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ORIGINAL ARTICLE

For Males Only? The Search for Serious, Violent, and Chronic Female Juvenile Offenders

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Abstract
Purpose The current study examines the prevalence and correlates of serious, violent, and chronic offending among female juveniles admitted to juvenile justice residential programs in the state of Florida.
Methods Results are based on 3008 female youth who completed juvenile justice residential commitment programs from July 1, 2009 to June 30, 2014. Prevalence and correlates of serious, violent, and chronic offending among female youth were examined using logistic regression. Correlates include criminal history, individual, and mental health risk factors as well as temperament constructs.
Results This sample of deep-end female offenders evidenced a serious, violent, and chronic prevalence rate of 27%. Female youth who offended earlier in life, those who were gang-involved, had a history of child welfare involvement, and had conduct disorder or temperament problems are more likely to evidence serious, violent, and chronic offending patterns.
Conclusions Serious, violent, and chronic female offenders represent a unique subset of juvenile offenders, presenting with myriad of mental health, temperamental, and individual risk factors. Large studies, such as the current examination, are needed to

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adequately understand the risks and correlates of serious, violent, and chronic offending among female delinquent youth.

Keywords Serious, violent and chronic offending · Juvenile delinquency · Female crime

Introduction

One of the most important and axiomatic findings in the study of externalizing problem behavior is its asymmetrical nature. That is, a small subset of persons accounts for the majority of antisocial behaviors. Research derived from birth cohort, criminal career, and nationally representative samples has repeatedly found that approximately 5% of a sample accounts for the lion's share of the offending [1–7]. Although a number of seminal and converging theoretical constructs have appeared that coalesce with the notion of a severe 5%, such as life-course-persistent and fledgling psychopathy [8–11], the one that is perhaps most notable in the realm of juvenile justice is the concept of serious, violent, and chronic (SVC) juvenile offenders [9, 12]. Notably, not only is this group distinguished by a disproportionate contribution to offending, but they are also known for prolific drug use, vandalism, co-occurring mental health distress, and social and economic burden [10, 11, 13–15].

Studies indicate that the behavioral and collateral consequences of SVC juvenile offending are immense and far-reaching, culminating in billions in total costs stemming from justice system, victimization, mental health, and other associated expenditures [16–19]. Specifically, the average cost of each chronically violent adolescent has been estimated at two million dollars. For these reasons, continued understanding of the developmental psychopathology and social epidemiology of SVC offending is central to advancing prevention, treatment, and policy-making around what has been termed one of the most pressing and important problems in child and adolescent behavioral and mental health [20]. The vast majority of research examining extreme offending, however, has been conducted on delinquent boys and males in general, while we know relatively little about this phenomenon in female juvenile offenders [21]. The present investigation seeks to contribute new knowledge on delinquent females by identifying the prevalence and examining the predictors of SVC offending in a uniquely large and data-rich sample of female juvenile offenders placed in juvenile justice residential programs. There is a dearth of research knowledge pertaining to extreme offending in females, and examination of these constructs will aid in elucidating the empirical status of SVC offending among females during the adolescent period.

SVC Offending and Females

Although there has been a durable interest in the long-term deviant careers of conduct disordered children and youth (e.g., [22, 23]), keen interest in offending trajectories and the convergence of serious, violent, and chronic youth offending began approximately 20 years ago. As one of the first handful of scholars to examine high risk groups, Moffitt's [10] developmental taxonomy stands as one of the most prominent theoretical frameworks.

Using the aggregate age-crime curve as her point of departure, Moffitt suggested that the offending population could be divided into one of two distinct typologies, adolescent limited and life-course-persistent offenders (for review see [24]). Embodying its name, the former group begins to offend during adolescence and (for the most part) restricts their antisocial involvement to this explosive yet transient period of time that is marked by the importance of peers and biological maturity. This interaction, which culminates with involvement in adult-like behaviors such as drug and alcohol use, promiscuous sex, and theft (to obtain money), is one that is restricted to the adolescent period because as early adulthood ensues, former adolescent-limited offenders are no longer prohibited from the things that they were once prohibited from engaging in. Only a few such offenders go onto adulthood offending for reasons related to being ensnared, such as a drug habit, pregnancy and early parenthood, or an incarceration stint. On the other hand, the life-course-persistent trajectory is characterized by the interaction between neuropsychological deficits and disadvantaged familial and economic environments. This interaction begins to take shape throughout the first few years of life, exhibits strains on parental socialization of the youth, and when left uncorrected or unattended to, continues to harden throughout childhood and into adolescence. Offenders in this trajectory tend to mirror serious, violent and chronic offenders, beginning their antisocial behavior early in life and continuing throughout adolescence into adulthood. Moreover, the range of their antisocial involvement is varied and variable and also includes person offenses and failure in many domains in the life-course, including education, employment, and inter-personal relationships. The prospects for change are very slight, though a select few life-course-persistent offenders do recover [25].

Importantly, while her original work did not make any gender-specific predictions regarding the prevalence of female life-course-persistent offenders, Moffitt later put forward a more specific set of expectations regarding gender and offending. Specifically, she suggested that while life-course-persistent offenders are expected to exist among females, there would be fewer of them, in large part because they do not suffer from the putative correlates of life-course-persistent style membership, including neurological deficits, at the same rate/level that males do [45].

Regarding serious, violent, and chronic offending, one of the first analyses of SVC juvenile offender classification was conducted based on data from Maricopa County (Phoenix, AZ). In this study, Snyder [26] found that among over 150,000 court referral offending careers, 3% met the criteria for SVC classification. Snyder also found that these SVC juvenile offenders were more likely to be early starters. Life-course research has examined the potency of an early age of onset of offending on criminal careers [27] and shows that the early onset marker possesses substantial risk for later SVC offending [28, 29] compared to later age of offending onset. Using the community-based Pittsburgh Youth Study, Loeber, Farrington, and Waschbusch [30] replicated Snyder's findings and found a similar prevalence of SVC offending. Classification findings on SVC adolescents are somewhat sensitive to the measurement of offending (e.g., court referral data, police contact, and self-report). For example, birth cohort analyses of SVC offending based on official police contact data found prevalence to be as high as 14% for males [31]. Most recently, Baglivio et al. [12] conducted analyses of statewide data from Florida and found that the classification of SVC juvenile offenders was relatively stable and SVC offenders were substantially more likely to first be referred at 12 years

or younger. There were no comprehensive analyses specifically of the SVC female juvenile offender subgroup in that study.

While it is well established that male sex is one of most robust correlates of crime [32] and there are trenchant challenges to the idea that females are represented among the most extreme of law breakers [20], there are a substantial number of females who have engaged in serious offending [33–35]. For instance, DeLisi [34] interviewed 55 adult female criminals who averaged well over 40 arrests. These arrests were not merely minor violations as many of these females accrued numerous violent charges including armed robbery and assault. Evidence from birth cohort and nationally representative samples also suggest that adolescent females are involved as extreme offenders. Based on police contact data, an SVC prevalence of 2% was identified for females from the 1958 Philadelphia Birth Cohort Study [31]. Using self-report data from adolescents (age 12–17 years) in the general population, Vaughn et al. [6] identified a severe 5% (actual 4.7) subgroup of which approximately one third was female. Moreover, their analyses of the externalizing behavior ratios for the severe group relative to the full sample indicated that females were roughly comparable to their fellow male five percenters accounting for relatively large proportions of total externalizing behavior such as drug use, selling drugs, fighting, theft, and carrying a handgun. In a study of 133 confined female delinquents, Odgers et al. [36] reported that 45% of serious female delinquents had used a weapon while fighting, 32% engaged in gang activity, 41% attacked a victim with the purpose of injuring or killing them, and 27% had shot someone. The most violent females exhibited the most acute psychopathology, had the most extensive abuse and victimization histories, and were reared in homes with more criminal parents and siblings.

In a systematic review of over 1600 studies on delinquent females, Zahn et al. [37] concluded that many of the same psychosocial risk factors were similar for females as males, though females may be more sensitive to certain risk factors such as sexual abuse and other adverse childhood experiences. However, their review was culled from the general female delinquent literature and did not specifically address extreme female offenders or SVC females.

To be sure, both prior work and theory suggest that it is unlikely that female juvenile offenders will engage in antisocial behavior with the same proportions, ferocity, and intensity as their male counterparts. As noted earlier, Moffitt's [38] work suggests that while it is possible that life-course-persistent styles of offending would be open for females, there would be fewer of them, in large part because they do not evidence the same levels of risk as their male counterparts. However, these aforementioned findings offer a potential window into the world of SVC females on a pathway toward adult offender status during their adolescence and warrant greater empirical scrutiny. Given the lack of research attention, salient questions remain such as can an SVC subgroup of juvenile females be identified that corresponds to what we know about SVC male juvenile offenders and severe 5% subgroups found in previous research on the asymmetry of offending? If so, are the risk factor profiles of these female SVC juvenile offenders largely the same or uniquely different? Answers to these questions not only are critical for prevention purposes and for informing the evidence based on gender-specific programming in the juvenile justice system, but are also relevant to theoretical frameworks that posit both similarities and differences with respect

to how the sexes are distributed within the offending population, especially with respect to "life-course-persistent" offenders [10, 14].

Current Focus

The purpose of the current study is to examine the prevalence and correlates of SVC offending among female juveniles admitted to juvenile justice residential programs in the state of Florida. To date, the epidemiology on female SVC offending is limited by methodological and data limitations such as small sample sizes and historic birth cohorts. The current study overcomes these limitations by examining more than 2000 residentially placed female offenders, over 600 of which met SVC classification at time of placement. As such, we attempt to advance the understanding of female SVC offenders by (1) examining the prevalence and correlates of female SVC offending in a large, diverse, multiyear statewide sample, (2) including demographic, personal, mental health, and attitudinal risk factors, and (3) comparing female delinquents across SVC categorizations of (1) either serious, violent, or chronic, (2) all three, and (3) none of the three, on an array of prominent risk factors.

Methods

Sample

The Florida Department of Juvenile Justice (FDJJ) evidenced 3008 female youth who completed juvenile justice residential commitment programs from July 1, 2009 to June 30, 2014. The current study examines all of those released females with a length of stay over 90 days that were assessed with the FDJJ residential risk/needs assessment, the Residential Positive Achievement Change Tool (R-PACT).[1] Additionally, eight youth were classified as "other" race/ethnicity, and were excluded as well due to the small sample size of this group prohibiting its ability to distinguish SVC offenders. This process resulted in a final sample of 2286 black, Hispanic, and white (non-Hispanic) female juvenile offenders who completed a FDJJ residential program during the 5-year study period, representing every female meeting the outlined criteria from each of the 28 distinct residential programs operating during the study period. Official FDJJ records from its Juvenile Justice Information System (JJIS) centralized database were used for demographic and system placement information. The JJIS maintains all social, offense, placement, and risk assessment history data for all youth referred to the FDJJ (equivalent to an adult arrest).

[1] One hundred and seventy-four females were excluded from the analysis due to placement lengths under 90 days. These would most often be youth transferred to other programs and unusual circumstances. While length of placement in Florida is indeterminate, and only a judge may approve release, all FDJJ residential programs have anticipated lengths of stay over 3 months (for descriptions of individual FDJJ facilities, see http://www.djj.state.fl.us/programs-facilities/residential-facilities). Additionally, 540 females were excluded due to not having been assessed using the R-PACT. The exclusions based on the lack of R-PACT assessment were due to the timing of the 2009–2010 statewide implementation of the R-PACT and the youth's admission date (as the R-PACT was implemented during 2009–2010, only new admissions were required to be assessed).

Procedures

The risk factor measures used in the current study (described below) were all derived from risk/need assessment information (the R-PACT assessment) also maintained in the JJIS. FDJJ Administrative Rules (63E-7: Operation of Residential Programs) require all youth placed in residential commitment programs in FDJJ to be assessed with the R-PACT and at specific intervals. Initial assessment occurs within 30 days of admission to assist with the development of an individualized treatment/case plan for each youth. The R-PACT assesses youth for risk and protective factors across 12 domains (criminal history, gender, school/vocational, use of time, employment, relationships, family, alcohol/drugs, mental health, attitudes, aggression, and social skills). The assessment is conducted as a semi-structured interview protocol, based on youth self-report which is corroborated with additional sources (such as parents, education records, a comprehensive psychological evaluation which is required prior to placement in a residential program in Florida, and child welfare records). Of note, criminal history information (official arrest and placement information) is automated from the FDJJ information system, and is therefore not based on self-report/recall of the youth.

Information obtained from these sources is used to select forced choice responses to specific multiple choice items in the R-PACT software. Bachelor's degree level case management staff complete the interview and assessment. All R-PACT assessors are required to complete a 2-day standardized motivational interviewing training, and a standardized 3-day R-PACT theory, assessment, and case planning training, which include inter-rater reliability exercises and a standardized exam which must be passed. Both the motivational interviewing and the R-PACT trainings must be facilitated by FDJJ-certified qualified trainers who have been observed conducting the training and received fidelity monitoring and coaching for proficiency. While the reliability of the R-PACT has not been empirically assessed, this assessment overlaps significantly (over 50% of the items are identical) with another assessment, the C-PACT, which has been demonstrated to be both valid and reliable. This "sister" assessment, which is conducted in the community (i.e., probation and diversion youth), has been assessed with Florida DJJ using videotaped interviews and an offense history file, with findings demonstrating an intra-class correlation coefficient (ICC) of 0.83 and only 4% of items (five items) with less than 75% agreement with an "expert" rater [39].

Based on best practices for community risk assessment, each youth is reassessed during residential placement every 90 days from the initial R-PACT assessment to measure treatment progress and guide any treatment/case plan revisions. Finally, the R-PACT is administered to each youth prior to exit from the residential program. Comparing the initial to exit R-PACT allows us to assess the extent to which risk factors have been reduced and protective factors increased throughout residential placement. As an indication of predictive validity, two prior studies have shown that the R-PACT exit risk scores are predictive of subsequent recidivism, with those youth having more risk remaining at release more likely to reoffend and that changes in dynamic risk from initial to exit assessment predict recidivism [40, 41, 42]. For the purpose of the current study, individual items were taken from the initial assessment to be examined for prevalence, as well as correlates of serious, violent, and chronic female offending. Using the initial

assessment examines youth as they are admitted, which alleviates the need to control for the treatment provided in assessment of any differences across groups of youth.

Dependent Measures

The criminal history items in the R-PACT risk/needs assessment are prepopulated into the assessment from charge and placement information maintained in the JJIS information system. This provides for accuracy, reliability, and consistency in definition of offenses, adjudications, and their classification, and eliminates issues surrounding retrospective recall of crime commission by juvenile offenders. The criminal history indicators regarding adjudicated misdemeanor, felony, against-person (violent) felony, and weapon/firearm offending were combined to create categories of serious, violent, and chronic offending. These SVC categorizations are identical to those of past research using Florida juvenile offenders [12] and similar to additional prior work (e.g., [26, 43]). It is important to note that each SVC indicator (explained below) uses adjudicated charges, and therefore, the end result of any "pleading down" that may have occurred for females initially charged by law enforcement/prosecutors with more serious offenses. To reiterate, each dependent measure is derived from the R-PACT assessment criminal history domain, which is the auto-populated official criminal history adjudicated charges of the youth, as maintained in the FDJJ centralized database.

Females admitted to the residential commitment program with a criminal history of at least one felony adjudicated offense were classified serious offenders. This indicator of serious offending is identical to that used in prior work [12]. Females admitted to the residential commitment program with a criminal history of at least one adjudicated felony against person offense or weapon/firearm offense were classified violent offenders. The inclusion of offenses in which a weapon is used is based on prior research [44, 45]. Females admitted with at least four prior adjudications, for which at least one of those adjudications were for a felony offense, as well as youth adjudicated for at least five misdemeanor offenses (with no requirement for felony adjudication) were classified as chronic offenders (=1, else = 0). Prior research operationalizing chronic offending based on official records has ranged from three or more previous legal adjudications [44], to four or more court referrals [26, 46], and to nine or more convictions [47]. The current measure of chronic as four or more referrals is consistent with that used by Snyder [26] and other previous research [46]. Using these classifications, three distinct groups were created.

SVC Offenders Females who met all three criteria for classification as a serious, a violent, and a chronic offender listed above were classified as an SVC offender (=1, else = 0).

None of the Above Youth who did not meet criteria for serious, violent, or chronic were classified as not S, V, or C (and can be thought of as "none of the above"; =1, else = 0).

All Other Youth Youth who met the criteria for at least one but not all three of the classifications (serious, or violent, or chronic) were classified as S, V, or C (and can be

thought of as "all other youth"; =1, else = 0). It is important to note that females in the final group may be a combination of any two of the three classifications, but are not classified as SVC.[2]

This process generated three mutually exclusive groups: SVC offenders, none of the above offenders, and all other youth. Finally, from these three groups, two dichotomous dependent variables were generated. First, a measure designed to explore the differences between not S, V, or C (none of the above) offenders (=0) and SVC offenders (=1) was created. This measures assesses the difference between the most serious female offenders (SVC) and the least serious female offenders (none of the above offenders). In the second measure, SVC offenders (=1) were compared to all other female offenders (=0) to determine which variables are capable of distinguishing SVC offenders from all other youth (those that are not SVC nor none of the above) in the sample.

Independent Measures

Race/Ethnicity Race/ethnicity was captured through separate dichotomous indicators for black (=1), and Hispanic (=1), with white (non-Hispanic) serving as the reference group. Race was included due to prior work showing racial differences in SVC prevalence, with black youth having a higher likelihood of SVC offending [12, 6].

Age at Time of Release Age at release captures the age of the youth at the time she completed the residential program (measured continuously). Within this sample of juvenile offenders, it is possible that younger youth have simply not had the time to evolve into SVC offenders. Thus, age is included in the current analysis to reduce the possibility of spurious findings among our other correlates and offender type.

Criminal History Risk Factor

Age at First Arrest The age at which the female was first arrested was included as a criminal history risk factor based on prior work indicating early-onset offenders more likely to evidence SVC criminal careers [26, 46]. Age at first arrest ranges from 12 years and under, 13 to 14 years, 15 years, 16 years, and over 16 years of age at first arrest (coded 1–5). Higher values indicate the female was older when first arrested.

[2] As mentioned above, there are different possible constellations of serious and/or violent and/or chronic that make up the group of remaining youth. Of this group, 2% were violent only, 30.7% were classified as serious only, 8.4% were chronic only, 23.8% were serious and chronic but not violent, and finally 35.1% were classified as violent and serious but not chronic. Within this sample of youth in residential facilities, the majority of violent offenders had been adjudicated of a felony and were thus also classified as a serious offender. Only a misdemeanor weapons offense would qualify a youth as violent only (and not serious), which accounts for the small proportion of violent only offenders included in the present study. From this ancillary analysis, we can also see that there is a significant proportion of youth who have been classified as serious, but are neither violent nor chronic offenders.

Personal Risk Factors Several individual risk factors both hypothesized and previously found to be correlates of SVC offending were included [9, 12, 48]. All of these measures are items contained in, or derived from, the R-PACT assessment.

Adverse Childhood Experience ACE Score A summary measure of adverse childhood experience (ACE) exposures captured the sum of dichotomous indicators (each captured in the R-PACT) for physical neglect, emotional neglect, physical abuse, emotional abuse, neglect, family violence, household mental illness, household substance abuse, and parental jail/imprisonment history (=1 for each where the indicator was self-report or collaterally confirmed). These nine dichotomous ACE indicators were summed to arrive at an ACE score ranging from 0 to 9.[3] This index is a cumulative stressor score indicative of the extent of multiple childhood trauma and maltreatment exposures, where higher values indicate more exposure types. Prior studies predicting SVC offending used this identical 9-point ACE score, showing that each additional ACE exposure (each additional point on the ACE score) increases the risk of becoming an SVC offender by 35% when controlling for other risks and criminal behavior in a sample of 22,575 youth arrested in Florida [43].

Age at First School Suspension/Expulsion The age at which the female was first suspended or expelled from school was captured in the R-PACT as 5–9 years of age, 10–13 years, 14–15 years, 16–18 years, or never suspended/expelled (coded 1–5, respectively). Higher values indicate older ages of first suspension/expulsion or never suspended/expelled and therefore indicate less "risk." This measure is included as Moffitt [10] hypothesized that persistent offenders would evidence educational and behavioral difficulties.

School Status Prior to Residential Placement The female's school status prior to admission to residential placement was captured in the R-PACT as graduated/GED, enrolled full-time, enrolled part-time, suspended, dropped out, and expelled (coded 0–5, respectively). Again, based on Moffitt's taxonomy, it is hypothesized female SVC offenders would be more likely to evidence educational difficulties and poor academic performance such as suspension, dropping out, or expulsion.

Pro-social Activity Involvement Based on Moffitt's expectation that persistent offenders would be more likely to suffer from pro-social peer alienation due to antisocial behavioral manifestations, the female's historic participation in structured and unstructured pro-social activities are captured with an index "activities" item. Structured activities included community activities, such as religious group/church, community group, cultural group, club, and athletics that were supervised, and were captured as involved in two or more groups/activities, one group/activity, or never involved (coded 0–2). Unstructured pro-social activities included activities that positively occupy the youth's time, such as reading and hobbies, and were captured as involved in two or more, involved in one, or never involved in pro-social unstructured hobbies/activities.

[3] Unfortunately, the R-PACT assessment does not contain information on divorce/parental separation. Therefore, the measure of ACEs included has a possible range of 0–9, which has been used in prior research utilizing data from the state of Florida.

These two R-PACT items were standardized and combined into the activities additive index with a mean of zero (α = 0.755), where higher values indicate less involvement in pro-social activities.

Gang Association/Membership Antisocial peer association has consistently been shown to be among the strongest predictors of delinquency risk [49–51], with prior work justifying the use of a single item measuring gang membership [52]. A dichotomous item captured the female's self-reported gang association/membership (=1, else = 0).

Witnessing Violence in the Community Females who have self-reported witnessing violence in their communities were coded 1 (else = 0). This item was included based on the research indicated above regarding adverse childhood experiences and SVC [43], as we argue witnessing violence is another form of traumatic exposure.

History of Positive Adult Non-family Relationships The female's history of positive relationships with non-family adults was captured by the R-PACT as no positive relationships, one positive, two positive, or three or more positive relationships with adults (coded 0–3, respectively). Positive adult relationships connected to school or employment were not included. The item captures adults who are not teachers and not part of the youth's family who can provide support and model pro-social behavior, such as religious leader, club member, or person in the community. Higher values indicate more positive relationships with supportive adults. As stated above, the antisocial behavioral manifestations of persistent offenders, according to Moffitt, should limit the possibility of pro-social relationships for SVC females in the current study.

Child Welfare System History Whether the youth has history of child welfare system voluntary or court-ordered out-of-home or shelter placements exceeding 30 days was captured as no history of placements, one placement, two placements, and three or more placements (coded 0–4, respectively). Indication of placement histories (via self-report of the youth) is corroborated through access of the assessment staff to the child welfare system database. Higher values indicate a more extensive child welfare system placement history and are potentially predictive of SVC offending as they are indicative of substantiated histories of abuse and/or neglect. Moffitt [10] places strong emphasis on the effects of inadequate parenting for persistent offending, as the "juxtaposition of a vulnerable and difficult infant with an adverse rearing context initiates risk" for persistent offending.

Prior Living Arrangement An R-PACT item categorizing the female's living arrangements prior to admission to the residential program was included. Prior living arrangements ranged from with adult supervision, with peers and no adult supervision, alone with no adults, and transient with no adults (coded 0–3, respectively). Based on Moffitt's theory, SVC offenders would be more likely to evidence conflicts at home that would lead to getting kicked out of the home, or running away (see indicator below).

History of Running Away/Getting Kicked Out of the Home The female's history of running away/getting kicked out of the home was captured as no history, less than six

instances, or six or more instances (coded 0–2, respectively). Six or more instances are the upper limits of captured by the R-PACT and was therefore used to separate youth without a runaway history, those with some instances, versus those with the most possible as per the assessment. Higher values on this measure indicate a greater history of running away.

Prior Alcohol use Elevated levels of substance use have been found in youthful offenders deemed the "severe 5%" [6], as well as previously identified and studied Florida SVC offenders [12]. As such, past use of alcohol was captured through the R-PACT assessment process as no past use, past use, and past use where such use caused problems in areas of life (coded 0–2). Life areas impacted by alcohol use may include disruptions in education, causing family conflict, interfering with keeping pro-social friends, causing health problems, contributing to criminal behavior, needing increasing amounts of alcohol, or withdrawal symptoms.

Prior Drug use Similar to alcohol use, past use of drugs was included based on prior work [12, 6], captured as no past use, past use, and past use where such use caused problems in areas of life (coded 0–2). The same life domain impacts were associated with drug use causing problems as described for alcohol use above.

History of Alcohol/Drug Treatment Program Participation The female's history of participation in drug or alcohol treatment programs was captured as no history, history of one prior programs, and history of multiple prior drug or alcohol treatment program participation (coded 0–2). Higher values indicate more instances of treatment program participation. Such participation is captured via self-report and corroborated with the comprehensive psychological evaluation report (a required assessment prior to placement in residential programs, as mentioned above).

Mental Health-Related Factors Several mental health indicators and risk factors were included as follows:

Special Education Student Moffitt's taxonomy places heavy emphasis on neuropsychological deficits, particularly poor verbal and executive functioning. A measure of special education needs/diagnoses as an indirect method of capturing this risk factor is therefore appropriate. Whether the youth had a history of being a special education student or a formal diagnosis of a special education need was captured as a dichotomous indicator (yes = 1, else = 0). Special education diagnosed needs include behavioral, learning, or mental retardation issues, and is gathered via self-report through the R-PACT process and corroborated with education records.

ADHD Whether the youth had a formal diagnosis of ADHD at admission was measured dichotomously (yes = 1, else = 0), captured via self-report and corroborated with the comprehensive psychological evaluation report. Prior work has argued and indicated ADHD to be more prevalent in persistent offenders than adolescent limited offenders [10, 53, 54].

Suicidal Ideation History Prior work has indicated a previous suicide attempt influences juvenile reoffending [55]. The extent of the youth's history of suicidal thoughts or actions was included. Suicidal ideation is based on youth self-report and evidence of hospitalization for self-injurious behavior or articulation as evidenced in the comprehensive psychological evaluation. This item ranged from no history of suicidal thoughts, history of suicidal thoughts, plans to commitment suicide or feeling life is not worth living, and youth who have attempted suicide. The item separates those with no prior thoughts, those who have thought or planned suicide, and those who have actually attempted suicide (coded 0–2), with higher values indicating greater suicidal history.

History of Depression The youth's history of depression or anxiety was captured as no history, occasional feelings, consistent feelings, or history of impairment in everyday tasks due to depression or anxiety (coded 0–3; again, based on self-report and information in the comprehensive evaluation). Higher values indicate more severity of depression/anxiety.

Conduct Disorder A dichotomous measure of whether the female had a formal diagnosis of conduct disorder (yes = 1) was included (based on information in the comprehensive evaluation). Persistent offenders are theorized to have increased prevalence of conduct disorder [56], and conduct disorder has been demonstrated to increase risk of violence, weapon use, teenage pregnancy, substance abuse, and school dropout [57].

Temperament Factors Four R-PACT items were included which we categorize as attitudinal factors. The items were maintained separately after exploratory factor analysis indicated a less-than-ideal measurement rating for an index.[4] Difficult temperament, low frustration tolerance, negative emotionality/hostile attribution, and effortful control deficits have all played major roles in Moffitt's taxonomy and work on offending and reoffending behavior [58–60, 44].

Behavioral Control The youth's belief in the ability to control her antisocial behavior was captured via self-report through the R-PACT process as believes that such behavior is out of her control, somewhat believes that antisocial behavior is controllable, or believes that she can stop her antisocial behavior (coded 0–2). Higher values indicate a stronger belief that delinquent behavior is under her control.

Tolerance for Frustration The reactions to frustration measure ranges from never getting upset over small things, rarely getting upset, sometimes gets upset over small things or has temper tantrums, and often gets upset over small things or has temper tantrums (0–3, respectively). Higher scores indicate a lower level of tolerance. This R-

[4] We conducted exploratory factor analysis (EFA) as the temperament items were believed to possibly represent similar/identical constructs. Prior work examining temperament in FDJJ community-based samples has used indices of temperament constructs (cf. [58]). However, EFA indicated that the items were better retained individually for the current sample.

PACT item is based on self-report and corroborated with education records and the comprehensive evaluation.

Hostile interpretation Hostile interpretations of the actions and intentions of others in a common non-confrontational setting was included with higher scores indicating greater levels of hostility attributed to others' actions and intent. Hostile interpretation ranges from primarily positive, primarily negative, and primarily hostile view of the intentions of others (coded 0–2). This R-PACT item is based on self-report and corroborated with the comprehensive evaluation.

Anger/Irritability History of anger or irritability was assessed along a continuum ranging from no history, history of occasional feelings of anger/irritability, history of consistent feelings of anger/irritability, and history of aggressive reactions to feelings of anger/irritability (0–3, respectively). This R-PACT item is based on self-report and corroborated with the comprehensive evaluation. Higher scores connote more anger/irritability. Descriptive statistics for all covariates across the three SVC categorizations are shown in Table 1.

Methods/Analytic Strategy

To address our primary research questions, we use several analytic techniques. First, we began our analysis by investigating the prevalence of SVC offending among this sample of female youth using simple descriptive statistics. Second, we employ both ANOVA and standard logistic regression models to explore the relationship between an extensive list of individual-level risk factors and SVC group membership. As both of the key outcomes are dichotomous, logistic regression represents an appropriate analytic method. In the tables below, odds ratios are presented. Odds ratios represent the odds that an outcome will occur given a particular characteristic (i.e., poor temperament), compared to the odds of the outcome occurring in the absence of that risk factor. Odds ratios greater than 1.0 signify an increased risk; that is, the presence of a given risk factor increases the probability of being designated an SVC female offender.

Results

SVC Categorization Prevalence and Comparisons

Table 1 provides the descriptive statistics and analysis of variance (ANOVA) results which examine the differences present in all covariates across the three offender classifications. Among the 2286 admitted females, 27% were classified as SVC, 51% serious offenders, violent offenders or chronic offenders (all other youth), and 22% none of the above as they do not meet classification for serious, violent, or chronic. In addition to the means and standard deviations for each group, the *F* statistic and results of post-hoc tests are presented. Results indicate that there are a multitude of significant differences across the offending groups, several of which are worth mentioning. In

Table 1 Descriptive statistics for all measures by offending category

	Serious, violent, and chronic (n = 612)		None of the above (n = 496)		All other youth (n = 1178)		ANOVA	Post-hoc difference tests
	Mean	sd	Mean	sd	Mean	sd	f	
White	0.278	0.448	0.500	0.501	0.463	0.499	37.43***	None of the above > SVC***, All others > SVC***
Black	0.658	0.475	0.417	0.494	0.455	0.498	43.86***	SVC > None of the above***, SVC > All others***
Hispanic	0.064	0.244	0.083	0.276	0.082	0.275	1.10	–
Age at release	17.047	1.262	16.861	1.238	17.081	1.249	5.54**	SVC > None of the above*, All others > None of the above**
Personal risk factors								
ACE score	3.116	2.006	3.183	1.924	3.090	1.911	0.41	–
Age at first suspension	2.158	1.002	2.427	1.093	2.527	1.137	23.03***	SVC < None of the above***, SVC < All others***
School status	1.631	1.290	1.488	1.133	1.690	1.322	4.39*	None of the above > All others**
Pro-social activity level	−0.041	0.890	0.030	0.866	0.009	0.907	0.99	–
Gang involvement	0.126	0.332	0.093	0.290	0.081	0.274	4.61**	SVC > None of the above**
Community violence	0.649	0.478	0.595	0.491	0.651	0.477	2.60	–
Positive adult relationships	1.021	0.948	0.952	0.979	0.900	0.944	3.29**	SVC > All others*
Child welfare involvement	0.784	1.137	0.514	0.888	0.647	1.006	9.71***	None of the above > None of the above***, SVC > All others*, None of the above > All others*
Living arrangements	0.057	0.305	0.091	0.460	0.126	0.534	4.56**	SVC < All others**
History of running away	1.109	0.784	1.220	0.718	1.172	0.773	2.94	–
Alcohol use	0.882	0.734	1.030	0.745	1.050	0.753	10.66***	SVC < None of the above**, SVC < All others***
Drug use	1.186	0.727	1.355	0.727	1.367	0.744	13.00***	SVC > <None of the above**, SVC > <All others***
Drug programming	0.423	0.666	0.419	0.640	0.445	0.654	0.37	–
Mental health related								

Table 1 (continued)

	Serious, violent, and chronic (n = 612)		None of the above (n = 496)		All other youth (n = 1178)		ANOVA	Post-hoc difference tests
	Mean	sd	Mean	sd	Mean	sd	f	
Special education	0.507	0.500	0.409	0.492	0.356	0.479	19.27***	SVC > None of the above**, SVC > All others***
ADHD	0.379	0.486	0.308	0.462	0.278	0.448	9.59***	SVC > None of the above*, SVC > All others***
History of suicide ideation	0.641	0.777	0.629	0.776	0.557	0.773	2.96	–
Depression	1.036	0.826	1.135	0.809	1.044	0.830	2.53	–
Conduct disorder	0.593	0.492	0.478	0.500	0.517	0.500	8.05***	SVC > None of the above*, SVC > All others**
Temperament								
Behavior control	1.258	0.532	1.274	0.544	1.261	0.561	0.14	–
Frustration tolerance	2.060	0.722	2.069	0.741	1.898	0.758	14.19***	SVC > All others***, None of the above > All others***
Hostility	0.614	0.628	0.609	0.639	0.505	0.613	8.41***	SVC > All others**, None of the above > All others**
Anger/irritability	2.016	0.959	1.804	0.956	1.671	0.969	25.84	SVC > None of the above**, SVC > All others***, None of the above < All others*
Criminal risk factors								
Age at first offense	1.582	0.663	2.222	0.910	2.104	0.977	91.14***	SVC < None of the above***, SVC < All others***, None of the above > All others*
Prior misdemeanors	2.047	0.698	1.355	0.770	0.936	1.112	277.79***	SVC > None of the above***, SVC > All others***, None of the above < All others*
Against-person misdemeanors	1.258	0.806	0.992	0.806	0.581	0.749	162.87***	SVC > None of the above***, SVC > All others***, None of the above < All others*
Felony arrests	1.989	0.798	0.000	0.000	1.357	0.824	1078.25***	SVC > None of the above***, SVC > All others***, None of the above < All others*
Weapon-related arrests	0.139	0.346	0.000	0.000	0.058	0.233	45.66***	SVC > None of the above***, SVC > All others***, None of the above < All others*

Table 1 (continued)

	Serious, violent, and chronic (n = 612)		None of the above (n = 496)		All other youth (n = 1178)		ANOVA	Post-hoc difference tests
	Mean	sd	Mean	sd	Mean	sd	f	
Against-person felonies	1.078	0.455	0.000	0.000	0.349	0.516	971.15***	SVC > None of the above***, SVC > All others***, None of the above < All others*
Felony sex offense	0.018	0.145	0.000	0.000	0.013	0.112	3.84*	SVC > None of the above*
Prior pickup orders	1.106	0.883	0.996	0.883	1.083	0.879	2.40	–
History of residential placement	1.338	0.473	1.089	0.285	1.182	0.386	59.01	SVC > None of the above***, SVC > All others***, None of the above < All others*
History of escape from residential placement	0.039	0.194	0.000	0.000	0.032	0.186	8.68***	SVC > All others***, None of the above < All others*

SVC serious, violent, and chronic, *None of the above* "none of the above" or not serious, violent, or chronic, *All others* youth who are serious, violent, or chronic

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

terms of race, SVC females were much less likely to be white and significantly more likely to be black than each of the other two groups. In terms of personal risk factors, SVC youth were younger at the age of their first suspension from school than each of the other groups. SVC female offenders were more likely than the none of the above group to be involved in gang activity, but were not significantly different from youth who were either serious, violent, or chronic (all other youth group). A significantly larger proportion of SVC youth had a history of child welfare involvement, alcohol abuse, or drug use. No significant differences in ACE scores, pro-social activity, witnessing community violence, running away, or prior drug programming participation were observed across the three groups.

In terms of mental health, a greater proportion of SVC youth had a history of documented special education needs, had been diagnosed with ADHD, or were diagnosed with conduct disorder. There were no significant differences observed in a history of suicide ideation or depression across the three groups. SVC female youth were also more likely to become frustrated, hold hostile interpretations, and had more frequent feelings of anger or irritability. Finally, and unsurprisingly, significant differences in many of the criminal history indicators were observed. SVC female youth were first contacted by police at a younger age, on average, than youth belonging to either of the other two groups. A larger proportion of SVC youth had a history of residential placement and was more likely to have escaped from a residential facility.

Logistic Regression Predicting SVC Classification

Next, logistic regression was employed, predicting female SVC classification. Table 2 displays the results of our logistic regression analyses, modeling the odds of being classified as an SVC offender compared to being an offender who is none of the above (not S, V, or C). As each block of independent variables represents a somewhat different domain of risk, we chose to examine a series of stepwise models that included each domain separately, prior to presenting the full model. For example, model 1 of Table 2 includes only demographic factors, while the subsequent models assess the effect of personal risk factors such as school status, community violence, and substance abuse, then mental health factors are examined, followed by the temperament constructs. Model 5 includes all variables, save for age at first offense, which is introduced in model 6, our full model. In addition to the presentation of odds ratios and 95% confidence intervals, log-likelihood statistics and a pseudo-R^2 are displayed to provide information on model fit.

Model 1 shows demographic indicators only, indicating that black females have 2.9 times the odds of being an SVC offender than white youth, while being Hispanic is not predictive of SVC classification. These race/ethnicity findings are consistent across all models, although the increased odds for blacks are reduced to 2.0 times as likely once all other risk factors are included. Age was also significantly related to SVC classification. Not surprisingly, older youth were more likely to have been designated as SVC than younger youth (O.R. = 1.53; $p < .001$). Next, model 2 includes all personal risk factors in addition to the race/ethnicity demographics. Of note, SVC females were first suspended/expelled from school at younger ages (OR = 0.811; $p < .01$), more likely to have self-reported gang association (OR = 1.548; $p < .01$), and more likely to have child

Table 2 Logistic regression results, SVC female youth versus female youth who are none of the above (n = 1108)

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	O.R.	C.I.	O.R.	C.I.	O.R.	C.I.	O.R.	C.I.	O.R.	C.I.	O.R.	C.I.
Black	2.914***	2.249–3.777	2.646***	1.965–3.563	2.803***	2.137–3.678	2.936***	2.259–3.817	2.552***	1.870–3.481	2.040***	1.458–2.854
Hispanic	1.396	0.862–2.259	1.436	0.870–2.370	1.413	0.866–2.306	1.323	0.813–2.154	1.373	0.821–2.294	1.399	0.799–2.451
Age at release	1.157**	1.049–1.277	1.162**	1.043–1.296	1.165**	1.054–1.288	1.162**	1.051–1.285	1.168**	1.045–1.306	1.529***	1.344–1.741
Age at first offense	–	–	–	–	–	–	–	–	–	–	0.313***	0.254–0.387
ACE score	–	–	0.971	0.904–1.044	–	–	–	–	0.964	0.894–1.039	0.973	0.897–1.055
Age at first suspension	–	–	0.811**	0.714–0.921	–	–	–	–	0.838**	0.735–0.954	0.951	0.825–1.095
School status	–	–	1.138*	1.022–1.268	–	–	–	–	1.132*	1.013–1.264	1.156*	1.026–1.302
Pro-social activity level	–	–	0.911	0.780–1.065	–	–	–	–	0.936	0.797–1.099	0.912	0.767–1.084
Gang involvement	–	–	1.580*	1.037–2.408	–	–	–	–	1.514	0.988–2.321	1.361	0.862–2.147
Community violence	–	–	1.162	0.889–1.519	–	–	–	–	1.072	0.814–1.413	1.048	0.779–1.409
Positive adult relationships	–	–	0.999	0.867–1.150	–	–	–	–	1.000	0.866–1.156	0.949	0.813–1.109
Child welfare involvement	–	–	1.397***	1.214–1.607	–	–	–	–	1.366***	1.185–1.575	1.251**	1.072–1.459
Living arrangements	–	–	0.639*	0.454–0.898	–	–	–	–	0.632*	0.446–0.898	0.566**	0.378–0.849
History of running away	–	–	0.781**	0.649–0.940	–	–	–	–	0.781*	0.647–0.944	0.800*	0.652–0.981
Alcohol use	–	–	1.041	0.831–1.306	–	–	–	–	1.030	0.818–1.298	1.040	0.810–1.335
Drug use	–	–	0.816	0.646–1.030	–	–	–	–	0.828	0.652–1.051	0.888	0.686–1.149
Drug programming	–	–	1.249*	1.006–1.551	–	–	–	–	1.266*	1.016–1.579	1.120	0.880–1.425
Special education	–	–	–	–	1.213	0.915–1.609	–	–	1.135	0.845–1.526	1.142	0.832–1.568
ADHD	–	–	–	–	1.344	0.999–1.807	–	–	1.234	0.903–1.684	1.171	0.837–1.638
History of suicide ideation	–	–	–	–	1.130	0.951–1.343	–	–	1.074	0.896–1.287	1.051	0.867–1.275
Depression	–	–	–	–	0.918	0.777–1.084	–	–	0.880	0.732–1.058	0.909	0.747–1.107
Conduct disorder	–	–	–	–	1.490**	1.160–1.915	–	–	1.409**	1.086–1.829	1.312	0.991–1.737

Table 2 (continued)

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	O.R.	C.I.	O.R.	C.I.	O.R.	C.I.	O.R.	C.I.	O.R.	C.I.	O.R.	C.I.
Behavior control	–	–	–	–	–	–	0.987	0.769–1.267	0.968	0.744–1.260	0.876	0.660–1.162
Frustration tolerance	–	–	–	–	–	–	0.946	0.779–1.149	0.914	0.745–1.121	0.949	0.761–1.182
Hostility	–	–	–	–	–	–	0.970	0.775–1.215	0.940	0.740–1.192	0.949	0.736–1.224
Anger/irritability	–	–	–	–	–	–	1.292***	1.133–1.473	1.275**	1.099–1.480	1.281**	1.092–1.503
Constant	0.057***	0.011–0.308	0.088**	0.014–0.548	0.035***	0.006–0.198	0.038***	0.006–0.237	0.055**	0.007–0.405	0.005***	0.001–0.041
Log-likelihood	−724.32***		−693.88***		−713.29***		−716.92***		−681.54***		−609.40***	
Nagelkerke R^2	0.088		0.155		0.112		0.104		0.181		0.322	

SVC serious, violent, and chronic, None of the above "none of the above" or not serious, violent, or chronic. *O.R.* odds ratio, *C.I.* 95% confidence interval

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

welfare system involvement (OR = 1.397; $p < .001$). SVC females had a less extensive history of running away/getting kicked out of the home (OR = 0.781; $p < .01$), and were more likely to be living under adult supervision (OR = 0.639; $p < .01$, where higher values would indicate living without supervision/transient). However, SVC females were more likely to have prior drug treatment program experience (OR = 1.249; $p < .05$). Of particular importance is the finding that the number of different childhood traumatic exposures (the ACE score) was not predictive of SVC classification among these deep-end placement female offenders.

Model 3 of Table 2 includes only the mental health indicators along with race/ethnicity. Of the mental health risk factors considered, only a conduct disorder diagnosis was significantly related to the probability of being classified as an SVC offender (O.R. = 1.490; $p < .01$), as such diagnosis increased the odds. Model 4 examines the relationship between several temperament constructs and offender classification. Youth who had a history of more extensive anger/irritability were 29% more likely to be an SVC offender.

Model 5 of Table 2 includes race/ethnicity, personal risk factors, mental health factors, and temperament indicators. As shown, all of the indicators predictive of SVC classification in separate models remained significant with the exception of gang involvement. None of the additional covariates not previously discussed were significantly related to SVC classification. Finally, a comprehensive model includes all prior predictors as well as age at first arrest. Youth who first offended at a younger age were more likely to be classified as an SVC offender (O.R. = .313, $p < .001$). Age at first school suspension, prior drug programming participation, and conduct disorder diagnoses were no longer significant, once age at first arrest was included in the comprehensive model. All of the other indicators seen to be related to the probability of SVC classification in prior models remained significant in the final model.

Table 3 displays a similar set of results, modeling the odds of being classified as an SVC offender compared to being a serious, violent, or chronic offender (the all other youth classification). This second set of regression models was conducted in order to examine the differences that exist between SVC offenders and a group of offenders who were classified as either serious, violent, or chronic, but not the confluence of the three. Interestingly enough, the results presented in Table 3 are remarkably similar to those presented in Table 2. Looking at model 6 of Table 3, black youth were 1.89 times as likely to be classified as SVC offenders. Older youth were again more likely to be classified as SVC offenders (O.R. = 1.32; $p < .01$). Female offenders who began offending later in life were less likely to be SVC (O.R. = 0.437; $p < .01$). Youth with a history of gang involvement were nearly 1.5 times more likely to be classified as an SVC offender (O.R. = 1.46; $p < .05$). Females with prior child welfare involvement were also more likely to qualify for SVC status. From the results of this comparison, there is more evidence that mental health factors may play an important role in serious offending. In the full model, female youth with a history of special education needs, or who were diagnosed with conduct disorder, were more likely to be SVC. Consistent with results in Table 2, youth who had a history of anger/irritability were 28% more likely to be an SVC offender.

Table 3 Logistic regression results, SVC female youth versus all other (S, V, or C) female youth (n = 1790)

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	O.R.	C.I.	O.R.	C.I.	O.R.	C.I.	O.R.	C.I.	O.R.	C.I.	O.R.	C.I.
Black	2.548**	2.074–3.130	2.277**	1.807–2.871	2.473**	1.999–3.061	2.480**	2.013–3.054	2.143**	1.690–2.718	1.892**	1.479–2.420
Hispanic	1.326	0.895–1.963	1.235	0.826–1.847	1.345	0.905–2.000	1.288	0.866–1.915	1.227	0.814–1.850	1.203	0.788–1.837
Age at release	1.043	0.967–1.124	1.088*	1.002–1.180	1.048	0.971–1.132	1.068	0.989–1.154	1.105*	1.016–1.201	1.322**	1.207–1.447
Age at first offense	–	–	–	–	–	–	–	–	–	–	0.437**	0.377–0.506
ACE score	–	–	1.017	0.962–1.075	–	–	–	–	0.991	0.935–1.050	0.993	0.935–1.055
Age at first suspension	–	–	0.765**	0.691–0.848	–	–	–	–	0.818**	0.737–0.908	0.894*	0.803–0.994
School status	–	–	1.027	0.950–1.111	–	–	–	–	1.023	0.945–1.108	1.040	0.958–1.130
Pro-social activity level	–	–	0.987	0.880–1.107	–	–	–	–	0.993	0.882–1.119	0.968	0.857–1.094
Gang involvement	–	–	1.739**	1.266–2.388	–	–	–	–	1.608**	1.165–2.220	1.460*	1.048–2.035
Community violence	–	–	1.010	0.822–1.240	–	–	–	–	0.931	0.754–1.149	0.899	0.723–1.119
Positive adult relationships	–	–	1.062	0.955–1.181	–	–	–	–	1.069	0.960–1.192	1.055	0.944–1.180
Child welfare involvement	–	–	1.198**	1.086–1.323	–	–	–	–	1.179**	1.066–1.303	1.117*	1.007–1.238
Living arrangements	–	–	0.667**	0.513–0.868	–	–	–	–	0.670**	0.514–0.874	0.628**	0.476–0.830
History of running away	–	–	0.837*	0.730–0.960	–	–	–	–	0.819**	0.712–0.942	0.829*	0.717–0.959

Table 3 (continued)

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	O.R.	C.I.	O.R.	C.I.	O.R.	C.I.	O.R.	C.I.	O.R.	C.I.	O.R.	C.I.
Alcohol use	–	–	0.955	0.804–1.135	–	–	–	–	0.950	0.797–1.132	0.976	0.814–1.170
Drug use	–	–	0.832*	0.700–0.989	–	–	–	–	0.841	0.706–1.002	0.844	0.703–1.013
Drug programming	–	–	1.231*	1.042–1.453	–	–	–	–	1.236*	1.044–1.463	1.137	0.955–1.353
Special education	–	–	–	–	1.445**	1.168–1.787	–	–	1.316*	1.054–1.643	1.282*	1.019–1.612
ADHD	–	–	–	–	1.272*	1.018–1.589	–	–	1.125	0.893–1.418	1.050	0.826–1.335
History of suicide ideation	–	–	–	–	1.163*	1.020–1.327	–	–	1.138	0.993–1.305	1.130	0.981–1.302
Depression	–	–	–	–	0.977	0.860–1.109	–	–	0.906	0.789–1.040	0.935	0.810–1.078
Conduct disorder	–	–	–	–	1.361**	1.120–1.653	–	–	1.263*	1.034–1.544	1.231*	1.000–1.515
Behavior control	–	–	–	–	–	–	1.119	0.929–1.347	1.080	0.891–1.310	1.028	0.842–1.256
Frustration tolerance	–	–	–	–	–	–	1.111	0.954–1.292	1.060	0.908–1.238	1.115	0.950–1.309
Hostility	–	–	–	–	–	–	1.048	0.878–1.249	1.020	0.849–1.224	1.002	0.829–1.212
Anger/irritability	–	–	–	–	–	–	1.355**	1.224–1.500	1.318**	1.179–1.474	1.282**	1.142–1.440
Constant	0.105**	0.028–0.387	0.110**	0.028–0.438	0.060**	0.016–0.228	0.028**	0.007–0.116	0.033**	0.007–0.148	0.007**	0.001–0.033
Log-likelihood	−1284.74***	−1241.75***	−1262.81***	−1262.79***	−1214.86***	−1143.48***						
Nagelkerke R^2	0.054	0.106	0.081	0.081	0.137	0.217						

O.R. odds ratio, *C.I.* 95% confidence interval, *$p < .05$; **$p < .01$; ***$p < .001$

Discussion

For a variety of reasons, theoretical and in particular empirical research on female delinquency and offending patterns was not a key feature of criminological research until the mid-1970s, and even then there was not much attention given, primarily because of the lack of longitudinal data on female offenders [61]. This lacuna started to change throughout the 1980s and into the 1990s as several prominent criminologists called for increased attention to female offenders, which coincided with data collection on female samples and in some cases female offenders. Then, throughout the late 1990s and into the 2000s, there was recognition that official arrest rates among female offenders was increasing [62, 63], though the underlying reasons for that rise were not necessarily clear.

To date, the field has come a long way to providing a much needed focus on female offenders and their offending patterns (cf. [41, 64, 65]). One key question about the nature of female offenders, however, has not received much attention: the extent to which they mimic the prevalence of serious, violent, and chronic (SVC) offenders that has been observed among males. While Moffitt [38] hypothesized that females could in fact fall into the life-course-persistent offending category, and anticipated that they would do so at lower rates, there are very few investigations of this hypothesis. Accordingly, this study sought to examine this key question using a large database of female juvenile offenders from the State of Florida. Several findings are noteworthy.

First, in our sample, a little over a quarter were identified as meeting the criteria for SVC, but over half met the criteria for at least one of the classifications (serious, violent, or chronic). Although this figure may appear to be significantly higher than SVC groups described in past research, it is important to remember the context of the population under investigation. As residential placement is the "deepest end" placement within the juvenile justice system in Florida (only transfer to the adult system is more restrictive), the female youth who have been placed in a residential facility are certainly among the most serious offenders. For example, during the same time period examined (2009–2014), there were an average of 17,913 females arrested per year, and of those 6654 females placed on probation supervision. In contrast, only 457 females (on average per year examined) completed a residential commitment placement. It is logical, then, to anticipate that of the females captured in the current analysis, a larger proportion of them would meet the criteria of a SVC classification. Second, at the bivariate level, there were several consistent differences with respect to how the SVC female offenders differed from two comparison groups. Third, two sets of regression analyses point to some interesting differences. When compared to non-SVC youth, or youth who were classified as serious, violent, or chronic, female offenders who began offending or were first suspended later in life were less likely to be SVC. Females with a history of gang involvement, those who had special education needs, or had a history of suicide ideation were more likely to be SVC. We also found that anger/irritability issues increased the risk of SVC classification, although many of the other measures of temperament did not distinguish between the groups. Interestingly, we did find that adverse childhood experiences (ACE) were not predictive of SVC membership, regardless when considered as a complete index or when investigated separately, though this could have been due to the limitations of the ACE measure, which focused on types of abuse and not their frequency, severity, or duration.

In short, while our findings on some of the key risk factors examined were able to distinguish between SVC female offenders and the two comparison groups, many of which have also been identified as being able to differentiate male SVC offenders; there were many risk factors that did not differentiate SVC offenders among several different female offender comparisons groups. Although there could be several reasons for this, it may be that female offenders are drawn into the juvenile justice system for different reasons than males are drawn into the system. That is, there is something unique about female delinquents who enter the system, which in turn seems to lead to less heterogeneity within the group in comparison to males. It may also be the case, as Moffitt [38] hypothesizes, that it is difficult to separately distinguish SVC females as they simply do not experience the same levels of risk as their male counterparts. In short, the intensity of their risk profiles and subsequent offending energy does not match those of males and as a result does not create the kinds of marked differences found between males. As such, findings are consistent with several conceptualizations that suggest that although there are similarities in offending patterns, there are pronounced sex differences in the distributions of severe offending [3, 6, 10, 14, 20]. This also suggests that theories which focus on severe offending rather than offending in general should attempt to elucidate the underlying etiology about why these sex differences develop and persist (see [66–68]).

While attempting to further knowledge regarding juvenile female serious, violent, and chronic offending, the current study is not without limitation. The SVC classifications are dependent on official measures of delinquency. Certainly, self-reported offending indicators would have uncovered more offending and may paint a slightly different picture than the official statistics. While the merits of self-reported versus official delinquency have been elucidated in prior work (see [69]), we contend that the differences become less integral the more serious and violent offenses are considered (though naturally indicators of chronicity would be affected by the measure of choice). While we employ a rather large sample of administrative data, future work should attempt to replicate the current findings with respect to the prevalence of SVC offending among female juveniles, and examine whether more distinct correlates of SVC offending emerge than we have found. The Florida data was limited to the R-PACT assessment in terms of the covariates that could be examined. Additionally, the initial R-PACT is required to be administered within 30 days of admission. We note here the possibility of measurement variation in some independent measures based on this 30-day window, but believe that almost all measures were indicative of a history of that measure prior to residential placement (such as past use of alcohol or drugs, prior child welfare placement).

There has been a dearth of knowledge with respect to the prevalence and predictors associated with SVC offending among female offenders. In total, our results tend to suggest that, for the most part, and at least with the data and risk factors available to us with the Florida data, that there are fewer characteristics that distinguish a unique SVC subset among female offenders more generally—at least in comparison to the differences observed among males in prior research. Additionally, while our results suggest that the risk factors that distinguish SVC females (i.e., age, age of first offense, race, gang involvement, mental health, and temperament) are in line with the risk factors that are associated with SVC offending among males, many of the characteristics examined were not significantly related to SVC classification among females. The main

implication of this finding is that the search for a SVC female offender, using the likely suspects from research on male offenders, is unlikely to return much promise, but additional work perhaps measuring different (and perhaps gender-specific) correlates for serious female offenders may provide some insight into this unique population.

This, of course, is not to suggest that we should abandon continued empirical work in this area and attend to the needs of female offenders in the juvenile justice system. Future research in this area should seek to replicate our work with a different and/or expanded range of risk factors that we were unable to capture within the existing Florida data. As well, going forward research should consider assessing some of the co-occurring disorders that are reflective of juvenile justice populations, including mental and physical health issues—both of which may be heightened among female offenders in the system (see [48], p. 262). Replication of our work should also consider assessing the potential for a female SVC offender later in the life-course, such that knowledge about one's offending history can cover the childhood, adolescence, and adulthood years. It may be that criminal careers among female offenders become more crystallized with a more expansive range of data. With respect to treatment and rehabilitative needs, although some risk factors are not modifiable, others are, including individual characteristics such as anger/irritability—which in the Florida data, emerged as a particularly relevant characteristic of SVC female offenders. Various evidence-based programs have shown promise toward anger reduction, including in particular cognitive behavioral therapy (CBT) and its more specific variant, CBT-informed anger management [28], which has been shown to also reduce both general and violent recidivism. Although the SVC concept may be a male-only phenomenon, it does not necessarily follow that we should abandon the important theoretical, empirical, and policy-relevant work associated with understanding the correlates of female offending throughout the life-course, but should develop effective policy responses for female offenders, especially young female offenders in the system who are at a precipice in their careers where some will abandon their offending proclivities but others will continue. Careful work into identifying those most in need of services is critically important.

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