of mental illness* (i.e., depression, anxiety, schizophrenia, bipolar disorder). Data regarding the presence of *Attention Deficit Hyperactivity Disorder (ADHD)*, diagnosed by a physician (i.e., board certified child and adolescent psychiatrist and/or pediatrician), were collected from the chart review. *Early adversity* extracted from the medical chart was assessed by exposure to substances in-utero and pregnancy problems or birth complications.

Perceived Control and Status Factor. The 17-item self-reported *Overall Sense of Control (OSOC)* scale[47] measured both positive (9 items) and negative (8 items) sense of control, consisting of statements related to having control over own's life (e.g., "I am in control of my life") or lacking control over own's life (e.g., "I lose control over myself"). An average of the items for positive sense of control and the reverse-coded negative items (i.e., lack of control) was calculated, where higher scores indicate a higher overall sense of control (ranged from 1.18 to 5.00). Cronbach's alpha of this scale was 0.90 in the present study. Subjective perceptions of social stratification

were assessed by the MacArthur Scale of *Subjective Social Status (SSS)* - Youth Version,[48] pictorially presenting two versions of the ladder (society and school ladders) with 10 steps. The participants marked where their family was located in the social hierarchy in comparison to the general society and where they were located in their school from 1 to 10, with higher scores representing a higher perceived rank. These two variables were used as continuous variables.

Environmental Factor. Negative Neighborhood Scale[34] assessed adverse events occurred in their neighborhood in the past 6 months, including drug dealing, shooting, murders, abandoned buildings, homeless people on the street, prostitution, business closing, bad schools, and graffiti and/or vandalism (0 = none, 1 = some, 2 = a lot). A sum score was calculated, with higher scores corresponding to a more negative neighborhood environment (ranging from 0 to 19). *Negative School Scale*[34] measured adverse events in their school that occurred in the past 6 months, including drug dealing, shooting or knifings, teachers injured by students, school equipment damage, and anger/stress. A total score was calculated, with higher numbers corresponding to a more negative school environment (ranging from 0 to 10). *Prior exposure to traumatic events* was assessed by the 14 items derived from part 1 of the UCLA Reaction Index Scale,[49] including traumatic events related to environmental disasters, accidents, domestic and community violence, physical and sexual abuse, and death of a loved one (0 = yes, having ever experienced the listed traumatic event, 1 = no, having not experienced it). The number of traumatic events experienced by the participant at the time of the survey was summed (ranging from 0 to 9).

2.2.3. Covariates

Socio-demographic measures abstracted from the medical record included age upon interview, sex at birth (0 = male, 1 = female), and self-identified race (0 = White, 1 = Black, 2 = other races or mixed race). For the data analytic purpose, each of the race categories was dummy-coded. *Socioeconomic status (SES)* was calculated using standardized z-scores of parental employment, education, and household income, with higher scores indicating higher family SES.[50]

2.3. Data analysis

Descriptive analyses explored the characteristics of the sample, the variables of interest, and the distribution of the study variables using SPSS software version 24. Missing data for all study variables were calculated with linear interpolation. Mplus version 7.31[51] was used for confirmatory factor analysis (CFA) and structural equation modeling (SEM). Prior to conducting the main analysis, we checked the assumptions of SEM, none of which were found to be violated. SEM is theory driven, allowing us to identify whether a prior theoretical model could be applied to observed data by testing the relations of all variables and underlying constructs simultaneously.[52] SEM was conducted in the recommended two-step approach.[53] First, a measurement model was assessed with all relevant paths set free to vary using CFA to identify the factor structure of independent variables (i.e., family and childhood mental health, perceived control and status, and environmental factors). Individual items with significant factor loadings were retained only in the final CFA to obtain a well-fitting parsimonious model.[54] Then, the hypothesized structure model (Figure 1) was tested, wherein all hypothesized paths were estimated freely, as validated by the measurement model. We evaluated which factors were associated with depression and suicidal

ideation among adolescents while adjusting for relevant sociodemographic and socioeconomic covariates.

We hypothesized that poor family/childhood mental health and environmental factors would be associated with an increase in the risk of depression and suicidal ideation, whereas greater perceived control and higher SSS would be associated with an increase of depression and suicidal thoughts. The final model was re-specified from the hypothesized model based on prior literature and modification indices (Mis).[52] All SEM analyses were conducted using weighted least squares mean and variance adjusted (WLSMV) estimator due to categorical observed variables (e.g., binary or ordinal). Two standardization options were used simultaneously to obtain standardized parameter estimates and standard errors of continuous (STDYX) and binary (STDY) covariates.[55]Goodness of fit was assessed by multiple-fit indices[52,56]: chi-square (χ^2) goodness-of-fit index, the Comparative Fit Index (CFI) and the Tucker–Lewis index (TLI) ≥ .95; the Root Mean Square Error of Approximation (RMSEA) ≤ .06; Weighted Root Mean Square Residual (WRMR) < 1.0; Standardized Root Mean Square Residual (SRMR) <.08. Path coefficients less than .1 indicate a small effect, those around .3 a medium effect, and those greater than .5 a large effect.[52]

3. Results

3.1. Descriptive Statistics

The average age of the respondents was 14.6 years (SD = 1.5). A majority of the respondents were female (63%) and Black (63%) and reported a family history of mental illness (68%) and early

adversity (52%). Over a quarter of the sample were diagnosed with ADHD (29%). More than one-third of the sample met the criteria for moderately severe to severe depression (39%) and reported suicidal ideation (33%). Table 1 shows the bivariate relationships of moderate/severe depression and suicidal ideation by sociodemographic, family/childhood mental health, perceived control and status, and environment variables. Adolescents with a family history of mental illness and lower perceived sense of control were more likely to report moderate or severe depression and suicidal ideation than those with no family history of mental illness or higher perceived sense of control. Having experienced a greater number of traumatic events was positively associated with suicidal ideation but not with depression.

Table 1. Depression and suicidal ideation by sociodemographic, family/childhood mental health, perceived control and status, and environment variables.

	Moderate or Severe Depression					**Suicidal Ideation**				
	No (n = 121)		Yes (n = 76)		χ^2	No (n = 132)		Yes (n = 65)		χ^2
	N	%	N	%		N	%	N	%	
Sociodemographics										
Age[a]	14.4	1.5	15.0	1.5	2.38*	14.6	1.5	14.6	1.5	.70
Sex at birth					4.71*					.94
Female	69	55.6	55	44.4		80	64.5	44	35.5	
Male	52	71.2	21	28.8		52	71.2	21	28.8	
Race					.97					4.21
White	28	59.6	19	40.4		26	55.3	21	44.7	
Black	79	63.7	45	36.3		89	71.8	35	28.2	
Others	14	53.8	12	46.2		17	65.4	9	34.6	
SES[a] (z score)	.0	2.8	.0	3.3	.86	-.1	2.7	.2	3.6	.98
Family and Childhood Mental Health										
Family mental illness					5.78*					5.30*
No	47	73.4	17	26.6		50	78.1	14	21.9	

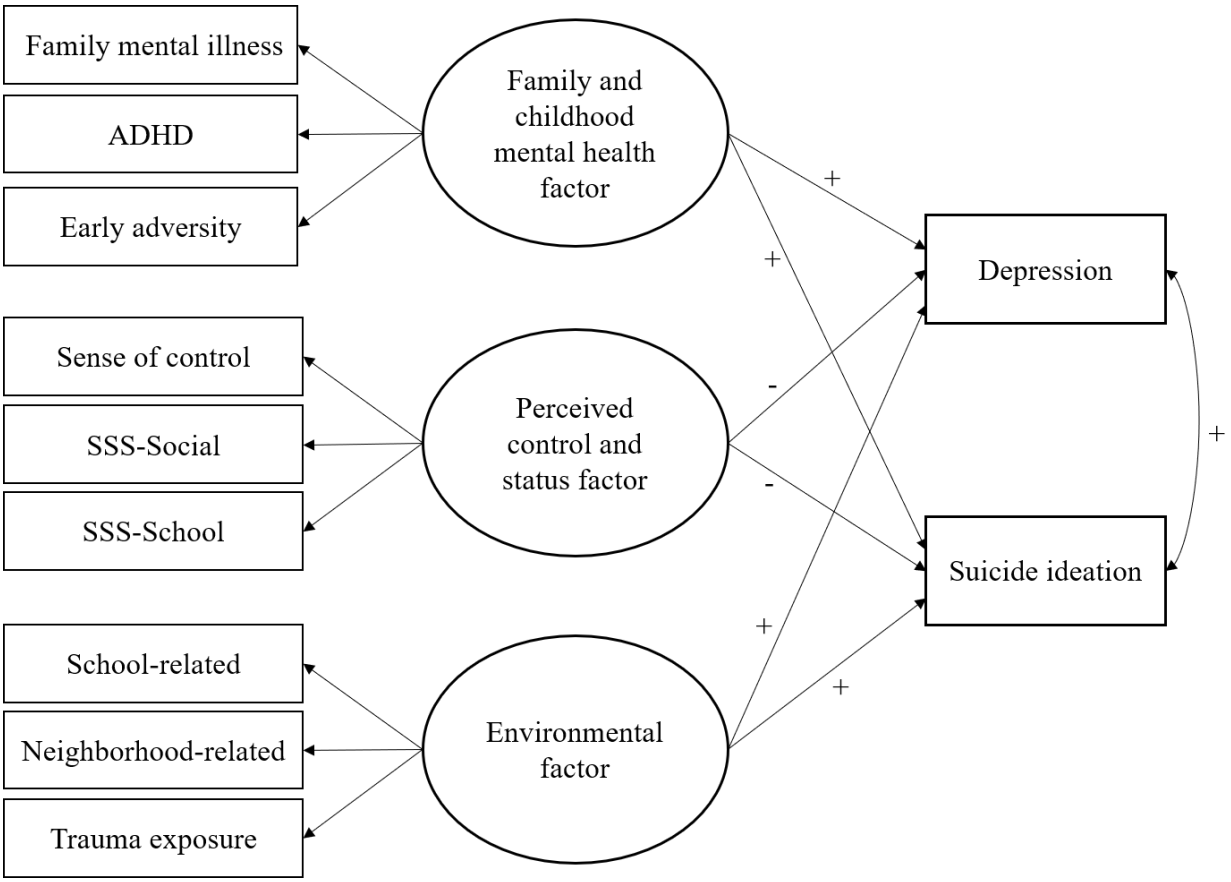
Yes	74	55.6	59	44.4		82	61.7	51	38.3	
ADHD					2.62					.07
No	91	65.0	49	35.0		93	66.4	47	33.6	
Yes	30	52.6	27	47.4		39	68.4	18	31.6	
Early adversity					.44					2.29
No	60	63.8	34	36.2		58	61.7	36	38.3	
Yes	61	59.2	42	40.8		74	71.8	29	28.2	
Perceived Control and Status										
Overall Sense of Control[a]	4.0	.6	3.5	.7	1.94**	4.0	.7	3.4	.6	1.77**
Subjective Social Status – Social[a]	6.4	1.5	6.0	1.7	.00	6.4	1.5	5.9	1.6	.77
Subjective Social Status – School[a]	6.7	2.2	6.1	2.1	.32	6.7	2.1	5.9	2.2	.10
Environmental Factors										
Negative Neighborhood Scale[a]	4.7	5.1	4.8	4.7	.04	4.5	5.0	5.2	4.9	.28
Negative School Scale[a]	2.8	1.8	3.0	2.2	.19	2.7	1.9	3.1	2.1	.34
Exposure to traumatic events[a]	1.6	1.7	2.0	1.9	68	1.4	1.6	2.5	1.9	2.68**

Note. Values for [a] presents mean, standard deviation, and F-value instead of n, %, and χ^2. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

3.2. Measurement Model

An initial three-factor CFA model (family and childhood mental health, perceived control and status, and environmental factors) demonstrated good fit (χ^2 (24) = 28.06, p = .258; CFI = 96, TLI = .94, RMSEA = .03 [90% CI = .00–.07, p = .78], WRMR = .70); however, all three observed variables for a latent variable of the family and childhood mental health factor were not statistically significant, indicating that those three observed variables would not be appropriate to be included as a latent variable and hence the posited three-factor CFA model did not appear reasonable. Based on these findings, we decided to use each of the sub-items of the family and childhood mental health factor as a separate observed variable (i.e., family mental illness, ADHD, early adversity).

Figure 1. Conceptual model linking family and childhood mental health factors, perceived control and status, and environmental factors to depression and suicidal ideation.



Note. Plus (+) and minus (-) signs indicate paths with positive and negative associations, respectively.

The revised two-factor CFA model (perceived control/status factor and environmental factor) yielded an excellent fit (χ^2 (7) = 7.71, p = .359; CFI = .99, TLI = .98, RMSEA = .02 [90% CI = .01–.09, p = .67], SRMR = .03). All standardized factor loadings were statistically significant

(ranging from .3 to .8, p <.01) with the anticipated direction (Table 2). Thus, this revised measurement model appeared reasonable and was adopted for the present study.

Table 2. Parameter estimates of the measurement model for perceived control and status, and environmental factors

Regression Parameters	*Unst.*	*St.*	*SE*	*p*
Perceived Control and Status				
Overall Sense of Control	1.00	.48	.15	.001
Subjective Social Status – Social	1.27	.28	.09	.003
Subjective Social Status – School	5.09	.79	.24	.001
Environmental Factor				
Negative Neighborhood Scale	1.00	.69	.10	.000
Negative School Scale	2.98	.57	.10	.000
Exposure to traumatic events	.81	.52	.10	.000

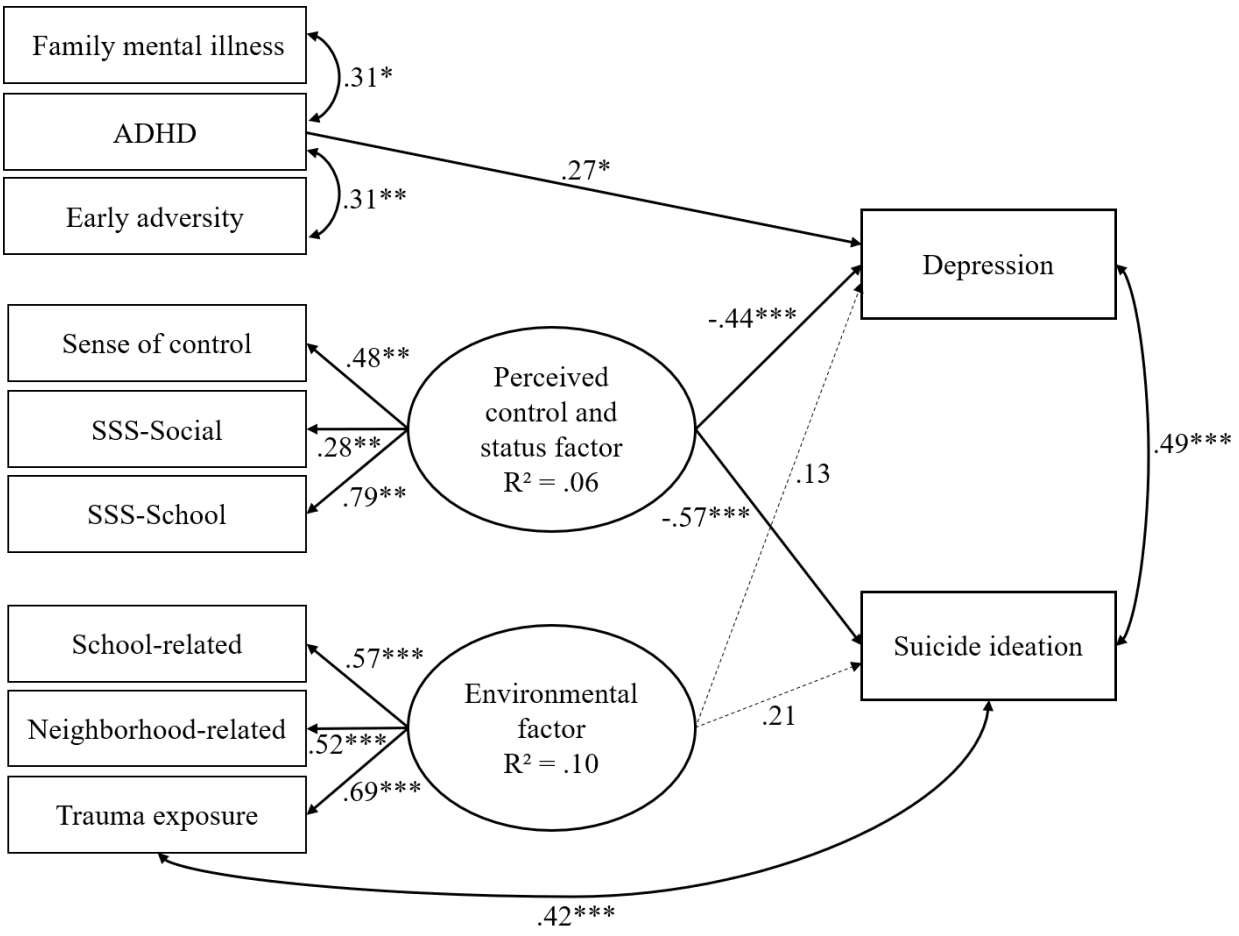
Note. Unst. = unstandardized; St. = STDY standardized. SE = standardized error

3.3. Structural Model

SEM was conducted to assess the effects of family and childhood mental health related variables, perceived control and status factors, and environmental factors on depression and suicidal ideation, while adjusting for all relevant covariates (Figure 2). The full structural model demonstrated an excellent fit to the data (χ^2 (50) = 52.59, p = .374; CFI = .99, TLI = .98, RMSEA = .02 [90% CI = .01–.05, p = .95], WRMR = .59). The perceived control and status factor was negatively associated with both depression (β = -.44, p = .000) and suicidal ideation (β = -.57, p = .000). Especially, among all significant path coefficients, the largest effect was found for the perceived control and status factor on suicidal ideation. No significant direct effects of the environmental factor on the outcomes were found, but the exposure to traumatic events was associated with an increased risk

of suicidal ideation (β = .42, p = .001). Depression was positively associated with suicidal ideation (r = .49, p = .000). ADHD had a significant positive association with depression, indicating that the presence of ADHD was associated with an increased risk of experiencing depression (β = .27, p = .047). Additionally, we tested alternative models to examine the mediation effects of 1) the perceived control and status factor and 2) the perceived control and status, and environmental factors on depression and suicidal ideation. However, no significant indirect effects were found on both models.

Figure 2. Structural equation model predicting depression and suicidal ideation.



Note. * p < 0.05, ** p < 0.01, *** p < 0.00

Figure 2. Full structural model that assessed the effects of family and childhood mental health related variables (family mental illness, ADHD, early adversity), perceived control and status factors, and environmental factors on depression and suicidal ideation.

4. Discussion

Depression and suicide in the U.S. constitute serious public health problems. The present study examined the relationships among family/childhood mental health, perceived control and social status, environmental factors, and depression and suicidal thoughts in a clinical sample of adolescents. The majority of participants in this sample were Black and female. Two factors (latent variables) were confirmed based on the measurement model: a *perceived control and status* factor and an *environmental risk* related factor.

Our measures of sense of control and SSS merged into one single factor: The *perceived control and status* factor included variables related to SSS of the adolescent in their school, the adolescent's family in the larger society, and the adolescent's sense of control. A sense of control is associated with social rank position[57,58] and health.[58] In this study, a greater *perceived control and status* factor was significantly associated with a decreased risk of depression, especially suicidal ideation. This finding is consistent with prior research showing an association between low sense of control and depressive symptoms, with one fourth to half of the variation in depressive symptoms associated with family wealth being accounted for by low sense of control.[59,60]

Furthermore, a higher sense of control can be protective of depression[59] and may serve as a buffer for socio-economic status risk.[61,62]

The current study contributes to understanding the mechanisms of social rank on depression and suicide. Status indices such as the person's sense of control and the placement in community rank hierarchy are associated with higher levels of multisystem physiological dysregulation (including the cardiovascular, endocrine, and autonomic nervous systems).[39]There are also age differences in the connection between social ranking and allostatic load in adults, with stronger effects in younger than older adults.[39] This finding emphasizes the need to include individual and community level interventions related to self-control and social rank, notwithstanding the need to work on macro factors of social rank.[57]

A second factor, the *environmental risk* factor was not significantly associated with either depression or suicide, but history of traumatic experiences was directly associated with suicide ideation. This finding is consistent with prior research showing increased suicidal ideation[63] and attempts[64-66] in individuals with a history of adverse events in childhood,[67,68] especially violence-related events[69] and sexual and physical abuse.[70,71] In this sample, a diagnosis of ADHD was directly associated with depressive symptoms, but not with suicidal ideation. ADHD can be associated with suicide attempts through its association with depression.[72] Some research has found the association of ADHD and suicidality is due to impulsivity,[73] but this association was not captured in our study. In this study, the effects of the environment were weaker than those of the *perceived control and status* factor. This finding could be due to the environment having more

longer-term effects on individuals. Adolescents who lived in relatively safe homes as children, are becoming more exposed to their neighborhood environments or the larger and potentially more violent environments in larger schools and neighborhoods. It could also be that the cumulative effects of chronic environmental stress have not been long enough to cause damage to their health.

The U.S. is experiencing historically high levels of income inequality,[6] which may heighten the subjective experience of social class as powerful in predicting social outcomes. In this climate, understanding social rank and environmental stress related to deprivation in schools and neighborhoods is important to design appropriate interventions that can buffer the effects of inequality. An encouraging finding in our study was that psychological factors appeared to have significant weight on depression and suicide even in adverse environments in a clinical sample, and these more malleable risk factors might be addressed in therapy. Given that this was a clinical sample, the findings open up opportunities for intervention in mental health and primary care clinical settings. Interventions to build resilience through adolescence, such as parenting interventions, promotion of early detection of stress-related disorders, and self-help for mood and anxiety disorders (e.g., through digital apps),[74] as well as the delivery of psychological therapies by non-specialists in low-resource settings[75] could all contribute to improvements in psychological distress related to social rank. Therapeutic interventions could focus on the social comparisons leading to feelings of worthlessness.[76,77] Third-wave psychological therapies that include components of self-validation to counter social defeat and worthlessness associated with depression and suicidality[78] are now being adapted to extreme poverty settings.[79] These initiatives need to be accompanied by efforts to reduce social inequalities in our communities, as we know

that macro and structural factors such as access to education and income inequality are the strongest determinants of adolescent health.[80]

This study presents several limitations. It is a cross-sectional study, and as such, causal relationships among the variables included cannot be drawn. Longitudinal studies looking at long-term effects and variation of one's SSS, sense of control, and school and neighborhood environment would help determine causal relationships. The measures were self-reported, which increases the risk of recall bias and social desirability. Additionally, the data were oversampled from a black and female population, which limits generalizability. While this is a relatively small sample, many studies do not have a sufficient sample size of minority youth. Furthermore, a limitation to the study of suicidal thoughts was the use of a single item. Finally, the chances of a bidirectional relationship between perceived measures of status and control with depression and suicide thoughts may be higher than for the environmental risk variables. In other words, people who are depressed may feel that they have a lower social status and lower sense of control, and those who see themselves as lower in the social hierarchies may also tend to feel more depressed. While the same could be said about the environmental variables, these questions elicited more objectivity as they are not focused on the respondent, and the bidirectional effect may have been lower, appearing as a weaker association in the model.

In conclusion, perceptions of social rank are important in determining depression and especially suicidality. In our study, these perceived control and status factors were more strongly associated with depression and suicidal ideation than environmental risk factors related to the school and the

neighborhood environment. Individual and environmental interventions that give adolescents a greater sense of control and status may be beneficial in treating depression and preventing suicide.

Declarations of interest

None.

Acknowledgment

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Appendix IV: Informed Consent Form (English Version)

JOHNS HOPKINS MEDICINE
Approved January 12, 2016

Date: January 12, 2016
Principal Investigator: Carolina Vidal, MD, MPH
Application No.: IRB00073672

If you are using Epic for this study, fax a copy of the signed consent form to 410-367-7382.

Patient I.D. Plate

PARENT INFORMED CONSENT AND PRIVACY AUTHORIZATION FORM

Protocol Title: **Perceived Relative Deprivation and Depression in an Adolescent Urban Population.**

Application No.: **IRB00073672**

Sponsor: **American Academy of Child and Adolescent Psychiatry**

Principal Investigator: Carolina Vidal, MD, MPH
1800 Orleans St, 12th Floor
Baltimore, Maryland 21287
Phone: 410-614-8014
Fax: 410-955-8691

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1. What you should know about this study:

- You are being asked to allow your child to join a research study. This consent form explains the research study and your child's part in the study. Please read it carefully and take as much time as you need. Ask your study doctor or the study team to explain any words or information that you do not understand.
- Joining this study is voluntary. If you allow your child to join the study, you can change your mind later. There will be no penalty or loss of benefits if you decide not to allow your child to continue the study.

- During the study, we will tell you if we learn any new information that might affect whether you wish to continue to allow your child to participate.
- If we think your child's participation in this study may affect your child's clinical care, information about your child's study participation will be included in your child's medical record, which is used throughout Johns Hopkins. Doctors outside of Johns Hopkins may not have access to this information. You can ask the research team to send this information to any of your child's doctors.
- When Johns Hopkins is used in this consent form, it includes The Johns Hopkins University, The Johns Hopkins Hospital, Johns Hopkins Bayview Medical Center, Howard County General Hospital, Johns Hopkins Community Physicians, Suburban Hospital, Sibley Memorial Hospital and All Children's Hospital.

2. Why is this research being done?

This research is being done to study the relationship between how a teenager perceives his environment and depression.

Any adolescent ages 12 to 17 may join.

How many adolescents will be in this study?

About 280 participants are expected to take part from Pediatric Outpatient Clinics.

3. What will happen if you allow your child to join this study?

If you agree to allow your child to be in this study, we will ask you to allow your child to do the following things:

Your child will complete a questionnaire about how she/he compares her/himself to the surrounding community and the country, a short survey asking questions about his school, zip code, and family history of depression, and a depression screening tool.

A few of the participants at the beginning of the study may be asked to participate in a voice-recorded interview. We would like to ask your permission to create and use the voice recordings.

Before making your decision, you should know that:

- You may request that the voice recordings be stopped at any time.
- If you agree to allow the voice recordings and then change your mind, you may request that the imaging/recording be destroyed. If the imaging/recording has had all identifiers removed, we may not be able to do this.
- These voice recordings will be used for the purposes of this research and will not be published for any other reason.

Please indicate your decision below by checking the appropriate statement:

_____ I agree to allow the Principal Investigator and Johns Hopkins study team members to make and use the voice recordings of my child for the purpose of this study.

_____ I do not agree to allow the Principal Investigator and Johns Hopkins study team members to make and use the voice recordings of my child for the purpose of this study.

Parent/Legally Authorized Representative Signature Date

How long will your child be in the study?

Your child will be in this study for less than one hour.

4. What are the risks or discomforts of the study?

There should be no physical risks, discomforts, or inconveniences during the study, other than the likely probability of being inconvenienced by having to sit for an extended period of time to complete the questionnaires. There is a possibility that your child might experience psychological or emotional discomfort when answering questions about his environment or symptoms of depression. There is also a risk for loss of confidentiality of sensitive information.

Your child may get tired or bored when we are asking her/him questions. Your child may find it tiring or boring when completing the questionnaires. Your child does not have to answer any question s/he does not want to answer.

5. Are there benefits to your child from being in the study?

There is no direct benefit to your child from being in this study. If your child takes part in this study, your child may help others in the future.

6. What are your options if you do not want your child to be in the study?

You can choose to have your child not take part in the study. You do not have to allow your child to join this study. If your child does not take part in the study, your child's care at Johns Hopkins will not be affected.

7. Will it cost you anything to allow your child to be in this study? No.

8. Will you or your child be paid if you allow your child to join this study?
Participants will receive a $10 gift card after completing the questionnaire. Those who complete the long interview will receive $25 gift cards. The compensation will be given at the end of the study participation only to those who complete the study. There are funds available for those who need transportation assistance to return home. The payment will be made the same day after completing the study.

You may be required to provide your social security number to be paid for taking part in this study. Federal tax law requires that you report your research payments when you file your taxes. If your total payments from Johns Hopkins exceed $600 per year, Johns Hopkins will report these payments to the Internal Revenue Service and you will receive a 1099-MISC form from us.

9. Can your child leave the study early?

- You can agree to allow your child to be in the study now and change your mind later.
- If you wish to end your child's participation, please tell us right away.
- Leaving this study early will not stop your child from getting regular medical care.
- If your child leaves the study early, Johns Hopkins may use or give out your child's health information that it already has, if the information is needed for this study or any follow-up activities.

10. Why might we take your child out of the study early?
Your child may be taken out of the study if:

- Staying in the study would be harmful.
- You or your child fail to follow instructions.
- The study is cancelled.
- There may be other reasons to take your child out of the study that we do not know at this time.
- If your child is taken out of the study early, Johns Hopkins may use or give out your child's health information that it already has if the information is needed for this study or any follow-up activities**.**

11. How will your child's privacy be protected?
We have rules to protect information about your child. Federal and state laws and the federal medical Privacy Rule also protect your child's privacy. By signing this form you provide your permission, called your "authorization," for the use and disclosure of information protected by the Privacy Rule.

The research team working on the study will collect information about your child. This includes things learned from the procedures described in this consent form. They may also collect other information including your child's name, address, date of birth, and information from your child's medical records (which may include information about HIV status, drug, alcohol or STD treatment, genetic test results, or mental health treatment).

The research team will know your child's identity and that your child is in the research study. Other people at Johns Hopkins, particularly your doctors, may also see or give out your child's information. We make this information available to your child's doctors for your child's safety.

People outside of Johns Hopkins may need to see or receive your child's information for this study. Examples include government agencies (such as the Food and Drug Administration), safety monitors, other sites in the study and companies that sponsor the study.

If your child is in a cancer study that receives federal funding, the National Cancer Institute (NCI) now requires that we report identifiable information (such as, zip code) about your child's participation. You may contact the NCI if you have questions about how this information is used.

We cannot do this study without your authorization to use and give out your child's information. You do not have to give us this authorization. If you do not, then you may not join this study.

We will use and disclose your child's information only as described in this form and in our Notice of Privacy Practices; however, people outside Johns Hopkins who receive your child's information may not be covered by this promise or by the federal Privacy Rule. We try to make sure that everyone who needs to see your child's information keeps it confidential – but we cannot guarantee that your information will not be re-disclosed.

The use and disclosure of your child's information has no time limit. You may revoke (cancel) your permission to use and disclose your child's information at any time by notifying the Principal

Investigator of this study by phone or in writing. If you contact the Principal Investigator by phone, you must follow-up with a written request that includes the study number and your contact information. The Principal Investigator's name, address, phone and fax information are on page one of this consent form.

If you do cancel your authorization to use and disclose your child's information, your child's part in this study will end and no further information about your child will be collected. Your revocation

(cancellation) would not affect information already collected in the study, or information we disclosed before you wrote to the Principal Investigator to cancel your authorization.

12. Will the study require any of your other health care providers to share your child's health information with the researchers of this study?

As a part of this study, the researchers may ask to see your child's health care records from her/his other health care providers.

13. What other things should you know about this research study?

a. What is the Institutional Review Board (IRB) and how does it protect you? The Johns Hopkins Medicine IRB is made up of:

- Doctors
- Nurses
- Ethicists
- Non-scientists
- and people from the local community.

The IRB reviews human research studies. It protects the rights and welfare of the people taking part in those studies. You may contact the IRB if you have questions about your child's rights as a participant or if you think you or your child have not been treated fairly. The IRB office number is 410-955-3008. You may also call this number for other questions, concerns or complaints about the research.

When the Johns Hopkins School of Medicine Institutional Review Board (IRB) reviews a study at another site, that site (institution) is solely responsible for the safe conduct of the study and for following the protocol approved by the Johns Hopkins IRB.

b. What do you do if you have questions about the study?

Call Dr. Carolina Vidal at (410) 614- 8014 if you have any questions about the study. If you wish, you may contact the principal investigator, Dr. Carolina Vidal, by letter or by fax. The address and fax number are on page one of this consent form. If you cannot reach the principal investigator or wish to talk to someone else, call the IRB office at 410-955-3008.

c. What happens to Data that are collected in the study?

Johns Hopkins and our research partners work to understand and cure diseases. The data you provide are important to this effort.

If you allow your child to join this study, you should understand that you/your child will not own your child's data, and should researchers use them to create a new product or idea, you/your child will not benefit financially.

14. Assent Statement

This research study has been explained to my child in my presence in language my child can understand. He/she has been encouraged to ask questions about the study now and at any time in the future.

15. What does your signature on this consent form mean?

Your signature on this form means that:

- You understand the information given to you in this form
- You accept the provisions in the form
- You agree to allow your child to join the study • You and your child will not give up any legal rights by signing this consent form.

WE WILL GIVE YOU A COPY OF THIS SIGNED AND DATED CONSENT FORM

_____

Signature of Parent (Print Name) Date/Time

_____

Signature of Person Obtaining Consent (Print Name) Date/Time

_____

Signature of Legally Authorized Representative (LAR) (Print Name) Date/Time

For CHILD PARTICIPANT

_____

Description of LAR's authority under state or applicable local law to act as surrogate health care Date/Time decision-maker for child research participant (for example, Legal Guardian; Court-ordered representative)

_____

Signature of Child Participant (optional unless IRB required) (Print Name) Date/Time

NOTE: **A COPY OF THE SIGNED, DATED CONSENT FORM MUST BE KEPT BY THE PRINCIPAL INVESTIGATOR;**
A COPY MUST BE GIVEN TO THE PARTICIPANT; IF YOU ARE USING EPIC FOR THIS STUDY A COPY MUST BE FAXED TO 410-367-7382; IF YOU ARE NOT USING EPIC A COPY MUST BE PLACED IN THE PARTICIPANT'S MEDICAL RECORD (UNLESS NO MEDICAL RECORD EXISTS OR WILL BE CREATED).

ONLY CONSENT FORMS THAT INCLUDE THE JOHNS HOPKINS MEDICINE LOGO CAN BE USED TO OBTAIN THE CONSENT OF RESEARCH PARTICIPANTS.

Appendix V: Informed Consent Form (Spanish Version)

Fecha: 12 de enero, 2016
Investigador Principal: Carolina Vidal, MD, MPH
Solicitud Número: IRB00073672

JOHNS HOPKINS MEDICINE
Approved January 12, 2016

Si está utilizando Epic para este estudio, envíe una copia por facsímil de este formulario de consentimiento informado al 410-367-7382.

CONSENTIMENTO PATERNO INFORMADO Y FORMULARIO DE

AUTORIZACIÓN DE PRIVACIDAD

Título del Protocolo: **Percepción de Privación Relativa y Depresión en una población Urbana Adolescente.**

Solicitud No.: **IRB00073672**

Patrocinador: **American Academy of Child and Adolescent Psychiatry**

Investigador Principal: Carolina Vidal, MD, MPH
1800 Orleans St, 12th Floor
Baltimore, Maryland 21287
Teléfono: 410-614-8014
Facsímil: 410-955-8691

1. ¿Qué debería saber sobre este estudio?

- Se le está pidiendo que permita a su hijo participar en un estudio de investigación. Este formulario de consentimiento explica el estudio de investigación y el papel que tendrá su hijo/a en el estudio. Por favor, léalo con cuidado y tome tanto tiempo como sea necesario. Pregúntele al doctor o al equipo que está realizando el estudio que le explique las palabras o información que usted no entienda.
- Su participación en este estudio es voluntaria. Si permite a su hijo formar parte del estudio, puede cambiar de opinión más tarde. No habrá ninguna penalización o pérdida de beneficios si decide no permitir que su hijo/a continue en el estudio.
- Durante el estudio, le diremos si aprendemos información nueva que pueda afectar sus deseos de continuar permitiendo la participación de su hijo/a en el estudio. Si creemos que la participación de su hijo en este estudio pudiera afectar el cuidado clínico de su

hijo, la información sobre la participación de su hijo/a se incluirá en la historia clínica de su hijo/a, la cual se usa a través del sistema de Johns Hopkins. Puede que los doctores de fuera de Johns Hopkins no tengan acceso a esta información. Puede preguntarle al equipo de investigación que le envíe esta información a cualquiera de los doctores de su hijo/a.

- Cuando Johns Hopkins se utiliza en esta autorización de consentimiento, eso incluye la Universidad de Johns Hopkins, el Hospital de Johns Hopkins, el Centro Médico de Johns Hopkins Bayview , el Hospital General del condado de Howard , Johns Hopkins Community Physicians, el Hospital de Suburban, el Hospital de Sibley Memorial y el Hospital de All Children's.

2. ¿Por qué se está realizando esta investigación?

Este estudio se está realizando para estudiar el relación entre la percepción que los adolescentes tienen de su ambiente y la depresión.

Cualquier adolescente de edades comprendidas entre los 12 y los 17 años puede participar.

¿Cuántos adolescentes se incluirán en este estudio?

Se espera que aproximadamente 280 participantes formen parte de este estudio, de entre las clínicas pediátricas ambulatorias.

3. ¿Qué pasará si usted permite que su hijo/a forme parte de este estudio?

Si está de acuerdo en permitir que su hijo/a participe en este estudio, le pediremos que permita a su hijo/a hacer las siguientes cosas:

Su hijo/a completará un cuestionario sobre como él/ella se compara con el resto de su comunidad y el país; un cuestionario corto con preguntas sobre su escuela, su distrito postal, e historial familiar de depresión; y un cuestionario sobre detección de depresión.

Al principio del estudio, se les preguntara a unos pocos participantes si desean participar en unas entrevistas en las que se grabará la voz. Nos gustaría que nos diera permiso para crear y usar las grabaciones de voz.

Antes de que tome una decisión, debería saber que:

- Puede solicitar que la grabación de voz se detenga en cualquier momento.
- Si está de acuerdo con permitir la grabación de voz y después cambia de opinión, puede pedir que la grabación se destruya. Aunque, si se han eliminado todos los identificadores de la grabación, puede que no seamos capaces de hacerlo.
- Estas grabaciones de voz se usarán para los propósitos de esta investigación y no serán publicadas por ninguna otra razón.

Por favor, indique su decisión debajo marcando la frase apropiada:

_____ Estoy de acuerdo en permitir al Investigador Principal y a los miembros del equipo de investigación de Johns Hopkins que utilicen las grabaciones de voz de mi hijo/a con el propósito de este estudio.

_____ No estoy de acuerdo en permitir al Investigador Principal y a los miembros del equipo de investigación de Johns Hopkins que utilicen las grabaciones de voz de mi hijo/a con el propósito de este estudio.

_____

Firma del Padre/Madre/Persona Autorizada Legalmente como Representante

Fecha

¿Cuánto tiempo estará su hijo/a en el estudio?

Su hijo/a estará en este estudio por menos de una hora.

4. ¿Cuáles son los riesgos o molestias del estudio?

No debería haber ningún riesgo físico, molestias, o inconveniencias durante el estudio, a parte de la probabilidad de estar incómodo por tener que estar sentado por un periodo de tiempo prolongado para completar los cuestionarios. Existe la posibilidad de que su hijo/a experimente incomodidad psicológica o emocional cuando responda a las preguntas sobre su medio ambiente o sus síntomas de depresión. También hay un riesgo de pérdida de confidencialidad de información sensible.

Puede que su hijo/a se canse o se aburra cuando le hagamos preguntas. Su hijo puede encontrar aburrido o cansado el completar los cuestionarios Su hijo/a no tiene que responder ninguna pregunta que él/ella no desee responder.

5. ¿La participación de su hijo/a en el estudio tiene beneficios?

No hay ningún beneficio directo para su hijo/a por su participación en el estudio. Si su hijo/a toma parte en este estudio, él/ella puede ayudar a otros en el futuro.

6. ¿Cuáles son sus opciones si no quiere que su hijo forme parte del estudio?

Usted puede decidir que su hijo no forme parte del estudio. Usted no tiene que dar permiso para que su hijo/a participe en este estudio. Si su hijo/a no participa en el estudio, su cuidado en Johns Hopkins no se verá afectado.

7. **¿Le costará algo permitir que su hijo/a participe en el estudio?** No.

8. **¿Se le pagará a usted o a su hijo/a si le permite participar en este estudio?**
Los participantes recibirán tarjetas de regalo por el valor de $10 después de completar los cuestionarios. Aquellos que completen la entrevista prolongada recibirán tarjetas regalo de $25 por tarjeta. La compensación se dará al final de la participación en el estudio sólo a aquellos que completen el estudio. Hay fondos disponibles para aquellos que necesiten asistencia con transporte para volver a su casa. El pago se hará el mismo día en que se complete el estudio.

Puede que se requiera que proporcione su número de seguridad social para que se le page por tomar parte en este estudio. La ley federal de impuestos requiere que usted informe de sus pagos de investigación cuando presente sus impuestos. Si sus pagos de Johns Hopkins exceden los $600 al año, Johns Hopkins informará de esos pagos al Servicio de Rentas Internas y usted recibirá un documento 1099-MISC de nosotros.

9. **¿Puede su hijo/a dejar el estudio temprano?**

- Usted puede permitir la participación de su hijo/a en el estudio y cambiar de opinión más tarde.
- Si desea que su hijo termine con su participación en el estudio, por favor, díganoslo en seguida.
- Dejar este estudio no causará que su hijo/a no reciba su cuidado médico habitual.
- Si su hijo/a deja el estudio temprano, Johns Hopkins puede que use o comparta la información de salud de su hijo/a que ya posee, si la información es necesaria para este estudio o cualquier actividad que siga.

10. **¿Por qué podríamos hacer salir a su hijo/a del estudio pronto?**
Su hijo/a puede salir del estudio si:

- Quedarse en el estudio puede ser dañino.
- Usted o su hijo/a no cumple siguiendo las instrucciones.
- El estudio se cancela.
- Puede que haya otras razones para sacar a su hijo/a del estudio que no sabemos en este momento.
- Si se saca a su hijo/a del estudio temprano, Johns Hopkins puede que use o comparta la información de salud de su hijo/a que ya posea, si la información es necesaria para este estudio o cualquiera actividad que siga.

11. **¿Cómo se protegerá la privacidad de su hijo/a?**
Tenemos reglas para proteger la información de su hijo/a. Las leyes federales y estatales y la ley federal de privacidad médica también protegen la privacidad de su hijo/a. Al firmar

este documento, usted da su permiso, llamado "autorización" para el uso y revelación de información protegida por la ley de privacidad.

El equipo de investigación que está trabajando en este estudio recopilará información sobre su hijo/a. Esto incluye cosas que aprendamos de los procedimientos descritos en esta autorización de

consentimiento. También puede que recopilen otras información, incluyendo el nombre, dirección, fecha de nacimiento e información de la historia clínica de su hijo/a (lo cual puede incluir información sobre el estado de VIH, tratamiento por drogas, alcohol o ETS, resultados de exámenes genéticos, o tratamiento de salud mental).

El equipo de investigación sabrá cuál es la identidad de su hijo/a y que su hijo/a es parte del estudio de investigación. Otras personas en Johns Hopkins, en particular sus doctores, también podrían ver o compartir la información de su hijo/a. Hacemos que esta información esté disponible para los doctores de su hijo/a para la seguridad de su hijo/a.

Hay gente fuera de Johns Hopkins que pueda necesitar ver o recibir información sobre su hijo/a para este estudio. Algunos ejemplos incluyen agencias de gobierno (como la Administración de Alimentos y Fármacos), monitores de seguridad, otros lugares en los que se realice el estudio y compañías que patrocinen el estudio.

Si su hijo/a está en un estudio de cáncer que recibe financiación federal, el Instituto Nacional del Cáncer (NCI) ahora requiere que compartamos información identificable (como el distrito postal) sobre la participación de su hijo/a. Puede contactar al NCI si tiene preguntas sobre cómo se utiliza esta información.

No podemos hacer este estudio sin su autorización para utilizar y compartir información sobre su hijo/a. Usted no tiene la obligación de darnos esta autorización. Si no lo hace, entonces no participará en este estudio.

Utilizaremos y compartiremos información sobre su hijo/a únicamente como se ha descrito en este formulario y en nuestra notificación de prácticas de privacidad; aun así, las personas de fuera de Johns Hopkins que reciban la información de su hijo/a pueden no estar cubiertas por esta promesa o por la ley federal de privacidad. Nosotros intentamos asegurar que todo el mundo que necesita ver la información de su hijo/a la mantenga confidencial, pero no podemos garantizar que su información no será divulgada de nuevo.

El uso y divulgación de la información de su hijo/a no tiene límite de tiempo. Usted puede revocar (cancelar) su permiso para el uso y divulgación de la información de su hijo/a en

cualquier momento, notificando al Investigador Principal de este estudio por teléfono o por escrito. Si usted contacta al Investigador Principal por teléfono, la llamada debe también ir seguida de una petición por escrito que incluya su número de estudio y su información de contacto. El nombre, dirección, número de teléfono y de facsímil del Investigador Principal están en la página número 1 de este formulario de consentimiento informado.

Si usted decide cancelar su autorización de uso y divulgación de la información de su hijo/a, su participación en este estudio terminará y no se recogerá más información sobre su hijo/a. Su revocación (cancelación) no afectará la información que ya se haya recogido en el estudio, o información que ya se haya divulgado antes de que escribiera al Investigador Principal para cancelar su autorización.

12. ¿El estudio requerirá que cualquiera de sus otros trabajadores de la salud compartan información sobre la salud de su hijo/a con los investigadores de este estudio?

Como parte de este estudio, los investigadores pueden pedir ver la historia clínica de su hijo/a a sus trabajadores de la salud.

13. ¿Qué otras cosas debería usted saber sobre este estudio de investigación?

a. ¿Qué es la Junta de Revisión Institucional (IRB) y cómo le protege a usted? El IRB de Johns Hopkins Medicine está formado por:

- Doctores
- Enfermeras
- Especialistas en ética
- Personas no científicas
- Y personas de la comunidad local.

El IRB revisa estudios de investigación hechos con personas humanas, protege los derechos y el bienestar de la gente que toma parte en esos estudios. Usted puede contactar al IRB si tiene preguntas sobre los derechos de su hijo/a como participante o si piensa que usted o su hijo/a han sido tratados injustamente. El número de la oficina del IRB es 410-955-3008. Usted también puede llamar a este número por otras razones, preocupaciones o quejas sobre la investigación.

Cuando la junta de revisión institucional (IRB) de la escuela de Medicina de Johns Hopkins revisa un estudio en otro lugar, ese otro lugar (institución) es la única responsable de la conducta prudente del estudio y de seguir el protocolo aprobado por el IRB de Johns Hopkins IRB.

b. ¿Qué hacer si tiene preguntas sobre el estudio?
Llame a la Dra. Carolina Vidal al (410) 614- 8014 si tiene preguntas sobre el estudio. Si lo desea, puede contactar al Investigador Principal, la Dra. Carolina Vidal, por carta o facsímil. La dirección y el número de facsímil están en la página número uno de este formulario de autorización. Si no puede contactar con el investigador principal o desea hablar con otra persona, llame a la oficina del IRB al 410-955-3008.

c. ¿Qué pasa con los datos recogidos en el estudio?
Johns Hopkins y nuestros socios de investigación trabajaran para comprender y curar enfermedades. Los datos que usted aporta son importantes para este esfuerzo.

Si permite a su hijo/a participar en este estudio, debería entender que ni usted ni su hijo/a tendrán posesión de los datos de su hijo/a, y si los investigadores lo utilizan para crear un producto o idea nueva, ni usted ni su hijo/a se beneficiarán financieramente.

14. ¿Declaración de Consentimiento:
Este estudio de investigación ha sido explicado a mi **hijo/a en mi presencia en una lengua que mi hijo/a puede comprender.** Se le ha animado al él/ella a hacer preguntas sobre el estudio ahora o en cualquier momento en el futuro.

15. ¿Qué significa su firma en este formulario de autorización de consentimiento?
Su firma en este formulario significa que:

- Usted entiende la información que se le ha dado en este formulario.
- Usted acepta las estipulaciones en este formulario.
- Usted está de acuerdo con permitir que su hijo participe en el estudio. • Usted y su hijo no perderán ningún derecho legal por firmar este formulario de autorización.

LE DAREMOS UNA COPIA DE ESTE FORMULARIO DE AUTORIZACIÓN, FIRMADO Y CON FECHA

_____

Firma del padre/madre (Nombre en letra de molde) Fecha/Hora

_____

Firma de la Persona obteniendo el consentimiento informado (Nombre en letra de molde) Fecha/Hora

_____

Firma del Representante Legalmente Autorizado (LAR) Nombre en letra de molde) Fecha/Hora

Para el PARTICIPANTE MENOR DE EDAD

_____

Descripción de la autoridad de LAR bajo la ley estatal o ley local que se aplique para actuar como sustituto en la toma decisiones de salud para el participante de investigación menor de edad (por ejemplo, tutor legal, representante por orden judicial) Fecha/Hora

_____

Firma del Participante menor de edad (Opcional, excepto si se requiere por el IRB) (Nombre Imprimido) Fecha/Hora

NOTA: UNA COPIA DE ESTE FORMULARIO DE AUTORIZACIÓN FIRMADO Y FECHADO DEBE SER GUARDADO POR EL INVESTIGADOR PRINCIPAL; SE DEBE DAR UNA COPIA AL PARTICIPANTE; SI ESTÁ UTILIZANDO EPIC PARA ESTE ESTUDIO, UNA COPIA TIENE QUE ENVIARSE POR FACSÍMIL AL NÚMERO 410-367-7382; SI NO ESTÁ
UTILIZANDO EPIC, UNA COPIA DEBE PONERSE EN EL HISTORIAL CLÍNICO DEL PARTICIPANTE (A NO SER QUE NO EXISTA UN HISTORIAL CLÍNICO O NO VAYA A SER CREADO)

ÚNICAMENTE AQUELLOS FORMULARIOS DE AUTORIZACIÓN QUE INCLUYAN EL LOGOTIPO DE JOHNS HOPKINS MEDICINE PUEDEN UTILIZARSE PARA OBTENER CONSENTIMIENTO DE LOS PARTICIPANTES EN LA INVESTIGACIÓN.

Appendix VI: In-depth Interview Guide

(Example adapted from http://www.uwex.edu/ces/4h/evaluation/documents/m_e_tool_series_indepth_interviews.pdf)

I want to thank you for taking the time to meet with me today.

My name is _____ and I would like to talk to you about your experiences when you compare yourself to other people in your school, your neighborhood and the country. Specifically, we are trying to understand how to measure these experiences in order to guide future interventions.

The interview should take less than an hour. I will be taping the session because I don't want to miss any of your comments. Although I will be taking some notes during the session, I can't possibly write fast enough to get it all down. Because we're on tape, please be sure to speak up so that we don't miss your comments. All responses will be kept confidential. This means that your interview responses will only be shared with research team members and we will ensure that any information we include in our report does not identify you as the respondent. Remember, you don't have to talk about anything you don't want to and you may end the interview at any time.

Are there any questions about what I have just explained?

Are you willing to participate in this interview?

_____	_____	_____
Interviewee	**Witness**	**Date**

_____

Legal guardian (if interviewee is under 18)

QUESTIONS:

1. Explain what you consider to be your "community."
2. Describe your family, neighborhood and city.
3. List the things would you change about your environment (the way your residence/neighborhood/city looks, the things those places have or don't have)
4. If you could change one thing about how you are in relationship to other people in your school, neighborhood, city or country, what would you change?
5. Which opinion matters most to you, that of the people in your school or the people in your neighborhood?
6. Do you ever compare yourself to other people on social media sites (like Facebook, Instagram, tweeter), other media (people on TV, YouTube, celebrities)?
7. Have you or your family struggled financially to buy things you needed or wanted? List what types of things you needed or wanted. How did it impact you to not be able to buy those things?
8. When you compare your and your family's wealth to other people's, who do you compare yourself to the most? Please, explain why.
9. When you compare your and your family's wealth to that of other people around you, what sort of things do you pay attention to? Please list.
10. If you see yourself in a worse situation financially than other people around you, how does that make you feel?

Is there anything more you would like to add?

I will be analyzing the information you and others gave me and submitting a draft report to the organization in 6 months. I am happy to send you a copy at that time, if you are interested.

Thank you for your time.

Appendix VII: Spanish Version of the Focus Group Guide

GUÍA DE ENTREVISTA EN PROFUNDIDAD

(Ejemplo adaptado de http://www.uwex.edu/ces/4h/evaluation/documents/m_e_tool_series_indepth_interviews.pdf)

Quiero darte las gracias por tomarte el tiempo para entrevistarte conmigo hoy.

Me llamo _____ y me gustaría hablar contigo sobre tus experiencias cuando te comparas con otras personas en tu escuela, tu vecindario, y tu país. En particular, estamos intentando comprender cómo medir estas experiencias con el objetivo de guiar intervenciones futuras.

Esta entrevista debería durar menos de una hora. Grabaré la sesión porque no quiero perderme ninguno de tus comentarios. Aunque tomaré notas durante la sesión, no es posible para mí escribir suficientemente rápido para escribirlo todo. Dado que estaremos grabando, por favor habla lo suficientemente alto para que no me pierda tus comentarios. Todas las respuestas se mantendrán confidenciales. Esto quiere decir que tus respuestas durante la entrevista sólo se compartirán con los miembros del equipo de investigación y nos aseguraremos de que ninguna de la información que se incluya en nuestro informe te identifique como el que responde. Recuerda, no tienes que hablar sobre nada de lo que no quieras hablar y puedes terminar la entrevista en cualquier momento.

¿Tienes alguna pregunta sobre lo que acabo de explicar?

¿Estás de acuerdo con participar en la entrevista?

_____ _____ _____

Entrevistado Testigo Fecha

_____

Guardián legal (si el entrevistado tiene menos de 18 años)

PREGUNTAS:

1. Explica que es lo que tú consideras que es tu "comunidad."
2. Describe a tu familia, vecindario y ciudad.
3. Nombra las cosas que cambiarías en tu medio ambiente (la apariencia de tu lugar de residencia/vecindario/ciudad, las cosas que estos lugares tienen o no tienen)
4. Si pudieras cambiar una cosa sobre como tú eres en relación con otras personas en tu escuela, vecindario, ciudad o país, ¿qué cambiarías?
5. ¿Qué opinión te importa más, la de las personas en tu escuela o la de las personas que viven en tu barrio/vecindario?
6. ¿Alguna vez te comparas con otras personas en los medios sociales (como Facebook, Instagram, Tweeter), u otros medios (gente en la Televisión, YouTube, famosos)?
7. ¿Alguna vez tú o tu familia han tenido dificultades financieras para comprar cosas que necesitabas o querían? Nombra los tipos de cosas que necesitabas o querías. ¿Cómo te impactó el no ser capaz de comprar esas cosas?
8. Cuando comparas tu riqueza y la de tu familia con la riqueza de otras personas, ¿con quién te comparas más? Por favor, explica por qué.
9. Cuando comparas tu riqueza y la de tu familia con la riqueza de otras personas alrededor tuyo, ¿en qué cosas pones atención/te fijas? Por favor, nómbralas.
10. Si te ves en una situación financiera peor que la de las personas de tu alrededor, ¿cómo te sientes?

¿Hay alguna otra cosa más que te gustaría añadir?

Analizaré la información que tú y otras personas me hayan dado y enviaré un informe borrador a la organización en 6 meses. Si estás interesado/a, sería un placer para mí enviarte una copia en ese momento.

Gracias por tu tiempo.

Appendix VIII: The MacArthur Scale of Subjective Social Status – Youth version

1a. Imagine that this ladder pictures how American society is set up.

- At the top of the ladder are the people who are the best off--they have the most money, the highest amount of schooling, and the jobs that bring the most respect.
- At the bottom are people who are the worst off--they have the least money, little or no education, no job or jobs that no one wants or respects.

Now think about your family. Please tell us where you think your family would be on this ladder. **Fill in the circle that best represents where your family would be on this ladder.**

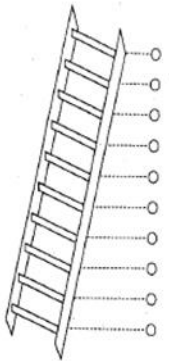
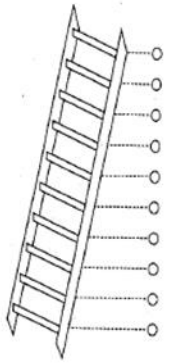


Fig 1. The MacArthur Scale of Subjective Social Status–Youth Version.

1b. Now assume that the ladder is a way of picturing your school.

- At the top of the ladder are the people in your school with the most respect, the highest grades, and the highest standing.
- At the bottom are the people who no one respects, no one wants to hang around with, and have the worst grades.

Where would you place yourself on this ladder? **Fill in the circle that best represents where you would be on this ladder.**



Appendix IX: Adaptation PICS Scale

ORIGINAL QUESTION	MODIFIED/ADAPTED QUESTION	RATIONAL FOR ADAPTATION
The following statements are aimed to identify your experiences during the first 16 years of your life in general. Please answer as honestly and accurately as possible by circling the appropriate response: In comparison to your school or neighborhood, how stable was your home environment (social and economic security)? 1. Unstable 2. Less Stable 3. The same 4. Slightly more stable 5. The most stable	**The following statements are aimed to identify your life experiences up until this point. Please answer as honestly and accurately as possible by circling the appropriate response:** In comparison to others in your community, how stable is your home environment (social and economic security)? 1. Unstable 2. Less Stable 3. The same 4. Slightly more stable 5. The most stable	The participants will be teens ages comprised between 12 and 18, therefore "the first 16 years of your life" would only apply to part of the sample. This is a double-barreled question, as the comparison of the home environment to the school may be different from that of the home to the neighborhood. The in-depth interviews will be used to learn more about whether the school or the neighborhood have a stronger impact on the teenagers in this cultural context. In the meantime, the term "community" will be used to enclose both neighborhood and school. This question and the following below will be changed to present tense as the participant will be reporting about current situations and not retrospectively.
In comparison to your school or neighborhood, the opportunities presented to you by your parents were (e.g. musical and cultural activities, activities and sports): 1. Very poor 2. Not as good 3. As good 4. Slightly better 5. The best	In comparison to others in your community, the opportunities presented to you by your parents are (e.g. musical and cultural activities, activities and sports): 1. Very poor 2. Not as good 3. As good 4. Slightly better 5. The best	See above.
In comparison to your school or neighborhood, the amount of time you spent with your parents was: 1. Far less 2. Less 3. The same 4. More 5. Significantly more	In comparison to others in your community, the amount of time you spent with your parents is: 1. Far less 2. Less 3. The same 4. More 5. Significantly more	See above.
In comparison to your school or neighborhood, your parents' involvement in your education was: 1. Far less 2. Less 3. The same 4. More 5. Significantly more	In comparison to others in your community, your parents' involvement in your education is: 1. Far less 2. Less 3. The same 4. More 5. Significantly more	

ORIGINAL QUESTION	MODIFIED/ADAPTED QUESTION	RATIONAL FOR ADAPTATION
In comparison to your school or neighborhood, the amount of time you spent with your extended family and family friends was: 1. More 2. Significantly more 3. Far less 4. Less 5. The same	In comparison to others in your community, the amount of time you spent with your extended family and family friends is: 1. More 2. Significantly more 3. Far less 4. Less 5. The same	See above.
In comparison to your school or neighborhood, how would you rate your holidays: 1. I very rarely or never went on holidays as a child 2. My holidays seemed not as good as those of other children in my neighborhood. 3. My holidays seemed as good as those of other children in my neighborhood. 4. My holidays seemed slightly better than those of other children in my neighborhood. 5. My holidays seemed the best in comparison to other children in my neighborhood.	In comparison to others in your community, how would you rate your vacations? 1. I very rarely or never go on vacations 2. My vacations seem not as good as those of other children in my community. 3. My vacations seem as good as those of other children in my community. 4. My holidays seem slightly better than those of other children in my neighborhood. 5. My holidays seem the best in comparison to other children in my neighborhood.	See above. Additionally, in American English, “vacations” is the term used for the British “Holidays”
Compared to others in your school and neighborhood, as a whole, did you feel that your family was: 1. Well below average wealth 2. Below average in wealth 3. Of average wealth 4. Above average in wealth 5. Well above average in wealth	Compared to others in your community, as a whole, do you feel that your family is: 1. Well below average wealth 2. Below average in wealth 3. Of average wealth 4. Above average in wealth 5. Well above average in wealth	See above.
In comparison to other children in your school and neighborhood, the birthday and Christmas presents you received were: 1. I got very few birthday and Christmas presents 2. Not as good 3. As good 4. Slightly better 5. The best	In comparison to other children in your community, the birthday presents you receive are: 1. I get very few birthday presents 2. Not as good 3. As good 4. Slightly better 5. The best	Due to the diversity of religions in American communities, the “Christmas presents” part of the question is omitted. The rest is as above.
In comparison to other children in your school and neighborhood, the cars owned by your family were: 1. We never owned cars 2. Not as good 3. As good 4. Slightly better 5. The best	In comparison to other children in your community, the cars owned by your family are: 1. We never owned cars 2. Not as good 3. As good 4. Slightly better 5. The best	See above.

ORIGINAL QUESTION	MODIFIED/ADAPTED QUESTION	RATIONAL FOR ADAPTATION
In comparison to other children in your school and neighborhood, the houses you lived in were: 1. Very poor 2. Not as good 3. As good 4. Slightly better 5. The best	In comparison to other children in your community, the houses you live in are: 1. Very poor 2. Not as good 3. As good 4. Slightly better 5. The best	See above.
In comparison to other children in your school and neighborhood, the clothes you wore to school were: 1. Second hand 2. Hand me downs 3. The same 4. Slightly better 5. The latest fashion	In comparison to other children in your in your community, the clothes you wear to school are: 1. Very poor 2. Not as good 3. As good 4. Slightly better 5. The best	See above. Additionally, the answer options in this question are changed as suggested by the author of the survey (Dr. Wickham).
The next questions are similar to those which you have just answered, but concern how you saw yourself, as a child, in comparison to the wider society. In comparison with other families in the country, how would you rate your holidays? 1. I very rarely or never went on holidays as a child. 2. My holidays seemed not as good as those of other children. 3. My holidays seemed as good as those of other children. 4. My holidays seemed slightly better than those of other children. 5. My holidays seemed the best in comparison to other children.	**The next questions are similar to those which you have just answered, but concern how you see yourself, as a child, in comparison to the wider society.** In comparison with other families in the country, how would you rate your vacations? 1. I very rarely or never go on vacations. 2. My vacations seem not as good as those of other children. 3. My vacations seem as good as those of other children. 4. My vacations seem slightly better than those of other children. 5. My vacations seem the best in comparison to other children.	See above the rationale for changing the verb tense.
In comparison with other families in the country, as a whole, did you feel that your family was: 1. Well below average in wealth 2. Below average in wealth 3. Of average wealth 4. Above average wealth 5. Well above average wealth	In comparison with other families in the country, as a whole, do you feel that your family is: 1. Well below average in wealth 2. Below average in wealth 3. Of average wealth 4. Above average wealth 5. Well above average wealth	See above

ORIGINAL QUESTION	MODIFIED/ADAPTED QUESTION	RATIONAL FOR ADAPTATION
In comparison with other families in the country, the birthday and Christmas presents you received were: 1. I got very few birthday and Christmas presents 2. Not a good 3. As good 4. Slightly better 5. The best	In comparison with other families in the country, the birthday presents you receive are: 1. I get very few birthday presents 2. Not a good 3. As good 4. Slightly better 5. The best	See above.
In comparison with other families in the country, the cars owned by your family were: 1. We never owned cars 2. Not as good 3. As good 4. Slightly better 5. The best	In comparison with other families in the country, the cars owned by your family are: 1. We never owned cars 2. Not as good 3. As good 4. Slightly better 5. The best	See above.
In comparison with other families in the country, the houses you lived in were: 1. Very poor 2. Not as good 3. As good 4. Slightly better 5. The best	In comparison with other families in the country, the houses you have lived in are: 1. Very poor 2. Not as good 3. As good 4. Slightly better 5. The best	See above.
In comparison with other families in the country, the clothes you wore to school were: 1. Second hand 2. Hand me downs 3. The same 4. Slightly better 5. The latest fashion	In comparison with other families in the country, the clothes you wear to school are: 1. Very poor 2. Not as good 3. As good 4. Slightly better 5. The best	See above.

Appendix X: English version of the PICS-modified questionnaire

The following statements are aimed to identify your life experiences up until this point. Please answer as honestly and accurately as possible by circling the appropriate response:

In comparison to others in your community, how stable is your home environment (social and economic security)?
1. Unstable
2. Less Stable
3. The same
4. Slightly more stable
5. The most stable

In comparison to others in your community, the opportunities presented to you by your parents are (e.g. musical and cultural activities, activities and sports):
1. Very poor
2. Not as good
3. As good
4. Slightly better
5. The best

In comparison to others in your community, the amount of time you spent with your parents is:
1. Far less
2. Less
3. The same
4. More
5. Significantly more

In comparison to others in your community, your parents' involvement in your education is:
1. Far less
2. Less
3. The same
4. More
5. Significantly more

In comparison to others in your community, the amount of time you spent with your extended family and family friends is:
1. More
2. Significantly more
3. Far less
4. Less
5. The same

In comparison to others in your community, how would you rate your vacations?
1. I very rarely or never go on vacations
2. My vacations seem not as good as those of other children in my community.
3. My vacations seem as good as those of other children in my community.
4. My vacations seem slightly better than those of other children in my neighborhood.
5. My vacations seem the best in comparison to other children in my neighborhood.

Compared to others in your community, as a whole, do you feel that your family is:
1. Well below average wealth
2. Below average in wealth
3. Of average wealth
4. Above average in wealth
5. Well above average in wealth

In comparison to other children in your community, the birthday presents you receive are:
1. I get very few birthday presents
2. Not as good
3. As good
4. Slightly better
5. The best

In comparison to other children in your community, the cars owned by your family are:
1. We never owned cars
2. Not as good
3. As good
4. Slightly better
5. The best

In comparison to other children in your community, the houses you live in are:
1. Very poor
2. Not as good
3. As good
4. Slightly better
5. The best

In comparison to other children in your community, the clothes you wear to school are:
1. Very poor
2. Not as good
3. As good
4. Slightly better
5. The best

The next questions are similar to those which you have just answered, but concern how you see yourself, as a child, in comparison to the wider society.

In comparison with other families in the country, how would you rate your vacations?
1. I very rarely or never go on vacations.
2. My vacations seem not as good as those of other children.
3. My vacations seem as good as those of other children.
4. My vacations seem slightly better than those of other children.
5. My vacations seem the best in comparison to other children.

In comparison with other families in the country, as a whole, do you feel that your family is:
1. Well below average in wealth
2. Below average in wealth
3. Of average wealth
4. Above average wealth
5. Well above average wealth

In comparison with other families in the country, the birthday presents you receive are:
1. I get very few birthday presents
2. Not as good
3. As good
4. Slightly better
5. The best

In comparison with other families in the country, the cars owned by your family are:
1. We never owned cars
2. Not as good
3. As good
4. Slightly better
5. The best

In comparison with other families in the country, the houses you have lived in are:
1. Very poor
2. Not as good
3. As good
4. Slightly better
5. The best

In comparison with other families in the country, the clothes you wear to school are:
1. Very poor
2. Not as good
3. As good
4. Slightly better
5. The best

Appendix XI: Spanish Version of the PICS – Modified

PICS- VERSIÓN MODIFICADA/ADAPTADA

Las siguientes declaraciones tienen el objetivo de identificar tus experiencias vitales hasta este momento. Por favor, responde lo más honestamente y exactamente posible que puedas haciendo un círculo en la respuesta apropiada.

Comparado con otras personas en tu comunidad, ¿cuán estable es el ambiente en tu hogar (seguridad social y económica)?
1. Inestable
2. Menos estable
3. Igual
4. Un poco más estable
5. El más estable

Comparado con otras personas en tu comunidad, las oportunidades que te presentan tus padres son (por ejemplo: actividades musicales y culturales, actividades, y deportes):
6. Muy escasas
7. No tan buenas
8. Igual de buenas
9. Un poco mejor
10. Las mejores

Comparado con otras personas en tu comunidad, la cantidad de tiempo que pasas con tus padres es:
1. Mucho menor
2. Menor
3. La misma
4. Mayor
5. Considerablemente mayor

Comparado con otras personas en tu comunidad, la participación de tus padres en tu educación es:
1. Mucho menor
2. Menor
3. La misma
4. Mayor
5. Considerablemente mayor

Comparado con otras personas en tu comunidad, la cantidad de tiempo que pasas con tu familia extendida y amigos de tu familia es:
1. Mayor
2. Considerablemente mayor
3. Mucho menor
4. Menor
5. La misma

Comparado con otras personas en tu comunidad, ¿cómo evaluarías tus vacaciones?
1. Casi nunca o nunca voy de vacaciones
2. Mis vacaciones parecen no tan buenas como las de otros niños/as en mi comunidad.
3. Mis vacaciones parecen tan buenas como las de otros niños/as en mi comunidad.
4. Mis vacaciones parecen un poco mejores que las de otros niños/as en mi vecindario/barrio.
5. Mis vacaciones parecen las mejores en comparación con otros niños/as en mi vecindario/barrio.

Comparado con otras personas en tu comunidad, en general, tú sientes que tu familia es:
1. De riqueza muy por debajo de la media
2. De riqueza por debajo de la media
3. De riqueza en la media
4. De riqueza por encima de la media
5. De riqueza muy por encima de la media

Comparado con otras personas en tu comunidad, los regalos de cumpleaños que recibes son:
1. Recibo muy pocos regalos de cumpleaños
2. No tan buenos
3. Igual de buenos
4. Un poco mejores
5. Los mejores

Comparado con otras personas en tu comunidad, los coches/carros que tu familia tiene son:
1. Nunca hemos tenido carros/coches
2. No tan buenos
3. Igual de buenos
4. Un poco mejores
5. Los mejores

Comparado con otras personas en tu comunidad, las casas en las que vives son:
1. Muy pobres
2. No tan buenas
3. Igual de buenas
4. Un poco mejores
5. Las mejores

Comparado con otras personas en tu comunidad, la ropa que llevas al colegio es:
1. Muy pobre
2. No tan buena
3. Igual de buena
4. Un poco mejor
5. La mejor

Las siguientes preguntas son similares a las que acabas de responder, pero se refieren a cómo te ves a ti mismo/a, como niño/a o joven, en comparación con el resto de la sociedad.

Comparado con otras familias en el país, ¿cómo evaluarías tus vacaciones?
1. Casi nunca o nunca voy de vacaciones.
2. Mis vacaciones no parecen tan buenas como las de otros niños/as.
3. Mis vacaciones parecen tan buenas como las de otros niños/as.
4. Mis vacaciones parecen un poco mejores que las de otros niños/as.
5. Mis vacaciones son las mejores en comparación con las de otros niños/as.

Comparado con otras familias en el país, en general, sientes que es tu familia es:
1. Muy por debajo de la media en riqueza.
2. Por debajo de la media en riqueza
3. De riqueza media
4. Por encima de la media en riqueza
5. Muy por encima de la media en riqueza

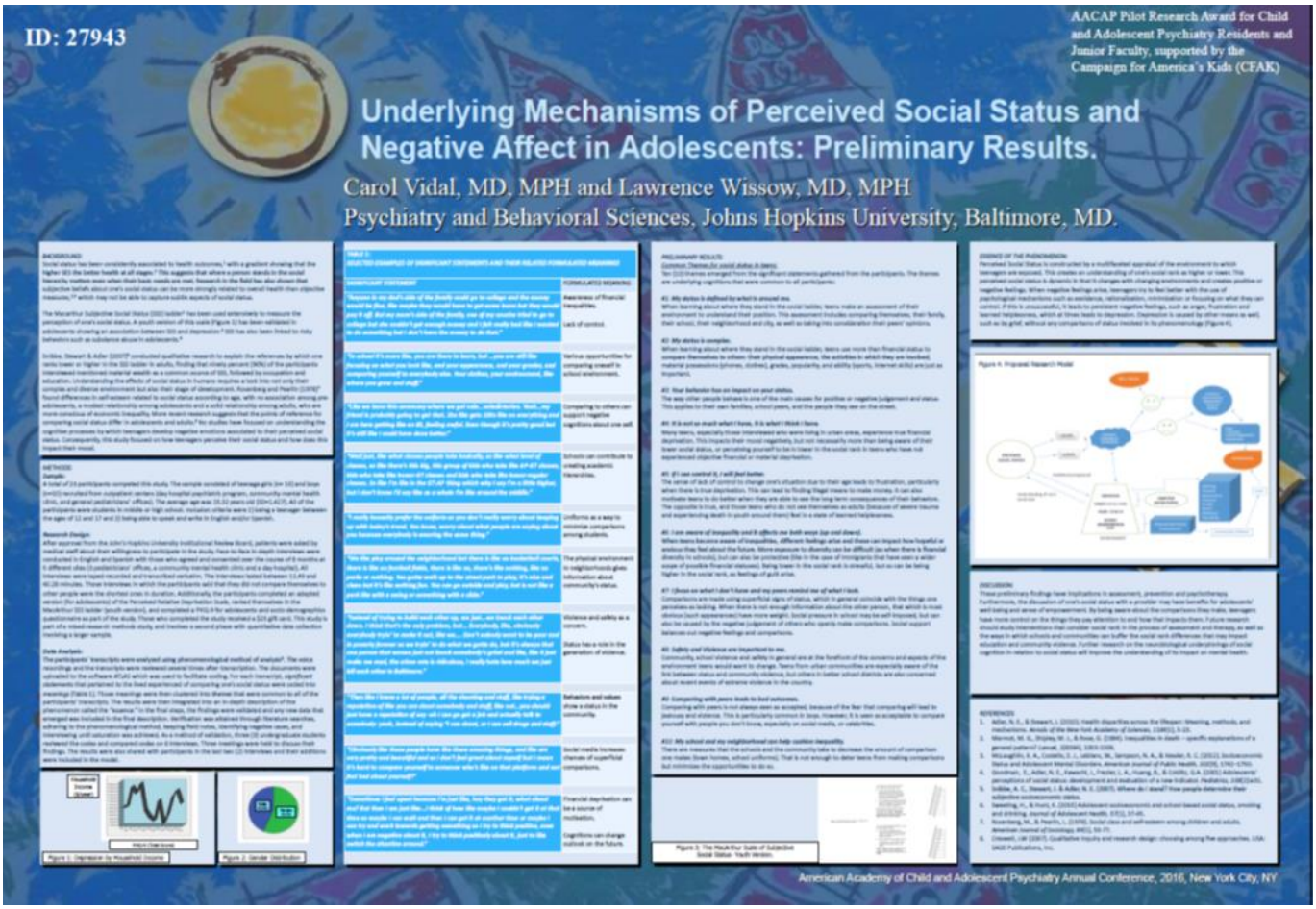
Comparado con otras familias en el país, los regalos de cumpleaños de recibes son:
1. Yo recibo muy pocos regalos de cumpleaños.
2. No tan buenos
3. Igual de buenos
4. Un poco mejor
5. Los mejores

Comparado con otras familias en el país, los carros/coches que mi familia tiene son:
1. Nunca hemos tenido carros/coches
2. No tan buenos
3. Igual de buenos
4. Un poco mejor
5. Los mejores

Comparado con otras familias en el país, las casas en las que has vivido son:
1. Muy pobres
2. No tan buenas
3. Igual de buenas
4. Un poco mejor
5. Las mejores

Comparado con otras familias en el país, la ropa que llevas al colegio/escuela es:
1. Muy pobre
2. No tan buena
3. Igual de buena
4. Un poco mejor
5. La mejor

Appendix XII: Poster presented at the AACAP Conference.



Appendix XIII: Proposed working model for future research.