Research article

Exploring sexuality profiles of adolescents who have engaged in sexual abuse and their link to delinquency and offense characteristics

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A B S T R A C T

Very few studies have taken a specific interest in the various sexual dimensions, beyond delinquent sexual behavior, of adolescents who have engaged in sexual abuse (AESA). Those that went beyond delinquent sexual behavior have report mixed results, suggesting they are a heterogeneous group. The current study used cluster analysis to examine the sexuality profiles of AESA, which included information on several sexual dimensions (atypical and normative fantasies and experiences, drive, body image, pornography, first masturbation, onset of sexual interest and first exposure to sex). Participants (N = 136) are adolescents who have engaged in sexual abuse involving physical contact, for which at least one parent also participated in the study. They were recruited from six specialized treatment centers and three youth centers in Quebec (Canada). Cluster analyses were performed to identify specific sexual profiles. Results suggest three clusters of AESA: 1- *Discordant sexuality* pertaining to adolescents who show mostly normative sexual interests, 2- *Constrictive sexuality*, characterizing adolescents who seem to be less invested/interested in their sexuality and 3- *Overinvested sexuality* for adolescents showing an exacerbated sexuality, including atypical sexual interest. Additional analyses (ANOVAs and Chi-square tests) reveal that five delinquency and offense characteristics were significantly more likely to be present in the *Overinvested* than the *Constrictive* cluster: non-sexual offenses, three or more victims, peer victims and alcohol and drug consumption. Advancing our knowledge on this topic can provide relevant data for clinicians to better target interventions.

1. Introduction

In North America, between 17 and 25.8% of individuals who have committed a sexual offense known to police are juveniles (Allen & Superle, 2016; Finkelhor, Ormrod, & Chaffin, 2009). Sexual crimes committed by juveniles are thus a significant and relevant issue. Even though an increasing amount of empirical and theoretical work on this topic has been published, many areas remain to be investigated. Seto and Lalumière's (2010) meta-analysis, comparing adolescents who had engaged in sexual abuse (AESA[1]) or in non-sexual delinquent behavior, brought major advancements to the field. The authors tested specific (factors specific to sexual abuse)

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[1] Following the ATSA's recommendation against referring to adolescents as "juvenile sex offenders", the term "Adolescents who have Engaged in Sexual Abuse (AESA)" will be used to designate our sample. The use of this terminology refers to a specific behavior (sexual abuse), without attributing a label (e.g., sex offenders) given that, for many, their developmental trajectories will be exempt from future sexual recidivism

and general explanations (general factors linked to general delinquency) for male adolescent sexual offending. Their results suggest that general delinquency risk factors are not sufficient to explain perpetrated sexual abuse. However, the hypothesis for specific explanations was supported, as the AESA group showed significantly more exposure to pornography, atypical sexual interest, a history of abuse or neglect, anxiety, and low self-esteem. These factors suggest that their experience of sexuality[2] is an interesting avenue to explore.

2. The difficulty of studying sexuality

Recognizing the difficulty to define and study sexuality and sexual development, Drury and Bukowski (2013) propose four basic premises. First, sexuality is not a single thing, and is implicated in various dimensions, including urges (e.g., sex drive, motivation), various sexual behaviors (e.g., relationships, interactions), sexual attitudes, and self-perceptions (e.g. body image). Second, sexuality is an integrative form of development since the intersection and coordination of its many intrapersonal and interpersonal components are at the core of its processes. For example, for some adolescents, the process of internalization of a positive body image may be more difficult when the satisfaction of sexual urges seems impossible given their deficits in reaching a more mature socialization with peers. Third, sexuality is a form of development that varies across age, and that is in part determined by past experiences. Thus, the impact of past sexual experiences (e.g., sexual initiation, early exposure to sex, etc.) and developmental stages must be considered. In fact, Bancroft (2006) considers that adolescents develop their emerging sexual identity before pre-labeling their sexual orientation and that evaluating the question of sexual orientation in adolescence is premature. Fourth, it is more difficult to define what would comprise normal sexuality than defining sex. In that sense, the attributes "atypical" or "deviant" or "anomalous", which are often used as synonyms, can be confusing as they can be interpreted in different ways. For example, Worling (2012) has well explained that in studies of individuals who have committed sexual crimes, the term "deviant" is often applied to the sexual arousal by prepubescent children and/or sexual violence. Thus, in the current study, sexuality is considered "atypical" if it implies the use of coercion (e.g., imposing a sexual behavior) or is in line with the definition provided by the DSM 5 for paraphilic disorder (excluding the age and duration criteria). For the purposes of this paper, adolescents' sexuality refers to the various dimensions in which adolescents experience and express their sexuality (current sexuality; ex. fantasies, drive, behaviors, body image, etc.) and the nature of their first sexual experiences that could possibly have influenced their sexual development.

3. Sexuality of adolescents who have engaged in sexual abuse

Studies that have taken a specific interest in the sexual experiences of AESA have reported mixed results. Some suggest that consensual sexual experiences among AESA are similar to those of adolescents who have reported non-sexual offenses with regards to the number of partners (Seto & Lalumière, 2010), or that they are "more experienced" than non-offending controls (McCord, McCord, & Verden, 1962). However, other studies report contradictory results indicating that they are less experienced and sexually active than adolescents involved in non-sexual offenses (Daleiden, Kaufman, Hilliker, & O'Neil, 1998; Driemeyer, Spehr, Yoon, Richter-Appelt, & Briken, 2013; Fagan & Wexler, 1988).

The literature has also shown that AESA report low satisfaction with regards to their physical appearance (Daversa & Knight, 2007). Adolescents with prepubescent victims struggling with masculinity challenges, embarrassed by their physical appearance, and worried about their ability to seduce same age partners, may choose younger victims to compensate for their inability to compete with their male counterparts Messerschmidt (1999, 2000). Hunter, Figueredo, Malamuth, and Becker (2003) also suggest that many AESA towards prepubescent victims view themselves as socially inadequate and anticipate ridicule and rejection.

As for atypical manifestations, including fantasies (Aylwin, Reddon, & Burke, 2005; Glowacz, 2009) or behaviors (Burton, 2003), they often emerge before the age of 18. As such, AESA report significantly more atypical sexual fantasies and behaviors, are more often diagnosed with a paraphilia, and spend significantly more time thinking about sex than adolescents who have perpetrated non-sexual offenses (Seto & Lalumière, 2010). Studies investigating recidivism risk factors have also highlighted that atypical sexual fantasies and sexual arousal, sexual preoccupations, and hypersexuality are significantly linked to re-offending (Johnson & Knight, 2000; Kenny, Keogh, & Seidler, 2001; Knight & Sims-Knight, 2004).

Thus, most empirical studies exploring sexual dimensions of AESA have been limited to the characteristics of their offenses or their atypical sexual interests, even though clinical and empirical data suggest that only a minority of these adolescents show atypical sexual interests (Worling, 2012). Although arousal or behaviors may likely play a role in perpetrating sexual abuse, research to date underscores that it is not the only factor. Therefore, we must consider broader dimensions of normative and atypical sexual experiences of AESA (e.g., fantasies, drive, experiences, behaviors, body image, pornography, etc.) and their sexual precocity (such as young age at first masturbation and at exposure to sex, and onset of sexual interest). These variables will therefore be investigated in the present study.

4. Sexual initiation and sexual development

Over the past decade, there has been a consensus that sexual development integrates several components and starts at an earlier

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[2] In this study, the term sexuality refers to 1) the global concept as used in previous studies or papers and 2) a multidimensional concept encompassing multiple variables in the current study (e.g., atypical and normative fantasies and experiences, drive, body image, pornography, behaviors, interests, and sexual precocity).

age than previously thought. Longo (1982) research represents a classic and rare investigation of AESA (n = 17) focusing explicitly on their sexual learning and experiences. The author concluded that AESA showed an atypical psychosexual development. While the average age of first sexual experiences (learning about or exposed to sex, masturbation, and sexual intercourse) did not appear to differ from other adolescents, the age range was vast and indicated that some began at a much early age. The nature of the first experience was also different; often with older consenting partner (on average 8 years older, which questions the notion of consent and suggest sexual victimization) and engaging in more overt behaviors (e.g., oral, vaginal or anal intercourse). The rate of childhood sexual victimization was also quite high (47%). The sample is old, small and very specific (AESA bound over to adult court), which introduced considerable limitations (e.g., statistical power, generalization of results, etc.). Friedrich, Davies, Feher, and Wright, (2003) found that earlier onset, longer, and more serious experiences of abuse in childhood were related to sexually intrusive behaviors in preteen children. These results partially support those of Longo in showing the atypical history of psychosexual development among youth with problematic sexual behaviors. Chewning (1991) also found that salient discriminating variables between three groups of adolescents (AESA towards child victims, adolescents who had perpetrated non-sexual offenses, and adolescents in the general population) include the tendency for AESA to have numerous sexual experiences at a younger age (e.g., kissing, fondling, etc.).

Since Longo's (1982) study, the effect of sexual victimization has received the most attention. Sexually abused children show more sexual behavior problems than other children (Berliner, 2011). Being prematurely exposed to adult sexuality can generate sexual feelings for which children are ill-equipped to manage; through sexual victimization, children may learn that sexual touching is pleasurable and self-soothing, or that sexual behavior is an effective way of getting attention (Berliner, 2011). Similarly, a history of sexual abuse is the most frequently identified factor when explaining sexual abuse committed by an adolescent (Seto & Lalumière, 2010). According to Burton (2003), sexual victimization is an aetiological factor of sexual offending: AESA are 3–4 times more likely to have been sexually victimized than youth in the general population and tend to mirror what was done to them. However, solely considering antecedents of sexual victimization seems insufficient to predict the perpetration of sexual abuse, as not all offenders have been victimized and not all victims will commit a sexual offense. Factors other than direct sexual victimization should therefore be explored, such as exposure to pornography or a sexualized or sexually dysfunctional family environment (Tardif, 2015).

Regarding exposure to sexually explicit material, links between the consumption of pornography and the risk for sexual aggression have also been studied for decades, but these associations remain a controversial issue. A recent meta-analysis by Wright, Tokunaga, and Kraus (2016) found that, among the general population, pornography consumption was correlated with attitudes supportive of violence and sexually aggressive behavior. Regarding AESA, Seto and Lalumière's (2010) meta-analysis suggests they had more exposure to sex or pornography than adolescents who had perpetrated non-sexual offenses. However, a context of poor parental monitoring may increase the probability of pornography exposure. Various studies have also reported that AESA are exposed to pornography at a younger age (before 10 years old) than adolescents who committed non-sexual offenses (Burton, Leibowitz, & Howard, 2010; Chewning, 1991; Leguizamo, 2000). These results support the proposition that early exposure to pornography constitutes a risk factor for perpetrating sexual abuse (Knight, Ronis, & Zakireh, 2009). As children's capacity to process and integrate information differs from that of adolescents, early exposure is more likely to have an influence on their sexual development, attitudes, values, and behaviors. Knight and Sims-Knight (2004) have suggested that pornography consumption could contribute to the development of aggressive sexual fantasies in teens, which may eventually lead to sexual offenses. The role of pornography in the emergence of problematic sexual behaviors is, however, not that obvious (Burton & Meezan, 2004). Nevertheless, among factors susceptible of modulating the influence of pornography exposure, age could be crucial.

Past experiences and exposure to certain materials can thus influence and generate future thoughts and experiences. Tardif (2015) highlights that it is important to consider the developmental stage at which sexual experiences occurred, as their influence on the child's sexual development is likely to differ in terms of proximal consequences and long-term repercussions, including triggering youth sexual awakening. Early sexual experiences, sexual abuse and exposure to pornographic material all seem to be key variables to understanding the aetiology of sexual offending. Surprisingly, the common denominator of precociousness among all forms of exposure to sexuality has yet to be investigated. In the current study, we will examine the potential influence of sexual exposure precocity, regardless of its manifestation (sexual victimization, access to pornography, first sexual intercourse), on sexual development. As early exposure could trigger sexual awakening, we also include the age of onset of sexual interests and the age of one's first masturbation as other measures of sexual precocity.

5. Classification of adolescents who have engaged in sexual abuse

It is well known that AESA form a heterogeneous group. Classification for clinical and research purposes have focused mostly on victims' ages (e.g., Hunter, Figueredo, Malamuth, and Becker, 2003), and offense and personality characteristics (e.g., Worling, 2001). Offense characteristics refer to aspects relating to the perpetrated offenses, such as non-sexual offense history, relationship to victims, severity of crimes and the use of strength or threats. Non-sexual offense history distinguishes adolescents who engage exclusively in sexual offenses (specialists or sex only) from those who engage in sexual and non-sexual offenses (generalists or sex plus) (e.g., Butler & Seto, 2002). The relationship to victims can refer to the victim's family relationship with the offender (intrafamilial or extrafamilial victim; e.g., Latzman, Viljoen, Scalora, & Ullman, 2011). Aspects linked to the severity of the offense include the degree of intrusion of the sexual abuse, such as Långström, Grann, and Lindblad, 2000 use of penetration versus non-contact offenses, (e.g., exhibitionist). Another classification system, provided by Butz and Spacarelli (1999), is based on the use of force by the perpetrator: rapists (i.e., those who used force), non-rapists, and deniers (offender denied the use of physical force reported in official records). The most common classification method is based on the victim's age; child versus peer victims (Kemper

& Kistner, 2010). Some overlap has been reported between the different classifications, but no model provides a perfect fit.

As AESA are perceived, and have thus been studied, as a distinct group from other offenders based mainly on the sexual nature of their crimes, it would be interesting to explore other sexual dimensions (e.g., behaviors, fantasies, drive, etc.), not limited to the characteristics of their sexual offense. Our initial proposal is that AESA are a heterogeneous group when it comes to their sexual development and that differences exist between the sexual profiles for certain delinquency and offense characteristics. The study's main goal are to: 1) identify the sexuality profiles of AESA, not limited to the nature of their delinquent sexual behavior (excluding delinquency and offense characteristics), and 2) examine if certain delinquency and offense characteristics are associated with them.

6. Method

6.1. Participants

A convenience sample of 136 adolescent males were recruited from six specialized treatment centers and six youth centers, taking part in a larger study investigating family dynamics and relationships among AESA and their parents. All adolescents who had engaged in at least one sexual abuse involving physical contact between the age of 12 and 17 were invited to participate, except for those with severe mental disorder(s) (i.e., psychotic disorder) or suffering from severe learning disabilities. To be included in the larger study, at least one parent had to accept to participate as well.

6.2. Procedures

In each facility, the clinical staff transmitted a list of families that had accepted to be contacted by the research coordinator. Both youth and parental informed assent was obtained. Trained research assistants handled the administration of the questionnaires at the participant's home or at a location considered secure and confidential (e.g., youth center, hospital). A modest financial compensation was paid to each participant. The primary data collection for the larger project was carried out during a 6-year period (2004–2010). The human participant procedures were reviewed and approved by the ethics committees of [Blind for review]. We believe that our high participation rate is explained, in part, by the recruitment strategy which focused on acknowledging the difficulties experienced by these families. We underscored that the project's overarching goal was to improve services for families who may face similar difficulties in the future, and that their participation would help us better identify and understand their needs.

6.3. Measures

Sociodemographic questionnaire (Québec, 1999), that included questions regarding sex, age, race, education, family structure, socio-economic level, substance use, etc., and a battery of assessment instruments designed to measure various dimensions were administered:

6.3.1. Sex knowledge and attitude test for adolescents (SKAT-A; Lief, Fullard, & Devlin, 1990)
The *Attitudes* scale (43 items, 5-point Likert-type scale) measures adolescents and young adults' attitudes towards sexuality. The authors report a good concurrent validity with other similar measures, such as Kirby (1984)'s *Knowledge and Sexual Attitude Scale* and Hendrick and Hendrick (1987)'s *Multidimensional Sexual Attitude Scale* (Lief, Fullard, & Devlin, 1990). Analyses revealed an adequate internal consistency for this subscale of 0.87 in our sample, which is similar to the 0.89 score of the original version (Lief, Fullard, & Devlin, 1990).

6.3.2. Pornography (Lavoie, Hébert, Vézina, and Dufort, 2001)
This self-report questionnaire measures overall engagement in and use of various forms of pornographic activities and materials (9 items). Authors identified two factors, *virtual* and *interactive* pornography, with an internal consistency of 0.76 and 0.49, respectively. The same factors were detected in our sample, but our Cronbach's alphas were higher, respectively 0.83 and 0.85. This questionnaire has been used with AESA population (Beauchemin & Tardif, 2007), but has yet to be validated. In the current study, the global score (0–36) was used, with a higher score suggesting greater involvement in activities and consumption of materials to access sexual content.

6.3.3. Derogatis sexual functioning inventory (Derogatis, 1975)
A French adaptation by Gauthier and Garceau (1982) of this self-report questionnaire was used to assess the quality of sexual functioning. The measure encompasses 10 subscales but only the *Experiences*, *Drive*, *Body Image,* and *Fantasy* scales were used for this study. The *Experiences* subscale (24 items), provides a global score of the sexual behaviors experienced by the participant in his lifetime (0–24). The *Drive* subscale measures libidinal erotic interests. The first five items (9-point Likert scale) are summed up to create a total score (0–40). Two additional items assess the age of onset of interest in sexual activity and sexual intercourse. The *Body Image* subscale gives an indication of the person's own perception of physical appearance. Scoring consists of the total sum on all 15 items (0–60), where a high score corresponds to a negative body image. The subscale *Fantasy* (20 items) explores the range of sexual fantasies endorsed by the participant. In the current study, this subscale was modified to allow for a more precise analysis of the results (see Atypical and normative fantasies section). Derogatis and Melisaratos (1979) reported internal consistency coefficients between 0.58 and 0.97. Coefficients in our sample were similar, between 0.59 and 0.94, respectively. The *Drive* low alpha coefficient

could be explained by the few items (5) making up the subscale. Following a systematic review of reliable and valid self-report outcomes of sexuality measures, we identified the SII (*Sexual Interaction Inventory*) and DSFI as the only contenders for an in-depth battery assessment of sexual function. As the SII is designed for couples, the DSFI was the obvious choice, the latter having been widely used in research and validated with an adolescent population (Sasloff, 1994).

6.3.4. History of victimization form—HVF (Wolfe, Gentile, and Bourdeau, 1987)

An adapted French version of this instrument (Parent & Hébert, 1995) assesses abuse related variables (sexual, physical, psychological, neglect, and witnessing of violence). It was used as a semi-structured interview, in comparison to its original file-review format, due to the limited access to other sources of information. In the present study, only the presence or absence of sexual abuses and age of first victimization were used.

To gather further, more specific information, we created additional measures:

6.3.5. Atypical sexual behaviors (author, [blind for review], unpublished)

A self-report questionnaire, inspired by the *DSM-IV-TR* and stemming from a thorough literature review on the sexual behaviors of individuals who have committed a sexual offense, was designed to assess atypical sexual behavior experiences in AESA (other than those specific to the sexual offense for which they were recruited). Items explore whether participants experienced, at least once, various (10) specific sexual behaviors (voyeurism, frotteurism, etc.). Items were summed to create a total score for the behaviors and atypical sexual behaviors variable.

6.3.6. Atypical and normative fantasies

Starting from the DSFI *Fantasy* subscale, two variables, atypical and normative fantasies, were created to allow for a more precise analysis of the data. Categorization is based on the use of coercion (e.g., imposing a sexual behavior) and the DSM 5 paraphilic disorders definition. Atypical fantasies variable combines 10 items (3–6, 8, 12–14, 18, 20) of the DSFI *Fantasy* subscale and the three additional items that assess the presence of sexual thoughts that are aggressive, belittling or coercive (scores range: 0 to 13). The remaining 10 items of the *Fantasy* subscale form the normative fantasies variable (scores range: 0 to 10). For both variables, items were summed, and a higher score indicates an interest in a wide variety of fantasies.

6.3.7. Early exposure to sexuality

Additional questions assessing age at first masturbation and pornography consumption was also collected. Following a review of the literature, the ages of first sexual victimization (HVF), exposure to pornography, and sexual intercourse (DSFI) were compared to determine the precociousness of exposure to sexuality. Specifically, the youngest age of those three experiences was used to create the age of first exposure to sex variable. Age at first sexual intercourse was included, as it is widely recognized that a child cannot consent to sexual activity, and a significant proportion of our participants (35.5%) report a first sexual intercourse before the age of 12, which should be considered as sexual victimization.

6.3.8. Characteristics of offenses (author, [blind for review], unpublished)

A self-report questionnaire was used to collect a wide array of data on past sexual and non-sexual offenses, including victims, offenders, and offenses characteristics (e.g., number of victims, duration, frequency, etc.) and friends' delinquency. Participants' responses were validated with information from the clinical staff (official file) and parents to confirm variables related to the number, age, gender, and relationship to the victim(s). Regarding the number of victims, if informants provided inconsistent responses, the highest number was retained.

7. Analytic strategies

Data were analyzed using IBM SPSS Statistics Version 20. Prior to the clustering approach, scores were standardized to z-scores so all variables were on a similar scale. Pearson correlation analyses were used to identify multicollinearity and data were prescreened for outliers by a visual inspection of histogram and boxplot. No multicollinearity problem was found since the correlations among variables ranged from -0.26 to 0.64, which is below the recommended 0.80 threshold. Potential outliers were investigated; they all seemed to be legitimate observations and were kept. Twelve participants were excluded from the cluster analysis due to missing data, which did not lead to major changes in the sample characteristics.

Cluster analysis includes an array of methods to categorize multidimensional data into subgroups, which helps identify relatively homogeneous groups based on the similarities between predetermined characteristics, in this case various dimensions of AESA sexuality and sexual development. Hierarchical and nonhierarchical methods can be used to generate cluster solutions. A combination of both methods was used to determine whether meaningful sexual profiles emerge among this sample, as it allows to capitalize on their strengths and compensates for their weaknesses (Henry, Tolan, & Gorman-Smith, 2005). Ten variables related to their current sexuality and to their first sexual experiences (not limited to the sexual abuse for which they were recruited for in the present study) targeted in the literature review and clinically relevant, were used: pornography consumption, normative and atypical sexual behaviors and fantasies, sexual drive, body image, age of first masturbation, initial interest in sexual activity and exposure to sexuality. Although the sexual attitudes variable was initially included, it was later dropped as it was no longer considered discriminant ($p > 0.01$).

First, a hierarchical agglomerative cluster analysis with Ward's linkage clustering and squared Euclidean distances was used to

determine the number of clusters and profile the cluster centers. A combination of methods was used to determine the number of clusters to retain; the visual inspection of the dendrogram and the calculation of the modified agglomeration tables indicated the existence of three or four distinct homogeneous groups. This hierarchical method is designed to minimize the variance within clusters at each stage of grouping, which optimizes within-cluster homogeneity. However, it does not allow for re-assignment and early entries, and consequently does not ensure optimum homogeneity of the final clusters solution (Borgen & Barnett, 1987). Therefore, in the second stage the predetermined number of clusters and initial centers were used as the starting point for a non-hierarchical, K-means analysis (Henry, Tolan, & Gorman-Smith, 2005). Analyses of variance (ANOVA) were conducted at each step to confirm that all variables were discriminant. Verification of the stability of the cluster solution in response to variations in the data or clustering technique was made by replication. ANOVAs and chi-square were also conducted on preselected external variables, to verify the concurrent and predictive validity of the cluster solution, and on the delinquency and offense characteristics to explore if certain variables were linked to the sexual cluster affiliation (second objective).

8. Results

8.1. Participant description

All participants were French-speaking, the majority Caucasian (95.6%) with a mean age of 15.13 ($SD = 1.63$). They had completed an average of 7.87 ($SD = 1.85$) years of schooling and 69.9% had repeated at least one grade. Regarding residential settings, 17.6% of adolescents lived with both parents, 27.2% with their mother, and 19.8% with their father. The remainder (35.3%) did not live with their parents (e.g., foster home, another family member, alone). Almost half (46.7%) reported having also committed non-sexual crimes (e.g., theft, vandalism, drugs). The majority (75.0%) abused children (male or female victims 11 years or younger), 13.2% abused peer victims (victims 12 years and older) and 11.8% had both child and peer victims. The majority (61.8%) had only female victims, 29.4% had only male victims and 8.8% had both. The proportion of offenses committed in an intrafamilial (44.9%) or an extrafamilial context (45.6%) is similar, and 9.6% committed offenses in both contexts.

8.2. Clustering strategy

In the first phase, a three-cluster solution was selected regarding the clinical and theoretical relevance of solutions. ANOVAs ran on each variable included in the model confirmed they were discriminant; clusters were significantly ($p < 0.01$) different on each variable. Regarding stability, the three-cluster solution was fairly robust, with good levels of agreement found with two subsets of the total sample and the k-means cluster (Table 1). In the second phase, a k-means iterative-partitioning cluster analysis was conducted to assign all 124 AESA to one of the three target profiles identified by Ward's methods. The same analyses were repeated and confirm all variables were discriminant ($p < 0.01$) (see Table 2).

8.3. Comparison of clusters

The clusters analysis result (see Table 2) suggests a continuum, ranging from an under (*Constrictive*) to an over (*Overinvested*) investment/interest in sexuality, with a profile seemingly at the midpoint (*Discordant*). Clusters were labeled based on their more prominent features.

Adolescents in cluster 1, *Discordant sexuality* ($n = 45$), have been exposed to and have shown sexual investment/interest at a later age. Their scores on most of the sexual dimensions are at the midpoint of those in the other 2 clusters, except for the body image score (more positive and closer to the *Overinvested sexuality* cluster) and both the atypical sexual fantasies and atypical sexual behaviors

Table 1

Percentage Agreement and Kappa Coefficient Scores Between Ward's Method Three Cluster Solution and Cluster Replications.

Cluster replication	Initial Ward method three cluster solution				% Agreement	κ [95% CI]
	Cluster 1	Cluster 2	Cluster 3	Total		
Random 85% subset					97.14	0.95 [0.90, 1.01]
Cluster 1	28 (96.55)	1	0	29		
Cluster 2	2	52 (96.30)	0	54		
Cluster 3	0	0	22 (100)	22		
Random 71% subset					75.00	0.60 [0.46, 0.74]
Cluster 1	16 (59.29)	8	3	27		
Cluster 2	6	36 (85.71)	0	42		
Cluster 3	5	0	14 (73.68)	19		
k-means cluster solution					85.48	0.77 [0.67, 0.87]
Cluster 1	33 (73.3)	8	4	45		
Cluster 2	5	50 (90.90)	0	55		
Cluster 3	1	0	23 (95.83)	24		

Notes. Number in (parenthesis) indicate the % agreement between the initial Ward's method (columns) and the alternate solutions' (rows).

Table 2

Means (SD) scores, ANOVAs and Pairwise Comparisons for Cluster Membership on Clustering Variables for Each Sexuality Cluster.

Variables	Discordant (n = 45)	Constrictive (n = 55)	Overinvested (n = 24)	F	
	M (SD)	M (SD)	M (SD)		p
Drive	14.31_a (5.83)	9.25_b (4.92)	20.42_c (7.20)	32.02^{***}	0.001
Normative experiences	12.00_a (6.29)	4.98_a (4.00)	18.29_c (4.15)	64.73^{***}	0.001
Body image (negative)	20.20_a (6.59)	23.20_b (5.45)	18.50_a (4.90)	6.55^{**}	0.002
Normative fantasies	4.09_a (1.77)	1.69_b (1.25)	6.17_c (1.76)	75.57^{***}	0.001
Atypical fantasies	0.78_a (0.85)	0.31_a (0.74)	2.54_b (1.74)	38.90^{***}	0.001
Atypical sexual behavior	0.58_a (0.81)	0.22_a (0.50)	1.75_b (1.15)	32.82^{***}	0.001
Pornography	5.82_a (4.17)	2.35_b (2.37)	10.17_c (7.16)	28.49^{***}	0.001
Age of first masturbation	12.56_a (1.70)	11.04_b (1.83)	9.52_c (2.06)	22.50^{***}	0.001
Age of onset of sexual interest	12.67_a (1.81)	11.24_b (2.45)	9.69_c (2.07)	15.35^{***}	0.001
Age of first exposure to sex	13.18_a (1.85)	11.28_b (2.59)	9.81_c (2.56)	17.64^{***}	0.001

Notes. Raw scores are presented to facilitate interpretation (standardized variables were used for the cluster analysis).
[a,b,c] Different subscript letters indicate significant differences between groups. $^{**} p < 0.01$, $^{***} p < .001$.

scores (low scores and closer to the *Constrictive sexuality* cluster), which suggests the idea of disharmony with regards to their sexually abuse behavior. Furthermore, results from the drive, experiences, fantasies and pornography scores suggest that these AESA do have sexual interests, but less than those in the *Overinvested sexuality* cluster. Results also suggest that they have mostly normative sexual interests: a majority reported never experiencing atypical sexual behavior (57.8%), almost half (44.4%) reported no atypical fantasies, with less than a fifth (17.7%) having two or more.

Adolescents in cluster 2, *Constrictive sexuality* (n = 55), seem to have less sexual investment/interest. They have significantly lower results on all the sexual dimensions, except body image for which they show a less favorable perception of self (inverse score): their libidinal erotic interests (drive) is rather low, very few report atypical sexual behaviors (18.2%) or having atypical sexual fantasies (21.8%), and they are sexually inexperienced and less inclined to explore as demonstrated by their fewer sexual experiences and their lesser use of activities and materials to gain access to sexual content. Finally, the onset of sexual initiation occurred around 11 years old, which falls between that reported by the other clusters.

Adolescents in cluster 3, *Overinvested sexuality* (n = 24), appear to be the exact opposite of the *Constrictive* cluster. This cluster seems to show the most sexual investment/interest, including atypical sexual behaviors and fantasies, and a younger age of onset of sexual initiation (around 9 years old). They have the highest scores on all dimensions, except body image (they have a more favorable perception of their body). The vast majority report atypical sexual behaviors (91.7%) or having atypical sexual fantasies (87.5%), which is significantly higher than the other two clusters. They also report the highest rate of sexual victimization (37.5%).

One-way ANOVA showed only one significant cluster difference on socio-demographic factors; the effect of age, $F (2, N = 121) = 7.33, p = 0.001$. Post-hoc comparisons using the Bonferroni post hoc criterion for significance indicated the only statistically significant difference was between cluster 1 ($M = 15.73, SD = 1.56$) and cluster 2 ($M = 14.58, SD = 1.45$). No significant differences were found for ethnicity, number of siblings, residential settings or school failure, with all p-value superior to 0.20.

8.4. Cluster differences on validation variables

To determine the concurrent and predictive validity, ANOVAs and Chi-square tests with Bonferroni correction were conducted on external variables to compare profiles. This step shows how the clusters relate to important external variables in theoretically meaningful ways. The preselected variables were variables that should be linked to cluster affiliation, not used in the cluster analysis, and delinquency and offense characteristics variables.

There were significant differences between the clusters regarding multiple sexually-related variables that are coherent with our cluster classification (see Table 3); dating experiences ($\chi^2 (2, n = 124) = 10.17, p < .01$), number of sex partners ($\chi^2 (2, n = 124) = 33.51, p < .001$), possession of sexual material ($\chi^2 (2, n = 104) = 12.32, p < .01$), attitudes towards using pornography to learn about sex ($\chi^2 (2, n = 108) = 6.14, p < .05$) and sexual victimization history ($\chi^2 (2, n = 124) = 6.62, p < .05$). The *Overinvested* cluster differs from the *Constrictive* cluster: adolescents in the former cluster are more likely to report that they dated a girl, had three sexual partners or more, and possess sexual material. The *Overinvested* cluster also differs from the *Discordant* cluster, as adolescents in this cluster are significantly more likely to report that they had three sexual partners or more, had been victims of a sexual abuse, and would recommend pornography to learn about sex.

Regarding the second objective, results suggest that five delinquency and offense characteristics are significantly more likely to be presented for the *Overinvested* than the *Constrictive* cluster (see Table 3): non-sexual offenses (($\chi^2 (2, n = 124) = 9.02, p < .05$), sexually abusing peer victim (($\chi^2 (2, n = 124) = 7.13, p < .05$), three or more victims, (($\chi^2 (2, n = 124) = 7.59, p < .05$) and alcohol (($\chi^2 (2, n = 122) = 7.62, p < .05$) or drug consumption (($\chi^2 (2, n = 124) = 9.25, p < .05$). Results also suggest that adolescents in the *Overinvested* cluster are significantly more likely to have committed a non-sexual offense than adolescents in the *Discordant* cluster. Finally, having at least one delinquent friend (($\chi^2 (2, n = 122) = 10.48, p < .01$) is significantly more likely for the *Discordant* cluster than the *Constrictive* sexuality cluster.

Table 3

Chi-square, ANOVAs and Pairwise Comparisons for Cluster Membership.

	Discordant (n = 45) M (SD) / %	Constrictive (n = 55) M (SD) / %	Overinvested (n = 24) M (SD) / %	F/$\chi 2$	p
AESA demographic					
Age	15.73$_a$ (1.56)	14.58$_b$ (1.45)	15.33$_{a,b}$ (1.61)	7.33	0.001
Siblings (#)[c]	2.53$_a$ (1.62)	2.84$_a$ (1.88)	2.54$_a$ (2.52)	0.37	0.672
Ethnicity[d]	93.3$_a$	98.1$_a$	100$_a$	2.81	0.245
Living situation[e]	20.0$_a$	10.9$_a$	20.8$_a$	2.00	0.368
School failure	64.4$_a$	69.1$_a$	79.2$_a$	1.60	0.449
Sexuality (validation variables)					
Sexual attitudes	155.53$_a$ (15.63)	147.18$_b$ (18.72)	154.25$_{a,b}$ (19.10)	3.08	0.050
Porn as education[g]	11.6$_a$	16.3$_{a,b}$	36.4$_b$	6.14	0.046
Dating experiences	82.2$_{a,b}$	69.1$_b$	100$_a$	10.17	0.006
Sex partners (≥ 3)	15.6$_a$	3.6$_a$	58.3$_b$	33.51	0.001
Sexual object (#)	34.1$_{a,b}$	19.5$_b$	63.6$_a$	12.32	0.002
Sexual victimization	11.1$_a$	21.8$_{a,b}$	37.5$_b$	6.62	0.037
Delinquency					
Non-sexual crime(s)	42.2$_a$	40.0$_a$	75.0$_b$	9.02	0.011
Delinquent friends	93.3$_a$	72.7$_b$	95.5$_{a,b}$	10.48	0.005
Alcohol[g]	80.0$_a$	58.2$_b$	82.6$_a$	7.62	0.022
Drugs	48.9$_{a,b}$	30.9$_b$	66.7$_a$	9.25	0.010
Offense characteristics					
Full intercourse[f]	27.3$_a$	16.4$_a$	33.3$_a$	3.19	0.203
More than 1 event	63.6$_a$	67.3$_a$	58.3$_a$	0.59	0.744
Duration (> 1 year)	62.1$_a$	54.3$_a$	42.9$_a$	1.43	0.490
Victims characteristics					
More than 3 victims	20.0$_{a,b}$	10.9 $_b$	37.5$_a$	7.59	0.023
Peer (12 or older)	28.9$_{a,b}$	14.5$_b$	41.7$_a$	7.13	0.028
Intrafamilial	48.9$_a$	52.7$_a$	29.2$_a$	9.38	0.052
Extrafamilial	44.4$_a$	41.8$_a$	45.8$_a$		
Intra and extra	6.7$_{a,b}$	5.5$_b$	25.0$_a$		
Female	55.6$_a$	61.8$_a$	70.8$_a$	3.86	0.425
Male	37.8$_a$	25.5$_a$	25.0$_a$		
Both sexes	6.7$_a$	12.7$_a$	4.2$_a$		

Notes. [a,b]Different subscript letters indicate significant differences between groups.

[c]Number of sibling include sister, brother, half-sister and half-brother.

[d]Ethnicity refers to canadian origin.

[e]Living situation refers to living with both parents.

[f]Full intercourse refers to digital, vaginal or anal penetration.

[g]Chi-square tests were run without the Bonferroni correction to identify the group differences due to a lack of statistical power.

9. Discussion

Consistent with our theoretical proposition that AESA are a heterogeneous group in terms of their sexuality, results suggest three sexual profile. The fact that investment/interests among adolescents from the *Discordant* cluster leans more towards normative than atypical sexual practices and thoughts could suggest they have less sexual issues, raising the hypothesis that they are similar to a non-AESA population. In the absence of a control group, results were compared to the DSFI validation studies with a non-AESA clinical population of 117 male adolescents, aged 12 to 18, on four scales; *Drive, Experiences, Body image,* and *Fantasy* (Sasloff, 1994). As expected, scores from the adolescents in the validation study resembled those of the *Discordant* cluster. Overall, they also have higher scores than our *Constrictive* cluster and lower scores than our *Overinvested* cluster for the *Experiences, Drive* and *Fantasy* dimensions. The fact that adolescents in the *Discordant* cluster have seemingly less sexual issues appears to be linked to the later age of their first sexual exposure and the outset of sexual interest. Delayed sexual exposure could have allowed them to reach a psychological and physical stage of development enabling them to fully understand that experience. Consequently, they could have been less likely to *over* or *under* invest in the sexual sphere. Nevertheless, adolescents in the *Discordant* cluster did commit a sexual offense, and a considerable proportion (42.2%) reported atypical sexual behaviors. For these reasons, it seems inappropriate to conclude that they do not present any sexual problems. Their sexual issues could be related to other factors not explored in the current study. A more in-depth investigation of atypical sexual thoughts, fantasies and behaviors, not limited to the use of self-reported questionnaires (e.g. cognitive measures of atypical sexual arousal/interest, see Akerman & Beech, 2012) could help refine our findings. It is also possible that their main difficulties may be in other non-sexual areas of their lives. On a more positive note, this group was not overinvested in sex, showed normative sexual fantasies and experiences, with scores indicating that they are similar to adolescents who have never perpetrated sexual abuse. This may imply that their sexual profile is the most likely to evolve favorably.

Overall, the adolescents in the *Constrictive* cluster seem to have a less invested sexuality. One hypothesis is that youth in this

cluster have a discomfort with sexuality, which could play a role in the perpetration of sexual abuse. As their sexual drive is not entirely repressed, they may turn to abusive behaviors to access and explore sexual interactions. In adolescence, confronted by their peers' or their own physical and psychological changes, a developmental desynchronization may result in both an interest and discomfort with sexual activity. It is possible that they grew up in a strict family environment (strict rules and supervision), in which sexuality was taboo. Their sexual "sterilization" could have contributed to the creation of a sense of inadequacy or sexual lateness, which in turn contributed to the favoring of abusive or dominant behaviors instead of a consensual approach. The opposite is also possible, that is, they grew up in a family with a lack of boundaries regarding sexual intimacy (e.g., exposition to parents' sexual behaviors) that generated a discomfort and avoidance surrounding sex. Growing up in such environments (strict or lack of boundaries) could have impaired the proper development of a healthy expression of sexuality. It could also have generated a "misperception of sexuality" and prevented these adolescents from learning more appropriate social skills necessary to successfully court a potential and appropriate sexual partner or lover. Likewise, Martin (2014) stresses that sex offenders' parents often adopt an attitude of resignation regarding the provision of sexual education to their children and that may lead them to a poor understanding of sexual social standards. This could particularly be the case in a family where sexuality is taboo. Martin (2014) also states that the transmission of conservative, rigid, and taboo attitudes about sexuality in some families can nurture "feelings of guilt, shame, disgust, and alienation towards the emerging sexual self and sexuality" (p.87). This suggests another complementary possibility, that their negative body perception has induced masculinity challenges as proposed by Messerschmidt, (1999, 2000) leading them to invest less in their sexuality due to feelings of inadequacy. However, at a certain point in their lives, they may use sexual abuse to gain a sense of masculine accomplishment and heighten their masculine self-esteem. Their poor opinion of their seduction abilities may then lead them to impose themselves on their victims instead of courting appropriate partners.

The problem of adolescents in the *Overinvested* cluster seems to be linked to an exacerbated sexuality. Sexual thoughts could have an overwhelming presence, discarding other forms of interpersonal relationships and urging them to impose sexual behaviors when they feel they cannot be satisfied consensually or as a way of sensation seeking. A key element that could contribute to this overwhelming presence is sexual precociousness, as they were exposed to and showed interest in sexuality at an early age (before 10) and experienced high rates of sexual victimization. The results derived from the study's second objective revealed a significant relationship between five delinquency and offense characteristics (non-sexual crimes, alcohol consumption in the last year, lifetime drug consumption, three or more victims and peers' victims) and this cluster, suggesting that these adolescents are inclined towards general delinquency. This also points to a possible link with the non-sexual offense history and victims' age classification, more precisely the generalists and peers' victims' categories. Previous research has found a similar link, stating that many aspects of AESA offenses towards peer victims (e.g. propensity to violate the rights of others, non-sexual crime, drugs or alcohol consumption, etc.) are consistent with the generalist perspective of sexual offending (Joyal, Carpentier, & Martin, 2016; Leroux, Pullman, Motayne, & Seto, 2016).

Overall, our results indicate that the *Overinvested* cluster shows a broader propensity towards transgressions, both in terms of sexual abuse and general delinquency. A possible explanation could be the presence of difficulties in executive functions, such as trouble regulating their impulses and emotions. However, a recent study on executive functions and social cognition in juveniles comparing four groups: AESA against a child or peers, adolescents who had committed non-sexual offenses, and non-delinquents, reports that all groups showed some signs of impulsivity. The adolescents from the child victim group were significantly more impulsive than those with peer victims or having perpetrated non-sexual offenses only, and reported social anxiety (author, [Blind for review]), submitted). It is very likely that we would find similar results, that is, signs of impulsivity in each of our groups. Thus, executive dysfunction alone is not a sufficient explanation; other factors, such as more self-confidence and less social anxiety, could explain the *Overinvested* cluster's broader propensity towards transgressive behavior. Various elements could have contributed to the development of their issues. The intrusiveness of being exposed to sexuality at an early age and their sexual victimization suggests that their own limits and personal space were violated, which could have prevented them from learning appropriate social skills involving consent and mutuality. It is also possible that the precocious exposure to sexuality initiated them to feelings of pleasure associated with sexual arousal before their psyche was mature enough to fully understand the experience, as the mentalization capacities of children are not as developed as those of adults. The appeal of sexual pleasure, egocentric in nature and focused on sensations rather than emotions, could have dominated over other forms of pleasure, which may be less attractive as they require more effort (e.g., engaging in a prosocial manner) for the same or less amount of satisfaction. Other pleasures would then represent a bigger challenge that may not seem worth it.

Our results, which confirm the heterogeneity of AESA sexuality profiles, can shed light on the mixed results of previous studies pertaining to their sexual experiences. Considering that the representativeness of samples may vary, it is possible that adolescents in the Daleiden, Kaufman, Hilliker, and O'Neil (1998); Driemeyer, Spehr, Yoon, Richter-Appelt, and Briken (2013), and Fagan and Wexler (1988) studies form a group more associated with the *Constrictive* cluster whereas those in the McCord, McCord, and Verden (1962) study may linked with the *Overinvested* cluster. Our results are also coherent with previous findings. Namely, Joyal, Carpentier, and Martin (2016) found that significantly more AESA of peers (64.3%) had at least one experience of consenting sexual intercourse with an age-appropriate partner prior to their sex offense, compared to AESA of children (22.9%) and AESA with mixed victims (37.0%, peers and child victims). Similarly, Glowacz (2009) found that among sexually active adolescents, 50% of those in the child victims group had their first consensual sexual experience following the disclosure of their sexual offense, compared to 19% of those in the peer victims group. Moreover, adolescents in the peer/adult victims group were less likely than those in the child victims group to report they had never experienced consensual sex. Leroux, Pullman, Motayne, and Seto (2016) found similar results: adolescents in the peer/adult victims group were significantly more likely than those with child victims to have had consenting sexual intercourse. In our study, the significant relationship between peer victims and the *Overinvested* cluster is consistent with those

results, as this cluster reported greater sexual experiences. It is also consistent with results from O'Brien, Burton, and Li, 2016 supporting a statistical trend between (p = .067) body disapproval (Millon Adolescent Clinical Inventory (*MACI) Body Disapproval* subscale) and victim's young age. With respect to the possibility of establishing links between the current clusters and existing classifications previously presented, those based on non-sexual offense history and victims' age (Joyal, Carpentier, & Martin, 2016; Leroux, Pullman, Motayne, & Seto, 2016) are the only ones that seem consistent.

10. Limitations and implications

A few study limitations should be considered. Firstly, the use of an uncontrolled cross-sectional, retrospective design with an at-risk sample limits the examination of the potential influence of sexuality developmental factors of AESA compared to a prospective longitudinal study. Secondly, AESA sample brings an additional obstacle of response bias due to feelings of shame, a desire of conformity, and self-preservation, following the disclosure of their offenses. Thirdly, the use of a convenience sample with an inclusion criterion requiring both the adolescent and a parent to participate in the study has impacted the generalizability of findings. Fourthly, the absence of a control group or suitable norms also limited the discussion. However, the use of multiple informants (parents and clinicians) to validate certain information and the comparison with available instrument norms, when possible, mitigated those limits. Finally, limited options of brief and validated sexual measures were available when the initial project was developed, which lead to the use of instruments that were not always optimal. However, by combining instruments that were already widely used in research with additional measures, we believe we have succeeded in investigating both atypical and normative sexual manifestations.

Very few studies have investigated both AESA atypical and normative sexuality. This study represents an initial effort in classifying them based on their own sexual experiences. Although it would be necessary to further explore and target the specific challenges inherent to each cluster, this classification can contribute to enhance our knowledge on AESA sexuality and help clinicians to better target their interventions, as our results suggest that each cluster has essentially different intervention needs and highlights the necessity to adapt treatments. For example, adolescents associated with the *Constrictive* cluster seem to need help in investing appropriately in their sexuality with consensual peers, whereas it seems that the *Overinvested* cluster would benefit from exploring other enjoyable and rewarding activities to develop their interpersonal skills and learn to find pleasure in other forms of intimacy. Our results also help identify potential interventions targets in terms of treatment, such as discomfort with sexuality and masculinity challenges for the *Constrictive* cluster, and prevention, such as educating parents and youth workers about the possible consequences of early exposure to sexual material or experiences on adolescents' sexual development. Furthermore, findings regarding the links between this new classification model and the different characteristics of traditional models (e.g. using readily available data from police records such as criminal history and victims' characteristics) could eventually simplify the evaluation process by providing clues to clinicians to guide their investigation of AESA sexual profile. Since this is a first effort to identify sexuality profiles among adolescents who engaged in sexual abuse, future studies are necessary to validate the stability of the clusters and further pursue our understanding of their sexuality. Exploring the role of parents in the development of atypical and normative sexual manifestations would also be a relevant avenue for future research.

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