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Abstract

This study examined how adolescents' sexual trajectories are associated with achievement of emerging adulthood developmental tasks (educational attainment, full-time employment, romantic involvement) and psychosocial outcomes (problems with alcohol, depression, self-esteem). Trajectories (identified in a previous report by Rossi, Poulin, & Boislard, 2017) based on annual number of sexual partners from age 16 to 22 (i.e., abstainers, low-increasing, medium-increasing, multiple partners trajectories) were compared on outcomes measured at age 22. Results showed that youths in the two less sexually active trajectories achieved higher levels of education than those in the two other trajectories, and females (but not males) in the multiple partners group reported more problems with alcohol than all other participants. The absence of significant differences in depression and self-esteem suggests that the impact of adolescent sexual trajectories on psychological outcomes might take longer to emerge.

Much of the early research on sexual development emphasized the problematic aspects of adolescent sexual activity. Recently, however, researchers have shifted their focus to examining sexual development within a normative framework, seeking to understand conditions in which early sexual experience acts as a stepping stone to healthy adult sexual and romantic relationships (Vasilenko & Lefkowitz, 2018; Zimmer-Gembeck & Helfand, 2008). While a great deal of research exists on the concurrent potential negative outcomes of adolescent sexual activity - especially unprotected sex (e.g., unwanted pregnancies, sexually transmitted infections; Boislard, Van De Bongardt, & Blais, 2016), less is known about how adolescent sexual experiences may impact functioning during emerging adulthood (EA) above and beyond the effect of the timing of first heterosexual intercourse (Boisvert, Boislard, & Poulin, 2017).

Early sexual onset has been associated with greater problem behaviors such as alcohol misuse in EA (Boisvert, et al., 2017), although late sexual onset and absence of sexual experimentation throughout adolescence have also been associated with problems such as lower sexual satisfaction and sexual self-esteem (Sandfort, Orr, Hirsch, & Santelli, 2008), as well as stigma later in life (Fuller, Boislard, & Fernet, 2019). Moreover, sexual experience, ranging from kissing to intercourse, has been found to increase sexual subjectivity, which can be defined as one's experience of oneself as a sexual being and includes feelings of entitlement to pleasure and sexual safety, sexual body-esteem, and sexual self efficacy (Boislard & Zimmer-Gembeck, 2011; Hewitt-Stubbs, Zimmer-Gembeck, Mastro, & Boislard, 2016). While these findings may appear contradictory at first glance, they may reflect that sexual desynchronization (i.e., early *or* late transition to sexual activity) is prospectively linked to lower sociosexual well-being

than sexual trajectories "in sync" with the current "normative" age window for becoming sexually active (Elder, Johnson, & Crosnoe, 2003). Widely-held expectations about the "right" age for a normative life transition – such as sexual initiation – impacts an individuals' experience with their transition (MacMillan, 2005; Mortimer, Oesterle, & Krüger, 2005). Indeed, *social clock theory* states that social norms within a cultural context identify an ideal age window for particular life transitions (Lehnart, Neyer, & Eccles, 2010), and serve as a barometer to judge how well an individual is doing in the context of lifecourse development (McCormick, Kuo & Masten, 2011). Overall, the current research on lifecourse sexual development highlights the importance of bringing out different sexual pathways from adolescence to EA in order to identify the conditions in which positive sexual growth is promoted. Doing so provides a valuable framework for understanding the potential implications of adolescent sexual experiences regarding accomplishment of developmental tasks and psychosocial adjustment during EA (Halpern & Kaestle, 2014).

One way that sexual developmental pathways can be identified is by tracking number of partners longitudinally. One study used a subsample (N = 4,125) from the National Longitudinal Study of Adolescent Health (Add Health), an American nationally representative study of approximately 20,000 adolescents in the United States in grades 7–12 in 1994 –1995. A variety of sexual and dating behaviors between 16 and 18 years were used to identify latent class membership and assessed outcomes at 28 – 34 years (Vasilenko, Kugler, & Lanza, 2016). Of the six identified classes, 60% of all participants belonged to one of two classes, and three minority classes emerged. Groups characterized by adolescent sexual behaviors reported more sexual partners as adults, and differences in

rates of marriage and health outcomes (e.g., contraction of an STI) were found between groups, differentiating normative from atypical pathways of sexual and dating development (Vasilenko et al, 2016).

Another study spanning six years and using 10 waves of data (mean ages at wave 1 and 10 were 18.4 and 23.8 years, respectively) used latent growth class analysis of number of partners in the past three months, prevalence of sex acts, and relationship status in a sample of 2,244 American emerging adults to identify three groups (Ashenhurst, Wilhite, Harden, & Fromme, 2017). The majority (90.8%) of participants belonged to two groups (*rare* and *single partners*) that reported zero to one partner consistently, with 22.9% of the *rare* group reporting no partners across the study. A minority group (*multiple partners*, 9.3%) demonstrated the greatest increase over time, consistently reported more than one partner, and, along with the *single partner* group, were more likely to have unprotected sex.

In a study that followed 527 American adolescents yearly between the ages 16 and 22, Lansford and colleagues (2010) used latent growth models to identify three groups based on annual number of sexual partners: 1) the *zero-initial* group (65.8%) reported no partners at 16; 2) the *one-initial* group (14.8%) reported 1 partner at 16); and 3) the *multiple-initial* group (19.4%) reported a mean of 2.4 sexual partners at 16. Both the *zero-initial* and *one-initial* groups showed a significant increase in the number of partners in late adolescence. The *multiple-initial* group was the only group to show a significant decline in late adolescence, followed by a significant increase after age 20.

Finally, the current study is a follow up to a study by Rossi et al. (2017), who modeled trajectories of annual number of sexual partners from ages 16 to 22 in a sample

of 332 French-Canadian participants. In contrast to abovementioned studies, an additional trajectory defined by abstention was identified: 1) 9.1% of participants reported zero partners throughout the majority of the period (*abstainers*); 2) 30.6% reported zero partners during the first two years, followed by an increase to one partner (*low-increasing*); 3) 53.0% reported one partner at age 16, followed by a slow increase, stabilizing at two partners (*medium-increasing*); and 4) 7.3% reported two partners at age 16, followed by a steady increase which slowly decreased after a peak at age 20, although the number of partners remained higher than those reported by the other trajectories at all times (*multiple partners*).

To our knowledge, no study has yet to examine the potential impact of trajectories of number of partners on developmental task achievement ad psychosocial adjustment during EA. Further, only Ashenhurtst et al. (2017) identified a group that could be comparable to the current study's *abstainers*, however their measure only covered the three months preceding assessment and 64.6% of their *rare partners* group endorsed having vaginal sex.

Emerging Adulthood

EA is characterized by identity exploration, instability, and experimentation with different worldviews and career possibilities (Arnett, 2007). An important developmental task during EA is the attainment of independence, achieved by either post-secondary education or though full-time employment, or both. Another key developmental task involves romantic relationships. As romantic relationships become a central part of one's life in EA, cohabitation can be understood as one facet of commitment as many youths see it as a way of testing the relationship (Shulman & Connolly, 2013). Erikson (1968)

pointed to the need for intimacy in early adulthood and empirical research continues to support his theory: emerging adults seek out committed relationships, often with the goal of cohabiting and starting a family (Stanley, Rhoades, & Fincham, 2011).

The instability characterized by EA can translate into internalizing and externalizing difficulties, such as depressive symptoms, lower self-esteem, and problematic alcohol use (Lanctôt & Poulin, 2018). Indeed, emerging adults have been found to report high rates of depression and alcohol intoxication/dependence (Findlay, 2017; Ministry of Health and Social Services of Quebec, 2016).

Abstainers trajectory

Adolescents who remain abstinent may focus more on their education than their peers. In one study, girls who were not sexually active during high school were more likely to be enrolled in a four-year program than in vocational, part-time or absence of studies (Frisco, 2008). Sexual and romantic abstention might reflect a decision to prioritize one's education, but might also come with romantic consequences: one study found heterosexual virgins and non-virgins reported themselves as unlikely to enter into a relationship with a virgin (Gesselman, Webster, & Garcia, 2017). While earlier studies have emphasized the positive correlates of sexual abstention, namely the avoidance of health risks and victimization (Sandfort et al., 2008), less is known about its potentially negative outcomes. The stigma associated with desynchronization (Fuller et al., 2019) as well as the desire to engage in romantic or sexual behaviors (Gesselman et al.,) may lead to internalizing problems. Adolescent abstainers have been found to be less socially competent than their sexually active peers (Rossi, et al., 2017), which can impact their ability to enter a romantic relationship. Evidence for this romantic disadvantage is found

in studies that show that adult virgins ore often unable to establish romantic or sexual relationships (Donnelly, Burgess, Anderson, Davis, & Dillard, 2001). Considering the importance of romantic relationships during EA, these findings suggest that the *abstainers* may be particularly susceptible to depressive symptoms and lower self-esteem.

Low-increasing and medium-increasing trajectories

Individuals in the *low-increasing* and *medium-increasing* trajectories experience normative sexual development. Owing to their synchronization with their peers' sexual and social clock, adolescents whose first intercourse is on time with their peers report better well-being (Vrangalova & Savin-Williams, 2011), which has been found to be a protective factor against later depressive symptoms (Wood & Joseph, 2010). Achievement of EA developmental tasks might be easier without the distraction or potential negative outcomes associated with multiple sexual partners and with the benefit of developing in a progressive and typical way. Indeed, individuals who report few sexual partners may be those who are in committed relationships – which may be reflected in cohabitation with one's partner - and who are learning to manage the emotional landscape that comes with this new milestone.

Multiple partners trajectory

Having multiple sexual partners during adolescence might act as a distraction from academic pursuits, and individuals who report more sexual activity, particularly outside of a romantic relationship, are more likely to experience a variety of problems at school (McCarthy & Grodsky, 2011). These individuals might also be at a disadvantage when it comes to establishing a committed relationship during EA, since a greater

number of partners during adolescence has been associated with shorter periods of romantic involvement during EA (Shulman, Seiffge-Krenke, & Walsh, 2017), which could directly impact youths' ability to develop intimacy and commitment. Indeed, in a follow-up study, researchers found that casual sexual behavior during adolescence, as opposed to sexuality with a romantic partner, was associated with negative affect four years later (Shulman Scharf, Ziv, Norona, & Welsh, 2019).

Adolescent sexual activity has consistently been associated with greater alcohol problems (Zimmer-Gembeck & Helfand, 2008). Indeed, adolescents who reported more alcohol use were more likely to have had multiple sexual partners over the past month (Green et al., 2017) and one year later (Boislard, Poulin, Kiesner & Dishion, 2009). An individual's perception of their sexual experiences can impact psychological and social health (Vasilenko, Lefkowitz, & Welsh, 2014). Therefore adolescents with multiple partners, particularly females vulnerable to societal double standards that are more permissive of male sexual behaviour, might be at risk to feel shame or guilt, which can result in using alcohol as a coping mechanism. Indeed, adolescent girls who engaged in casual sex have been found to report increased psychological distress and alcohol consumption (Dubé, Lavoie, Blais, & Hébert, 2017). Alternatively, many adolescents use alcohol as a means of facilitating sexual experimentation (Livingston, Bey-Chang, Hequembourg, Testa, & Downs, 2012), suggesting a bidirectional association between alcohol use and sexual behaviour. Therefore, youths in the *multiple partners* trajectory are expected to display problematic alcohol use in EA, and thus might also be more vulnerable to depressive symptoms. Links between early onset of sexual activities and depressive symptoms have been documented, especially for females (Zimmer-Gembeck

& Helfand, 2008), but it is unknown whether this also applies for multiple sexual partners and whether it persists into EA. Finally, adolescent females who initiate sex early and have more partners have been found to have lower self-esteem (Ethier, Kershaw, Lewis, Milan, Niccolai, & Ickovics, 2006), and lower self-esteem at 15 years has been associated with a greater number of partners from 18-21 years (Boden & Horwood, 2006) although literature reviews on the topics reveal inconsistencies between studies (Goodson, Buhi, & Dunsmore, 2005; Zimmer-Gembeck & Helfand, 2008).

The current study

A previous study using the same sample (Rossi et al., 2017) identified four trajectories based on annual number of sexual partners from ages 16 to 22: *abstainers (9.1%)*, *low-increasing (30.6%)*, *medium-increasing (53%)*, and *multiple partners (7.3%)*. Using these trajectories as a grouping variable, we explored whether differences could be found in accomplishment of EA developmental tasks (educational attainment, full-time employment, living with a romantic partner) and psychosocial difficulties (problematic alcohol use, depressive symptoms, lower self-esteem) measured at age 22. To take into account pre-existing levels of behaviors and symptoms, variables similar to outcomes that were measured at ages 14 and 15 were used as covariates (i.e., academic performance, alcohol use, depressive symptoms, self-esteem).

The following hypotheses were tested: 1) participants in the *abstainers* trajectory were expected to be more educated, least likely to be living with a romantic partner, report more depressive symptoms and lower self-esteem; 2) participants in the *low-increasing* and *medium-increasing* trajectories were expected to demonstrate the best outcomes in developmental tasks and psychosocial adjustment (i.e., higher academic

achievement and self-esteem, lower depression), and 3) participants in the *multiple partners* trajectory were expected to have achieved fewer developmental tasks (obtained less education, not working full-time, not living with a romantic partner) as well as to display more problematic alcohol use and depressive symptoms.

A breadth of research has demonstrated that sexuality can develop differently for males and females (Tolman, McClelland, 2011; Boislard et al., 2016). The previous study did not identify separate trajectories and instead groups males and females together (see Rossi et al., 2017 for supplementary information regarding sex distribution across the trajectories); given the pre-established trajectories, gender was factored into analyses in the current study to best consider its impact.

Method

Participants

This longitudinal study began in 2001 with 390 Grade 6 students (58% girls; M age = 12.38 years; *SD* = 0.42) enrolled in eight elementary schools in a large French-speaking school district in Canada. The sample was 90% European Canadian, 3% Haitian Canadian, 3% Middle Eastern Canadian, 2% Asian Canadian, and 2% Latino Canadian. Seventy-two percent of the participants lived with both biological parents. Mean family income was between $45,000 and $55,000 (CAN) at the initial assessment. Mothers and fathers had completed an average of 13.10 (*SD* = 2.68) and 13.20 (*SD* = 3.20) years of schooling, respectively.

The data used for this study were collected yearly from ages 14 to 22 (2003 to 2011). The sample retained participated in at least 3 out of 7 yearly waves of data collection between the ages of 16 and 22 (the years on which the trajectories of number

of sexual partners were based). Of the 390 youths initially recruited, 332 (60.8% girls) participants met this criterion and were included in the current analyses. The retained participants did not differ from those who were excluded on ethnicity, gender, mother's education, or family income, but participants in the retained sample were more likely to come from two-parent households (X^2 (387) = -3.24, p = .007).

Design and Procedures

During the high school years, questionnaires were completed in the school setting under the supervision of research assistants. After high school, a research assistant completed questionnaires during a home visit. Parents provided written consent for their child's participation at each year of the study until the youths were 18. From ages 18 to 22, the participants provided written consent. Youths received a gift card for their participation at each time point. Ethical approval for this research was obtained from the authors' university ethics review board.

Measures

Trajectories of annual number of sexual partners from ages 16 to 22. From ages 16 to 22, participants were asked yearly how many sexual partners they had had over the course of the previous year, consistent with the current literature at the time of data collection (Huang, Murphy, & Hser, 2012; Lansford et al., 2010; Moilanen, Crockett, Raffaelli, & Jones, 2010). The wording of this item was different for males and females and referred to other-sex partners only. Participants answered the question "Over the past year, how many different *girls/boys* have you had as a sexual partner?"

Using these data, developmental trajectories based on the annual number of partners were identified using non-parametric growth mixture modeling (PROC TRAJ in

SAS; Nagin, 1999; see Rossi et al., 2017 for a detailed account of the analytic procedure and model fit indices). This technique assumes heterogeneity within a given population with regard to a specific variable, in this case the annual number of sexual partners, and identifies relatively homogenous subgroups. Trajectory groups are defined by both initial levels and patterns of growth, and participants are assigned to the group that best fits their individual trajectory. The previous study tested two-group, three-group, four-group, five-group and six-group models. Selection of a four-group model was based on inspection of BIC and AIC values as well practical usefulness and theoretical relevance (Nylund, Asparouhov, & Muthen 2007). The probability that each participant had of belonging to each group was tested. These posterior membership trajectory probabilities represent the accuracy of the participants' placement into their trajectory group. All posterior probabilities were greater than .5 and most were close to 1, which, according to Nagin (1999), represent appropriate values. The final model consisted of four distinct trajectories of annual number of sexual partners: 1) *abstainers* (N = 32, 9.1%), 2) *low-increasing* (N = 102, 30.6%), 3) *medium-increasing* (N = 173, 53%), and 4) *multiple partners* (N = 25, 7.3%; see Figure 1, originally published in Rossi et al., 2017).

Due to the wording of the question, same-sex sexual partners were not included in the annual assessments, potentially creating a bias in the data. This was dealt with in two ways: first, at 22 years participants were asked to report the total number of same-sex partners they had had in their lives. Ten percent reported having had a same-sex partner at least once, and analyses revealed no differences among the groups ($\chi 2(8) = 5.22$, $p = 0.73$). Second, again at 22 years, participants were asked if they had ever engaged in sexual activity beyond kissing with someone of the same-sex. This dichotomous variable

was used as a dummy variable and controlled for in analyses. Results did not change significantly when the dummy variable was considered and thus it was not included in the final models. Accordingly, we believe that our omission of same-sex behaviour does not preclude us from drawing conclusions from our analyses.

Dependant variables (measured at age 22)

Educational attainment. Participants were asked about the highest level of education they had completed and whether they were pursuing ongoing studies. Responses were coded into five categories treated as a continuous variable: 1 = high school diploma not obtained (9%), 2 = high school diploma obtained (32%), 3 = attending junior college (13%), 4 = junior college degree obtained (14%), and 5 = attending university (33%).

Full-time employment. Participants were asked whether they were currently employed in full-time work (‘yes’ or ‘no’).

Cohabitation with a romantic partner. Cohabitation was used as an indicator of romantic relationship commitment. Participants were asked whether they currently live with a romantic partner and could answer either ‘yes’ or ‘no’.

Problems with alcohol. Poulin and Denault’s (2012) questionnaire was used to measure problematic alcohol use. Participants were asked to specify whether (yes/no) they had experienced each of the 19 items pertaining to alcohol abuse/dependence, intoxication, addiction, and adverse consequences of alcohol use. Sample items included “Have you ever fainted following alcohol use?” and “Have you ever unsuccessfully attempted to stop drinking alcohol?” Positive (yes) responses were summed up to obtain a global score. Cronbach’s alpha test revealed good internal reliability ($\alpha = .88$).

Depressive symptoms. During earlier waves of data collection when participants were children and adolescents, the Children's Depression Inventory (CDI; Kovacs 1981) was used to assess depressive symptoms. As participants were adults when outcomes were measured, the CDI was no longer appropriate and The Center for Epidemiological Studies–Depression Scale (CES-D; Radloff, 1977) was used. Participants were asked to report on the frequency with which they experienced of a variety of symptoms over the previous week using a 4-point Likert scale ranging from 0 (rarely or never) to 3 (most or all of the time [5–7 days]). The CES-D consists of 20 items and is considered to be a valid and reliable screening instrument for depression (Roberts, Lewinsohn, & Seeley, 1991). A sum-score was calculated for each participant. Cronbach's alpha test revealed good internal reliability ($\alpha = .91$).

Self-esteem. Self-esteem was measured with Rosenberg Self-Esteem Scale (1979), a 10-item unidimensional scale. Participants were asked to indicate to which extent they were in agreement with each statement on a 4-point Likert scale ranging from 1 = *strongly disagree* to 4 = *strongly agree*. A global score was obtained by computing the mean scores for each item and Cronbach's alpha test revealed good internal reliability ($\alpha = .83$).

Covariates (measured at ages 14 and 15)

Academic performance. Academic performance was assessed using participants' grades (shown as percentages) in math and French (first language), drawn from their school report cards at ages 14 and 15. To verify whether these two subjects could be used to reflect academic performance, bivariate correlations were computed and deemed acceptable ($r = .64$ at age 14 and .62 at age 15). Grades in these subjects were then

averaged within each year, resulting in a measure of academic performance across two main subjects per year. To validate whether these two scores could be combined to reflect academic performance across the two years, a bivariate correlation was calculated and deemed acceptable (r = .71). These scores were then averaged across the two years, resulting in a broad reflection of participant's academic performance from ages 14 to 15.

Alcohol use. Participants were asked to report how many drinks they had had over the previous month using a 14-point Likert scale ranging from "0 drinks" to "41 drinks or more" at ages 14 and 15 (Poulin & Denault, 2012). The bivariate correlation of both time points was acceptable (r = .57), and the final measure consisted of participants mean alcohol use across the two years.

Depressive symptoms. A 26-item version of the Children's Depression Inventory (CDI; Kovacs 1981) was used to measure depressive symptoms at ages 14 and 15. For each item, participants were asked to choose one of three statements that best described how they had felt over the previous two weeks. Individual item scores ranged from 0 to 2, with higher ratings indicating more severe symptoms. A sum-score across all the items was calculated. Cronbach's alpha revealed good internal reliability at both time points (α = .84 at age 14 and α = .85 at age 15). The bivariate correlation between the two years was acceptable (r = .65) and thus the final measure was obtained by calculating the average between participant's two scores.

Self-esteem. The Self-Perception Profile for Adolescents (Harter, 1988) is a measure of nine domains of self-concept, one of them being global self-worth which was used to measure self-esteem. Validation studies have demonstrated that this subscale reflects self-esteem and has good concurrent validity with the Rosenberg Self-Esteem Scale

(Hagborg, 1993). Each item presented the participant with two opposing statements and they were asked to choose which statement better reflected themselves. Participants were then asked to choose one of two options relaying the extent to which the statement described them (e.g., “Really true for me” or “Sort of true for me”). Thus, responses for each item were coded from one to four. Cronbach’s alpha test revealed good internal reliability at both time points ($\alpha = .88$ at age 14 and $\alpha = .76$ at age 15). Because the bivariate correlation across the time points was acceptable ($r = 50$), the final measure of self-esteem was obtained by averaging participant’s two scores.

Analytical Strategy

The four trajectory groups were compared with regard to markers of EA developmental task achievement (educational attainment, full-time employment, and cohabitation with a romantic partner) and psychosocial outcomes (problematic alcohol use, depressive symptoms, and self-esteem) at age 22 using SPSS. Assumptions of analyses of covariance (ANCOVA) were met by examining the skewness, kurtosis, and using Levine’s test of equality of variance. Variables were examined by conducting four separate 4 (trajectory groups) by 2 (gender) ANCOVAs, controlling for corresponding variables at ages 14-15. Post-hoc analyses using a Bonferroni correction were used to identify where the differences lay. Chi-square analyses were conduced for the dichotomous variables (employment and cohabitation), and a series of two by two chi-square analyses were conducted in order to inspect differences between groups. A multiple-imputation method was used to account for missing data on the outcomes and control variables. The multiple imputation method repeatedly fills in missing data with a set of plausible values, representing the likely range of a given value, and results in

several data sets upon which statistical analyses may be conducted. The results of these analyses are combined and result in valid statistical inferences that suitably reflect uncertainty due to missing data. This method allows for good and unbiased estimates of standard error, and can be used when data is found to be missing at random, which ours was identified as using Little's MCAR test in SPSS.

Results

Descriptive statistics for all outcome variables are presented by trajectory group in Table 1. Results of the ANCOVA's and chi-square analyses revealed significant effects for educational achievement, full-time employment, cohabitation with a romantic partner, and problematic alcohol use.

Educational achievement was found to vary significantly by sexual trajectory ($F(3,323) = 11.12$; $p = < .001$, $\eta_p^2 = .094$) albeit no interaction with gender was found ($F(3,323) = 1.102$; $p = 0.385$, $\eta_p^2 = .003$). Prior academic success was used as a covariate and found to contribute significantly to educational achievement ($F(3,323) = 126.71$; $p = < .001$, $\eta_p^2 = .282$). As expected, post hoc analyses revealed that *abstainers* achieved higher education than those in the *medium-increasing* ($p = .007$) and *multiple partners* groups ($p = .001$), and this was true for those in the *low-increasing* group as well ($p < .001$ and $p = .009$, respectively). Those in the two least active trajectories did not differ from one another, and neither did those in the two more active trajectories.

The percentage of participants who were employed full-time ranged from 26% of *abstainers*, 34% of *low-increasing*, 49% of *medium-increasing*, and 46% of *multiple partners*. Chi-square analyses revealed that participants employed full-time were not similarly distributed across sexual trajectory groups ($X^2(3) = 8.07$; $p = 0.045$, $V = .162$),

and this effect was independent of gender. To explore where the differences lay, a series of 2 x 2 chi-square analyses were conducted and revealed the *medium-increasing* trajectory more likely to be employed full-time when compared to the *abstainers* ($X^2(1) = 4.750$; $p = 0.029$, $\varphi = .158$) and the *low-increasing* group ($X^2(1) = 4.888$; $p = 0.027$, $\varphi = .137$). However, after applying the Bonferroni correction, the results fell below significance. The percentage of participants who were cohabitating with a romantic partner ranged from 4% of *abstainers*, 16% of *low-increasing*, 25% of *medium-increasing*, and 14% of *multiple partners*. A significant difference among the trajectories in cohabitation with a romantic partner was also found ($X^2(3) = 7.97$; $p = 0.047$, $V = .164$), and this effect was also independent of gender. After applying the Bonferroni correction, post-hoc analyses revealed that the effect pertained to the *abstainers*, who were the least likely, and the *medium-increasing* group, who were most likely, to be living with their partner ($X^2(1) = 5.98$; $p = .014$, $\varphi = .180$).

A significant effect of trajectory was found for problematic alcohol use ($F(3,323) = 3.88$; $p = 0.009$, $\eta_p^2 = .033$). The covariate (prior alcohol use) was found to significantly contribute to problematic alcohol use ($F(3,323) = 12.43$; $p = < .001$, $\eta_p^2 = .037$). The trajectory effect was qualified by a trajectory by gender interaction ($F(3,323) = 4.11$; $p = 0.007$, $\eta_p^2 = .038$), showing that trajectories had a greater impact on alcohol problems for females than for males. Post hoc analyses revealed that females in the *multiple partners* trajectory differed from all three other groups, which did not differ from each other: females in the *multiple partners* trajectory had significantly more alcohol problems than those in the *abstainers* ($p = .002$), the *low-increasing* ($p = .008$), and the *medium-increasing* ($p = .049$) trajectories.

Finally, no main effect and no interaction with gender emerged among the four sexual trajectory groups for depressive symptoms ($F(3,323) = 0.925$; $p = .428$, $\eta_p^2 = .017$) and self-esteem ($F(3,323) = 0.490$; $p = .689$, $\eta_p^2 = .008$), and their covariates were found to significantly contribute to the models ($F(1,323) = 29.05$; $p = < .001$, $\eta_p^2 = .083$ and $F(1,323) = 19.06$; $p = < .001$, $\eta_p^2 = .056$, respectively).

Discussion

This study aimed to examine whether adolescent sexual trajectories, based on annual number of sexual partners from ages 16 to 22, were associated with EA developmental task achievement and psychosocial functioning. Four previously identified sexual trajectories were compared and pre-existing levels of adjustment were factored in. The sexual trajectories differed on educational attainment, full-time employment, cohabitation with a romantic partner and problematic alcohol use, but not on depressive symptoms and self-esteem. Results will be summarized and discussed for each trajectory.

Abstainers

The *abstainers* group distinguished themselves by remaining abstinent across the entire study. This is of particular interest as comparable groups in other studies often initiate eventually, later on (Lansford et al., 2009; Ashenhurst, et al., 2017), or contain a subsample within the least active group that reports having sex (Vasilenko et al., 2016). Our hypothesis that participants in the *abstainers* trajectory would achieve more education was supported. The *abstainers* and the *low-increasing* group achieved a similar level of education, significantly more than both the *medium-increasing* and *multiple partners* groups. The majority of our *abstainers* attended university, which suggests that less focus on sexuality and romance in adolescence may be a protective factor for

academic achievement later on, an association possibly mediated by more time spent on - and more value attributed to – academic success. Indeed, abstainers have been found less likely to drop out, skip class, or have problems in school (McCarthy & Grodsky, 2011). While accompanied by a stronger investment in education, abstinence may also be associated with a desynchronization with peers on romantic development, a central task of EA, which can be reflected in rates of cohabitation with a partner. The *abstainers* were the least likely to be living with a romantic partner at age 22. While their abstinence may allow a greater focus on education, research has found adult virgins to be seen as less desirable partners (Gesselman et al., 2017). Our hypothesis that abstainers would report more depressive symptoms and lower self-esteem as a result of remaining virgins beyond the normative period among their peers was not supported. This finding suggests that their abstinence, whether by choice or not, does not yet seem to be problematic for them at age 22. One explanation for this may be that the instability and stress of early EA might be experienced in all trajectories: indeed, we found little variance in depressive symptoms and self-esteem. Alternatively, their greater investment in school might serve as a protective factor as they may be less aware or bothered by their inexperience. However, as they get older and their desynchronization becomes more dramatic, they may experience distress as they face the stigma of being an adult virgin (Gesselman et al., 2017), suggesting the possibility that not enough time had elapsed for the impact of desynchronization to be observed in this study.

Medium-increasing and low-increasing

The two middle trajectories might represent different normative pathways of sexual development: the *low-increasing* group who focus on school while balancing

romantic or sexual relationships and the *medium-increasing* group who is relatively quick to establish independence by working full-time and cohabiting with their partner. With this view, the majority of our sample can be seen as belonging to a normative pathway.

The participants in the *low-increasing* group stood out only in their higher levels of education; they were not distinguished by other markers of EA task accomplishment or psychosocial outcomes. Similar to the *abstainers* in their levels of education, their differences lie in their experience with sexual relationships. Having had the opportunity to experiment with the role of sexual and romantic partner, these individuals might have an advantage over their abstaining peers when it comes to relationships, while also remaining focused on school. Compared to the *abstainers*, the more socially competent *low-increasing* group (Rossi et al., 2017) might start off with a social advantage that allows them enter into relationships more easily, thereby protecting from desynchronization while also benefiting from their focus on school.

Participants in the *medium-increasing* group seem to represent a pathway marked by an earlier transition into adulthood. About half of these participants worked full-time, and a quarter lived with a romantic partner. Cohabitation during EA is common, with 43% of women reporting having lived with a partner at least once by the age of 24 (Chandra, Martinez, Mosher, Abma, & Jones, 2005). While 25% may not seem high, considering the participants' young age (22 years), and compared to the other groups, (3.7%, 16.3%, and 14.3%), it seems that those in the medium-increasing groups are more advanced in this domain. These results differ from Vasilenko et al.'s (2016), who found the highest probability of cohabitation in two of their minority groups as compared to our largest group. This may be due to cultural context as over the last two decades Quebec

has seen a steady increase in cohabitation and its population is more likely than the rest of Canada to cohabitate early and without ever getting married (Institut de la Statistique du Québec, 2016).

Participants in the *medium-increasing* group were the most likely to be working full-time, implying a decision to pursue immediate employment over higher education, distinguishing them from their comparably less educated peers in the *multiple-partners* group. Though they achieved some of the lowest levels of education, their employment and cohabitation indicate stability and independence, two tasks important to EA (Arnett, 2007). These participants may represent those who experimented less with career paths and romantic relationships during EA and found stability relatively early.

Multiple partners

Several of our significant results pertain to a small and unique group of participants reporting the most sexual partners. Its size makes it difficult to draw firm conclusions about this minority group, and thus our discussion of them is explorative. Overall, these participants appear to be at a disadvantage in EA developmental task achievement: they are not invested in school or work, nor they are more likely to be living with a romantic partner. A first result pertained to educational attainment; consistent with our hypothesis, the *multiple partners* group attained lower levels of education than their peers in the *abstainers* and *low-increasing* trajectories, and beyond their prior academic performance. This group shares similarities to Vasilenko and colleagues' (2016) minority *private* group, characterized by sexual behavior and less dating, and who had lower grades as adolescents and greater number of sexual partners as young adults. The mechanisms through which these adolescents disengage from

academic pursuits can be contemplated upon. A greater number of partners can result in negative health outcomes (e.g., STI's, unwanted pregnancies; Boislard, et al., 2016) and greater alcohol use, which might serve as a distraction from school.

As hypothesized, these youths reported the highest levels of problematic alcohol use, and this effect was specific to females. The link between sexual activity and alcohol use in adolescence is widely documented (Zimmer-Gembeck & Helfand, 2008) and earlier sexual debut has been found to predict greater problems with alcohol at 25 years (Boisvert et al., 2017). What our study adds to this literature is that adolescent females with multiple partners presented the most problematic patterns of alcohol use in EA, even after considering prior alcohol consumption. Given that the prevalence of alcohol use and addiction reach a peak during EA (Britton, Ben-Shlomo, Benzeval, Kuh, & Bell, 2015; Ministry of Health and Social Services of Quebec, 2016), identifying the developmental pathways more likely to lead to these problems is particularly salient. The association between multiple sexual partners and alcohol misuse could be explained by a personality trait such as sensation seeking (Zuckerman, 1994) or by increased exposure to contexts in which both alcohol and sex are normalized (e.g., parties). Throughout adolescence, these two behaviors likely impact one another in a bidirectional way (Kugler, Vasilenko, Butera, & Coffman, 2017), but the end result in EA is a pattern of problematic alcohol use, especially for females.

Why is this effect specific to females? One possible explanation lays in the characteristics of their sexual partners: it has been found that adolescent females tend to have older male friends (Poulin & Pedersen, 2007), which may be due to a maturity gap during which adolescents perceive behaviors like sex and alcohol use as signs of

adulthood and independence (Moffitt, 2006). Given this tendency to choose older male friends, we posit that these females would also be more likely to choose older sexual partners, potentially increasing their exposure to alcohol. Another explanation pertains to sexual double standards and the meaning assigned to sexual experience. Females are more likely to be negatively perceived for having more sexual partners (Crawford & Popp, 2003), and internalized double standards can result in negative mental health outcomes (Vasilenko, et al., 2014). Therefore, adolescent females who negatively evaluate their sexual experiences (e.g., feeling ashamed) might be vulnerable to using alcohol as a coping mechanism. If this were the case however, we would expect to find greater internalizing symptoms and lower-self esteem among this group, which we did not. Further research on the mechanisms by which these females experience increased problems with alcohol during EA is needed to clarify this finding.

Research has linked greater number of partners with internalizing problems (Mazzaferro et al., 2006). Our hypothesis that participants in the *multiple partners* trajectory would report more depressive symptoms was not supported and no difference among the trajectories was identified. Considering their delay in developmental task achievement, it is surprising that we did not find any differences in depressive symptoms or self-esteem. One reason for this result may be that the negative impact of their delay may only emerge later on, towards the end of EA. Similar to the *abstainers,* participants in the *multiple partners* trajectory may not yet have lived consequence associated with their delay in developmental task achievement at 22 years. Given their pattern of alcohol use, it seems plausible that the women in the *multiple partners* group might experience negative psychological outcomes later. Another possibility is that having multiple sexual

partners may not directly impact depression or self-esteem. However, these findings should be replicated using a more contemporary assessment of depressive symptoms (Eaton, Smith, Ybarra, Muntaer, & Tien, 2004) and through a follow-up study at the end of EA.

Strengths, limitations, and future research

The strengths of this study include the use of a longitudinal design (yearly assessments from the ages of 14 to 22) to examine the outcomes in EA of four previously found distinct sexual development pathways, after controlling for prior relevant variables. Some limitations should also be noted. Our trajectories were based on sexual behavior with the other sex, thereby excluding same-sex partnerships. However, further analyses revealed that the trajectories did not differ in number of same-sex partners, and results were unchanged when same-sex behaviour was considered. Still, we did not ask about sexual orientation, and discrepancies have been identified between orientation and behavior (Diamond, 2016). It is possible that sexual developmental patterns differ across sexual orientations, not only in number and shape of trajectories based on number of partners, but on psychosocial outcomes. Most of our instruments were self-reported and this study used a fairly socioeconomically and ethnically homogenous sample of adolescents from a single geographic area (at the beginning of this study, at least), limiting generalizability. Finally, the effect sizes that we found were small and thus should be kept in mind when contemplating the results. Considering the numerous factors that can be expected to have a direct impact on the outcome variables we examined, it is not surprising that magnitude of effect for sexual trajectory group was small. However modest the effects, we believe the results contribute to the growing literature on

adolescent sexual behaviour and emerging adult outcomes. The results of this study can be applied to sexual education curriculum to normalize adolescent sexuality (as opposed to abstinence-based programs), while also helping target adolescents who may be at greater risk for later psychosocial problems.

Conclusion

Our results indicate that the greater the extent to which romantic and sexual relationships are present, the less focus is given to academics and the more problems with alcohol emerge, although the directionality is unclear.

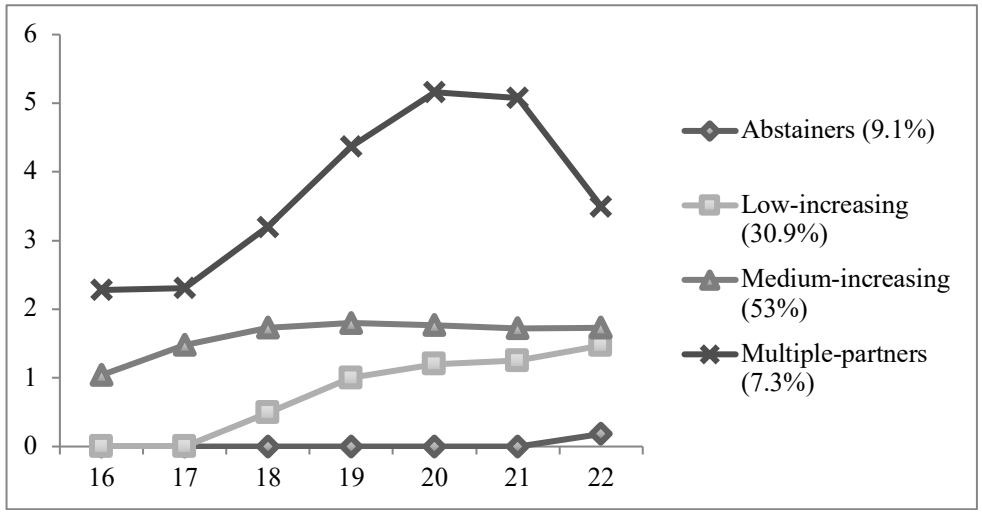

Figure 1. Developmental trajectories based on number of sexual partners from ages 16-22

Table 1
Descriptive Data and Pairwise Comparisons of ANCOVAs for Outcomes at Age 22 by Sexual Trajectory Group

	Trajectory Group								
	1. Abstainers (*N* = 32, 9.1%)		2. Low-Increasing (*N* = 102, 30.6%)		3. Medium-Increasing (*N* = 173, 53%)		4. Multiple Partners (*N* = 25, 7.3%)		Pairwise Comparisons
Dependent Variable	*M(SD)*	95% CI	*M(SD)*	95% CI	*M(SD)*	95% CI	*M(SD)*	95% CI	
Education	3.80 (0.24)	[3.32, 4.27]	3.74 (0.12)	[3.49, 3.98]	2.79 (0.10)	[2.76, 3.17]	3.10 (0.28)	[2.54, 3.63]	1, 2 > 3,4
Problems with alcohol	1.54 (0.70)	[0.16, 2.92]	2.90 (0.38)	[2.15, 3.55]	3.48 (0.30)	[2.89, 4.06]	4.97 (0.84)	[3.32, 6.61]	4 > 1,2,3
Depression	29.42 (1.47)	[26.52, 32.31]	28.77 (0.79)	[27.22, 30.32]	27.06 (0.63)	[25.82, 28.30]	27.66 (1.74)	[24.25, 31.09]	
Self-esteem	2.59 (0.08)	[2.43, 2.74]	2.64 (0.04)	[2.56, 2.73]	2.69 (0.04)	[2.62, 2.75]	2.77 (0.10)	[2.58, 2.96]	

Note. Variables are adjusted for covariates measured at 14 and 15 years.

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