

THE IMPACT OF PERCEIVED PROCEDURAL JUSTICE ON HEALTH, HIV RISK
BEHAVIORS, SUBSTANCE USE, AND OFFENDING IN JUVENILE OFFENDERS

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ABSTRACT

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Research into the impact of perceived discrimination and health has shown that it is related to poorer health status and health behaviors compared to those who perceive less discrimination. Perceived procedural injustice, however, may also have implications for health and health behaviors. Due to the evidence on perceived discrimination and its impact health and health-related behaviors, it is suggested that perceived procedural injustice—a concept similar to perceived discrimination—will have a similar impact on health through similar mechanisms (which include health-related behaviors and a stress response). The current study seeks to examine whether perceived procedural justice is related to poor health via psychological distress, substance use, HIV risk behaviors, or offending using archival data from the Pathways to Desistance Study. The Pathways to Desistance Study was a longitudinal study, which collected data from November of 2000 through March of 2010, from adjudicated youth from Phoenix, Arizona and Philadelphia, Pennsylvania. Results indicated a significant positive association between perceived procedural justice change scores and psychological distress change scores, in the opposite direction as hypothesized. No significant associations between psychological distress and offending, HIV risk behaviors, substance use, and self-reported health occurred. However, significant negative associations occurred between perceived procedural justice and substance use, as well as perceived procedural justice and offending, although no significant associations occurred between perceived procedural justice change scores and

health or HIV risk behaviors. Significant, positive associations occurred between offending, substance use, and HIV risk behaviors, as expected. Overall, results of the study were inconsistent with prior research examining the relationship between perceived discrimination and health. Possible explanations of contrary and unexpected results are discussed, along with limitations of the study.

CHAPTER ONE: INTRODUCTION

In the past decade, psychologists have become increasingly aware of the many physical and psychological impacts of discrimination (Pascoe & Richman, 2009). Some of these consequences include depression, anxiety, hypertension, obesity, lower perceived quality of life, poorer general health, and an increased likelihood of substance use. The primary mechanisms in which perceived discrimination has been shown to impact health is through an overly activated stress response (which is invoked by negative emotions) and through health behaviors (Pascoe & Richman, 2009). To a much lesser degree, there has been some research into the negative outcomes of other types of unfair treatment, such as perceived procedural injustice. Perceived procedural injustice is the perception of unfairness during procedural processes or interactions with specific institutions and authorities, such as the criminal justice system (Dion, Dion, & Pak, 1992; Tyler, 1989), while discrimination is the belief one has been treated unfairly during every day experiences. The literature has focused on how perceived procedural injustice may be linked with offending, with little discussion of the health implications of perceived procedural injustice. However, it seems likely that perceived procedural injustice would impact individual's health and behavior, similar to the way in which perceived discrimination does, given the high overlap in the constructs. In fact, perceived procedural injustice may be viewed simply as a specific type of perceived discrimination.

Early on in the research of justice, the primary understanding of the way people evaluate fairness was through particular outcomes. Essentially, people were thought to believe a particular interaction with an authority or institution was fair if they received the outcome or decision they

had wanted, or felt was deserved (Cook & Hegtvedt, 1983). For example, if a person was convicted of a crime, and they received a sentence which was worse than what they believed they deserved, they would evaluate the judge as unfair or unjust. However, more recent research has identified other variables which account for perceptions of fairness. In particular, procedural justice—fairness in procedures or processes—has received significant attention in more recent years (Tyler & Lind, 1988). Thibaut & Walker (1975) suggested that people care about having control over procedures or decisions (Tyler, 1994). The underlying assumption was that they care about having this control because of the way it influences outcomes. If people had little control or influence in the decision-making processes, they were more likely to judge those processes as unfair, compared to if they had a significant amount of control over the decision making processes. Tyler & Lind (1988) proposed that, although people do care about decisions and the amount of control they have in those decisions, they also care about procedures because it gives them information about their social identity in a group. Specifically, people want to know that they are a valued and respected member of the group they are engaging in a procedure with. If they feel that they are treated in unbiased manner, that the authority is trustworthy, and that authorities treat them as a valued member of the group, then they are more likely to believe that the processes of decisions are fair and, consequently, they are more likely to comply with group regulations (Tyler & Lind, 1988).

Of interest to the present study is whether or not perceived procedural injustice, or unfair treatment during procedures with institutions or authorities, can impact individuals' health via negative emotions, poor health behaviors, and offending. It is believed that perceived procedural injustice will impact poor health through these mechanisms because: (1) research has shown that perceived discrimination—a concept similar to perceived procedural injustice—influences

objective measures of health (i.e., hypertension, blood pressure) and health behaviors, (2) perceived discrimination and perceived procedural injustice have been linked to negative emotions, and (3) perceived procedural injustice is associated with offending (Gottfredson, Kearley, Najaka, & Rocha, 2007; Pascoe & Richman, 2009; Paternoster, Brame, Bachman, & Sherman, 1997; Wales, Hiday, & Ray, 2007). Specifically, it is believed that perceived procedural injustice will invoke negative emotions and psychological distress, which will cause poor health-related behaviors and criminal behavior (Tyler, 1994). In turn, psychological distress, health-related behaviors (i.e., risky sexual behavior, substance), and offending will then contribute to poorer self-reported health. These hypotheses will be tested using data from the Pathways to Desistance study, a longitudinal data set of young adjudicated offenders. This research is important given that juvenile offenders are at risk for many adverse outcomes, and it is important to understand how perceived procedural injustice can contribute to these outcomes. If perceived procedural injustice does, in fact, influence health (via psychological distress and health behaviors), and offending, it is hoped that findings of this study will bring attention to an understudied, but important contributor to offending and poorer health outcomes in young offenders so that strategies for reducing perceptions of perceived procedural injustice may be considered and examined within the context of the criminal justice system.

CHAPTER TWO: LITERATURE REVIEW

In recent decades there has been a convergence of evidence showing that discrimination is linked to many negative outcomes (Pascoe & Richman, 2009; Schmitt, Branscombe, Postmes, & Garcia, 2014). Pascoe and Richman (2009) summarized the findings of both experimental and correlational research examining the impact of discrimination on physical health and found that perceived discrimination is related to poorer physical health outcomes (i.e. cardiovascular disease, higher systolic and diastolic blood pressure throughout the day, coronary heart disease, hypertension, and a vulnerability to other physical illnesses) through a stress response. This is true even after controlling for other possibly influential variables, such as age, gender, race, socioeconomic status, education, income, marital status, and employment. Other research has shown that perceived discrimination can influence other behaviors, including criminal behavior and poor health behaviors, such as substance use (Gibbons, Gerrard, Cleveland, Wills, & Brody, 2004; Martin et al, 2011; Mays & Cochran, 2001; Tran, Lee, & Burgess, 2010). For instance, individuals experiencing discrimination may use substances or engage in risky behaviors as a coping mechanism (Gibbons et al, 2012; Pascoe & Richman, 2009).

While a significant body of research has emerged examining the impact on these outcomes (health, substance use, and offending) via perceived discrimination in general, little research has examined the impact of perceived procedural injustice on these various outcomes. Perceived discrimination is the belief one has been treated unfairly during every day experiences, while perceived procedural injustice is the perception of unfairness during procedural processes or interactions with institutions and authorities, such as the criminal justice system (Dion, Dion,

& Pak, 1992; Tyler, 1989). Thus, clearly there is overlap between these two constructs, but, perceptions of procedural injustice can be conceptualized as a specific type of perceived discrimination. As such, it is likely that there would be similar outcomes in terms of producing offending, poorer health, and substance use in individuals perceiving procedural injustice, as have been observed in studies examining the link between perceiving discrimination and these outcomes.

Defining Procedural Justice

Early justice models focused solely on the outcomes of procedures (Tyler & Lind, 1988), and whether the outcome was perceived as fair. In accordance with outcome based models, if an individual received what they thought they deserved, they were expected to evaluate a particular institution or authority as just. A prominent theory of this type at the time was equity theory, which assumed that people's main concern was whether people received rewards and punishment commensurate with their effort or input (Cook & Hegtvedt, 1983). Equity theory referred mostly to the fair exchange of resources (Cook & Hegtvedt, 1983). Eckhoff (1975) made distinctions between situations in which people were evaluating fairness of exchanges, and those situations in which they were evaluating the fairness of distributions; the latter of which is referred to as procedural justice (Cook & Hegtvedt, 1983). Both equity theory and distributive justice focus solely on outcome based evaluations. It eventually became apparent that these models were not enough to completely account for people's evaluations of justice.

More recent models of justice have primarily focused on the fairness of procedures in evaluations of fairness, rather than the perceived fairness of outcomes (Cook & Hegtvedt, 1983). This is known as procedural justice, or the fairness of a procedure. Procedural justice is critically important in interactions with institutions or authorities (Tyler, 1989). There are three potential

factors that can influence individuals' perceptions of procedural justice: (1) whether the outcome is viewed as fair and just (based upon one's expectation of outcomes and one's own investment of resources), (2) a person's control or input into the processes, and (3) individuals' relational concerns, such as do they view the decision maker as neutral and trustworthy (Tyler, 1992; Tyler, 1994). The first factor is grounded in resource based models. Specifically, resource based models suggest that individuals' decisions on whether a process is fair is often based upon their evaluations of the outcome relative to how much effort or investment they had in a situation. This is grounded in the literature of distributive justice and social exchange theory, where individuals try to maximize their rewards in social interactions with others and minimize their costs (Tyler, 1994). Similarly, individuals' perceptions of fairness in outcomes can be influenced by their assessment of whether individuals in a similar situation received the same outcome (Tyler & Lind, 1992).

The second factor influencing perceptions of fairness is explained in Thibaut and Walker's control model of procedural justice. The control model proposed that people care about having control over procedures and decisions (Thibaut & Walker, 1975; Tyler, 1989). According to this model, the primary motive for people caring about process control is to gain a favorable outcome (Tyler, 1989). More Specifically, Thibaut & Walker (1975) suggested that people want to have control over two separate processes within the procedure: decision control and process control. Process control is wanting to have control over the presentation of evidence, while decision control refers to having control over the decisions being made (Tyler, 1989). For example, Lind, Kanfer, and Earley (1990) found that in a sample of undergraduates, when participants were able to voice their opinions before or after a decision, they felt more control over a decision, in addition to procedural and outcome fairness, than the group who was unable

to state their concerns. This finding supports the notion that people care about having some control over procedures, and this influences perceptions of procedural justice.

The third set of components that can influence perceptions of procedural injustice are relational concerns, such as individuals' perceptions of the decision makers' trustworthiness and one's social standing relative to decision makers. These ideas are encapsulated by the group-value model of procedural justice (Tyler, 1994; Tyler & Lind, 1992). People view fair procedures as more enduring aspects of a group than fair outcomes, and these procedures become symbolic of group values (Tyler & Lind, 1992). As a result, they evaluate procedural justice based upon several variables unrelated to control over procedural processes or outcomes. These three variables include: (1) whether or not the authority is neutral and unbiased, and treats the individual in a neutral and unbiased manner (neutrality); (2) their trust in an institution or authority (what they believe the intentions of the authority are); and (3) evidence about social standing (Tyler, 1989). Evidence about social standing involves whether or not people are being treated in a polite and respectful manner, which then allows people to evaluate their social standing within a group (Tyler, 1989). People care about standing, neutrality, and trust according to the group value model, specifically because they care about their social status and social standing within a group, as well as their relationship to authorities in the group. This is because this gives them information about their social identity (Tyler & Blader, 2003). The underlying principle of the group value model, then, is that people value their group memberships, and identification with groups is rewarding (Tyler, 1989; Lind & Tyler, 1988). If people perceive that decision makers are not neutral, are not trustworthy, and do not value the person's standing in a group, then an individual is more likely to perceive the processes are unfair or biased, and in turn individuals will experience stress and not comply with group rules.

There is evidence to support the notion that relational concerns impact our perceptions of fairness in processes and how we view decision makers. Tyler (1989) found that neutrality, standing, and trust explained a significant portion (22%) of the variance in people's perceptions of procedural justice, which was independent of the outcomes of the procedure or whether they had control in the decision making process. It is important to note that they also found people cared about process control even when they knew it did not influence a decision, which is inconsistent with the control model. Tyler's extensive work in this area has shown that these relational concerns are important in evaluating procedural fairness, but they also influence how people view outcomes of procedures. For example, Tyler (1994) tested whether control, resource, or relational variables (neutrality, standing, and trust) were related to procedural justice and found that relational concerns impacted both the perceptions of the fairness of outcomes, as well as the perceptions of fairness of procedures in both a work and a legal setting. Tyler (1994) found, in both studies, that procedural justice evaluations were influenced by neutrality, trust, and standing, and only concern over group status shaped these motivations. Importantly, these factors have been found to influence procedural justice judgements cross-culturally (Lind, Tyler, & Huo, 1997).

Over the years, Tyler has identified outcomes of procedural justice in accordance with the group-value model. On the basis past research, Tyler and Lind (1992) proposed that people's perceptions of procedural fairness, based upon judgements of relational concerns, go on to influence people's perception of the legitimacy of authorities. People's legitimacy of authorities then will influence people's compliance with authorities (Tyler & Lind, 1992). When people feel respected and treated fairly (experience procedural justice) they experience pride and respect in the group they are a part of, and respect authorities they are involved with, which leads them

to participate in group oriented behaviors (Tyler, Degoey, & Smith, 1996). Tyler, Degoey, and Smith (1996) tested this hypothesis with various populations and authority-types, and found that relational aspects of procedural justice (fairness, trust, and standing) tended to be more strongly related to their attitudes and behaviors than did evaluations regarding whether they received fair outcomes; thus how they perceived decision makers mattered more than the outcomes of the decisions. Also, neutrality, trust, and standing were found to be related to feelings about pride in group membership and perceived respect within groups. These evaluations, in turn, influence self-esteem, via informing them of their social standing in a group, influence group pride, and can influence behavior. This suggests when evaluations are unfair, it communicates that an individual is not a valued group member, and that they should not feel pride in their group membership (Clay-Warner, 2001; Tyler, Degoey, & Smith, 1996). Tyler and Blader (2003) expanded the group value model later to incorporate their findings on the outcomes of procedural justice. This macro-level social psychological perspective is referred to as the group engagement model, and it succinctly summarized how procedural justice influences identification with the group, via procedural justice which impacts feelings of pride and respect in the group (and then ultimately identification) (Tyler & Blader, 2003). This identification leads to the incorporation of one's identity and self-worth with that of the group, which then leads to group-oriented behaviors (Tyler & Blader, 2003).

Upon reviewing the past research and conceptualizations of procedural justice by Tyler and his colleagues we can form an understanding of what perceived procedural injustice involves. Procedural injustice implies that an authority or institution is perceived as biased, untrustworthy, disrespectful or impolite, and thus the processes in which they are involved in will be perceived as unfair (Tyler & Lind, 1992). Additionally, whether or not individuals have

control over decisions being made, or are able to influence procedures, also influences perceptions of procedural justice (Tyler, 1994). When an individual is treated in a procedurally unjust way, it infers that they have low social standing in the group (Tyler, 1994; Tyler, 1997; Tyler & Lind, 1992). For example, if a police officer pulled over an individual for speeding and is rude to the individual, treats them in a biased manner, appears untrustworthy, or does not let the individual explain why they were speeding, they would be perceived as procedurally unjust. This would then cause the individual to feel that they are not a valued member of the community in which the police officer serves (Gau & Brunson, 2015; Tyler, 1997). This infers that experiencing procedural injustice, when an individual does identify with the larger group in which the criminal justice system represents, poses a threat to the individual's self-concept or social identity (Tyler & Lind, 1988). Both of these consequences—being denoted as lower status and a loss of self-concept or identity—may lead to youths engaging in risky behaviors, such as criminal behavior, either in defiance to procedural injustice, as a means of coping with it, or as a method of seeking out a new/alternative identity.

Perceived Procedural Injustice and Offending

Many studies have demonstrated that people's perceptions of fairness of their treatment can have an impact on their future behavior, and that these perceptions of fairness can have long-lasting effects on people's offending. For example, one study of male domestic assault offenders found that those who were arrested and perceived high levels of procedural injustice were .131 times more likely to reoffend within a 12-month period compared to arrested suspects who perceived no procedural injustice, using a prediction model (Paternoster et al., 1997). Additionally, evidence has shown that participating in mental health courts often results in heightened attitudes of procedural justice, because defendants are explicitly treated with dignity

and respect, criminal justice actors are open and forthcoming about the processes by which they make decisions, and the courts recognize the responsibility of both the participant and the provider in proceedings (Wales, Hiday, & Ray, 2007). Importantly, participation in these mental health or diversion courts often leads to reductions in recidivism (Wales et al., 2007). Another study by Gottfredson, Kearley, Najaka, & Rocha (2007) found that offenders participating in drug treatment courts (DTCs) in Baltimore, Maryland had lower levels of recidivism because the DTC increased offenders' perceptions of procedural justice. A more recent study conducted with young offenders on probation found procedural justice to be related to recidivism 3 months and 6 months later, even after controlling for other variables related to offending. Specifically, results indicated that perceptions of procedural justice was related to total reported offending, violent offending, and income offending at a 3 month follow-up, but not at the 6 month follow-up (Penner, Viljoen, Douglas, & Roasch, 2014).

One reason that perceiving procedural injustice may be linked to recidivism is because procedural justice has been shown to be linked to people's perceptions of legitimacy of law enforcement and the criminal justice system (Sunshine & Tyler, 2003). This is crucial, as legitimacy predicts whether or not people will view law enforcement as an authority that should be obeyed, respected, and to be deferred to. Sunshine and Tyler (2003) examined the relative contribution of procedural justice, risk of being caught, performance of the police in fighting crime, and the fairness of the distribution of police services both before and after the events of September 11, 2001, using a sample of New York registered voters on legitimacy. They found that the most significant predictor of police legitimacy was procedural fairness prior to 9/11 and post-9/11. Importantly, across races, procedural justice remained the most significant predictor of police legitimacy. This is crucial, given that it is suggested that people will be more likely

cooperate with police, to assist police in their efforts, and will be more likely to empower the police if they feel law enforcement is legitimate, and law enforcement will be viewed as legitimate when they are perceived as being procedurally just (Sunshine & Tyler, 2003). Additionally, procedural justice has been shown to be important for people at different stages of the criminal justice system. For example, Casper, Tyler, and Fisher (1988) examined the most important factors influencing treatment satisfaction in a sample of 411 individuals being tried for felonies in Baltimore, Maryland and found that perceptions of fairness were important to determining treatment satisfaction for both convicted offenders ($\beta = .40, p < .001$) as well as incarcerated offenders ($\beta = .45, p < .005$). Thus, it is suggested by this literature that people's judgments of procedural justice could influence future or current offending behaviors as a result of legitimacy (perceived procedural injustice \rightarrow decreased legitimacy \rightarrow increased offending), and that this process may occur regardless of the severity of the offending.

An alternative explanation, is that negative emotions account for the relationship between perception of procedural injustice and offending (perceived procedural injustice \rightarrow increased negative emotions \rightarrow increased offending) (Bernard, 1990; Martin et al., 2011; Sherman, 1993). General strain theory posits that unfair (or negative) treatment can cause anger, frustration, and resentment (Agnew, 2001; Martin et al., 2011). These negative emotions could then result in a need for revenge, which motivates criminal behaviors. Similarly, angry aggression theory posits that anger, in combination with a situation where people cannot retaliate to the source of the anger (or the instigator), could cause offending behavior as they transfer this anger into more immediate targets (Bernard, 1990). Finally, unjust treatment may lead people to want to re-assert their independence and individuality through crime (Martin et al., 2011; Sherman, 1993). These explanations can also be applied to Lind & Tyler (1988) group value model. If an individuals'

group identity is threatened, via perceived procedural injustice, and they experience negative emotions as a result, they may cope with these negative emotions via offending.

Perceived Procedural Injustice, Health Behaviors, and Health

Previous literature has shown that perceived discrimination can cause poorer health in those that experience injustice via both an increase in poorer health behaviors (i.e., risky sexual or drug using behavior) and a stress response (Pascoe & Richman, 2009). Given that perceived procedural injustice and perceived discrimination share similarities, in that they both involve evaluations about fair treatment, it seems likely that people might experience similar adverse health effects via perceptions of procedural injustice. Despite the similarities in conceptualization between perceived procedural injustice and discrimination, research investigating the relationship between perceived procedural injustice and health, specifically in the criminal justice system, is lacking.

While there is little to no investigation of the effects of perceptions of procedural injustice on health outcomes, there are several reasons to believe that perceived procedural injustice may have health implications. For instance, there has been research investigating the relationship between organizational justice, which involves evaluations of fairness of organizational procedures, and health, as well as health behaviors (Elovainio, Kivimäki, & Vahtera, 2002; Elovainio, Kivimäki, Vahtera, Keltikangas-Järvinen, & Virtanen, 2003; Kivimäki, Elovainio, Vahtera, & Ferrie, 2003). For example, Kivimäki, Elovainio, Vahtera, and Ferrie (2003) examined the relationship between organizational justice (which included justice of decision making procedures and interpersonal treatment) and health of employees. Low justice in decision making procedures was associated with a 41% increase in the likelihood of sickness

absence in men and 12% higher likelihood in women after adjustment for baseline characteristics. In regards to interpersonal treatment, low justice perceptions were related to a higher likelihood of sickness-related absences in women (RR=1.3) and men (RR=1.2) (Kivimäki, Elovainio, Vahtera, & Ferrie, 2003).

Also, there has been evidence from both experimental and correlational studies that support strong linkages between perceived discrimination and physical health (Pascoe & Richman, 2009). For example, studies have shown a relationship between perceived discrimination and hypertensive status, self-reported health, and nocturnal ambulatory blood pressure (Borrell, Kiefe, Williams, Diez-Roux, & Gordon-Larsen, 2006; Dolezsar, McGrath, Herzig, & Miller, 2014). A meta-analysis of 44 studies, with an average of 742 participants per study, found that perceived discrimination was related to systolic and diastolic blood pressure (when institutional measures of discrimination were used) and ambulatory nighttime blood pressure (Dolezsar, McGrath, Herzig, & Miller, 2014). There has been some research examining institutional discrimination and health as well. One study demonstrated a relationship between institutional discrimination and health, even after controlling for many confounding factors such as acculturation, sex, age, social support, income, health insurance, employment status, neighborhood poverty, and housing value (Gee, 2002). This supports the idea that multiple types of unfair treatment can influence health.

Perceived discrimination is also thought to impact health via health behaviors, such as substance use (Pascoe & Richman, 2009). This relationship has been observed in both adults and youth. For example, one study of 1,332 Latino high schoolers found that those who perceived discrimination were 1.73 times more likely to use cigarettes, 1.53 times more likely to use alcohol, 1.50 times more likely to use inhalants, and 1.70 time more likely to use marijuana over

the course of their lifetime after controlling for gender, SES, acculturation, and age (Okamoto, Ritt-Olson, Baezconde-Garbanati, & Unger, 2009). In the past 30 days those who perceived discrimination were 2.54 times more likely to have used cigarettes, 1.63 times more likely to have used alcohol, 1.84 times more likely to have engaged in binge drinking, 1.95 times more likely to have used marijuana, and 1.64 times more likely to have used inhalants (Okamoto et al, 2009). In a study of Black males, who were in early adulthood, racial and ethnic harassment was related to increased tobacco usage, such that those who experienced racial and ethnic harassment were twice as likely to use tobacco (Bennett, Wolin, Robinson, Fowler, & Edwards, 2005). Finally, in a study of 2,638 African American adults, it was found that perceived discrimination was related a four-fold increase in the likelihood of endorsing drinking as a coping strategy to deal with job pressure and to forget work problems. In addition, those who reported discrimination were 3 times more likely to report that drinking helps to relieve job tension. Those who reported discrimination were nearly twice (1.90) as likely to report that drinking was an acceptable way to cope with sadness and 1.33 times more likely to report drinking as an acceptable way to unwind on the weekends (Martin, Tuch, & Roman, 2003).

The literature seems to suggest a co-occurrence or comorbidity between perceived procedural injustice/discrimination, poor health, and criminal behavior. For instance, it has been well-documented that: (1) incarcerated populations tend to have poorer health (though little is known about the health of criminal offenders in general), even after controlling for confounds, and (2) they are at risk for many problems often caused by poor health behaviors like hepatitis C, HIV, and substance use (Binswanger, Krueger, & Steiner, 2009; Solomon, Flynn, Muck, & Vertefeuille, 2004). One study conducted in Australia found that adolescents with a criminal history had a higher than average likelihood of death due to substance abuse or suicide (Coffey,

Veit, Wolfe, Cini, & Patton, 2003). However, little research has examined whether perceptions of procedural injustice has implications for one's overall health. Even fewer studies have examined the specific underlying mechanisms for the relationships between perceptions of procedural injustice, offending, and poor overall health. Given the extensive research garnering support for the notion that discrimination causes poorer health, it is important that risky health behaviors (i.e., substance use, risky sexual behavior) be considered as a mechanism in the relationship between perceived procedural injustice and poor health (Binswanger, Krueger, & Steiner, 2009; Pascoe & Richman, 2009; Solomon, Flynn, Muck, & Vertefeuille, 2004).

Mechanisms

Mediators of the effect between health and perceived discrimination appear to be: (1) a stress response, due to negative emotions caused by discrimination, and (2) risky health behaviors. Specifically, when people are treated unfairly and they feel that they have been discriminated against it causes negative emotions which then produces a stress response (Pascoe & Richman, 2009). When people are consistently perceiving discrimination from others, this leads to a constant negative emotional state, and thus, a constantly activated stress response which causes physiological responses such as higher cardiovascular reactivity and cortisol responses (Pascoe & Richman, 2009). Some research has shown that perceived discrimination is associated with higher outputs of cortisol and higher cardiovascular reactivity (Pascoe & Richman, 2009). For example, an experimental study of adult black males found that those who perceived more racism after watching a video featuring unfair (but not blatantly racist) video in the study had higher blood pressure when later recalling a time where they were discriminated against than those who were exposed to a blatantly racist video. Those exposed to the non - blatantly racist or neutral video also had higher increases in blood pressure during a rest period

following giving a speech expressing their feeling about the non-blatantly racist video, when recalling a discriminatory event, and in a second rest period compared to those exposed to the blatantly racist video, as measured by mean heart rate and blood pressure during recovery periods after exposure to a video either depicting overt discrimination or without a depiction of discrimination (Merritt, Bennett, Williams, Edwards &, Sollers, 2006). In another study of Mexican American adolescents, perceived discrimination was related to a higher output of cortisol (Zeiders, Doane, & Roosa, 2012). Over time, it is expected that these effects, induced by a stress response, will impact health. It is suggested that these physiological stress effects may contribute to illnesses such as coronary heart disease, hypertension, and increased vulnerability to physical illness (Pascoe & Richman, 2009).

Similar to perceived discrimination, perceptions of procedural unfairness have been shown to be related to negative emotions as well. For example, Tyler (1994) found that procedural justice ($b=.31$) was associated with peoples' feelings (feeling, pleased, frustrated, or angry) about the police or the courts. Based on the group value model, it is thought that these emotional reactions are caused by threats to social identity via perceptions of procedural injustice (Lind & Tyler, 1988). These psychological responses to perceived procedural unfairness are thought to be psychological indicators of a stress response (Cohen, Kessler, & Gordon, 1997; Pascoe & Richman, 2009). Psychological responses, such as anxiety, depression, anger, self-esteem, reports of positive emotions versus negative emotions, changes in well-being and life satisfaction, and psychologically felt stress have all been used to measure stress responses to perceived discrimination (Pascoe & Richman, 2009). Given that perceived procedural injustice can result in negative emotions, it is believed that this is a psychological indicator of stress responses (Pascoe & Richman, 2009; Tyler, 1994). Since a stress response is one viable

explanation for the relationship between perceived discrimination and health, it is believed that perceived procedural injustice will also cause a stress response (as measured by psychological distress), which will then be related to poorer self-reported health.

A second mediator of the relationship between poor health and perceived procedural injustice is poor health behaviors. It is suggested that people will use unhealthy coping mechanisms to alleviate negative emotionality and stress that result from perceived discrimination (Pascoe & Richman, 2009). Specifically, those who perceive more procedural injustice will likely be prone to participating in unhealthy behaviors, like substance use. For example, in a study of Black college students, those who experienced racial harassment were twice as likely to use tobacco daily (Bennett et al., 2005). Another study of Black male workers found that perceived discrimination was related to problem drinking, even after accounting for lower economic status and that this relation was mediated by beliefs that alcohol was an effective coping strategy (Martin, Tuch, & Roman, 2003). A second risk behavior which may be increased is the likelihood of engaging in risky sexual behaviors, such as those which would predispose someone to developing HIV. For example, in one longitudinal study of 889 Black youth from Georgia and Iowa, perceived discrimination at ages 10 or 11 was significantly related to sexual risk behaviors such as not using condoms, having sex, and number of sexual partners at age 18 or 19 ($t = 4.52, p < .001$) (Roberts et al., 2012). In another study of African Americans in high school, those who reported perceiving more discrimination also reported having had more sexual partners (Stevens-Watkins, Brown-Wright, & Tyler, 2010).

Lastly, a final mediator of this relationship is between offending and health. Some studies have shown that those who offend, tend to have poorer health (Farrington, 1995). For example, in a longitudinal study of 411 young men from London, it was found that offending was related

to hospital visits for both illness and injury at age 18, and that this association remained even after controlling for variables such as antisocial personality or childhood predictors of poor health (Farrington, 1995). Thus, a final mediator of this relation may be that being involved with criminal behavior contributes to poor health.

Model and Hypotheses

The present study will examine the long-term effects of lower levels of perceptions of procedural justice on psychological distress, risky health behaviors (in this case substance use and HIV risk behaviors), offending, and overall health in adjudicated adolescents. This study is desperately needed given the dearth of research conducted of the impact of perceptions of procedural injustice may have on offending, health, and risky health behaviors (substance use and HIV risk behaviors), particularly in adolescents. Importantly, there is no current research investigating the impact that perceived procedural justice on health behaviors in the context of the criminal justice system itself. This is concerning in light of: (1) the well-established link between perceived discrimination and health, (2) the similarities between the concept of perceived discrimination and perceived procedural injustice, and (3) the fact that many offenders exhibit a host of chronic health problems (such as hepatitis C and HIV/AIDS), and that local, state, and federal criminal justice entities may spend upwards of \$3.7 billion dollars to address offenders' health care needs (Kinsella, 2004). It seems likely that there will be a similar link between perceived procedural justice, health and health behaviors (here measured as substance use, HIV risk behaviors, and offending) (Pascoe & Richman, 2009).

Specifically, this study will test three hypotheses (Figure 1):

1. Lower perceptions of procedural justice will be related to poorer self-reported health;
2. Lower perceptions of procedural justice will lead to higher levels of psychological distress, and in turn psychological distress will increase the risk for poor health behaviors (HIV risk behaviors and substance use), offending, and poorer self-reported health.
3. The association between perceptions of procedural justice and poorer self-reported health will be partially mediated by poor health behaviors (HIV risk behaviors and substance use), offending, and psychological distress.

Figure 1.

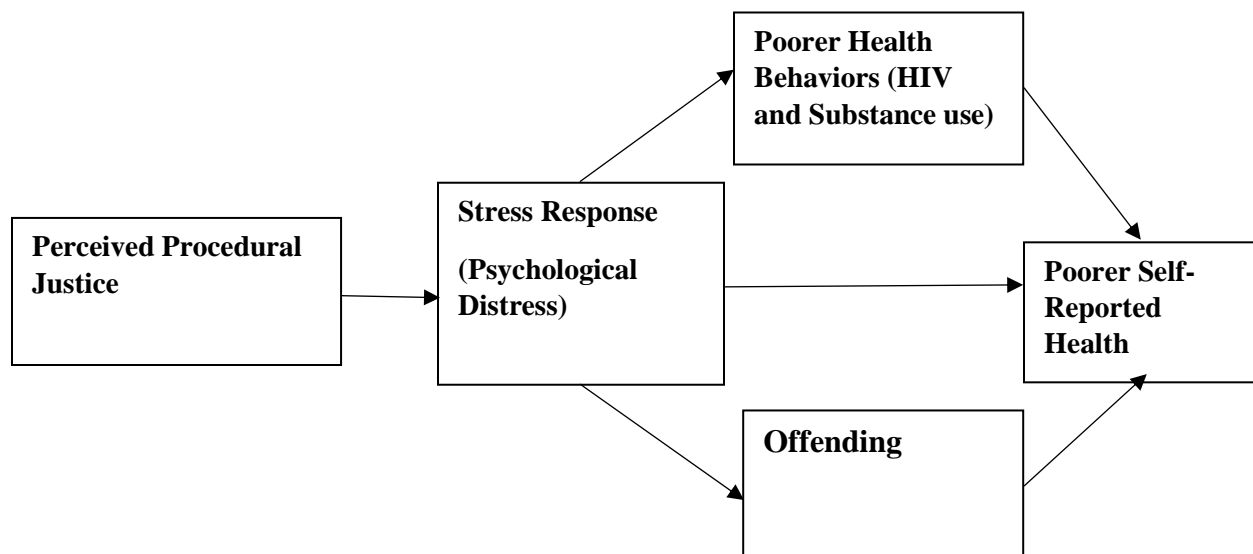


Figure 1. Perceived procedural justice will be negatively related to psychological distress, and this psychological distress will be related to poor health behaviors and offending, which will then contribute to poorer self-reported health.

CHAPTER THREE: METHODS

The present study used archival data from the Pathways to Desistance Study. The Pathways to Desistance study was a multi-site, longitudinal study of serious adolescent offenders. The study collected data as these adolescent offenders transitioned into adulthood. The primary goal of the Pathways to Desistance study was to examine factors which influenced desistance of adolescent offenders from criminal behavior. The study includes data from 1,354 adjudicated adolescent offenders from the Maricopa County (Phoenix), Arizona (N = 654) and Philadelphia County, Pennsylvania (N = 700) adult and juvenile court systems. Participants were at least 14 years old, but younger than 18 years old, at the time of their offense. Additionally, they had to be charged of a serious offense to be included in the study. Most participants were charged with felonies, however, exceptions were made for some misdemeanor (property) offenses, sexual offenses, or weapons offenses. The proportion of youth who were charged with a drug related was capped at 15% to avoid the overrepresentation of drug offenders. Data collection took place over the course of 7 years, with recruitment occurring between November of 2000 and January of 2003. Data collection ended in April of 2010 (Mulvey & Schubert, 2012). Follow-up interviews were conducted at the following time points after baseline: 6, 12, 18, 24, 36, 48, 60, 72, and 84 months.

Both parents and youths in the study completed a consent form, and baseline interviews were conducted within 75 days of the adjudication hearing (for those involved with the juvenile court system) and within 90 days of a decertification hearing in Philadelphia, or the adult arraignment hearing in Phoenix (for those being tried as adults). Parent collateral informants

were used at the baseline interview. At interviews following the baseline interview a peer informant, who was nominated by the participants, was used. Additional cross-validation for self-reports included were FBI records of arrest and juvenile and adult court records. Participants also complete “release interviews” which followed their stay at a residential facility. Interviews were typically conducted in the participant’s home or in a private room if the participant was being held in an institutional facility. The majority (56%) of the interviews took place in the participant’s home, while 36% were conducted in a facility. At the 48 month follow up, 25.8% of interviews were conducted at a facility and 64% were conducted elsewhere, while the remaining participants missed this interview (10.3%). The remaining 11% of interviews were conducted elsewhere. Initial baseline interviews were conducted in two 2-hour-long sessions, but follow-up interviews were conducted in a single 2-hour-long session. Interviews took place on laptop computers, with the participant and interviewer sitting side-by-side (Schubert et al., 2004). Interviewers read aloud each item for the participant, and the participants were permitted to enter their responses on a key pad. Honest reporting was encouraged, and participants were guaranteed confidentiality.

In order to examine the relationship between procedural justice (measured at baseline and at the 48-month follow-up), psychological distress (measured at baseline and at the 48-month follow-up), offending (measured at 48 month follow-up), health behaviors (measured at the 48 month follow-up), and self-reported health (measured at the 60 month follow-up), the present study used a measure of procedural justice, HIV risk behaviors, self-reported frequency of substance use, psychological distress, self-reported offending, and a measure of self-reported health. In order to examine the concordance of perceived procedural justice and psychological distress over time, data was used from both baseline and the 48-month follow-up. Specifically,

difference scores (48-month follow-up - baseline measure) were used, as alterations (decreases) in perceptions procedural justice over time, in combination with increases in psychological distress, are hypothesized to more strongly be associated with health and health behaviors, rather than more consistent levels of perceptions of justice and psychological distress. Finally, impulsivity, a variable often related to offending, was to be controlled for using a measure of impulse control.

Procedural Justice. The procedural justice measure is comprised of 55 items which measure various aspects of procedural justice, legal cynicism, and legitimacy. This measure which was used in the Pathways to Desistance Study was adapted from a version used by Tyler (1997). Data was collected from this measure at the baseline interview and all follow-ups at 6, 12, 18, 24, 30, 36, 48, 60, 72, and 84 months. The present study used data collected at the baseline interview and 48 month follow up. Specifically, two subscales which include 28 items measured at baseline and the 48 month follow up, meant to measure procedural justice perceptions of judges ($\alpha=.75$) and police ($\alpha=.74$) via direct experience were used. Each of these measures (procedural justice with police and procedural justice with judges) includes 14 items that were rated on either a 5 point Likert scale ranging from strongly disagree to strongly agree, a 4 point Likert scale ranging from showed a lot of concern to showed no concern, or a 3 point Likert scale ranging from showed respect/dignity to showed disrespect. However, all items were converted to a 5 point Likert scale that were not already on a 5 point Likert scale. Higher scores represent higher perceptions of justice. The maximum raw score attainable on both scales is 140, while the lowest raw score attainable is 28. These numbers are then divided by 14 (on each scale). The mean on each scale (perceived procedural justice from police and courts) were added together, to form a total average score of perceived procedural justice for each participant. Thus,

the total possible score attainable was 10, while the lowest score attainable was 2. Procedural justice scores at baseline were subtracted from procedural justice scores at the 48 month follow up. These change scores will be used in the analysis. Thus, positive scores represented an increase in perceived procedural justice over time, while negative scores represented a decrease in perceptions of procedural justice over time. Again, change scores are being used in the present analysis as alterations (decreases) in perceptions of procedural justice are hypothesized to be more strongly related to health and health behaviors.

Psychological Distress. A measure of psychological distress at baseline, called the Global Severity Index (GSI), was used from the Brief Symptom Inventory Scale (BIS), which has been found to be a reliable and valid instrument for examining general psychological distress. Participants responded to this measure at all follow-ups (at 6, 12, 18, 24, 30, 36, 48, 60, 72, and 84 months) and the baseline interview. Data collected from the baseline interview and 48-month follow-up were used in the present study. The BIS includes 53 items which ask participants to respond to a number of symptoms in the past few weeks on a 4-point Likert scale ranging from not at all to extremely. The GSI is a mean of all subscale scores. Subscales include; somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobia, paranoia, and psychoticism. Thus, higher scores reflect more distress or a more severe presence of symptoms. The scales and subscales of the BSI demonstrated internal consistency ($\alpha=.71-.85$), and test-retest reliability ($r=.68-.91$) in the normative study (Derogatis & Melisara, 1983). Additionally, the scale was found to be reliable at the 6-month follow-up ($\alpha=.95$). Scores from the baseline interview were subtracted from the 48 month follow up interview. Thus, negative scores represented a decrease in distress, or the severity of symptoms, while positive scores

represented an increase in distress or the severity of symptoms. These change scores were used in the analysis.

Offending. Select items from the Self-Reported Offending (Huizinga, Esbensen, & Weiher, 1991) measure were used in the present study to measure the frequency of participants committing 22 different acts in the past 12 months. The minimum score possible is 0, with the maximum being 21,890 as individuals were able to report a maximum of 995 on each individual act. Items assessed the frequency in which participants damaged or destroyed property, set fire to a house, building, or vehicle, entered a building to steal, shoplifted, bought, received, or sold stolen property, used checks or credit cards illegally, stole a car, sold marijuana, sold other illegal drugs, carjacked someone, drove drunk, paid for sex, shot at someone, shot at someone and hit them, robbed someone with or without a weapon, beat up someone badly, got in a fight as a part of a gang, carried a gun, broke into a car to steal something, or and went joy riding. A total score was calculated to create a single index of offending. Data was used from the 48-month follow-up.

HIV Risk Behaviors. A measure of risk for being infected with HIV was included and data from the 48-month follow-up were used in the current study. The measure includes 14 items which assesses the risk of the individual becoming HIV positive. Questions involve content assessing the frequency in which the individual had unprotected sex, traded sex for money, drugs, or other resources, the frequency in which the individual has injected drugs in the past 12 months and shared needles with others, whether they have had sex with someone who was HIV positive, and whether the individual has been tested for HIV or STDs. Questions are either responded to in a dichotomous (yes or no) format or by indicating the precise frequency of the behavior. The minimum score is 0.

Health. Limited information was collected on the health of participants; however, the study did include a measure of health, which included a single item where subjects were asked to rate their overall health on a 4 point Likert scale from excellent to poor. Data from the 60-month follow-up was used in the present analysis.

Impulsivity. The Weinberger Adjustment Inventory (WAI) assessed a youth's socio-emotional adjustment within the context of their environment. The WAI includes 23 items; however, 22 items are used in the development of each subscale. The WAI includes a number of subscales, one of which is the Impulsivity Index, which was used as the measure of impulse control for the present study. The Impulsivity Index includes 8 items ($\alpha=.76$). Questions are responded to on a 5-point Likert scale from 1 (true) to 5 (false). Lower scores indicate lower levels of impulse control, while higher scores indicate higher levels of impulse control. Data from the baseline interview will be used in the present analysis.

Substance Abuse. The Pathways to Desistance Study includes a measure of substance abuse, alcohol use, and illegal substance (drug) use. The measure was adapted from a measure from Chassin, Rogosch, and Barrera (1991). The present study used items involving the frequency of alcohol, substance, and illegal drug use at the 48-month follow-up. One item assesses the use of alcohol in the recall period. Specifically, it asks the frequency of alcohol use using a 9 point Likert scale ranging from not at all to everyday. Similarly, a single item assesses the frequency of cigarette usage on a 9 point Likert scale ranging from not at all to every day. Next, items assessing illegal drug use assess the frequency of past month drug use in 10 different drug areas including marijuana, simulants, cocaine, opiates, ecstasy, hallucinogens, inhalants, amyl nitrate odorizes, prescription medications, other drugs, ranging on a 9 point Likert scale from not at all to every day.

Analyses

The present study was to use zero order correlations and path analysis in MPLUS to examine the relationship between procedural justice and psychological distress, psychological distress and health, procedural justice and risky health behaviors (HIV risk behaviors and substance use), and procedural justice and self-reported health. Zero order correlations were calculated to test the first hypothesis; that perceptions of procedural justice at baseline will be related to poorer health.

The second hypothesis states that lower levels of perceptions of procedural justice will lead to higher levels of psychological distress, and in turn psychological distress will increase the risk for poor health behaviors (HIV risk behaviors and substance use), offending, and poorer self-reported health. Thus, psychological distress were expected to mediate the relationships between perceived procedural justice and poor health behaviors, offending, and self-reported health. Per Baron and Kenny (1986) four conditions must hold for a mediated relationship to occur: (1) Perceptions of procedural justice difference scores must be significantly related to self-reported health at the 60 month follow-up; (2) Perceptions of procedural justice difference scores must be significantly related to psychological distress change scores.; (3) Psychological distress change scores must be significantly related to self-reported health at 60 months.; (4) When the effect of psychological distress change scores on self-reported health at 60 months is controlled for, the relationship between the perceptions of procedural justice change scores and the self-reported health at 60 months must no longer be significant. Steps 1 thru 3 were tested using zero order correlations, and step 4 was tested through ordinal regression if the results from steps 1 thru 3 are statistically significant. If steps 1 thru 3 were not significant, then step 4 was not to be executed.

Path analysis was to be used to test the third hypothesis that the association between perceptions of procedural justice change scores and self-reported health would be mediated by or indirectly associated with psychological distress change scores, self-reported offending, substance use, and HIV-risk behaviors. Additionally, indirect effects can be present even if there is no significant zero effect found between perception of procedural justice change scores and self-reported health, and path analysis can be used to assess for these relationships (Preacher & Hayes, 2004). For an indirect effect to be present, the independent variable (procedural justice) would need to be linked to the dependent variable (self-reported health) through one of the mediators (psychological distress, self-reported offending, substance use, or HIV). If none of the mediators are related to the outcome, then path analysis would not be necessary as an indirect effect cannot be present. Path analysis is viewed as a better alternative over conducting multiple regression analysis, in that it enables the ability to examine the impact of perceptions of procedural justice on all outcome variables, while also examining the relationship between mediators, simultaneously. In addition, path analysis allows one to calculate the indirect effects of perceptions of procedural justice on poor health via psychological distress, poor health behaviors, and offending (Lleras, 2005). Specifically, path analysis would allow for more confidence that lower levels of perceived procedural justice causes psychological distress, which would then be related to increased offending and poorer health behaviors (HIV risk behaviors and substance use) and, ultimately, poorer self-reported health.

CHAPTER FOUR: RESULTS

Descriptive Statistics

As shown in Table 1, of 1354 adolescent offenders, 86.4% were male, while 13.6% were female. The average age among participants included was 16. Among the sample, 20.2% identified themselves as White, 41.4% identified themselves as Black, 33.5% identified themselves as Hispanic, and 4.8% identified themselves as other.

Within this sample, the mean of total self-reported offending rates at 48 months was 63.560 while the mean of total substance use at 48 months was 20.167. The data for offending, however, is skewed with the standard deviation of self-reported offending being high (SD=226.907). The most frequent number of offenses reported was 0 and the median number of offenses reported was 0, indicating many people reported no engagement in offending behavior. If offenses were endorsed they most likely indicated the subject had sold drugs or marijuana, carried a gun, bought, received, or sold stolen property, or driven while under the influence of a substance. It is important to note as well, that the setting of the participant's 48-month interview significantly impacted the number offences reported.

Substance use frequency was, again, reported using a 9-point Likert scale for each individual item thus, this number represents the total number of points they earned via their responses on the Likert scale, with the maximum score being 108, and the minimum score being 11. The average substance use score was 20.167, with subjects being more likely to report using alcohol, tobacco, or marijuana, than other, more serious, drugs.

In terms of HIV risk behaviors, the average total score was 49.153, representing the combined score of the frequency of HIV risk behaviors reported during the previous 12 months, along with questions endorsed as “yes”. However, the data was significantly skewed for HIV behaviors, with the standard deviation for HIV risk behaviors extremely high (SD=98.689), making the average HIV risk behavior score a poor indicator of HIV risk behaviors. The median score for HIV risk behavior was 5, and most individuals obtained a score of 2. This indicates most participants did not engage in many HIV risk behaviors. The item most commonly endorsed indicated the participant had sex without using protection. Few other items were endorsed by a significant number of participants.

At baseline, the average total procedural justice score was 6.011 while at 48 months the average procedural justice score was 6.592. Procedural justice difference scores (procedural justice at baseline minus procedural justice at 48 months) were calculated, with an average of .578. This change means that, on average, participant’s perceptions of procedural justice increased considerably given that the maximum possible score is 10, and the minimum score is 2. Mean scores for baseline psychological distress were calculated at .559 while the average score at 48 months was .384. The psychological distress change score (psychological distress at 48 months minus psychological distress at baseline) was averaged to be -.193. This means that, on average, psychological distress decreased from baseline to the 48 month follow up.

Table 1

Sample Characteristics (N=1354)

Characteristics	Mean or % (S.D.)
Gender (% male)	86.400
Age	16.040 (1.143)
Ethnicity	
White	20.200
Black	41.400
Hispanic	33.500
Other	4.800
Offending Total	63.560 (226.907)
Substance Use Total	20.167 (8.104)
HIV Risk Behavior Total	49.153 (98.689)
Procedural Justice: Baseline	6.011 (0.996)
Procedural Justice: 48 Months	6.592 (1.271)
Procedural Justice Difference (Baseline - 48 months)	0.578 (1.650)
Psychological Distress: Baseline	0.559 (0.532)
Psychological Distress: 48 Months	0.384 (0.450)
Psychological Distress Difference (Baseline - 48 months)	-0.193 (0.688)
Impulse Control	2.962 (0.950)
Self-Reported Health: 60 Months	1.810 (0.693)

Table 2

Zero-order correlations among the variables

Variable	1	2	3	4	5	6	7
1. Perceived Procedural Justice	-						
2. Psychological Distress	.079*	-					
3. HIV Risk Behavior Total	-.036	-.008	-				
4. Substance Use	-.082**	.065	.153**	-			
5. Offending Total	-.120***	.037	.125***	.326***	-		
6. Self-Reported Health	.019	-.064	.044	-.007	-.010	-	
7. Impulse Control	.038	-.255***	-.017	-.056	-.048	.004	-

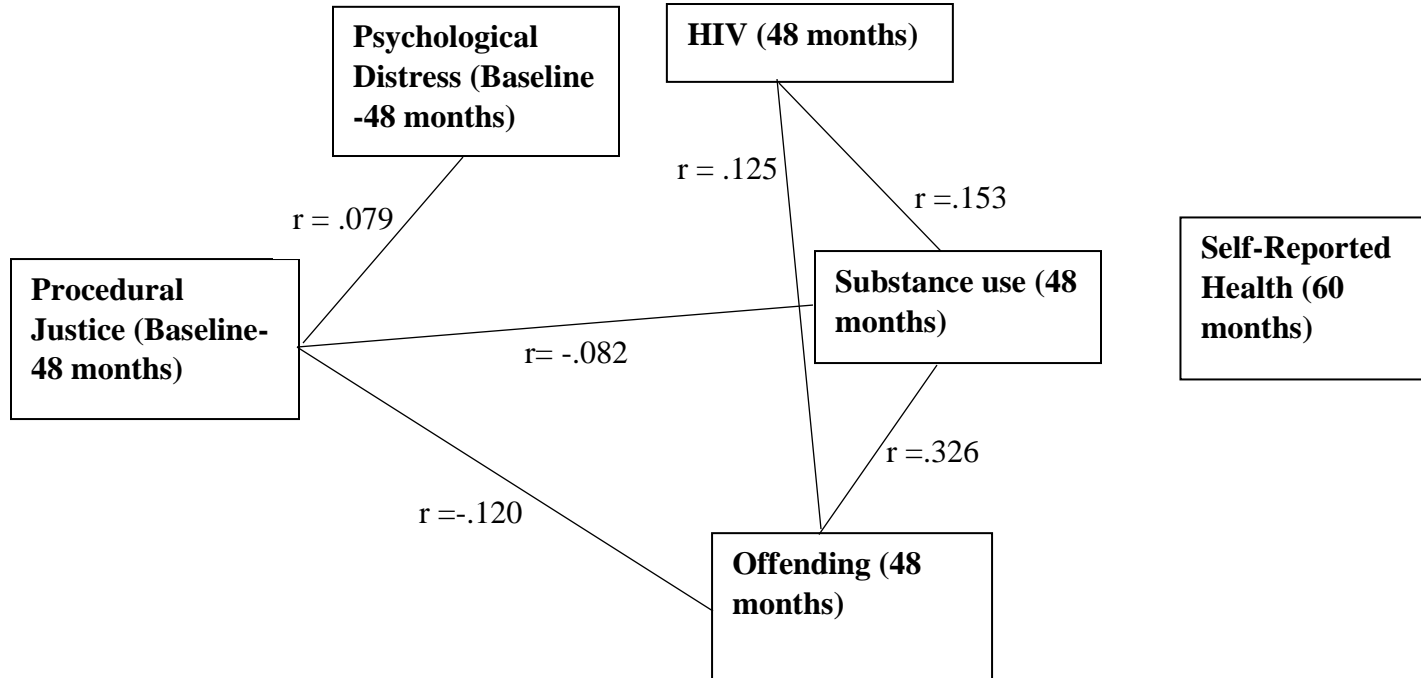
* $p < .05$, * $p < .00$, ** $p < .000$ ***

Hypothesis 1: Perceptions of procedural justice will be related to poorer self-reported health.

As shown in Table 2 and Figure 4.1, results revealed no significant relationship between changes in perceptions of procedural justice and poorer self-reported health ($r = .019, p = .557$). Thus, results disconfirm hypothesis 1 that perceptions of procedural justice would be related to poorer self-reported health at the 60-month follow-up.

Figure 4.1

Zero order correlations for difference variables



Hypothesis 2: Lower levels of (increases in) perceptions of procedural justice will be related to higher levels of psychological distress, and in turn psychological distress will be positively associated with poor health behaviors (HIV risk behaviors and substance use), offending, and poorer self-reported health.

As shown in Table 2 and Figure 4.1, results revealed a significant positive relationship between changes in perceptions of procedural justice and changes in psychological distress ($r = .079, p = .038$). This is contrary to the expectation that changes in procedural justice would be *negatively* correlated with changes in psychological distress. In addition, results indicated significant relationships between procedural justice difference scores and offending at the 48

month follow up ($r = -.120, p < .000$) as well as substance use at the 48-month follow-up ($r = -.082, p < .009$). This indicates that increases in perceptions of justice over time (represented by positive scores) are related to lower reports of offending and substance use, whereas decreases in perceptions of justice (indicated by negative scores) over time is related to higher reports of offending. It is important to note, however, that changes in psychological distress were not related to HIV risk behaviors, substance use, offending, or poorer self-reported health.

Hypothesis 3: The association between perceptions of procedural justice and poorer self-reported health will be partially mediated by poor health behaviors (HIV risk behaviors and substance use), offending, and psychological distress.

As can be seen in Table 2 and Figure 4.1, no significant relationships were found between perceived procedural justice difference scores and health, and poor health was not related to any of the mediators. Thus, psychological distress, poor health behaviors, offending, and substance use cannot mediate the relationship between perceptions of procedural justice and self-reported health. Although, there was a significant positive relationship found between perceived procedural justice and psychological distress difference scores ($r = .079, p = .007$), it was not in the expected direction (e.g., increased perceptions of justice were related to increased distress).

CHAPTER FIVE: DISCUSSION

The current study sought to examine the relationships between perceptions of procedural justice and self-reported health via psychological distress, HIV risk behaviors, substance use, and offending using data from a longitudinal study of juvenile offenders. Specifically, the present study sought to examine whether lower perceptions of procedural justice would be related to poorer self-reported health via psychological distress, poor health behaviors (substance use and HIV risk behaviors), and offending. These data, being longitudinal, were ideal for testing such a hypothesis in adolescents and young adults, as it enabled one to examine the adverse outcome that perceiving less procedural justice might have on health over time. This question was important to examine given recent evidence which has demonstrated that perceptions of discrimination is related to poorer health outcomes (Pascoe & Richman, 2009). Some of these poorer physical health consequences include hypertension, obesity, poorer general health, but they also include psychological health consequences such as lower perceived quality of life, anxiety, and depression (Pascoe & Richman, 2009). Again, the mechanisms underlying these poorer health outcomes have been hypothesized to be both an overly activated stress response and poor health behaviors (Pascoe & Richman, 2009).

Results ultimately revealed no significant relationship between perceptions of procedural justice and self-reported health, disconfirming the hypotheses that lower perceptions of procedural justice would be related to poorer self-reported health via its associations to psychological distress, offending, substance use, and HIV risk behaviors. Results did reveal a significant positive relationship between perceptions of procedural justice and psychological

distress, a significant negative relationship between perceptions of procedural justice and offending, and a significant negative relationship between perceptions of procedural justice and substance use. Substance use, HIV risk behaviors, and offending were all positively correlated.

The results of the study contradict prior findings on the relationship between perceptions of unjust treatment and health (Pascoe & Richman, 2009). However, the associations between perceptions of justice, offending and substance use were expected. The positive associations found between HIV risk behaviors, substance use, and offending are also expected. These are all considered “risky” and deviant types of behaviors, which often coincide with one-another (Osgood, Johnston, O'Malley, & Bachman, 1988).

The result that perceptions of procedural justice and self-reported health were found to be unrelated may indicate there is no relationship between perceptions of procedural justice and health in young offenders. However, there are additional possible explanations which may be considered. First, although the study was longitudinal, the participants were still young, between the ages of 18 and 24, when the measure of self-reported health was taken. Young adults generally experience fewer health problems than older adults, in part because they are less susceptible to them (Yashin, Arbeev, Kulminski, Akushevich, Akushevich, & Ukraintseva, 2007). Additionally, many of the negative health impacts of perceived discrimination, and thus chronic stress, are hypothesized to occur over lengthy periods of time (Pascoe & Richman, 2009). Even though the period elapsed between the time the baseline measure of perceived procedural justice was taken, and the time the measure of health was taken was 5 years, this span of time may not have been long enough for health problems to manifest. Furthermore, even when young adults experience physical health impairments, they may be more difficult for young adults to acknowledge (Mechanic & Hansell, 1987). For example, in one study examining

variables which influence self-reports of physical health in adolescents, results revealed that reports of physical health were influenced by variables such as competence and well-being (Mechanic & Hansell, 1987). Taken together, it may be that the impact of perceptions of procedural justice on health would need to be measured at a later age, particularly if it were to be measured using a self-report measure. Alternatively, measures of health behaviors might be better ways of measuring the impact of perceptions of discrimination on health in youth, given that they may occur more immediately, and the resulting impact of health may occur much later, which is consistent with the results of this study and others (Okamoto, Ritt-Olson, Baezconde-Garbanati, & Unger; Roberts et al, 2012). It is also possible that examining the impact of perceptions of justice on psychological health might be more apparent in young adults or adolescents, as the influence of perceived procedural justice on mental health may be more immediate, whereas the effects of perceived procedural discrimination on physical health may take years or decades. For example, research investigating the relationship between perceived discrimination and mental health outcomes in LGTBQ, Black, Asian, and Hispanic adolescents have shown that perceived discrimination is associated with lower self-esteem and increased depressive symptoms (Almeida, Johnson, Corliss, Molnar, & Azrael, 2009; Greene, Niobe Way, & Kerstin, 2003). Then again, we would have expected perceptions of procedural justice to be related to psychological distress, in the hypothesized direction, if this were the case.

Lastly, and perhaps most importantly, null results may be a consequence of the methodological procedures used in the current study. Self-reported health was measured via a single item, as it was the only measure of physical health collected. Obviously, it would have been ideal to have a more comprehensive, and ideally more objective, measure of physical health. For instance, prior research examining the relation between perceived discrimination and

health have used blood pressure (as it is associated with higher risk of cardiovascular disease), assessments of coronary calcification, the presence of various diseases or conditions, and general health questionnaires that ask about specific symptoms (i.e., the presence of headaches or pain) as measures of physical health (Dolezsar, McGrath, Herzig, & Miller, 2014; Kriegar & Sydney, 1996; Lewis et al., 2006; Pascoe & Richman, 2009). Also, the current study examined the relationship between perceived procedural justice change scores and self-reported health. The method of using change scores has been criticized by some, as identical correlations can result from different patterns with each reflecting a different interpretation (Griffin, Murray, & Gonzalez, 1999). Also, change scores can also be less reliable than the variables that they are comprised of (Peter, Churchill, & Brown, 1993). Consequently, a later analysis was conducted to test the relationship between perceived procedural justice at baseline and self-reported health at 60 months. Results revealed no significant relationship.

Next, there was a negative relationship between perceptions of procedural justice and offending and substance use. These findings are consistent with the arguments made by Tyler and his colleague's that low levels of perceptions of procedural justice could make people more likely to delegitimize authority, and to therefore offend (Sunshine & Tyler, 2003; Tyler & Fagan, 2008; Tyler, Sherman, Strang, Barnes, & Woods, 2007). Alternatively, it could be that perceptions of justice or low perceptions of justice, cause a negative emotional response, which then causes individuals to want to reassert their independence through crime, displace retaliation against their oppressor through crime, as in the case of angry aggression hypothesis, or experience anger (due to strain) and engage in criminal behavior, as in General Strain Theory (Bernard, 1990; Martin et al, 2011; Sherman, 1993). An additional possible explanation is that young offenders might perceive lower levels of justice, but this might be primarily due to a

tendency to be aversive to authority in general, and these traits may make offending more likely as well. More specifically, it might be that these offenders perceive lower levels of justice from authorities due to impulsive tendencies, or antisocial traits, which have been shown to be more prevalent in serious adolescent offenders (Baldry, & Farrington, 2000 ; Cauffman, Steinberg, & Piquero, 2005). The results did not confirm this hypothesis. Impulse control measured at baseline was not related to perceived procedural justice, offending, or substance use. Similarly, in regard to the negative relationship found between perceptions of procedural justice and substance use, it might be that antisocial or impulsive traits might be both related to lower perceptions of procedural justice and to increased substance use. Or, it could be related, again, to de-legitimizing the justice system, as some substances are illegal to use (Sunshine & Tyler, 2003). Lastly, as with offending, a negative emotional response (as with General Strain Theory and the Angry Aggression Hypothesis) may be related to substance use, as using some substances may be illegal (Bernard, 1990; Martin et al, 2011; Sherman, 1993).

Furthermore, no relationship was found between psychological distress and HIV risk behaviors, offending, and substance use, while the relationship between perceptions of justice and psychological distress were positively correlated. Regarding the latter result, it may be that, over time, individuals perceived more justice and reported more distress because they internalized responsibility for their criminal behavior and experienced shame and/or guilt as a byproduct of development (Mulvey et al, 2004). The unexpected null results found between psychological distress and substance use, offending, and HIV risk behaviors was also inconsistent with the hypothesis that psychological distress would mediate relationships between perceptions of procedural justice and offending, substance use, and HIV risk behaviors. One reason this may be the case is that the psychological distress measure used was not an adequate

measure for a stress response. However, many other studies examining the relationship between perceived discrimination have used similar methods such as measuring anger, changes in emotion, feelings of depression or anxiety, and psychologically felt stress (Pascoe & Richman, 2009). For example, some studies have used more objective measures of psychological distress, such as cardiovascular indicators, like blood pressure (Pascoe & Richman, 2009). Higher levels of cortisol upon awakening has also been suggested to be a good objective measure of chronic stress (Schulz, Kirschbaum, Prüßner, & Hellhammer, 1998). If it were the case that the measure used was not a good index of psychological distress, we would not have been measuring the mediator intended, and therefore would not expect psychological distress to mediate the relationship between perceptions of procedural justice and HIV risk behaviors, substance use, and offending.

There were also many limitations to the current study, which may explain the results. The primary limitation is that, is that this is an archival data study, and the data collected was not designed to test the hypotheses tested in the present study (Elder, Pavalko, & Clipp, 1993). In particular, the measures used from the study were not always ideal. For example, the measure used to assess physical health, though it was the only measure of physical health available, was not adequate given it contained a single item. Again, a more objective or comprehensive measure of health, such as a physiological indicator measuring heart rate or blood pressure, or a self-report instrument that assessed the presence of multiple, specific symptoms (e.g., headache, pain, etc.), such as those used in prior studies would have been more ideal (Pascoe & Richman, 2009).

Another limitation of the study is that each variable was measured using self-report measures. As a result, there is no way to verify whether each question was answered accurately or honestly. It seems possible that participants would lie about habits such as offending,

substance use, and HIV risk behaviors, given that participation in such activities are not considered socially desirable. Specifically, the validity of self-reports used in the current study could have been impacted by social desirability, or the tendency for individuals to want to present themselves in a favorable manner (Brener, Billy, & Grady, 2003). Even when participants attempt to report behavior accurately, their self-reports of behavior are susceptible to errors in memory (Stone, Bachrach, Jobe, Kurtzman, & Cain, 1999). Additionally, in a meta-analysis examining factors influencing the accuracy of self-reporting of sexual behavior, alcohol, drug, and tobacco use in adolescents, situational and cognitive variables were found to affect the validity of self-reports of these behaviors (Brener, Billy, & Grady, 2003). Furthermore, for self-report measures examining internal cognitive processes, it has been suggested that people are perhaps unable to accurately report such cognitive processes (Nisbett & Wilson, 1977).

Although it is possible that there is no significant relationship between perceptions of procedural justice and health, given that past research has generally demonstrated that perceived discrimination can lead to poorer health outcomes, via poor health behaviors and an overly activated stress response, it is important for researchers to continue to examine the possible impacts of perceived unjust treatment on health and health behaviors (Pascoe & Richman, 2009). Although the current study did not find a relationship between perceived procedural justice and health, it did find relationships between lower levels of perceptions of justice and health behaviors, as well as lower levels of perceptions of procedural justice and offending. This could be a result of the delegitimization of authority, negative emotional responses, or antisocial and impulsive traits (Baldry, & Farrington, 2000; Cauffman, Steinberg, & Piquero, 2005; Bernard, 1990; Martin et al, 2011; Sherman, 1993; Sunshine & Tyler, 2003; Tyler & Fagan, 2008; Tyler, Sherman, Strang, Barnes, & Woods, 2007 offenders). However, it could also be that the

psychological distress measure used did not adequately measure a stress response. Future research should be aimed at clarifying these associations in serious, young offenders.

Furthermore, perceived procedural justice may be related to health, but a more objective measure or broader measure would need to be used to examine health in young adults. For example, using a different measure of health, such as an objective measure of health (e.g., blood pressure and the presence of medical conditions) or a more comprehensive measure of health that assesses multiple specific symptoms, such as those used in prior studies of the relationship between perceived discrimination and health might be more valid (Pascoe & Richman, 2009).

Additionally, it might be preferable to use a physiological measure of a stress response in conjunction with a psychological measure of a stress response, like cortisol responses or blood pressure (Pascoe & Richman, 2009; Schulz, Kirschbaum, Prüßner, & Hellhammer, 1998). Then again, it may be easier to measure health risk behaviors rather than health in young adults or adolescents, given it may take time for poorer physical health to manifest, which corresponds with the results of this study and those of others examining the relationship to perceptions of discrimination and health behaviors (Okamoto, Ritt-Olson, Soto, Baezconde-Garbanati, & Unger, 2009). Last, future studies should use a sample of individuals who have been convicted with less serious crimes, as well as more serious ones, might be as it is possible that characteristics of serious offenders differ considerably (i.e., are more likely to be impulsive or have antisocial traits) and these traits might influence the results of the study (Baldry, & Farrington, 2000; Cauffman, Steinberg, & Piquero, 2005). Specifically, offenders convicted with less serious crimes may respond to perceived procedural injustice differently, and be more accurate in their perceptions.

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APPENDIX A: PROCEDURAL JUSTICE MEASURE

Procedural Justice Police Direct Experience

**During your last contact with the police when you were accused of a crime, how much of your story did the police let you tell?

Response Categories: All of it = 1, Most of it = 2, Some of it = 3, None of it = 4

**Think back to the last time the police accused you of doing something wrong. Did the police treat you with respect and dignity or did they disrespect you?

Response Categories: 1 = Respect Dignity, 2 = Neutral Treatment, 3 = Disrespect

**Think back to the last time the police accused you of doing something wrong. Did the police show concern for your rights?

Response Categories: 1 = Showed a lot of concern, 2 = Showed some concern, 3 = Showed little concern

The police treat me the same way they treat most people my age.

Over the last couple of years, the police have been treating me the same way they always treated me in the past.

During my last encounter with the police, they treated me in the way that I expected they would treat me.

During my last encounter with the police, they treated me in the way that I thought I should be treated.

*Even after the police make a decision about arresting me, there is nothing I can do to appeal it.

Even after the police make a decision about arresting me, someone in higher authority can listen to my case, and even in some cases, change the decision.

Police considered the evidence/viewpoints in this incident fairly.

*Police overlooked evidence/viewpoints in this incident.

Police were honest in the way they handled their case.

Police used evidence that was fair and neutral.

*Police made up their mind prior to receiving any information about the case.

Response Categories: 1=Strongly disagree, 2= Disagree, 3=Neither agree nor disagree, 4=Agree, 5= Strongly agree

*Indicates item which was reverse coded

**Indicates item which was reverse coded and converted to a 5 point Likert scale

Procedural Justice – Judge Direct Experience

During your last contact with the court system when you were accused of a crime, how much did the judge let you tell your side of the story?

Response Categories: All of It = 1, Most of it = 2, Some of it = 3, None of it = 4

**The judge made up his/her mind prior to receiving any information about the case. [Reverse coded]

Think back to the last time you were before a judge because of something you were accused of doing. Did the judge treat you with respect and dignity or did he/she disrespect you?

Response Categories: 1=Respect Dignity, 2= Neutral Treatment, 3= Disrespect

**Think back to the last time you were before a judge because of something you were accused of doing. Did the judge show concern for your rights?

Response Categories: 1= Showed a lot of concern, 2=Showed some concern, 3=Showed little concern

During my last encounter with the court, the judge treated me the same way s/he treated most people my age.

Over the last couple of years, judges have been treating me the same way they have always treated me in the past.

During my last encounter with the judge, s/he treated me the way that I expected s/he would treat me.

During my last encounter with the judge, s/he treated me in the way that I thought I should be treated.

*Even after the judge makes a decision about sentencing me, there is nothing I can do to appeal it.

Even after the judge makes a decision about sentencing me, someone in higher authority can listen to my case, and even in some cases, change the decision.

The court considered the evidence/viewpoints in this incident fairly.

*The court overlooked important evidence/viewpoints in this incident.

The court was honest in the way they handled their case.

The court used evidence that was fair and neutral.

*The judge made up his/her mind prior to receiving any information about the case.

Response Categories: 1= Strongly disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = Strongly agree

*Indicates item which was reverse coded

**Indicates item which was reverse coded and converted to a 5 point Likert scale

APPENDIX B: HIV RISK BEHAVIORS MEASURE

*How many times in the 12 months have you had unprotected sex (by that we mean, sex without a condom)?

*[If more than once] About how many different partners did you do this with?

*How many times in the last 12 months have you injected drugs?

*[If more than once] About how many times in the last 12 months have you shared a needle to inject drugs?

*About how many people did you share the needle with?

*With how many different people did you trade sex for drugs, money, or other things in the last 12 months?

To the best of your knowledge, do/did any of your sex partners in the last 12 months inject drugs?

Have you traded sex for drugs, money, or other things in the last 12 months?

*[If yes] How many times did you trade sex for drugs, money, or other things in the last 12 months?

Have you ever been told by anyone that one of your sex partners was HIV positive?

*[If yes] How many different partners were HIV positive?

Have you ever been tested for HIV?

Have you ever been tested for Sexually Transmitted Diseases (like syphilis, gonorrhea, or herpes)?

Response Categories: 1=Yes, No = 0.

*Indicates an item where the subject responded with a frequency count of the times they engaged in the behavior.

APPENDIX C: SUBSTANCE USE MEASURE

How often have you had alcohol to drink in the past 12 months?

How many times have you used sedatives or tranquilizers in the last 12 months?

How many times have you used stimulants or amphetamines in the last 12 months?

How many times have you used cocaine (including powder, crack, free base, cocoa leaves, or paste) in the last 12 months?

How many times have you used opiates in the last 12 months?

How many times have you used ecstasy in the last 12 months?

How many times have you used hallucinogens to get high in the last 12 months?

How many times have you used inhalants to get high in the last 12 months?

How many times have you used amyl nitrate, odorizers, or rush to get high in the last 12 months?

How many times did you use these other drugs in the last 12 months?

How many times have you abused prescribed medications (own or someone else's) in the last 12 months?

How often have you smoked cigarettes in the last 12 months?

Response Categories: 1 = Not at all, 2 = 1-5 times, 3 = 6-11 times, 4 = 1X per month, 5 = 2-3X per month, 6 = 1X, per week, 7 = 2-3X per week, 8 = 4-5X per week, 9 = Every day

APPENDIX D: SELF-REPORTED OFFENDING

How many times have you purposely destroyed or damaged property that did not belong to you in the last 12 months?

How many times have you purposely set fire to a house, building, car or vacant lot in the last 12 months?

How many times have you stole something from a store (shoplifted) in the last 12 months?

How many times have you entered or broke into a building (home or business) to steal something in the last 12 months?

How many times have you bought, received, or sold something that you knew was stolen in the last 12 months?

How many times have you used checks or credit cards illegally in the last 12 months?

How many times have you stole a car or motorcycle to keep or sell in the last 12 months?

How many times have you sold marijuana in the last 12 months?

How many times have you sold other illegal drugs (cocaine, crack, heroin) in the last 12 months?

How many times have you carjacked someone in the last 12 months?

How many times have you driven drunk or high in the last 12 months?

How many times have you taken something from another person by force, using a weapon with a weapon in the last 12 months?

How many times have you taken something from another person by force, without a weapon in the last 12 months?

How many times have you beat up or physically attacked somebody so badly that they probably needed a doctor in the last 12 months?

How many times have you carried a gun entered or broke into a car to steal something from it in the last 12 months?

How many times have you shot someone where bullet hit the victim in the last 12 months?

How many times have you shot at someone where you pulled the trigger in the last 12 months?

How many times have you been in a fight in the last 12 months?

How many times have you beat up, threatened, or physically attacked someone as part of a gang in the last 12 months?

How many times have you been paid by someone for having sexual relations with them in the last 12 months?

*Subjects enter the number of times they engaged in the behavior over the recall period

APPENDIX E: HEALTH MEASURE

Generally speaking, how would you rate your overall health?

Response Categories: 1 = Excellent, 2 = Good, 3 = Fair, 4 = Poor