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Hostile, quick-tempered, and exposed to dangerous environments: Exploring the link between temperament and street code adherence

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Abstract

Although Elijah Anderson's (1999) code of the street thesis has received a great deal of scholarly attention, fewer studies have examined the characteristics associated with its adoption. Existing evidence is supportive of Anderson's initial observations, however, less is known about the association between personality and emotional characteristics and adopting street code norms. The current study assesses the role of Delisi and Vaughn's difficult temperament index in the adoption of the street code among a sample of juvenile justice-involved youth. Results indicated youth with more difficult temperaments, characterized by lower levels of effortful control and higher levels of negative emotionality, were more likely to report greater street code adherence. Implications for juvenile justice policy and future research are discussed.

Temperament and the street code

Introduction

In 1999, Elijah Anderson provided a rich and detailed description of life in inner-city Philadelphia, when he coined “The Code of the Street” as a normative system that emphasizes the achievement of respect and status among residents through the use of toughness, retribution, and violence. In his seminal work, he suggested the absence of educational and occupational opportunities coupled with experiences with (legal) discrimination, and elevated levels of violence present within the community, provide a ripe environment for the code to develop (Anderson, 1999; Wilson, 1987, 2009). Individuals who adhere to the code believe that it is necessary to follow a set of rules, as well as use violence against those who show disrespect to protect their status and to avoid becoming the target of further transgressions. These norms associated with the street code, which include a general distrust of others, the need to gain respect through conflict, and the need to be responsible for oneself are common among adults and adolescents living in the community and dictate how one should act in public and have been identified as a precursor to participation in violent behavior (Anderson, 1999; Stewart & Simons, 2006, 2010). As adherence to the code is linked to antisocial behavior and delinquency, understanding the correlates and causes of the street culture can have important implications for understanding violence and its prevention, which is a focus of much interdisciplinary research more generally.

Much like Anderson’s code of the street, temperament encompasses the usual ways in which an individual regulates their emotions and behaviors, as well as how they interact with their environment. Temperamental features are multifactorial thus their etiology can be traced to genetic and environmental factors (Clark, 2005; McCrae et al., 2000; Rothbart, 1989). Recently, DeLisi and Vaughn (2014) have argued that the intersection of two of these traits, self-regulation capacity (coined effortful control) and the degree to which one experiences negative emotions (negative emotionality), represent the key elements of temperament which are most likely to be associated with the onset and continuance of antisocial behavior. Thus, it is these characteristics of one’s temperament which are most likely to contribute to an individual’s criminality and involvement with the justice system. More specifically, the authors argue that individuals who lack a sufficient degree of effortful control and experience a high degree of negative affect are those who are the most likely to respond to environmental cues with aggression and/or violence (DeLisi & Vaughn, 2014).¹

¹ The nomological network of constructs relating to self-regulation and emotional regulation is admittedly confusing as several constructs, including constraint, conscientiousness, attentional control, effortful control, inhibitory control, and temperance appear in the literature (see, Caspi, 2000, Caspi & Silva, 1995; Clark, 2005; Kagan, 1998; McCrae et al., 2000). Although these are similar constructs, they are not the same. For instance, a key distinction in the temperament

Temperament and the street code

Recent empirical tests of this consolidated theory have provided support for these assertions in studies among youth involved in the juvenile justice system (Baglivio, Wolff, DeLisi, Vaughn, and Piquero, 2016; DeLisi, Fox, Fully, & Vaughn, 2018; Veeh, Renn, Vaughn, & DeLisi, 2018; Wolff, Baglivio, Piquero, Vaughn, and DeLisi, 2016). Given findings from the existing research in this area, it may be likely that temperament is related to a variety of characteristics and behaviors that are consistent with individuals who embrace the street code. For example, the portrayal of social identity and respect are key components of those who endorse street code values. Specifically, according to Anderson (1999:72-73), those who embrace the street code belief system have to earn and maintain a violent self-image (a piece of one's identity) that is often accomplished through the use of violence. As such, it can be argued that an individual's temperament (low effortful control and high negative emotionality) contributes to the violent and antisocial behavior that is essential to one's identity to be respected within one's environment.

Although past research has begun to identify the individual-level and contextual factors associated with the adoption of street code attitudes (Brezina et al. 2004; Kurtenbach and Rauf, 2019; Henson, Swartz, & Reyn, 2016; McNeeley, Meldrum, & Hoskin, 2018; Intravia et al. 2014; Stewart & Simons 2006), several important questions remain to be explored. In the current study, we assess the association between an individual's temperament and their adherence to the street code, controlling for a host of other factors shown to be related to street code adoption. Importantly, we explore this association among serious juvenile offenders serving time in a residential facility in the state of Florida, a tremendously policy-relevant group. Before we present the results of our study we provide a brief review of the empirical research related to Anderson's code of the street and then move to explore the potential relationship between temperament and street code values. We go on to describe the data, measures, and methods used in the current analysis, and close with a discussion of potential policy, prevention, and research implications.

Background

Scholars have noted that higher rates of violence tend to be normative in inner-city neighborhoods (Kuo & Sullivan, 2001a, 2001b). Using structural and cultural theories of crime

approach is that temperament is the physiological and psychological framework upon which personality rests. Specifically, temperament is the stable, largely innate tendency with which an individual experiences the environment and regulates response to the environment. This is the opposite perspective of Gottfredson and Hirschi's (1990) work that explicitly eschews the notion that self-control is related to underlying biological or psychological processes in any form.

Temperament and the street code

causation to explain the prevalence of violence and ethnographic field research, Anderson (1999) developed the term “code of the street,” which he contends individuals support the use of violence as a cultural adaptation to adverse neighborhood conditions. As such, adherence to the street code has been described as the acquisition of values that require individuals to display toughness and use violent behavior, to gain and maintain respect amongst inner-city peers (Wilkinson & Fagan, 2001). Behavior associated with adherence to the street code includes demanding respect, projecting a certain image of “toughness,” and responding to perceived disrespect with the use of violence. Scholars have postulated that those who adhere to the codes of the streets are not simply deviant or possess maladaptive traits; in fact, it has been shown that many of them believe following such rules is essential to survival and acts as a potential buffer against violent victimization (Brezina, Agnew, Cullen, & Wright, 2004; Stewart, Schreck, & Simons, 2006). Although adhering to street codes serves a functional purpose in the context of the neighborhood environment, it has also been shown to be associated with antisocial behavior. Below we briefly review this body of literature to highlight the salience of street code values in the generation of violence and other negative outcomes.

Consequences of Adherence to the Street Code

A growing body of research has been devoted to the street code and its association with several criminal justice-related outcomes. Street code values have been linked to violent and non-violent criminal behavior (e.g., Stewart & Simons, 2006, 2010; Allen & Lo, 2012; McGloin, Schreck, Stewart, & Ousey, 2011), personal victimization (e.g., McNeeley & Wilcox, 2015a; Stewart, Schreck, & Simons, 2006), inmate violence (Mears, Stewart, Siennick, & Simons, 2013), the likelihood of arrest and conviction (Burgason et al., 2020; Mears, Stewart, Warren, & Simons, 2017) as well as the fear of crime (McNeeley & Yuan, 2016). More recently, adopting street codes has been shown to be related to a broad range of outcomes such as perceptions of procedural justice, crime reporting, and mistreatment by the police (Moule Jr, Burruss, Gifford, Parry, & Fox, 2019; Intravia, Wolff, Stewart, & Simons, 2014) as well the belief that one may die prematurely (Wolff, Intravia, Baglivio, & Piquero, 2020).

Scholars have also noted that the anticipated relationships have been observed among a number of different groups above and beyond Black youth in disadvantaged urban settings. More specifically, researchers have explored the association between adherence to the street code and several outcomes among college students (Henson et al., 2017; Intravia, Wolff, Gibbs, & Piquero, 2016), youth under the custody of the juvenile justice system (Keith & Griffiths, 2014; Wolff et al.,

Temperament and the street code

2020), youth in Europe (McNeeley & Hoeben, 2017), as well as adults across a number of settings (McNeeley & Wilcox, 2015a, 2015b; Piquero et al., 2012). Collectively, the research reviewed above highlights the prominence of Anderson's street code thesis within the social science literature, as well as its connection to a number of criminal justice-related outcomes. Further, the existing evidence demonstrates that values consistent with Anderson's hypothesis are widely held among populations outside the group he originally described.

Adoption of the Street Code

Understanding the predictors of the street culture can have important implications for our knowledge surrounding violence; as such, researchers have recently begun to examine the individual and contextual factors associated with the adoption of the street code. In terms of demographic characteristics, it is generally anticipated that street code values will be more prevalent among African American males living in disadvantaged, high-crime urban contexts. Indeed, some of the existing research suggests that males are more likely to believe in the code (Intravia et al., 2016; Taylor et al., 2010), while other findings suggest fewer sex-based differences exist (Keith & Griffiths, 2014; Stewart & Simons, 2006). Similarly, the bulk of research has demonstrated fewer differences across race than may be expected given Anderson's description of the code in inner-city Philadelphia (Brezina et al., 2004; Intravia et al., 2016; Keith & Griffiths, 2014; Piquero et al., 2012), although there is some evidence that Blacks are more likely to ascribe to the street code (Taylor, Esbensen, Brick, & Freng, 2010).

Previous research has also highlighted the importance of specific neighborhood-level conditions that are conducive to the development of a subculture of violence. For example, Brezina et al. (2004) found that code-related violence is associated with neighborhoods characterized by low SES, high levels of crime, and other indicators of social disorganization (also see Matsueda et al. 2006; Stewart & Simons, 2006; 2010). It is important to note that this finding has not been universal, as other researchers have not found a relationship between neighborhood context and adopting street code values (Keith & Griffiths, 2014). Additional studies have expanded on Anderson's (1999) original research, demonstrating that the street code may cut across cultures as well. For example, Kurtenbach and Rauf (2019) showed that youth in segregated neighborhoods in Germany tend to be more likely to adopt street code values. More recently, scholars have investigated the relationship between neighborhood context and family factors as predictors of street-code adherence, finding that street code values were closely related to time-varying conditions such as racial discrimination,

Temperament and the street code

peer interaction, and community violence as well as harsh parenting practices (Berg, Lei & Simons, 2020).

At the individual-level, existing studies have also have found a positive relationship between strain or perceived lack of opportunities and adoption of the code (Brezina et al., 2004; Stewart & Simons, 2006). Other factors related to street code values include prior victimization (Brezina et al., 2004), perceived police discrimination (Intravia, Wolff, Stewart, & Simons, 2014) as well as a general lack of respect for police (Piquero et al., 2012). Finally, and perhaps most relevant to the current study, street code values have been shown to be associated with levels of self-control as described by Gottfredson and Hirschi (1990) (Intravia et al., 2018; Piquero et al., 2012; McNeeley et al., 2018; Moule et al., 2015). For instance, a study of young adults demonstrated a significant association between low self-control and adherence to the code of the street after accounting for demographic characteristics, past involvement in violent behavior, and past victimization experiences (McNeeley, Meldrum, & Hoskin, (2018), highlighting the role of individual-level personality characteristics in the adoption of the street code.

Collectively, this body of research points to factors that are likely to contribute to the adoption of street code values. Notably missing, however, is an analysis of the relationship between an individual's temperament, and other values that may govern an individual's behavior, such as the street code. In the following section, we demonstrate the parallels between DeLisi and Vaughn's (2014) temperamental theory and how it may be an important and relevant predictor in explaining one's adherence to attitudes conducive to violence. Further, we review literature that highlights the potential role of temperament in the development of street code values at the individual level and explicates the role of each of these constructs in the generation of delinquent and violent behavior.

Temperament & The Code

Anderson's (1999) street code concept is seemingly consistent with self-regulation and emotional regulation concepts inherent in temperament research. Temperament, which is the usual ways that an individual experiences the environment and regulates responses to the environment, has been studied since antiquity and is essentially the biological foundation upon which personality resides (Baer et al., 2015; Clark, 2005; Giancola, 2000; Giancola et al., 1998; Kagan, 1998; Rothbart, 1989, Rothbart et al., 1994). Defined as constitutionally-based individual differences in emotional, motor, and attentional reactivity and self-regulation, an individual's temperament has been shown to exhibit a great deal of consistency across situations and relative stability over time (Shiner et al.,

Temperament and the street code

2013). In recent years, criminologists explicitly invoked temperament in a general theory of antisocial behavior and criminal justice system involvement. In that work, DeLisi and Vaughn (2014) theorized that two temperamental features, effortful control and negative emotionality, along with the interaction of these two features are robustly associated with conduct problems across childhood, adolescence, and adulthood. Moreover, these same constructs and their interaction are linked to justice system outcomes involving antagonistic relations with law enforcement and correctional officials.

The equivalence between temperament theory and the street code is clear. Both theories articulate that antisocial behavior unfolds among individuals who view situational provocation as threatening and one that requires an impulsive, violent response. According to DeLisi and Vaughn (2014):

Overwhelmingly, the temperamental features of recurrent offenders are characterized by impulsiveness, poor planning, a short time horizon, meanness, anger, and hostility. Criminal offenders almost always choose the immediate, emotionally-laden solution instead of the delayed, more prudent one. There is no bad decision they won't make, and much of this is caused by the constructs herein. Their back pages are composed of effortful control problems and negative emotional displays during adolescence, spanning childhood, and even in the first months of life (pp 19-20).

Although empirical support for temperament theory is considerable (e.g., Baglivio et al., 2016; DeLisi et al., 2018; Veeh et al., 2018; Wolff et al., 2015; Wolff et al., 2016; Wolff et al., 2020), most prior research overlooked the potential interrelation between temperament and the street code with one notable exception. Drawing on a sample of youth in residential juvenile facilities, Burgason et al. (2020) examined the street code and its association with self-reported arrests, self-reported delinquency, and self-reported violence while also controlling for several covariates including temperament deficits relating to effortful control and negative emotionality. They found that street code was significantly related to all outcomes even when accounting for temperament. However, additional analyses split by race found that the street code and temperament deficits had differential relationships with the offending outcomes among whites and African Americans, and in some models, temperament rendered street code effects non-significant. Others have highlighted that traits, such as hostile attribution bias, low self-control, and negative emotionality share important

Temperament and the street code

variance with the street code yet did not test these ideas empirically (DeLisi, 2018). Thus, although both street code and temperament theories point to the role of impulsive self-regulation during encounters and other social interactions, the linkages between the street code, temperament, and conduct problems remain relatively unclear.

Current Study

Empirical support for the street code is considerable, but it is critical to recognize that Anderson (1999) developed the theory as an explanation specifically for violent criminal behavior among African American males and primarily those living in urban centers. Yet, there is also consistent evidence that street code adherence is associated with conduct problems, violence, and related problems among other racial and ethnic groups, and indeed, among participants outside the United States (Brookman, Bennett, Hochstetler, & Copes, 2011; Brookman, Copes, & Hochstetler, 2011; Henson et al., 2017; Intravia, Wolff, Gibbs, & Piquero, 2016). This suggests that more universal etiological factors contribute to street code adaptation than merely the racial, social, and cultural environmental forces within the United States. Based on Anderson's (1999) discussion of having a violent identity among those who embrace the street code, one of those potential factors is temperament, especially considering the critical role of effortful control, the ability to resist or inhibit a dominant response (i.e., impulsive violence) in favor of a subdominant one (i.e., resolving a dispute verbally) and negative emotionality (especially ones with a hot or reactive valence, such as anger and hostility). In the current study, we examine whether these temperamental features are associated with street code values above and beyond a host of common demographic and structural variables.

Data and Methods

Participants and Procedures

The current study leverages data from a larger project, Voices of Incarcerated youth Concerning Exit Strategies (VOICES), which includes both official juvenile justice agency data as well as original data collected via surveys of youth in juvenile justice residential placement. VOICES was designed to assess the fears, challenges, and motivation for changing antisocial behavior upon transition back to their communities among a sample of male and female offenders returning from juvenile justice residential placement to a varying array of socioeconomic contexts. Herein we employ the VOICES survey results utilizing measures of Anderson's street code values used in prior

Temperament and the street code

empirical research coupled with risk/need assessment information on each respondent as well as socioeconomic and contextual measures of the youth's home census tract.

The principal investigators received both university and juvenile justice agency IRB approvals during the months of June and July 2018. The surveys were deployed across the residential programs of a single large private provider of residential programming in a southeastern state, asking juveniles serving a residential placement to participate in the VOICES project. Participation was completely voluntary, and both participants and non-participants were awarded an incentive (e.g., pizza party) after the surveys were completed. The provider-operated 1,092 "beds" within the state at the time of the survey, and exactly 1,177 youth were serving a placement between June 18, 2018, and July 31, 2018 (the dates when the hardcopy surveys were mailed to each program and when completed surveys returned).² Each survey contained a unique identifier and was provided to the youth represented by that identifier by program staff at each facility. This official identifier allowed the research team to match the survey results back to the juvenile justice agency administrative data housed in its information system (see below).

Identifying information (except the unique identifier number) was removed from each survey and surveys were hand-delivered to the co-principal investigator's university office, where they were entered by research staff into a database developed by the principal investigators specifically for the project. Of the 1,177 in-house youth, 874 youth completed at least a portion of the survey. However, 48 respondents were removed from the analysis because they did not provide responses to each of the key survey items used in the current study. Following Huang, Curran, Keeney, Poposki, and DeShon (2012), several steps were taken in order to ensure the reliability of the data collected. First, within the survey, there were a number of insufficient effort responding items embedded (Huang, Bowling, Liu, & Li, 2015). We excluded participants who responded inaccurately to more than one of these items ($n= 18$). Further, both the principal researcher and a graduate assistant reviewed the paper surveys together to determine whether it appeared the surveys had been completed with sufficient effort. Upon examination, an additional 56 surveys were excluded based on hand-checks because the youth indicated the same response for a large number (10+) of questions on the page (i.e., 'Christmas-treed' it), or used a solid line across items to indicate a response for multiple questions.³ Finally, small number of youth were excluded to accommodate

² The total possible number of youth (1,177) exceeds the total number of "beds" (1,092) operated by the provider as some youth were discharged and some admitted during the course of the survey months.

³ All models shown below were re-estimated using youth who had data on all of the necessary measures (including those flagged as suspicious. Results were not sensitive to their exclusion.

Temperament and the street code

the use of census tract-level measures capturing the neighborhood conditions from where youth lived prior to placement. Only youth with valid addresses, within the state, were retained, resulting in a final sample of 608 youth.⁴ The final analysis sample was predominately male (80%), and slightly over half non-Hispanic Black (54%), with an average age of almost 17 years old (see Table 1).

The unique identifier retained in the survey data was then used to match responses to each youth's juvenile justice agency data. Agency official data is inclusive of each youth's comprehensive arrest/offense history, all prior juvenile justice placement(s), demographics, and risk/need assessment information. The juvenile justice agency has employed a risk/need assessment specifically for residentially placed youth, the Residential Positive Achievement Change Tool (R-PACT), statewide since 2009.⁵ As per policy, every youth is assessed at admission, every 90 days thereafter the first assessment, and before release. As the youth in the current study were at different points of their placement when surveyed, the current study uses the R-PACT at admission for each youth to gain an understanding of their risk/needs at the point of entry into the facility, which also predates the administration of the survey.

TABLE 1 ABOUT HERE

Measures

Dependent Measure: Code of the Street

The dependent measure consists of the extent to which youth held beliefs that were consistent with adopting the street code. Consistent with prior work (Intravia et al., 2016; Stewart et al., 2006), a street code index was created from seven Likert scale items assessing agreement with: 1)

⁴ A total of 19 youth were excluded because their addresses on file were located in a state other than the current study state. In comparison to the 1,177 total in-house census during the survey period, the 608 included youth were more likely female (20% in comparison to 11.1% for the full sample, $p < .001$), and significantly less Black (54% compared to 63.9%, $p < .001$). The included youth sample did not differ from those who were excluded with respect to ethnicity, proportion with self-reported gang involvement, past drug use (yes/no), past mental health problems, or past child welfare history. As such, while more likely to be female and less likely to be Black, the 608 youth analyzed in the current analysis are arguably representative of all youth served in the provider's residential programs (approximately 65% of the entire state's residential youth) in terms of many prominent risk factors.

⁵ The R-PACT is administered as a semi-structured interview protocol where the assessor answers multiple forced-choice responses to items across twelve distinct domains. The R-PACT software then produces both static and dynamic risk scores for each domain (except criminal history, which only includes a static risk score). The youth's highest dynamic risk scores are then targeted in case management/ treatment plans for intervention. All R-PACT assessors are bachelor's level case management staff that have successfully completed a 3-day R-PACT assessment and case planning training, as well as a standardized 2-day Motivational Interviewing training. The validity of the R-PACT has been demonstrated in prior work where risk scores assessed at release were predictive of subsequent recidivism (Baglivio, Wolff, Jackowski, & Greenwald, 2017; Hay, Widdowson, Bates, Baglivio, Jackowski, & Greenwald, 2018).

Temperament and the street code

When someone disrespects you, it is important that you use physical force or aggression to teach him or her not to disrespect you; 2) If someone uses violence against you, it is important that you use violence against him or her to get even; 3) People will take advantage of you if you do not let them know how tough you are; 4) People do not respect a person who is afraid to fight physically for his/her rights; 5) Sometimes you need to threaten people to get them to treat you fairly; 6) It is important to show others that you cannot be intimidated; and 7) People tend to respect a person who is tough and aggressive. Response categories for each item ranged from 1= strongly disagree to 3 = neither strongly agree or disagree to 5 = strongly agree and the items were reverse coded such that higher values indicate a stronger agreement with the code of the street. An average of the seven items was calculated in order to obtain a total score representing the extent to which the youth held beliefs that were consistent with adopting the street code (mean = 2.88; SD = .864; $\alpha = .845$).

Focal Independent Measure: Difficult Temperament Index

The focal predictor in the present study is DeLisi and Vaughn's difficult temperament index which is constructed from a total of 11 R-PACT items, with higher values indicative of lower effortful control and higher levels of negative emotionality. In regards to the first dimension of temperament, 6 R-PACT items were used to capture one's level of effortful control. More explicitly, *Impulsivity* was assessed as using self-control/usually thinks before acting, some self-control, impulsive/often acts before thinking, and highly impulsive/usually act before thinking (coded 1-4, with higher values indicative of greater impulsivity). *Belief in control over impulsive behavior* ranges from believes he/she can control impulsive behavior, somewhat believes, and believes his/her antisocial behavior is out of his/her control (coded 1-3, with higher values indicative of less control over antisocial behavior). *Consequential thinking* is measured through the range of acting to obtain desired consequences, identifies consequences of actions, understands there are consequences to actions, and does not understand there are consequences to actions (coded 1-4, with higher values equating to lower consequential thinking). The *Control of aggression* item captures whether the youth has no issues with aggression/often uses alternatives to aggression to resolve disputes, sometimes uses alternatives to aggression, rarely uses alternatives, or lacks alternatives to aggression (coded 1-4, with higher values indicating a greater problem with aggression). Similarly, *control of impulsive behaviors* captures youth with no impulsive behavior issues, sometimes uses alternatives to impulsive behavior, rarely uses alternatives, and lacks alternatives to control impulses (coded 1-4, with higher values indicative of less control of impulses). Using *self-control* classifies youth as often using self-control,

Temperament and the street code

sometimes using, rarely used, and lacking skills in using self-control (coded 1-4, with higher values for less self-control).

The second dimension described by DeLisi and Vaughn (2014), negative emotionality, was captured using a total of 5 R-PACT items. *History of anger/irritability* was included, ranging from no history, history of occasional feelings, history of consistent feelings, and history of aggressive reactions to feelings of anger/irritability (coded 1-4, with higher values indicating more prominent anger). Similarly, *history of feelings of depression/anxiety* captured no history, occasional feelings, consistent feelings, or history of impairment in everyday tasks due to depression/anxiety (coded 1-4, with higher values equating to more depression/anxiety). *Tolerance for frustration* classified youth as never getting upset over small things, rarely, sometimes, or often getting upset over small things/having temper tantrums (coded 1-4, higher values indicative of less tolerance for frustration). The youth's *interpretation of the intentions/actions of others* classified youth as having a primarily positive view, primarily negative view, or primarily hostile interpretation of the intentions/actions of others (coded 1-3, with higher values indicative of a more hostile attribution bias. Finally, *respect for authority figures* ranged from respecting most, not respecting and maybe resenting some, resenting most, to being defiant and hostile toward authority (coded 1-4, with higher values indicating less respect for authority).

The covariation between each of the 11 temperament items described above was assessed using a principle component exploratory factor analysis. Exploratory factor analysis determines the number of factors that account for the covariation between the 11 items included in the measures of the scale. Results of this analysis suggest that each of the 11 items load onto a single factor with an eigenvalue of 3.44. Further, each of the items loaded significantly onto this common factor, with factor loadings greater than .40. Using the results of the factor analysis, we chose to create an index where higher values represent a more difficult temperament including lower levels of effortful control and elevated levels of negative emotionality by standardizing and summing each of the 11 measures discussed ($\alpha = .819$).

Demographics. Demographic items included *sex* (male = 1) and a series of dichotomous indicators of race and ethnicity. Specifically, *Black* (= 1) and *Hispanic* (= 1) were included, leaving White as the reference group, where ethnicity supersedes race such that all Black youth are non-Hispanic and Hispanic youth may be either Black or White. Additionally, the youth's *age at admission* to the program was included as a continuous measure (mean = 16.7, SD = 1.24). Finally, because youth receive a number of services during residential placement that may be related to an agreement

Temperament and the street code

with the street code (e.g., cognitive behavioral therapy), we control for the time spent in the program prior to the administration of the VOICES survey. The youth's *time in the program* captured using number of days (logged) the youth was in the program at the time of completing the VOICES survey (mean = 4.92, SD = .90).

Prior Residential Placement. Whether the youth had any prior residential placements were included. As all youth had at least one residential placement (the current placement), this measure dichotomously distinguished those with any additional prior residential placements (= 1), versus those for which the current placement was their first residential program (= 0). As shown, nearly 22% of youth had at least one additional prior residential placement.

Self-reported Gang Involvement. This item distinguished youth with no history of gang involvement from those with a self-reported history of being a gang member or associate. Notably, in the event the youth had been verified as a gang member or associate by law enforcement as per state statute, that indication would be used to “override” the youth’s self-report (this information is maintained as an “alert” in the juvenile justice agencies information system).

Current Mental Health Problems. Youth with current mental health problems were distinguished from those without such problems. As shown in Table 1, 47% of youth had such current problems. Mental health problems constitute a formal diagnosis, made by a qualified mental health practitioner (e.g., psychologist, psychiatrist, licensed mental health counselor), but do not include conduct disorder, oppositional defiant, ADD/ADHD, or substance abuse disorders.

Past Drug Use. Whether the youth has a history of past drug use that caused problems in life domains such as education, family, maintaining prosocial peers, leading to committing crimes, and health problems was included. Of note, 36% of youth had prior drug use where there were indicators that such use led to significant problems in such areas of life (as per interviews with the youth and family, comprehensive evaluation prior to placement, etc.).

Finally, *neighborhood violence*, was included to account for the degree of exposure to violence a youth has had in their neighborhood. The presence of neighborhood violence was captured dichotomously, distinguishing those youth who have not witnessed violence (= 0) from those who have witnessed violence (= 1). As shown in Table 1, 61.8% of the sample has witnessed violence in the neighborhood prior to their residential placement.

Neighborhood Level Contextual Measures. Characteristics of the neighborhood where the youth resided prior to residential placement may, at least in part, influence the extent to which the youth exhibits values and beliefs indicative of the code of the street. As such, we control for three

Temperament and the street code

contextual indicators of concentrated affluence, immigrant concentration, and residential instability (each measured at the census tract level). We note similar contextual measures have been used in prior work, including such measures among juvenile offenders generally (e.g., Rodriguez, 2013; Wolff, Baglivio, Piquero, Vaughn, & DeLisi, 2015), their impact on homicide (Kubrin & Weitzer, 2003), as well as how they are related to fear of crime (Roman & Chalfin, 2008). The construction of our contextual measures is derived from the 2013–2017 American Community Survey (ACS) 5-year estimates for census tracts in the current study state (U.S. Census Bureau, 2014). The 608 youth resided in 485 census tracts across the state prior to placement, with an average of 1.5 youth per tract (ranging from 1 to 5 youth).

To measure *concentrated affluence*, we use Massey's (2001) ICE measure. ICE captures the degree to which affluence is concentrated, relative to the concentration of poverty in a neighborhood. Accordingly, it reflects the relative socioeconomic inequality in a community, rather than the absolute level of disadvantage. Consistent with prior research, the ICE index was calculated using the following formula: $[(\text{Number of affluent families} - \text{Number of poor families}) / \text{Total number of families}]$ (Kubrin & Stewart, 2006). In the current analysis "affluent" is defined as families with incomes two standard deviations above the mean and "poor" is defined as families below the poverty line. This measure ranges from +1 to -1. A value of +1 indicates that all families in a given neighborhood are affluent; a value of -1 indicates all families are poor; and a value of 0 indicates an equal balance between affluent and poor families (Kubrin & Stewart, 2006; Massey, 2001; Morenoff et al., 2001).

Immigrant concentration included the percentage of foreign-born and percentage Latino/a. Both indicators were standardized and combined to create an immigrant concentration index where higher values indicate more immigrant concentration ($\alpha = .832$). This measure is consistent with prior research, which has examined the effect of immigrant concentration on crime and delinquency (Desmond & Kubrin, 2009; Reid, Weiss, Adelman, & Jaret, 2005; Wolff, Baglivio, Intravia, & Piquero, 2015; Wolff, Intravia, Baglivio, & Piquero, 2017).

Finally, *residential instability* was created from an item of percent renters and an item of percent residing in the same home from the year prior (reverse coded). Both indicators were standardized and combined to create the index of residential instability ($\alpha = .643$). Residential (in)stability has demonstrated relevance in prior work regarding neighborhood conditions and offending (e.g., Boggess & Hipp, 2010; Sampson, Raudenbush, & Earls, 1997), including juvenile offender recidivism (Wolff, Baglivio, Intravia, Greenwald, & Epps, 2017).

Temperament and the street code

Analysis

The current analysis uses bivariate and multivariate approaches to examine the relationship between youth- and community-level characteristics and our dependent measure of street code values. Prior to our multivariate assessment, bivariate correlations were utilized to explore the relationships present between the key variables used in the analysis for the current sample of justice-involved youth. In addition to assessing for the possibility of collinearity issues, these bivariate relationships provide preliminary evidence related to the proposed relationship between youths' temperament and street code values.

After establishing the bivariate relationship between the measures used in the current study, we utilize ordinary least squares (OLS) to assess the relationship between temperament and adherence to the street code while controlling for a number of youth-level characteristics. An examination of the residuals was used to assure there were no problems of heteroscedasticity present within the model. Variance inflation factors were also assessed in order to be sure there was not a problematic degree of multicollinearity. Finally, because in a small number of cases more than one youth resided in the same neighborhood prior to residential placement, robust standard errors that account for the clustering of youth within neighborhoods were estimated.

TABLE 2 ABOUT HERE

Results

Table 2 displays the bivariate correlations between the key variables included in the current study. Of primary interest, results presented in Table 2 indicate the dependent measure of street code values was significantly related to our measure of temperament in the anticipated direction. Specifically, youth with more difficult temperaments reported a greater adherence to the street code, although this relationship was relatively weak in absolute terms ($r = .041, p < .05$). In addition, male youth and Black youth reported a greater adherence to the street code than females and whites, ($r = .140$ and $r = .169, p < .05$, respectively). Higher scores on the street code value index were also significantly associated with prior gang involvement ($r = .122, p < .05$). As might be expected, time spent during current residential placement was negatively associated with street code values ($r = -.108, p < .05$), as was a greater concentration of community affluence ($r = -.098, p < .05$).

TABLE 3 ABOUT HERE

Table 3 presents the results of our multivariate analyses. Three models are presented. The first two models display the OLS regression results, where the continuous measure of street code values was regressed on youth demographics (model 1) and then a more robust set of youth- and neighborhood-level controls (model 2). The final model includes our difficult temperament index measure (model 3). Consistent with past research, males ($b = .379, p < .05$) and Black youth ($b = .316, p < .05$) were more likely to endorse street code values, as did youth who reported prior gang involvement ($b = .265, p < .05$). Surprisingly, results suggest that the level of concentrated affluence and witnessing violence in one's neighborhood were not significantly related to street code values within this sample ($p > .05$).⁶ However, time spent in residential placement was associated with lower scores on the street code index ($b = -.129, p < .05$), net of other factors considered. Regarding our primary research question, the results displayed in Model 3 of Table 3 suggest that after controlling for other factors in the model, a youth's temperament was significantly related to a greater adherence to street code values. Youth with more difficult temperaments, as measured by lower levels of effortful control and a higher degree of negative emotionality, reported a greater adherence to the street code ($b = .124, p < .05$). The magnitude of these effects are shown in Figure 1 (as standardized coefficients), along with 95% confidence intervals. We discuss these results in greater detail below.

FIGURE 1 ABOUT HERE

Discussion

In the current study we assessed whether youth with more difficult temperaments, as indicated by lower levels of effortful control and elevated levels of negative emotionality, were more likely to hold values consistent with the code of the street. In doing so, we hoped to add to the existing literature in this area by expanding the individual-level (and relevant theoretical) characteristics shown to be associated with the adoption of street code values (i.e. Henson et al., 2016; McNeeley et al, 2018; Piquero et al., 2012). Further, we assessed this relationship among an

⁶ In ancillary models, not shown here, we assess the relationship between other neighborhood-level measures of disadvantage and the adoption of the street code. Results of these additional models suggest that neighborhood measure of concentrated disadvantage is not significantly related to the adoption of street code values. Importantly, however, within this select sample of deep-end youth serving a residential placement, variation in these neighborhood-level measures is more limited, which may have an impact on the results obtained. Future research should examine these relationships among a broader sample of juvenile offenders. Full results available from the first author upon request.

Temperament and the street code

extremely policy-relevant sample of serious juvenile offenders serving a residential placement in the state of Florida. The findings suggest that temperament, as described by DeLisi and Vaughn (2014), is indeed associated with street code values among our sample of young adults, net of several demographic and contextual variables as well as exposure to community violence. Collectively, these results provide support for the key elements underpinning DeLisi and Vaughn's temperament-based theory within a large sample of adjudicated youthful offenders. Thus subsequent research in this area should consider such constructs alongside more established criminological frameworks that are inclusive of aspects of temperament more generally (i.e. self-control theory).

Assessing these relationships among a sample of deep-end juvenile offenders is important on multiple fronts, but primarily because they represent a very policy-relevant group in part due to their risk for future offending (Trulson et al., 2016). Accordingly, our findings lend themselves to a number of important policy considerations. Existing research on childhood temperament suggests that youth most likely to become involved in antisocial or criminal behavior can be identified early in life and that efforts should be made to intervene in cases where youth display uninhibited and uncontrolled temperaments (DeLisi, et al. 2018). This implies that interventions that target impulsiveness and negative emotionality, such as child skills training (e.g., Augimeri et al., 2007; Lösel & Beelman, 2006), may prove effective. In addition, youth programs such as the Gang Resistance Education and Training (G.R.E.A.T.) program have been shown to reduce future violence and gang membership, both which represent potential bi-products of higher street code attitudes.

Importantly, research suggests that individuals and treatments must be appropriately matched as it seems likely that different temperamental styles would interact differently with different criminological risk factors, and therefore that interventions would be better suited if they were tailored to individuals and associated risk factors (Baglivio, Wolff, Howell, Jackowski, & Greenwald, 2018; Baglivio, Zettler, Craig, & Wolff, 2021; Taxman, Thanner, & Weisburd, 2006). If a lack of effortful control and elevated negative emotionality are associated with perceptions and values shown to contribute to delinquent or violent behavior, targeting them in intervention programs should have desirable effects in reducing individual perceptions and values associated with increased use of hostility and violence.

As the current study focused on deep-end juvenile offenders in residential placement, many of which already appear to endorse the street code, it could be suggested that any intervention should employ cognitive-behavioral therapeutic approaches and curricula based on cognitive

Temperament and the street code

restructuring and skill-building. One such intervention, Cognitive Behavioral Therapy, has been shown to be effective among this target population, and could be used to disrupt negative cycles of thought, by slowing down individuals' emotional reactions, and avoiding instinctive responses to environmental stressors and thus reducing hostile and or violent behavior (Piquero, Jennings, Farrington, Diamond, & Gonzalez, 2016). Another promising approach, Aggression Replacement Training, treats aggression and violence by teaching prosocial responses to conflict and has been shown to be effective among youthful offenders (Currie, Wood, Williams, & Bates, 2012) We would be remiss, however, to not mention that youth residing in the most disadvantaged contexts like suffering from a severe lack of prosocial opportunities and family support that even the most effective evidence-based programs may be hard-pressed to combat.

As with all empirical research, the current study suffers limitations that merit further discussion. First, our results are based on youth-serving time in residential facilities within a single state, pointing to a need for additional research to examine whether similar findings are observed across different contexts. In particular, this study should be replicated using a more general sample of youth living in areas akin to those described by Anderson (e.g. higher levels of disadvantage and racial segregation, higher violent crime rates, and weaker police-community relations). Also important, the cross-sectional nature of the study, temporal ordering cannot be established, which limits the ability to draw causal inferences. We also cannot weigh in on the debate regarding how stable or dynamic the index of temperament is among this sample of youth. Secondly, although we statistically adjusted for the hierarchical nature of the data analyzed, controlling for levels of disadvantage in a youth's neighborhood, there were too few youth nested within individual census tracts to conduct a true multilevel analysis. Future studies should examine the association between the domains of temperament and street code values across a broad array of neighborhood contexts, including efforts to capture the objective level of crime present in one's community. Results of future research which include a broader swath of justice-involved youth are likely to shed more light on the associations between neighborhood context, temperament characteristics and values consistent with the code of the street.

Third, given the difficulty in operationalizing some concepts, as well as our reliance on the R-PACT assessment for many of the measures included in the current study (e.g. temperament), we cannot dismiss the possibility that better psychometric measures might yield more nuanced or potentially different results. We hope future research will be in a position to collect even stronger psychometric data in order to assess the relationship at hand but nevertheless believe that our

Temperament and the street code

preliminary investigation into this research question adds to the knowledgebase in several areas within criminology. While the current study is in no way explicitly stating assessment of street code is akin to an assessment of personality, we do argue that individuals who are more prone to having low effortful control coupled with high negative emotionality are those that are both quick to act with disregard/indifference for consequences and rules, as well as those that attribute hostility to the actions of others. This difficult temperament, especially in contexts of disadvantage with scarce resources and legitimate opportunities, promotes adoption of street code values and norms. We hold that street code flows from temperament deficits as those most likely to suffer from such deficits are those that most easily conform to the street code, as it most closely aligns with their personality. Certainly, anyone may be forced to act in certain ways in very specific circumstances, but those who have less behavioral inhibition and emotional regulation as well as who attribute hostility coming from others are more likely to live the street code across circumstances. Finally, it is possible that our measurement of street code values using self-report methods among an incarcerated sample of youth suffers from a kind of self-serving bias. Youth committed by the juvenile court to a correctional facility (for criminal activity) may be hesitant to report violent attitudes during their time in residential placement. Unfortunately, the current study leveraged the opportunity to collect data from this sample while the youth were in custody and we are unable to assess whether or not this is in fact the case. Future research measuring street code values and temperament among more diverse samples of youth, including those from states outside of Florida would provide additional support for the findings presented here. Further, if data collection at multiple time points was to be undertaken, a more complete understanding of the etiology of these characteristics would be possible. Given the possibility of longitudinal design, it would be valuable to assess whether institutional-level characteristics (such as extent of violence, aggregate levels of institutional misconduct, staff vacancies) also affect the extent to which within-individual changes in street code adherence during placement occur. Further, future work should test whether specific treatment/interventions affect within-individual change in street code during the course of residential placement with the goal of minimizing future delinquency and violence.

Toward this end, there are some recommendations for future research that emanate from the current study that may hold relevance for prevention and especially intervention efforts. For example, prospective longitudinal studies in which personality traits are measured early in life and related to later offending are needed, in order to investigate the relative importance of biological, individual, family, peer, and environmental influences on elements of temperament and antisocial

Temperament and the street code

behavior. Also critical are the ways in which culture (such as that described by Anderson) may interact temperament, the ways in which high-stress environments can alter genetic activity, and the ways in which innate physiological reactions impact individuals' perceptions of their environment. Additionally, as past research has suggested that neighborhood conditions and culture play a large role in fostering street code values, future research should consider the potential for environmental factors to have a joint effect on both the development of certain temperament characteristics in addition to those effects seen street codes. Relatedly, additional mechanisms should be examined that may be related to pathways by which difficult temperaments and street code adherence are related. As example, prior work has demonstrated negative emotionality accounts for over half of the total effects of heightened traumatic exposure on juvenile recidivism (Wolff & Baglivio, 2017), indicating cumulative trauma a potential candidate for future exploration. Further, future research in these wide-reaching areas may benefit from research designs that include data on twins or siblings in an effort to account for the portion of the association between youth temperament and street code values that could be due to heritability and shared environmental sources. Finally, as results illuminated those who had been at the residential program longer evidenced lower street code values, future work should examine within-individual changes in street code during juvenile justice placements/services and to assess the extent to which street code changes through treatment intervention. Unfortunately, the current study data lacked repeated measures of street code to allow such analysis and associated policy recommendations.

Conclusion

In sum, the results from our study contribute to the body of literature which explores the core characteristics associated with the adoption of the street code. Following Anderson's ethnographic depiction of the code of the street, we have presented a model that further highlights the association present between the core constructs of DeLisi and Vaughn's temperament-based theory and Anderson's code of the street. Given the substantial scholarly interest in subcultural theories among scholars in the field, we hope this current study will encourage additional research in this area.

Temperament and the street code

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Table 1: Descriptive Statistics for the Analysis of Street Code Values and Temperament

	Mean	SD	Min	Max
	%			
Street Code Values	2.881	0.864	1	5
Temperament Index	0	0.598	-1.61	1.97
Male	80.4%		0	1
White (reference)	31.1%		0	1
Black	54.3%		0	1
Hispanic	14.6%		0	1
Age	16.726	1.239	12.36	20.16
Prior Residential	21.9%		0	1
Gang Member	11.0%		0	1
Mental Health	47.2%		0	1
Past Drug Use	36.3%		0	1
Neighborhood Violence	61.8%		0	1
Time in Program (logged)	4.923	0.902	1.39	7.16
Concentrated Affluence	.055	.237	-.60	.73
Immigrant Concentration	.009	.916	-1.03	4.27
Residential Instability	.033	.839	-1.59	3.58
<i>N</i>	608			

Table 2: Bivariate Correlations Between Independent Measures and Street Code Values

		Street Code Values
(1)	Temperament Index	.041*
(2)	Male	.140**
(3)	Black	.169**
(4)	Hispanic	-.037
(5)	Age	-.044
(6)	Prior Residential	.006
(7)	Gang Member	.122**
(8)	Mental Health	-.009
(9)	Past Drug Use	-.008
(10)	Neighborhood Violence	.057
(11)	Time in Program	-.108**
(12)	Concentrated Affluence	-.098*
(13)	Immigrant Concentration	-.028
(14)	Residential Instability	.062

N = 608; * $p < .05$, ** $p < .01$

Table 3: Multivariate Analysis of Street Code Values and Temperament

	Model 1	Model 2	Model 3
	B/95% CI	B/95% CI	B/95% CI
Temperament Index	--	--	.124*
	--	--	[.002,.245]
Male	.312**	.350**	.379**
	[.136,.488]	[.166,.534]	[.192,.566]
Black	.314**	.317**	.316**
	[.160,.468]	[.155,.478]	[.153,.478]
Hispanic	.103	.136	.131
	[-.112,.317]	[-.093,.365]	[-.099,.361]
Age	-.047	-.037	-.029
	[-.103,.010]	[-.094,.020]	[-.086,.028]
Prior Residential	--	-.033	-.009
	--	[-.191,.125]	[-.167,.150]
Gang Member	--	.268**	.265*
	--	[.065,.470]	[.062,.467]
Mental Health	--	.056	.024
	--	[-.077,.188]	[-.111,.160]
Past Drug Use	--	.009	-.024
	--	[-.147,.164]	[-.180,.133]
Neighborhood Violence	--	.076	.072
	--	[-.073,.225]	[-.076,.220]
Time in Program	--	-.124**	-.129**
	--	[-.192,-.056]	[-.198,-.060]
Concentrated Affluence	--	-.172	-.190
	--	[-.487,.142]	[-.508,.129]
Immigrant Concentration	--	-.043	-.046
	--	[-.127,.040]	[-.129,.037]
Residential Instability	--	-.004	-.006
	--	[-.090,.081]	[-.091,.080]
Constant	3.224**	3.547**	3.440**
	[2.276,4.172]	[2.578,4.517]	[2.464,4.416]

N = 608; * p < .05 - ** p < .01; 95% Confidence intervals that account for youth clustered within neighborhoods shown.