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SEXUAL TRAJECTORIES FROM ADOLESCENCE INTO EMERGING
ADULTHOOD

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ERIKA ROSSI

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DE L'ÂGE ADULTE

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ERIKA ROSSI

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RÉSUMÉ

Cette thèse de doctorat examine l'évolution de la sexualité de l'adolescence à l'émergence de l'âge adulte, en proposant une distinction entre développement normatif et non normatif. Au cours des deux dernières décennies, la recherche sur la sexualité des adolescents s'est éloignée d'une conception intrinsèquement problématique et de ses conséquences négatives potentielles (e.g., grossesses non désirées, contraction des infections sexuellement transmissibles). Les chercheurs se sont intéressés à comprendre comment évolue la sexualité normative et à identifier ce qui distingue ceux dont les expériences précoces renforcent une adaptation et une identité sexuelle saine de ceux dont les expériences sont plus négatives et associées à d'autres comportements problématiques. Cette thèse contribue à cette littérature grandissante en utilisant un devis longitudinal s'étendant sur 10 ans (de 13 à 22 ans) afin d'identifier des trajectoires de développement de la sexualité distinctes, et d'examiner leurs antécédents à l'adolescence et leurs corrélats à l'émergence de la vie adulte.

La thèse se compose de deux études rapportées dans deux articles. Le premier article identifie et décrit quatre trajectoires distinctes de développement sexuel de l'adolescence à l'émergence de l'âge adulte et examine leurs antécédents psychosociaux. De 16 à 22 ans, 332 participants (dont 60,8% femmes) ont rapporté leur nombre annuel de partenaires sexuels. Une méthode appelée '*Group-Based Trajectory Modeling*' a permis d'identifier quatre groupes représentant quatre voies de développement partagées distinctes: (1) le groupe *abstainers* (9,1%), (2) le groupe *low-increasing* (30,6%), (3) le groupe *medium-increasing* (53,0%) et (4) le groupe *multiple partners* (7,3%). Ces trajectoires variaient quant à l'âge de l'initiation sexuelle, le nombre de partenaires rapportés à 16 ans et l'évolution du nombre de partenaires. Le deuxième objectif de l'étude consistait à examiner si certaines caractéristiques familiales et individuelles étaient associées à des trajectoires sexuelles spécifiques. Ces caractéristiques ont été mesurées à 14 et 15 ans. Les régressions multiples multinomiales ont révélé que (1) une plus grande compétence sociale augmentait les chances d'appartenir au groupe *multiple partners* par rapport aux *abstainers* et aux *low-increasing*, (2) une moindre consommation de drogues et d'alcool augmentait les chances d'appartenance aux *abstainers* plutôt qu'au *multiple partners* et (3) les femmes étaient surreprésentées dans le groupe *medium-increasing* par rapport aux *abstainers*.

Dans la deuxième étude, les trajectoires sexuelles identifiées dans la première étude ont été utilisées de nouveau afin de procéder à un examen de leurs corrélats à l'émergence de l'âge adulte. L'adaptation psychosociale (dépression, estime de soi, problèmes d'alcool) et des indicateurs d'atteintes de certaines tâches développementales (niveau de scolarité atteint, emploi à temps plein, cohabitation avec un partenaire amoureux) ont été mesurés lorsque les participants étaient âgés de 22 ans. À l'instar de la première étude, les deux groupes les moins actifs sexuellement étaient également très scolarisés, alors que les groupes les plus actifs l'étaient moins. Bien qu'ils ne tendaient pas à poursuivre d'études supérieures, les membres du groupe *medium-increasing* semble vivre une transition plus précoce vers l'âge adulte; ils étaient plus susceptibles de travailler à temps plein et de cohabiter avec leur partenaire, contrairement à leurs pairs du groupe *multiple partners*. Une interaction avec le sexe a été observée pour la consommation problématique d'alcool. Les femmes du groupe *multiple partners* ont rapporté davantage de problèmes avec l'alcool comparativement aux femmes des autres groupes. Il n'y avait aucune différence dans les mesures de dépression et l'estime de soi entre les quatre groupes.

La discussion générale de cette thèse propose un portrait plus global de chacune des trajectoires. Les résultats issus de l'examen des antécédents et ceux découlant de l'analyse de leurs corrélats à 22 ans sont intégrés afin de mieux comprendre ce qui caractérise chacun de ces parcours de développement de la sexualité. Le devis longitudinal de cette étude et le recours à des analyses centrées sur la personne sont identifiés comme des forces méthodologiques. La différenciation entre deux voies normatives et deux voies non normatives du développement sexuel est présentée comme un apport théorique important. Enfin, certaines limites sont reconnues des pistes de recherche future sont proposées et les implications pour la pratique sont discutées.

Mots-clés : devis longitudinal, développement sexuel, trajectoires de développement, l'émergence de l'âge adulte

ABSTRACT

This doctoral thesis examines how sexuality evolves from adolescence into emerging adulthood, drawing distinctions between normative and nonnormative development. As in most spheres of an adult's life, early experiences shape later one's by providing opportunities to learn and experiment with different roles, skills, and identities. The past two decades of research on adolescent sexuality has shifted away from conceptualizing it as inherently problematic and putting emphasis on potential negative outcomes (e.g., unwanted pregnancies, contraction of sexually transmitted infections). Researchers have become interested in understanding how normative sexuality develops and in identifying what distinguishes those whose early experiences reinforce adaptive patterns and promote a healthy adult sexual identity from those whose experiences are associated with negative outcomes and other problematic behaviours. This thesis contributes to this growing literature by using a longitudinal design spanning 10 years (ages 13 to 22) to identify distinct developmental pathways, their adolescent antecedents, and outcomes as emerging adults. The initial sample consisted of 390 sixth grade students (58%).

The thesis consists of two studies, reported in two articles. The first article identified and described four distinct sexual development trajectories from adolescence into emerging adulthood and examined their psychosocial predictors. From the ages of 16 to 22, 332 participants (60.8% females) reported their yearly number of sexual partners. Non-parametric growth mixture modeling was used to identify four trajectory groups representing four distinct shared developmental pathways: (1) the *abstainers* group (9.1%), (2) the *low-increasing* group (30.6%), (3) the *medium-increasing* group (53.0%), and (4) the *multiple partners* group (7.3%). These groups varied in their age of sexual initiation, number of partners reported at 16 years, and in their pattern of change over time. The second objective of the study involved examining whether family and individual characteristics were associated with specific sexual trajectory groups. Apart from pubertal development, which was measured at 13 years, all predictor variables (LIST) were measured when participants were 14 and 15 years, one year prior to the identification of sexual trajectory groups. Univariate analyses revealed a pattern in which the two least active groups (i.e., *abstainers* and *low-increasing*) reported significantly more positive traits (e.g., higher school grades, less substance use, more parental monitoring) than the two most active groups (i.e., *medium-increasing* and *multiple partners*). The two most active groups reported significantly more social competence, and were rarely distinct from one another. Multinomial multiple regressions revealed that, (1) greater social competence increased the odds of belonging to the *multiple partners* group as compared to the *abstainers* and the *low-increasing* group, (2) less substance use increased the odds of belonging to the

abstainers as compared to the multiple partners group, and (3) females were overrepresented in the *medium-increasing* group when compared to the *abstainers*.

A second study used the previously identified sexual trajectories to explore whether distinct outcomes were associated with each group. Psychosocial adjustment (e.g., depression, self-esteem, problems with alcohol) and markers of developmental task achievement (e.g., educational attainment, full-time employment, cohabitation with a romantic partner) were measured when participants were 22. Mirroring the results of the first study, the two least active groups were similarly highly educated while the most active groups reported the least education. Though they did not pursue higher education, the *medium-increasing* group appeared to represent an earlier transition into adulthood as they were more likely to work full-time and cohabit with their partner while their peers in the *multiple partners* group did not. An effect for gender and alcohol was found in that females in the *multiple partners* group reported significantly more problems with alcohol, a measure that included frequency of use and dependence. No differences in depression or self-esteem were identified among the groups. This might reflect the instability of EA which is associated with higher rates of depression, or it may suggest that not enough time had elapsed in order for differences among the groups to emerge.

The general discussion of this thesis elaborates on the results of the two studies and places them within a greater theoretical context. The study's longitudinal design and person-centered analyses are identified as methodological strengths, and its differentiation between two normative and two nonnormative pathways of sexual development are presented as an important theoretical contribution. Finally, certain limitations are acknowledged and avenues for future research are proposed.

Key words : longitudinal study, sexual development, adolescence, emerging adulthood.

CHAPTER 1

GENERAL INTRODUCTION

Sexuality can be defined as the way one expresses oneself sexually and can encompass biological, psychological, physical, social, and spiritual components. It is intrinsic to one's identity and healthy functioning as an adult but is not explicitly taught; rather, the accumulation of experiences, skills, and knowledge achieved through experimentation form the building blocks of healthy sexual relationships. Through these experiences, one learns to navigate a new dimension of one's self and to identify evolving emotional, intimate, and physical needs and boundaries. Early sexual experiences play an instrumental role in the development of healthy adult sexuality and, depending on individual and contextual factors, can have a lasting positive or negative impact (Vasilenko, Kugler, & Lanza, 2016). Thus, sexuality is a developmental phenomenon rooted in adolescence and researchers in this field have explored intertwining physical, social, and psychological processes at various points during the lifecourse in order to better understand its development (Tolman & McClelland, 2011).

Prior to the last two decades, the focus of research on adolescent sexuality was primarily on identifying consequences associated with early experiences. Researchers conceptualized adolescent sexual behaviour as risky and ripe with potential physical and mental health consequences. Indeed, negative health risks associated with early sexuality were well documented: greater substance use, unwanted pregnancies, and sexually transmitted infections (Boisvert, Boislard & Poulin, 2017). Despite the

substantial evidence for negative consequences, inconsistencies in the literature pushed researchers to question the underlying risk framework. For instance, early starting girls had long been found to report greater depressive symptoms (Meier, 2007), yet this effect was not consistently found to be lasting (Spriggs & Halpern, 2008; Wesche, Kraeger, Lefkowitz, & Siennick, 2017), and relational context (e.g., with a romantic or casual partner) affected this association (Vasilenko et al., 2016). Thus, even one of the more robust findings could not be generalized to all, implying that sexual development is heterogeneous and not experienced in the same way by all. It is therefore an oversimplification to classify all adolescent sexual behaviour as risky as it ignores the complexity and diversity of individuals' experiences. While this early line of research was instrumental in targeting prevention strategies and interventions aimed at increasing adolescents' sexual and physical health, focusing solely on problematic aspects overlooks the fact that early sexuality is not fundamentally risky and limits our understanding of how it may in fact be contributory to later well-being.

Gaining an understanding of how sexuality develops normally is as important as identifying its negative consequences. Increasingly, sexual experiences during adolescence have become normative and expected: the majority of 16-18 year-old adolescents in Québec report having had sexual intercourse (Lambert, Mathieu-Chartier, Goggin, & Maurais, 2017), and virginity becomes rare by young adulthood (Boislard, van de Bongardt, & Blas, 2016). Considering this reality has encouraged researchers to identify factors that contribute to a positive or normative sexual development and to question how and why early experiences have a negative impact on some but not others.

Because sexuality is so broad and encompasses many facets of experience, researchers must make decisions on which elements of its expression they choose to study. A review on the subject identified sexual behaviour, sexual selfhood, and sexual socialization as three categories that emerge in recent years (Tolman & McClelland,

2011), with each approach providing unique perspectives and insights into adolescent sexual development. Exploring the heterogeneity of sexual behaviour provides an opportunity to differentiate between developmental pathways associated with negative outcomes from ones that may form the basis of a healthy sexual identity and thus was examined in this thesis.

Despite the heterogeneity of adolescent sexuality, relatively homogenous groups can be identified by distinct shared behavioural patterns. Once identified, researchers can examine whether some pathways are more or less related to positive and negative outcomes. This thesis uses longitudinal data and a person-centered approach to identify distinct shared trajectories of development based on yearly number of sexual partners from the ages of 16 – 22 in a sample of 390 Quebec youth. In doing so, it hopes to address the following questions: Can distinct developmental patterns can be identified? How do early adolescence individual and family factors contribute to them? Which of these developmental patterns is associated with the best or worst outcomes?

1.1 Theoretical context

In their influential review, Tolman and McClelland (2011) conclude that researchers using a “positive” framework tend to overlook the risks and negative outcomes associated with adolescent sexuality, while more traditional risky frameworks problematize sexuality in a way that disregards developmentally appropriate behaviours. The authors propose the term “normative” when considering a framework as it reflects its developmental nature (pertaining to the majority and resulting in healthy adult sexuality). They encourage an integration of both positive and risk elements of sexuality, urging researchers to consider how these elements may develop in tandem and are influenced by ecological contexts (Tolman & McClelland, 2011).

Earlier theories focused on explaining problematic aspects of sexuality while more recent models allow for the understanding of normative or positive development (Zimmer-Gembeck and Helfand, 2008; Vasilenko, Lefkowitz, & Welsch, 2014). With the exception of problem behavior theory, which uses a risk framework, the models presented in the following section allow for the understanding and contextualization of both negative and normative features of sexual development.

It is important to consider the strengths and weaknesses of each of these models as no single framework fully encompasses the complexity and heterogeneity of sexual development.

1.1.1 Problem behavior theory

A commonly used conceptual framework in which risky sexual behaviour had been understood in early sexuality research is problem behavior theory (Jessor & Jessor, 1977). Jessor and Jessor define problem-behaviour as behaviour which departs from regulatory norms, that is a source of concern, or as socially unacceptable or frowned upon. This theory states that problem behaviours are associated with each other, and predicts that an adolescent who engages in risky sexual behaviour would be more likely to also engage in substance use, a finding that has been consistently reported (Tapert, Aarons, Sedlar, & Brown, 2001). At the core of this theory are three systems of variables: perceived environment (e.g., group norms, family factors), personality systems (e.g., beliefs, values), and behaviour systems (e.g., smoking, drinking). Problem behaviour depends on the balance of protective and risk factors within these three systems, and the theory posits that the closer a variable is to the individual, the greater impact it will have. For instance, an adolescent will more likely be influenced by their best friend's behaviour than by parental support (Jessor & Jessor, 1977). The dynamic nature of protective and risk variables as well as its predictive ability are

strengths of this theory. A criticism of this theory is that it does not provide a framework in which to understand normative sexual behaviour. It does not allow for the contextualization of normal sexual behaviour nor does it explain how some adolescents appear to engage in some level of risky behaviours without it becoming a problem.

1.1.2 Sullivan's interpersonal theory

Buhrmester and Furman's neo-Sullivanian theory (1986) provides a social development framework in which to understand the individual's motivation to seek out sexual experiences. The theory posits that interpersonal skills develop through satisfactorily meeting basic needs at crucial times during development. They argue that social competence is developed by exposure to contexts in which these competencies are needed. In order to obtain a particular social need, one must have achieved a prior set of competencies. Within each stage, there is a key relationship through which the individual satisfies their social need, as well as learns the necessary skills in order to achieve the next stage's need. In the *sexuality* stage (12 to 16 years), the authors argue that the emergence of lust directs individuals to relationships in which they will learn to balance intimacy and sexuality. According to the theory, anxiety and maladaptive coping mechanisms can arise when one's needs are not met, and these developmental arrests can have serious consequences (Buhrmester & Furman, 1986). Along with normalizing the motivation for sexual experimentation and identifying its developmental benefits, a strength of this theory is that it provides an explanation for negative impacts that might be observed via developmental arrests. Beyond its addressing why an individual might be more or less skilled at engaging with a potential partner however, this model does not provide an understanding of their subjective experience or differentiate among those who are socially competent. The narrow focus

on social competence leaves out different motivations to engage sexually (or not), and does not provide any predictive validity of mental and physical health outcomes.

1.1.3 Multiple pathways model: Zimmer-Gembeck and Helfand

Zimmer-Gembeck and Helfand (2008) proposed a multiple-pathway model of development that encompasses those whose early experiences represent a greater constellation of risky behaviours as well as those whose experiences represent normative sexual development. The authors point to Moffitt's theory of antisocial behaviour (1993), which differentiates between those who consistently engage in antisocial behaviours throughout their lives from those who do so only during adolescence. Similarly, the authors posit that one pathway of sexual development is characterized by deviant behaviors and marked by unconventionality, while another is associated with a more common level of risky behaviours (e.g., normal experimenting with alcohol). This theory is coherent with past models and allows for the understanding of normative sexual development for some while still considering its negative implications for others. However, the authors do not specify how many pathways researchers might be likely to find nor do they hypothesize on their unique characteristics. Similarly, the model does not address what might differentiate the normative pathways from one another, and whether some might be considered more adaptive than others.

1.1.4 Vasilenko, Leftowitz, and Welsch: health outcomes

Vasilenko, Lefkowitz, and Welsch (2014) proposed a conceptual model that focused on the question: how does adolescent sexual behaviour impact health? The authors considered a broad spectrum of sexual behaviours and used the World Health Organization's definition of health, which includes physical, mental, and social dimensions (World Health Organization, 1946). Their model is founded upon two tenets: first, sexual behaviours are life events that can impact health, and second, these events do not *universally* impact health but are influenced by the individual's perception. An individual's perception of their sexual experiences (based on attitudes shaped by their ecological context) will impact their psychological and social health. In the same way that a major negative event (like losing a loved one) can indirectly impact health via depression, the way an individual makes sense of their early sexual experiences can either positively or negatively impact their psychological and social well-being. In this way, sexual experiences can *directly* impact physical health (e.g., STI's, unwanted pregnancies) as well as *indirectly* impact psychological or social health (e.g., depression, relationship satisfaction). A major strength of this model is its recognition of the heterogeneity of sexual development and its explanation of health outcomes based on individual differences and perception. The core concept that sexual events are not experienced universally represents both a strength and weakness of this model: while it allows for great specificity at the individual level it lacks in greater application. It does not tell us about how sexuality might develop in general for relatively homogenous groups of adolescents.

1.1.5 Emerging adulthood

Noting a disruption in the normative sequence and postponement of traditional tasks associated with adulthood, Arnett (2000) proposed the adoption of a new developmental period spanning from 18 to 29 years that he named emerging adulthood

(EA). He posited that emerging adulthood encompasses five dimensions (identity exploration, self-focus, feeling in between, age of possibilities, and instability), brought on by shifts in demographics in industrial societies. Indeed, these demographic shifts are observed in Quebec where the average age of first marriage has risen to 33.3 years for males and 31.8 years for women (Girard, Binette Charbonneau, & Payeur, 2016); similarly, women are now having their first child at an average age of 28.9 years, as compared to the average of 25 years observed in 1975 (St-Amour & Binette Charbonneau, 2015). In Quebec, however, many couples choose never to marry and thus cohabitation can be viewed as a marker of serious commitment. Thus, the identity exploration and instability characteristic of emerging adulthood has resulted in heterogeneity that is not observed in other development periods. Emerging adulthood can be seen as a time where the total dependence of adolescence has been left behind, while the self-sufficiency of adulthood has yet to be attained. The characteristics of EA are conducive to sexual exploration and discovery. Experimentation with new possibilities and sexual identities has been culturally normalized and encouraged, making it a particularly salient period to investigate (Halpern & Kaestle, 2014). One way emerging adults may experiment with their sexual identity is through casual sexual experiences (CSEs), uncommitted sexual encounters that can encompass a broad array of sexual activity (Rodrigue & Fernet, 2016). In their 2012 review, Garcia and colleagues report that the vast majority of college students report some CSEs, and Quebec studies reveal that CSEs are common among adolescents (Dubé, Lavoie, Blais, & Hébert, 2017) and emerging adults (Rodrigue, et al., 2015). The variability in the way emerging adults experience frequency, type, relational context, and outcomes associated with their sexual behaviour strongly suggests different developmental pathways that may be normative for some and not for others.

Identifying EA as a unique developmental period has been at the center of much debate and is worthy of discussion. A major criticism lies in its usefulness and universality (or lack thereof). To qualify as a developmental stage, many consider that something

specific and essential must develop during this time that would otherwise set the individual upon an unfavourable developmental trajectory (Lerner, 2002). It has been argued that EA does not fit this criteria as no specific trait or skill develops during this time, and that Arnett's characterization applies mostly to one group, namely the middle class college students, leaving out many (Côté, 2014). Another criticism lies in its usefulness as theory: it is argued that EA is simply descriptive and that nothing is gained from considering it a unique developmental period (Furstenberg, 2016). Supporters of EA as a developmental stage argue that description is a necessary first step towards theory and that not all developmental stages are experienced universally and across cultures. It has been argued that the function of adolescence is to prepare the individual for adulthood, and thus can differ across cultures (Schlegel & Barry, 1991). For example, adolescence in traditional cultures that identify marriage as one's entry into adulthood will have different features than those from cultures that emphasize independence (Syed, 2015). Using college student samples has been criticized as reflecting social class bias while defenders warn against the conflation of college attendance and class. It has been argued that college attendance is not exclusive to the middle and upper class and that what has long been considered the typical college experience (four-year residential programs) no longer represents the majority as many students can be considered non-traditional (e.g., being a parent, attending community college; Syed, 2015).

1.1.6 Applying the models to this thesis

Because the shift away from risk frameworks of adolescent sexual development is relatively new, research that differentiates between normative experiences is sparse. While it is widely accepted that sexuality develops heterogeneously, few longitudinal studies exist to shed light on this dynamic process. How many shared patterns of sexual

development are there, and which might be considered favourable? What might predict one type of sexual development over another, and are there long-term consequences associated with them? The five conceptual models explored above provide a framework in which to contemplate these questions. To address the gaps in the literature, the broad goal of this thesis was to identify shared pathways of sexual development by examining number of sexual partners over time, as well as to explore their developmental precursors and psychosocial outcomes during emerging adulthood.

Zimmer-Gembeck and Helfand's multiple pathways model provides the foundational framework on which this thesis is built. The authors posit that multiple shared experiences of sexual development exist, at least one of which is associated with risky behaviours and negative outcomes. The model also supports the examination of individual and family characteristics as predictors of group membership, while problem behaviour theory's predictive validity made it relevant to specifically explore other risky behaviours (such as antisocial behaviour and substance use). Research on non-normative development has often considered those at the more active end of the spectrum, though abstainers and late starters also represent non-normative development. One way to explore this group is by considering that for some, abstinence may not be a choice but rather a result of social difficulties and the neo-Sullivanian theory provides a context to explain how some of these individuals might find themselves in this position. The Vasilenko model's emphasis on perception helps explain why we might see psychosocial outcomes related to the different pathways, and because this model lacks in universality, further examining these outcomes through the lens of EA is a helpful as it accounts for shared experiences.

Based on these models as well as the results of empirical research (reviewed in a later section), the three main objectives of this thesis are: (1) to identify and describe shared trajectories of sexual development from adolescence to emerging adulthood based on

yearly number of sexual partners, (2) to identify individual and family predictors of these trajectories, and (3) to identify their positive and negative outcomes during EA. The following section will present an overview of optimal research methods for studying sexual development.

1.2 Studying shared trajectories of sexual development from adolescence to emerging adulthood

Two main approaches to researching early sexual experience can be identified when examining the literature. The first involves categorizing individuals based on the timing of their sexual initiation and the second involves repeatedly measuring a particular sexual behaviour over time.

Early research focused on timing of initiation and compared individuals whose first sexual experience was early, on time, or late relative to their peers or cultural norms. In an early and extensive review, Zimmer-Gembeck and Helfand (2008) showed that early age of initiation was most often associated with negative outcomes. More recent studies support this conclusion and indicate that earlier age of first intercourse is associated with increased likelihood of having an STI (Kugler, Vasilenko, Butera, & Coffman, 2017), more alcohol use (Boisvert, Boislard, & Poulin, 2017), and more antisocial behaviour (Kastbom, et al, 2014). Recently, researchers began to study late starters and young adult virgins and have consistently reported a minority of individuals who delay their sexual initiation well past their peers (Haydon, Cheng, Herring, McRee, & Halpern, 2012). Indeed, rates of virginity drop from between 10-40% at 18 years to 5% (males) and 3% (females) in 25-29 year olds (Boislard, van de Bongardt, & Blais, 2016). Late starting has long been viewed as protective and has been associated with better educational (Schvaneveldt, Miller, Berry, & Lee, 2001) and

health outcomes (e.g., decreased risk of contracting an STI, fewer unwanted pregnancies, less substance use; Haydon, Herring, & Halpern, 2012). However, recent literature has yielded results that suggest late starters may be vulnerable to adjustment difficulties and less well-being (Haase, Landberg, Schmidt, Ludke, & Silbereisen, 2012; Vrangalova & Savin-Williams, 2011). Moreover, adult virgins have been found more likely to be overweight or perceived as unattractive (Haydon et al., 2014) and less likely to have ever been in a romantic relationship (Boislard, van de Bongardt, & Blais, 2016), resonating life course theories which emphasize the importance of being developmentally in sync with peers and group norms (Elder, 1998). Whether by choice or by circumstance, these individuals become important to study as they represent an atypical experience of sexual development.

Studies using timing of initiation have been instrumental in identifying risk factors and outcomes associated with early and late sexual behaviour. However, categorizing individuals in this way, even with a longitudinal design, runs the risk of overlooking important differences and limits researchers' ability to draw conclusions about patterns and change over time. Focusing on a static variable denies researchers the opportunity to identify pathways that can vary based on a range of behaviours. Therefore, longitudinal studies using repeated measures of a behaviour are more suitable for studying sexuality as they provide a more nuanced picture of development.

A breadth of variables has been used to differentiate sexual developmental patterns over time, and include (but are not limited to): sexual risk behaviours (Fergus, Zimmerman, & Caldwell, 2007), types of sexual behaviours (e.g., kissing, oral sex, intercourse; Haydon, Herring, Prinstein, & Halpern, 2012), frequency and perceived importance of sex (McGuire & Barber, 2010), and number of sexual partners (Lansford et al, 2009). Many researchers have focused on number of sexual partners as it has been widely associated with sexual risk behaviours, an increased likelihood of contracting an STI, and other health consequences (Forhan et al., 2009; Tubman, Windle, &

Windle, 1996). Repeatedly measuring number of partners over time provides a dynamic way to observe how sexuality develops. Using number of sexual partners as the primary variable of interest is not without its limitations. Arguably, number of partners can be understood as a meaningful way to categorize individuals as it can be theorized that those who report few partners are likely qualitatively different from those who report many. However, it can result in a narrow focus that excludes sexual partnerships that do not fit the definition provided by researchers. What constitutes sex? Sexual behaviour constitutes a range of possible activities and researchers must specify what they are referring to when they ask adolescents to report their number of partners. Commonly used definitions include referral to vaginal penetration and ‘penile-vaginal intercourse’; these definitions reflect heteronormative standards pervasive in the literature until very recently and omit potentially important differences in individuals who engage in non-coital sex (Tolman & McClelland, 2011). Thus, researchers need to consider this reality and the potential limitations of their operationalization of sexual partner when interpreting and generalizing results.

Despite these limitations, the theoretical relevance of studying number of partners can be understood in light of emerging adulthood, as those who report a greater number of yearly sexual partners are not likely moving towards a stable romantic relationship. Moreover, problem behaviour theory posits that a greater number of partners would be associated with other problem behaviours and consequences, and the multiple pathways model distinguishes between those individuals from the ones whose experiences represent normative development. This theoretical support, along with the empirical evidence, makes number of sexual partners an appealing and pertinent variable to study.

1.2.1 Importance of using person-centered approach to study sexual development

Healthy sexuality is achieved through developmental tasks that traverse the lifespan, thereby making cross-sectional and longitudinal research using static variables limited in their ability to identify developmental change (Halpern & Kaestle, 2014). Within longitudinal developmental research, two main analytic techniques emerge and are suitable to answer questions about differences in developmental patterns: variable-centered and person-centered approaches. Variable-centered approaches assume homogeneity across given processes or variables as well as on their impact on outcomes. In other words, these approaches focus on how variables relate to other variables across individuals and are effective in answering questions concerning the impact of variables on outcomes using analyses such as correlations, regressions, and structural equations modeling (Laursen & Hoff, 2006). Person-centered approaches assume heterogeneity in how variables influence each other, and focus on the identification and study of relatively homogenous *subgroups*. Otherwise put, these approaches identify distinct groups of individuals who share similar attributes, and examine how these groups differentially experience outcomes. Person-centered approaches use profile, class, and cluster analysis techniques in order to answer questions concerning shared patterns of development and their outcomes (Laursen & Hoff, 2006). Trajectory analyses are a person-centered approach in which individuals are categorized based on their shared pattern on a given variable over time. These categories, or trajectories, can be examined in terms of predictors and outcomes, expanding our understanding of distinct developmental pathways and allowing for causal inference.

Variable- and person-centered analyses can be applied to longitudinal data in order to elucidate change over time, and both have strengths and limitations. Parametric analyses, such as growth curve analyses, model an average trajectory of a given variable and allows researchers to explore individual differences on initial levels of the

variable (the intercept of the trajectory) as well as in their change over time (the slope of the trajectory; Muthén & Muthén, 2006). These analyses have good statistical power and have helped to elucidate the role of early physical maturation, alcohol use, and dating behaviour on number of sexual partners during adolescence (Zimmer-Gembeck & Collins, 2008). However, it is possible that sexual development is not experienced along the same trajectory for all youth, thus making person-centered analyses pertinent. This thesis employed semi-parametric trajectory analyses because we assumed that sexual development (as measured by number of yearly partners) develops heterogeneously, as supported by the multiple pathways model, and we were interested in identifying distinct subgroups. Some researchers have argued that trajectory analyses create artificial categories of individuals whose behaviours would be more parsimoniously explained by parametric analyses (Bauer, 2007). While these critics are valid, trajectory analyses do not necessarily purport to reflect literally distinct groups, but can produce descriptively informative taxonomies in which the causes and consequences of different developmental paths can be explored. Further, they allow for the exploration of similarities in pre-existing characteristics and outcomes, an objective of this thesis.

1.3 A review of longitudinal research on sexual behaviour

To situate the first objective of this thesis, identifying shared trajectories based on yearly number of sexual partners, into context, a review of key studies will be presented in two parts (see table 1.1 for a summary of results). First, research that focused on sexual behaviours other than number of sexual partners will be presented. Second, studies that used a repeated measure of number of sexual partners as their grouping variable will be considered. Findings on predictors and outcomes will be briefly reported as they pertain to the second and third objective of this thesis, but will be elaborated further in later sections.

1.3.1 Studies examining other sexual behaviours

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. Researchers established latent class membership when adolescents were 16–18 years by assessing a variety of sexual and romantic behaviours (Vasilenko, Kugler, & Lanza, 2016). Six groups were identified and used to assess outcomes when participants were 28–34 years. The groups varied in both sexual and romantic involvement, and unsurprisingly, the three groups that engaged in sexual behaviours reported the most sexual partners as adults. However, the *no relationship* group (defined by no romantic relationship) was not among them, despite 14% endorsing casual sexual experiences. This result suggests that the risky sexual behaviour outcomes previously associated with adolescent casual sex are not universal, as some participants engaged in casual sex but did not report more sexual partners.

Four waves of the Add Health data were recently used in a study that examined the impact of individual and parent-child factors on growth of number of sexual partners over time (Cheshire, Kaestle, & Miyazaki, 2019). At each wave, the 5,385 participants were asked their total number of sexual partners, and researchers found that number of partners increased with age but decelerated over time, plateauing at an average number of 6.37 partners at 28.85 years. Analyses revealed that: (1) females consistently reported fewer partners, (2) earlier physical maturation predicted an average of 20.8% more partners, (3) living with two parents predicted fewer partners, and (4) parent factors (quality of relationship, communication, disapproval of sexual engagement) significantly influenced number of partners in different ways at different time points

(Cheshire et al., 2019). This study highlights overall trends in sexual partner accumulation and introduces predictor variables of developmental pathways, the focus of the second objective of this thesis and elaborated on in later sections.

In an important study, Haydon and colleagues (2012) used a subsample ($N=12,194$) of the Add Health study to identify groups by shared patterns of sexual behaviour. Groups were identified based on responses collected during one wave of data collection (ages 24-34), and data from an earlier wave (ages 11-21) were used to predict group membership. Latent class analyses were used to identify groups based on first sexual behaviour, age at first behaviour, number and variety of behaviours, spacing between first and second behaviour, and whether or not anal sex had been initiated by age 18. Five groups were identified, with the largest (*vaginal initiators/multiple behaviours*, 49%) consisting of participants reporting first initiating vaginal sex, followed by a year before initiating another behaviour. Two important minority groups were identified: *postponers* (6%), who delayed all activity until age 22, and *early/atypical initiators* (6%), who initiated early (mean age of 15) and who reported two or more behaviours in the same year, including anal sex (Haydon et al., 2012). The results of this study were significant as the authors were able to demonstrate distinct patterns of sexual behaviour, some of which appeared to represent atypical development. A brief look at follow up studies is presented to demonstrate the value and significance of this research design, and to introduce outcomes of sexual pattern groups, the third objective of this thesis. A more complete review of outcome literature will be provided in a later section.

Using the same data and grouping variables as Haydon and colleagues (2012), a follow up study examining sexual health outcomes revealed that *postponers* had lower odds of having had an STI, reporting concurrent sexual partners, and exchanging sex for money as compared to the normative group (*vaginal initiators/multiple behaviours*; Haydon et al., 2012). A separate follow up study using the same classification system found that a greater number of partners was associated with lifetime diagnosis of STI,

unintended pregnancy, and less romantic relationship quality for those in the majority group (*vaginal initiators/multiple behaviours*, 49%), but not for the *posptoners* (6%). These results suggest complex patterns of development and demonstrate the need for further examination.

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 (Ashenhurst, Wilhite, Harden, & Fromme, 2017). Three groups were identified: (1) the *rare partners* group (46.8%) reported no partners at the end of high school with a slow growth over time, though 48.2% (22.9% of the total sample) reported no partners across the entire study, (2) the *single partners* group (44%) consistently reported one partner during the three-month assessment periods, and (3) the *multiple partners* group (9.3%) consistently reported more than one partner and demonstrated the greatest increase over time (Ashenhurst, et al., 2017). The authors found that the single partner group (in which women were overrepresented) and the multiple partner group were more likely to have unprotected sex, and that being in a relationship impacted number of partners for all except those in the single partner group.

1.3.2 Studies using a repeated measure of number of sexual partners

Two longitudinal studies used annual number of sexual partners to identify trajectories. Over the course of five time-points, one American study used a subsample (N= 1,121) of the National Longitudinal Survey of Youth (Zagorsky & White, 1999) to identify shared trajectories of sexual risk from adolescence into early adulthood (Moilanen, Crockett, Raffaelli, & Jones, 2010). Demographic and family variables were assessed

when participants were 13-14 years, sexual behaviour (number of partners and condom use) was assessed every two years between 16 to 22 years, and outcome variables were assessed at 22 years. Semi-parametric growth mixture modeling was conducted to identify four trajectories of sexual risk behaviour. The *low risk* group (24%) reported low risk across all time points. The *increasing risk* group (29%) reported low risk at 16 and 18 years, followed by an increase to moderate risk at 20 and 22 years. The *decreasing risk* group (10%) reported moderate risk at 16 years, an increase at 18 years, followed by a decrease to low risk at ages 20 and 22. Finally, the *high risk* group (37%) reported moderate risk at 16 years, increased at both 18 and 20 years, and decreased but remained moderately high at 22 years (Moilanen, et al., 2010). The authors also examined predictors and young adult correlates of trajectory groups. Greater substance use and delinquent behaviour increased one's probability of belonging to the *decreasing* and *high risk* groups as compared to the *low risk* group, in which females living with both biological parents were overrepresented (Moilanen, et al., 2010). The authors also considered markers of transitions to adulthood and found that those in the *low risk* group were more likely to be enrolled in college and less likely to be parents as compared to those in the two highest sexual risk groups. Indeed, as compared to the *low risk* and *increasing risk* group, the two highest sexual risk groups appear to transition to adulthood sooner: they reported the lowest college enrolment, were more likely to have children, and more than half cohabitated with their partner by age 22 (Moilanen et al., 2010).

Lansford and colleagues (2010) used data ($N = 527$) from an American longitudinal multisite study on child development to identify sexual trajectory groups based on annual number of sexual partners between ages 16 and 22 and examined their demographic predictors. Latent growth curve modeling allowed the authors to identify three distinct sexual trajectory groups. The *zero-initial* group (65.8%) reported no partners at 16, followed by a significant increase during late adolescence that slowed by early adulthood. The *one-initial* group (14.8%) reported one partner at 16, a

moderate but significant increase in late adolescence followed by a decrease during early adulthood. Finally, the *multiple-initial* group (19.4%) had an average of 2.4 partners at 16, followed by a significant decline during late adolescence and an increase in early adulthood (Lansford et al., 2010). The authors explored whether individual and family factors distinguished the groups, and found that later puberty and more parental monitoring was predictive of belonging to the *zero-initial* group, who were more likely to attend college, while having more delinquent peers increased the likelihood of belonging to the *multiple-initial* group, the least likely to attend college (Lansford et al., 2010).

Table 1.1 Literature Review Summary of Longitudinal Studies of Adolescent Sexual Development

Study	Sample information	Analyses	Variables examined	Groups identified	Main findings
Vasilenko, Kugler, & Lanza (2016)	$N = 4,125$ Ages: 16-34	Latent class analyses	Dating and sexual behaviours	<ul style="list-style-type: none"> - <i>No Relationship</i> (33%) - <i>Waiting</i> (22%) - <i>Intimate</i> (38%) - <i>Private</i> (3%) - <i>Low Involvement</i> (3%) - <i>Physical</i> (2%) 	<ul style="list-style-type: none"> - Groups that endorsed having sex during adolescence reported more partners as adults - 14% were sexually active outside of relationships, did not report more partners as adults
Cheshire, Kaestle, & Miyazaki (2019)	$N = 5,385$ Ages: 15-32	Growth curve modeling	Individual and parent-child variables, number of sexual partners	N/A	<ul style="list-style-type: none"> - Females reported fewer partners - Earlier physical maturation predicted an average of 20.8% more partners - Living with two parents predicated fewer partners
Haydon, Herring, Prinstein, & Halpern (2012)	$N = 12,194$ Ages: 11-34	Latent class analyses	Timing and sequence of initiation of various sexual behaviours	<ul style="list-style-type: none"> - <i>Vaginal initiators/multiple behaviours</i> (49%) - <i>Dual initiators</i> (32%) 	<ul style="list-style-type: none"> - Nearly half of participants initiated vaginal sex first at 16 years, and reported a spacing of 1 year between initiation of the first and second behaviours

				<ul style="list-style-type: none"> - <i>Vaginal initiators/single behaviours</i> (7.6%) - <i>Postponers</i> (5.7%) - <i>Early and atypical initiators</i> (5.7%) 	- Groups characterized by postponement of sexual activity or by initiation with anal sex were less common
Haydon, Herring, & Halpern (2012)	Follow up to Haydon et al., (2012) N = 9,441 Ages: 11-34	Logistic regressions	Reproductive health and sexual risk taking outcomes	Used groups identified by Haydon et al., (2012)	- Postponement of sexual activity during adolescence reduced odds of negative health outcomes in adulthood
Kahn & Halpern (2018)	Follow up to Haydon et al., (2012) N = 6,587 Ages: 11-34	Logistics regressions and ordinary least squares (OLS) regressions	Health outcomes, romantic relationship quality	Used groups identified by Haydon et al., (2012)	- For the majority (<i>vaginal initiators/multiple behaviours</i>), fewer sexual partners was associated with negative health outcomes and lower romantic relationship satisfaction, but this was not true for the <i>postponers</i>
Ashenhurst, Willhite, Harden, & Fromme (2017)	N = 2,244 Ages: 18-24	Latent class analyses	Number of partners in the past three months, sex	<ul style="list-style-type: none"> - <i>Multiple</i> (9.3%) - <i>Single</i> (44%) - <i>Rare</i> (46.8%) 	- The <i>multiple</i> group were most likely to have unprotected sex, followed by the <i>single</i> group

			without protection		- Relationship status impacted number of partners for all except the <i>single</i> group
Moilanen, Crockett, Raffaelli, & Jones (2010)	<i>N</i> = 1,121 Ages: 16-22	Group based trajectory modeling	Sexual risk (age at first intercourse, number of sex partners in the last 12 months, condom use at last intercourse), markers of transition to adulthood	<ul style="list-style-type: none"> - <i>Low risk</i> (24%) - <i>Increasing risk</i> (29%) - <i>Decreasing risk</i> (10%) - <i>High risk</i> (37%) 	<ul style="list-style-type: none"> - Greater substance use and delinquent behaviour predicted membership to <i>decreasing</i> and <i>high risk</i> groups - Two highest risk groups reported less college enrolment, were more likely to have children; the opposite was true for the <i>low risk</i> group
Lansford, Yu, Erath, Pettit, Bates, & Dodge (2010)	<i>N</i> = 527 Ages: 16-22	Latent growth curve modeling	Yearly number of partners, individual and family characteristics	<ul style="list-style-type: none"> - <i>Zero-initial</i> (65.8%) - <i>One-initial</i> (14.8%) - <i>Multiple initial</i> (19.4%) 	<ul style="list-style-type: none"> - Three groups varied on age of initiation and change in number of partners over time - Later puberty and more parental monitoring predictive of <i>zero-initial</i> group, who were more likely to attend college - More delinquent peers predicted <i>multiple-initial</i> group, who were least likely to attend college

1.3.3 Addressing gaps in the literature

Whether researchers use repeated measures of varied sexual behaviours or examine number of partners over time, distinct patterns of sexual development emerge. Comparing these groups has yielded results that speak to the complexity of sexual development and leaves one with many questions. For example, the seminal work by Haydon and colleagues (2012) identified two small but important minority groups that appear to reflect two extremes of a continuum: one that delayed sexual activity until age 22 (*postponers*) and one that initiated early and with several behaviours (*early/atypical*), including anal sex. The fact that in follow up studies the *postponers* reported fewer partners and a lower likelihood of having contracted an STI is unsurprising and does not address how these individuals may have already been different from their peers at 16 years. What makes these individuals more likely to abstain throughout adolescence? On the other end of the spectrum, the *early/atypical* group did not distinguish themselves on several outcomes once relationship type was taken into account. These results are surprising as this group represents a stark deviation from the norm in terms of behaviour acquisition, compelling one to question how and why these individuals are so different from their peers. Haydon and colleagues' *postponers* and the growing literature on adult virginity highlights the puzzling absence of an abstaining group in Lansford et al's (2010) study. Moreover, their most active group reported their highest number of partners at 16 years which is surprising considering that late adolescence and emerging adulthood is a time when sexual exploration is normalized and number of partners has been found to increase (Halpern & Kaestle, 2014).

This thesis addresses the gaps and inconsistencies in the literature pertaining to: the presence (or absence of) abstainers, the identification of normative and non-pathways,

and the developmental antecedents and consequences associated with shared trajectories. To our knowledge, it is the first study using trajectory analyses based on yearly number of partners from 16 to 22 years in a Canadian sample.

1.4 Identifying predictors of sexual trajectories

A logical next step in studying developmental trajectories is the exploration of whether group membership can be predicted by other shared traits. Identifying characteristics predictive of groups defined by risk or positive outcomes could inform prevention programs. Considering both protective and risk factors, the multiple pathways model posits that shared traits may be associated with sexual development pathways, and problem behaviour theory provides an organization of systems (personality, environment, and behaviour) to understand the varying impact of these variables. In the following section, predictor variables will be situated in the literature and their theoretical relevance addressed. Variables are considered as either individual or family characteristics. This categorization provides a distinction between personal and environmental impact on sexual development and is supported by problem behaviour theory's systems (Jessor & Jessor, 1977).

1.4.1 Individual characteristics

Individual characteristics representing both risk and competence are explored: timing of puberty, substance use, antisocial behaviour, internalizing symptoms, social competence, and academic performance. In their study, Lansford and colleagues (2009) found that for both males and females, more advanced puberty measured at 12 years

predicted more partners at 16 years but was not associated with the rate of growth over time. Others have observed differences between the sexes as earlier maturing girls initiate sex sooner and report more sexual risk behaviour than their peers (Flannery, Rowe, & Gulley, 1993; Kaestle, Halpern, Miller, & Ford, 2005). Indeed, girls rated as appearing more physically mature in a longitudinal study reported an average of 20.8% more sexual partners than their peers (Cheshire et al., 2019). These results suggest that puberty may have a cascading effect on females: girls who appear physically mature are more attractive to older males and are therefore more likely to have older and more sexually experienced boyfriends (Mendle, Turkheimer, & Emery, 2007). Early maturing girls who spend time with older boys may be more likely to find themselves in environments (e.g., parties) in which they are exposed to certain behaviours (e.g., drinking alcohol, sexual experimentation) sooner than their peers. Problem behaviour theory would therefore classify early puberty as a risk factor for girls as it might make one more likely to engage in problem behaviours, while it may reflect a normative pathway for boys.

Substance use and antisocial behaviour (particularly for boys) are strongly interrelated and have been associated with early sexual initiation (Capaldi, Crosby, & Stoolmiller, 1996; Green et al., 2017). In a longitudinal study, substance use and antisocial behaviour were the strongest predictors of belonging to a group categorized by earlier sexual initiation (Boislard & Poulin, 2011). Another longitudinal study identified trajectories based on substance use during adolescence and found that those with the least use reported fewer sexual partners at 25 years (Green et al., 2017). Interestingly, those with the highest use did not report more partners than moderate users, suggesting that substance use influences sexual behaviour up until a certain point. Problem behaviour theory accounts for more sexually active individuals who engage in antisocial behaviour and substance use, and the multiple pathways model posits them to belonging to a pathway characterized by greater risk and negative outcomes.

Internalizing symptoms have been associated with early sexual behaviour for girls, and this may be related to the reasons adolescents have sex. A qualitative study found that adolescent females cited several non-autonomous motivations for sex such as feeling pressured, wanting to please their partner, or getting drunk (Skinner, Smith, Fenwick, Fyfe, & Hendriks, 2008). These results were replicated with emerging adults as a significant minority of females reported low self-esteem, loneliness, and a desire for affirmation as reasons to have sex (Kenney, 2013). Females may be vulnerable to media and societal messages that objectify women and emphasize men's sexual desire (Murnen & Smolak, 2011), leading young women to seek out external validation via sex, a coping mechanism that can be carried into young adulthood. The Vasilenko, Lefkowitz, and Welsch (2014) model would suggest that these individuals perceive their sexual experiences differently, resulting in negative health outcomes and representing a riskier sexual pathway.

In addition to risk factors associated with sexual behaviour, two domains of competence are explored as protective factors: social competence and academic performance. Having better social skills can be an advantage at a time when peer relationships become more important and romantic relationships emerge. A longitudinal association has been found between sociability at 30 months and number of sexual partners at 19 years (Zimmer-Gembeck, Siebenbruner, & Collins, 2004) and sexually attractive adolescents are rated as more popular than their peers (Prinstein, Meade, & Cohen, 2003). These results suggest that adolescents perceive socially competent youth as desirable romantic and sexual partners. The neo-Sullivanian theory states that those with greater success in previous developmental stages might be at an advantage in novel sexual and romantic contexts, while those with less social competence may struggle to satisfy their need for sexual intimacy. Thus, lower initial levels of social competence might lead to fewer opportunities to develop the skills needed to achieve sexual intimacy, further reinforcing these individuals' difficulty meeting their needs.

Vocational identity begins to form during adolescence and academic success has an impact on future education and career opportunities. Prioritization of one's education might result in an investment in academic over social pursuits, and sex might serve as a distraction for some. Problem behaviour theory and the multiple pathways model would therefore view academic competence as a protective factor. Indeed, educational measures have been found to predict sexual behaviour. Poor academic performance measured in children in grade four significantly predicted sexual involvement in grade nine (Capaldi, Crosby, & Stoolmiller, 1996), and a bidirectional association has been found between earlier sexual initiation and academic goals and achievement (Schvaneveldt, et al., 2001).

1.4.2 Family characteristics

Two characteristics of participant's family are examined: family structure and parental monitoring. Intact family structure has been linked with postponement of sexual initiation as well as fewer sexual experiences (Sturgeon, 2002). In a longitudinal study, compared to adolescents living with both parents, those living with a stepparent, with a biological parent cohabiting with a partner, or coming from a single parent home reported a greater number of sexual partners (Cheshire, et al., 2019). Problem behaviour theory would consider an intact family as a protective environmental factor increasing one's likelihood of belonging to a normative sexual development pathway.

Parental monitoring can be defined as the degree to which parents supervise, are aware of, and control their child's activities. It has been identified as an important component of effective parenting during adolescence (Laird, Pettit, Dodge, & Bates, 2003), and less monitoring has been associated with greater involvement in antisocial and

delinquent behaviours (Barnes, Reifman, Farrell, & Dintcheff, 2000). Greater parental monitoring has been associated with postponing of sexual initiation as well as fewer sexual partners (Boislard & Poulin, 2011). This result may be due to the direct effect of parental presence, but may also reflect parent-child relationship quality, which has been positively associated with parental monitoring (Laird et al., 2003). In a longitudinal study, better parent-child relationship quality indirectly impacted later sexual experiences and sexual emotions via self-esteem (van de Bongardt, Reitz, & Dekovic, 2015). Sexual emotions represents the way an individual feels about their sexual experiences, which can be understood as the perception element vital to the Vasilenko, Lefkowitz, and Welsch (2014) model.

Based on theoretical models and empirical support, a breadth of individual and family characteristics were examined as predictors of sexual trajectory groups. Gaining a better understanding of the different factors that influence adolescent sexual behaviour is an important element for identifying both risky and normative trajectories.

1.5 Identifying outcomes of sexual trajectories in emerging adulthood

The third objective of this thesis is to identify outcomes of sexual trajectories during emerging adulthood. Two domains are considered: psychosocial indicators of functioning (problems with alcohol, depression, and self-esteem) and developmental task achievement (educational attainment, employment, and romantic involvement). First, psychosocial indicators are of interest owing to the increased risk associated with this developmental period. In Canada, 14 to 25 years olds report the highest rates of depression and emerging adults report the greatest prevalence of substance abuse (Lesage, Bernèche, & Bordeleau, 2010). Second, despite the heterogeneity that typifies

emerging adults, some indications of developmental task achievement can be identified.

1.5.1 Psychosocial outcomes

The association between alcohol and sex appears to remain stable past adolescence. Alcohol inebriation is often reported by emerging adults as a reason to have sex, and is associated with several risk behaviours including decreased likelihood of discussing sexual health with one's partner prior to intercourse and inconsistent condom use (Cooper, 2002). Coherent with the multiple pathways model, problem behavior theory postulates that risky sexual behaviour is associated with greater alcohol use, and thus we could expect to find a trajectory defined both a greater number of partners and problems associated with alcohol at 22 years. Applying the Vasilenko, Lefkowitz, and Welsch (2014) model, individuals might be more likely to look back on risky sexual behaviours (directly impacted by alcohol) with negative emotions, making them more likely to experience negative health outcomes.

Adolescent sexual activity has been explored in relation to well-being, often measured by depressive symptoms and self-esteem. One longitudinal study found no association between number of sexual partners during adolescence and depression or self-esteem during young adulthood (Manning, Longmore, Copp, & Giordano, 2014). The authors did find however, that sexual non-exclusivity resulted in more depression and lower self-esteem, prompting them to conclude that the *type*, rather than *number*, of sexual relationships has an influence on later well-being. The neo-Sullivanian model can help explain why sexual behaviour during adolescence does not impact depressive symptoms universally. Unaffected by the sexual double standards which can negatively impact girls, boys may experience more positive outcomes related to achieving their

need for pleasure and intimacy. In contrast, those who are unable to achieve these needs might suffer from developmental arrests that may take the form of depressive symptoms.

1.5.2 Developmental task achievement

In their conceptual framework of young adult development, Scales and colleagues (2016) identify educational involvement, participation in the workforce, parenthood, and relationship status as factors that contribute to well-being and success during emerging adulthood. These factors can be impacted by adolescent sexual behaviour, prompting the question: are certain sexual trajectories predictive of developmental task achievement?

Individuals who initiate sex during high school are less likely to enroll in post-secondary programs (Frisco, 2008). One longitudinal study found a similar result, and elucidated the mediating role of transitioning into adulthood. The authors found that when participants endorsed attitudes reflective of an earlier transition to adulthood, those who initiated sex at 16 years were comparable to non-initiators (Parkes, Wight, Henderson, & West, 2009). This was not true for those who initiated by 14 years, who remained less likely to be enrolled regardless of indications of adulthood transition, demonstrating that the influence of sexual initiation on education was not universal or direct.

An absence of academic pursuit may reflect a transition into adulthood marked by full-time employment. One study found that number of sexual partners during adolescence did not negatively impact enrollment in post-secondary education or full-time employment at 22-23 years after controlling for socio-demographic characteristics and

prior GPA (Manning et al., 2014). In light of these results, it can be expected that for some, normative development be characterized by sexual behaviour during adolescence as well as full-time employment during emerging adulthood. Conversely, for certain individuals (e.g., early starters), problem behaviour theory accounts for the association between early sexual behaviour and decreased professional engagement during emerging adulthood.

Involvement in a committed romantic relationship might reflect stability and a transition to adulthood in a time characterized by instability and experimentation. Researchers have begun to explore how early sexual experiences impact romantic outcomes during emerging adulthood. Giordano and colleagues (2009) found that sex within a romantic context increased feelings of love, and that emotional rewards were associated with duration of relationship during adolescence. Another study found that casual sex at 16 years predicted involvement in shorter romantic relationships, increased likelihood of having friends with benefits, and increased CSEs at 23 years (Shulman, Seiffge-Krenke, & Walsh, 2017). Applying the Vasilenko, Lefkowitz, and Welsch (2014) model to these results, adolescents might have more favorable perceptions of their sexual behaviour within a romantic context, positively impacting their psychological and social health (e.g., romantic relationship quality). Conversely, a greater number of partners during adolescence can negatively impact relationship duration (and therefore quality), and increase patterns of casual sexual activity during emerging adulthood.

1.6 Objectives and hypotheses

This thesis used a person-centered approach to investigate three objectives: (1) to identify and describe shared trajectories of sexual development from adolescence to

emerging adulthood based on yearly number of sexual partners, (2) to examine individual and family predictors of these trajectories, and (3) to investigate their positive and negative outcomes during emerging adulthood. For the first objective, non-parametric growth mixture modeling was used to identify multiple trajectory groups based on yearly number of partners from ages 16 to 22 and semi-parametric group-based modeling was used to model the trajectories (PROC TRAJ in SAS; Nagin 1999). Based on the literature, we hypothesized that at least three groups would emerge, one of which would be characterized by abstention, another by a high number of partners as compared to their peers, and at least one group that would contain the majority of participants and represent normative development.

For the second objective, the following hypotheses were tested: (1) adolescents with the most partners would be characterized by: earlier puberty, being male, higher levels of substance use, higher levels of antisocial behavior, lower grades, not living with both biological parents, and lower parental monitoring; (2) the majority groups would report higher grades, an intact family structure, and greater parental monitoring; and (3) adolescents in the abstaining group would be characterized by less social competence.

For the third objective, the following hypotheses were tested: (1) participants with the most partners were expected to have achieved fewer developmental tasks (obtained less education, not working full-time, not engaged in a committed relationship) as well as report more problematic alcohol use and depressive symptoms; (2) sexually abstinent participants were expected to have obtained more education, but to be the least likely to be in a committed relationship and to report more depressive symptoms and lower self-esteem; and (3) participants in majority group(s) were expected to demonstrate the best outcomes in all domains.

The first two objectives of this thesis are addressed in a first article. From ages 16-22, 390 participants were asked to report on their number of sexual partners, and person-

centered trajectory analyses were conducted to identify shared sexual developmental pathways. Individual and family characteristics measured at an earlier time were explored as potential predictors of particular sexual trajectory group. To address the third objective of this thesis, a follow up study is presented in a second article in which psychosocial outcomes and developmental task achievement at age 22 are explored in relation to participants' pre-established sexual trajectory groups.

CHAPTER II

TRAJECTORIES OF ANNUAL NUMBER OF SEXUAL PARTNERS FROM ADOLESCENCE TO EMERGING ADULTHOOD: INDIVIDUAL AND FAMILY PREDICTORS

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ABSTRACT

Adolescent sexual development is not the same across the board, and can be seen as both normative as well as risky behavior, depending on factors such as age of onset and number of partners. This longitudinal study identified developmental trajectories of annual number of sexual partners from adolescence to emerging adulthood and their antecedents. From the ages of 16 to 22, 332 participants (60.8% females) annually reported their number of sexual partners. Measures of adolescent and family characteristics taken at ages 13 to 15 were used as predictors. Group-based modeling identified four trajectory groups: the abstainers group (9.1%), low-increasing group (30.6%), medium-increasing group (53.0%), and multiple-partners group (7.3%). Multinomial logistical regressions indicated that better social competence increased chances of belonging to the multiple-partners group as compared to the abstainers and low-increasing groups, and more substance use predicted membership in the multiple-partners group as compared to the abstainers group. Moreover, females were overrepresented in the low-increasing and medium-increasing groups. These results imply a greater diversity in sexual development than proposed in the literature and highlight the importance of identifying the strengths and competencies associated with healthy sexual development along with the early risk factors.

Key words: sexual development, adolescence, longitudinal study, emerging adulthood.

2.1 Introduction

While engagement in sexual behaviors is now considered normative in adolescence (Tolman & McClelland, 2011), research indicates that early starters are more vulnerable to potential risks and subsequent health outcomes, such as non-consensual sexual interactions (De Graaf et al., 2012), more condomless sex (Siebenbruner, Zimmer-Gembeck, & Egeland, 2007), and other undesirable long-term sexual health outcomes (Sandfort, Orr, Hirsch, & Santelli, 2008). Adolescents who engage in early sex tend to cumulate more sexual partners over time (Rotermann, 2008), have higher probabilities to contract sexually transmitted infections (Kaestle, Halpern, Miller & Ford, 2005), and become pregnant as a teenager (Wellings et al., 2001). Moreover, younger adolescents are generally more impulsive (Steinberg, Albert, Cauffman, Banich, Graham, & Woolard, 2008) and more sensitive to social pressure (Sumter, Bokhorst, Steinberg, & Westenberg, 2009). Furthermore, sexual precocity is often comorbid with other psychosocial problems, mostly externalizing symptoms (Boislard & Poulin, 2011) and internalizing symptoms (Spencer et al., 2002). As such, in adolescent sexuality research, one of the most commonly studied variables has been age at first sexual intercourse (Boislard, van de Bongardt & Blais, 2016).

However, using the number of partners as a basis for sexual developmental trajectories could provide better insight into how sexual behavior develops over time, in both risky and normative pathways, and enlarge the static view of development based on an examination of the timing of sexual onset in terms of early, on-time or late onset. In such trajectory studies, individuals' shared pathways of sexual development represent behavior spanning several years rather than at a single point in time and are therefore particularly informative. The current study aimed to identify trajectories of the number

of sexual partners from adolescence to emerging adulthood and to examine whether individual and family factors predicted membership in these distinct pathways.

In their review of 35 longitudinal studies on the timing of sexual onset among adolescents, Zimmer-Gembeck and Helfand (2008) proposed a multiple-pathway model of sexual development. This model posits that adolescent sexual behavior can be viewed as part of healthy development as well as within a deviant or risky context, although the latter has been the focus of more research than the former (Boislard, Poulin, Kiesner & Dishion, 2009; Tolman & McClelland, 2011). Hence, adolescents belonging to normative pathways have been underrepresented in the research on adolescent sexuality (Boislard & Zimmer-Gembeck, 2011).

To identify distinct shared pathways, it is necessary to examine both the onset and the heterogeneity of changes in a given variable over time. One way of doing this is through multilevel non-parametric analysis, which assumes that a population consists of multiple subgroups that differ from one another. The members of these subgroups are purported to develop similarly with regard to a particular aspect, in this case, sexual development. The number of sexual partners can be examined in order to study sexual development over time. One such study identified four distinct trajectories of sexual risk from ages 16 to 22 and found that participants characterized by greater delinquency and substance use were more likely to belong to the high-risk group (Moilanen, Crockett, Raffaelli, & Jones, 2010). Similarly, another study identified five trajectories of sexual risk behaviors from ages 15 to 23 and found delinquent behavior at age 14 to be highly associated with membership in the higher-risk group (Huang, Murphy, & Hser, 2012). Both of these studies used composite scores of sexual risk that included number of sexual partners among other indicators. Another study involved 527 participants who reported their number of sexual partners annually from ages 16 to 22, as the basis for identifying trajectories in sexual behavior (Lansford, Yu, Erath, Pettit, Bates, & Dodge, 2010). Using an unconditional non parametric growth model, this

study brought out three trajectories: the “zero-initial” trajectory, characterized by no sexual partners at age 16 (65.8%); the “one-initial” trajectory, characterized by one sexual partner at age 16 (14.8%), and the “multiple-initial” trajectory, characterized by a mean of 2.4 sexual partners at age 16 (19.4%). Both the “zero-initial” and “one-initial group” showed a significant increase in the number of partners during late adolescence. During early adulthood, however, the group characterized by no partners at age 16 showed a significant decline in the rate of increase while the group with one partner at age 16 showed a significant decline in the number of partners. The “multiple-initial” group was the only group that showed a significant decline during late adolescence, followed by a significant increase after the age of 20.

Lansford et al.’s (2010) results support heterogeneity in adolescent sexual development. However, certain questions remain. First, it appears possible that a subgroup of abstainers was underrepresented. While estimates of adult virginity have been inconsistent, longitudinal studies with the Add Health sample reveal that 8% of 11,407 18 to 27 year olds (mean age 21.85) were virgins at wave III (Halpern et al., 2006), and that of those who were virgins at age 18, more than one in eight remained sexually abstinent at age 28 (Haydon et al., 2014). Whether they abstain by choice, lack of opportunity, or lack of sexual interest, sexual abstainers share a distinct pathway of sexual development. Second, all previously mentioned studies have used American samples. In 2010, the American Centers for Disease Control and Prevention revealed that 13.8% of students in grades 9 to 12 had already had four or more sexual partners (CDC, 2010). In comparison, in the province of Quebec (Canada) where the current study was conducted, 30% of sexually active high school students aged 14 to 17 reported having had three or more partners (Pica, Leclerc, & Camirand, 2012), and 37% reported some experience with oral, vaginal or anal sex. These numbers suggest that sexual trajectories found in American samples may not necessarily generalize to Canadian youth and thus warrant further examination. Third, given that the multiple-pathway model of sexual development (Zimmer-Gembeck & Helfand, 2008) posits the

existence of both risky and healthy sexual trajectories, predictors of these pathways should include competencies in addition to their focus on risky behaviors.

2.1.1 Identifying predictors of trajectories

According to the biopsychosocial perspective (Weiss, 2000), individual factors (i.e., biological, psychological) and environmental factors (i.e., family structure) are likely to predict membership in trajectories of sexual development. Moreover, a multiple-pathway model of sexual development also suggests that some pathways might be predicted by individual vulnerabilities whereas others might be explained by the presence of positive traits. While Lansford et al.'s (2010) "multiple-initial" group may be posited to represent Zimmer-Gembeck and Helfand's (2008) deviant pathway, it is unclear whether either of the other two groups is associated with certain skills or certain domains of competencies. In addition, Arnett's theory (2000) on the commonalities in the developmental trajectories of emerging adults provides a conceptual lens to examine these trajectories. This theory suggests that emerging adults are characterized by identity formation, exploration, instability, optimism toward future and focus on their sense of self. These hypothesized distinctive features of the developmental period bridging adolescence to adulthood are helpful when examining changes through time and differences in the individual trajectories, especially with regard to the levels of instability and the domains most invested for exploring and consolidating one's identity. Surprisingly, very few studies have addressed youth sexual development from this perspective. This study is an attempt to do so.

2.1.2 Individual predictors

Gender appears to play a role in number of sexual partners. A recent Quebec report found that more boys reported having had three or more oral, vaginal, or anal sexual partners than girls (Pica, Leclerc, & Camirand, 2012). Moreover, a meta-analysis found that men report more sexual behaviors and have more permissive attitudes toward casual sex than women (Peterson & Hyde, 2010). On the other hand, girls report more feelings of guilt and less pleasure from their first sexual experience than boys, although the magnitude of these differences diminishes over time (Sprecher, 2014). Because girls' first experiences are generally less positive than boys', girls may be less likely to seek out subsequent experiences, and would therefore report fewer partners. Taken together, these findings suggest that boys may report more partners than girls during adolescence. Puberty may also play a role in number of sexual partners. An association between pubertal development and early sexuality, especially in girls, has been found in many studies (Mendle, Turkheimer & Emery, 2007; Zimmer-Gembeck & Helfand, 2008). Given that earlier age of first sexual intercourse has been found to increase subsequent risky sexual behaviors and potential health outcomes, it appears likely that earlier developing teens would report a greater number of sexual partners (Kaestle, Halpern, Miller, & Ford, 2005).

Greater alcohol and substance use have consistently been associated with having an earlier sexual debut as well as with a greater number of partners (Zimmer-Gembeck & Helfand, 2008). Additionally, alcohol has been associated to having multiple partners (Cooper, 2002). Antisocial behavior has also been linked with earlier sexual debut, although gender differences have been identified (Boislard, Dussault, Brendgen, & Vitaro, 2013). Delinquency, antisocial behavior, and having delinquent peers have been found to predict earlier sexual debut, which in turn has been associated with other risky behaviors (French & Dishion, 2003). Sensation-seeking may explain the association between substance use, antisocial behavior and risky sexual behavior. Adolescents who have a desire for strong sensory stimulation report more reckless

behavior, such as vandalism, theft, unprotected sex, and a higher number of sexual partners (Arnett, 1996).

Finally, studies have reported more depressive symptoms in early-starting girls, although the results are inconsistent (Martin et al., 2005; Meier & Allen, 2009; Zimmer-Gembeck & Helfand, 2008). Perhaps it is less the timing of sexual debut than the number of sexual partners that is linked with internalizing problems. Within youth's romantic relationships, persistent depressive symptoms often lead to the avoidance of the depressed partner (Coyne, 1976; 1976b). This rejection could lead to a lack of experience in maintaining stable romantic relationships, and increase the number of changes in sexual partners. Moreover, adolescents with greater internalizing symptoms may be at risk for interpersonal instability (Chan & Poulin, 2009), which could lead to a greater number of sexual partners.

Apart from the pace of physical maturation and problem behaviors, other individual characteristics are also expected to influence sexual development among youth. For instance, social and academic competencies may have compelling effects on sexual involvement at a time when both peer relationships and professional identity are forming and evolving. Indeed, research has shown that socially competent individuals have more success finding sexual partners. For example, a strong longitudinal association has been found between sociability at 30 months and number of sexual partners at age 19 (Zimmer-Gembeck, Siebenbruner, & Collins, 2004). Another study showed that sexually active adolescents were rated as more popular by their peers (Prinstein, Meade, & Cohen, 2003). Altogether, these studies suggest that their peers often perceive socially competent youth as desirable romantic and sexual partners. It can be hypothesized that these socially competent youth are involved in dating in middle and late adolescence, a time when romantic relationships are increasingly invested. However, it remains unclear whether they get involved in stable romantic relationships with a chosen partner with whom they have intercourse, and whether they

engage in coitus activities with all dating partners. Even though social competency tends to increase popularity among peers, being popular alone may not be the only factor influencing sexual involvement, especially at a time where professional goals are forming and academic success has impact on future career opportunities. Thus, it seems important to examine academic and social competency in parallel. There is longitudinal evidence that high educational goals and achievement delay sexual intercourse (Schvaneveldt, Miller, Berry, & Lee, 2001), and that competence in the academic domain can have a protective effect against risky sexual behaviors (Capaldi, Crosby, & Stoolmiller, 1996; Santelli, Kaiser, Hirsch, Radosh, Simkin, & Middlestadt, 2004), possibly through less partner changes, or by choosing partners also involved in their academic and professional development, through selection effects.

2.1.3 Family predictors

With regard to family factors, empirical studies and literature reviews have tended to show that adolescents who grow up in intact families are more likely to postpone sexual activity and to report fewer sexual experiences than their peers from non-intact families (Sturgeon, 2002). Moreover, families characterized by high parental monitoring (the extent to which parents supervise and are aware of their child's activities) are more likely to postpone sexual activity and to have fewer sexual partners (Boislard & Poulin, 2011; Parkes, Henderson, Wight, & Nixon, 2011; Sturgeon, 2002; Zimmer-Gembeck & Helfand, 2008).

2.1.4 Objectives

The first goal of this study was to identify developmental trajectories of number of sexual partners assessed each year from ages 16 to 22. Based on the studies conducted by Lansford et al. (2010) and Zimmer-Gembeck and Collins (2008), we expected to find at least three distinct trajectory groups. The first was expected to be characterized by sexual abstinence, the second by at least one partner, and the third by having several partners, and always having the most relative to the other groups.

The second goal was to examine individual (e.g., gender, pubertal timing, substance use, antisocial behavior, internalizing problems and social and academic competencies) and family (e.g., family structure and parental monitoring) predictors (at ages 13–15) of trajectory group membership. We expected adolescents in the most extreme group to be more likely to have begun puberty earlier, be male, report higher levels of antisocial behavior, substance use and internalizing symptoms, have lower grades, not be living with both biological parents, and report lower parental monitoring than all the others groups. Given that academic competence and the parent-adolescent relationship can be understood as protective factors, we hypothesized that the middle group would report higher grades and greater parental monitoring, and live with both parents. Furthermore, we hypothesized that adolescents who reported zero partners would be characterized by less social competence than the other groups. Finally, we hypothesized that the groups characterized by both the lowest and highest number of partners would report the most internalizing symptoms.

2.2 Method

2.2.1 Participants

This longitudinal study began in 2001 with 390 Grade 6 students (58% girls; mean age = 12.38 years; $SD = 0.42$) enrolled in eight elementary schools in a large French-speaking school district in Canada. Parents provided written consent for their child's participation. 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), meaning that the sample was largely middle class given that this measure was taken in 2001. Mothers and fathers had completed an average of 13.10 ($SD = 2.68$) and 13.20 ($SD = 3.20$) years of schooling, respectively.

This study involved ten waves of data collection from ages 13 to 22. As in most longitudinal studies, there were missing data at different time points for different youth. Of the 390 youth initially recruited, 78% were still participating at age 22 ($N = 303$). In order to be included in the trajectory analyses, participants had to have at least 3 data points out of 7 between the ages of 16 and 22. Fifty-eight participants were excluded. Among the non-excluded participants, 215 had 7 data points, 57 had 6, 26 had 5, 20 had 4 and 14 had 3. T-tests and chi-square analysis revealed that males were overrepresented among non-participants, who reported more antisocial behavior and had lower grades compared to the non-excluded study participants ($N = 332$; 60.8% girls).

2.2.2 Design and procedures

In high school (ages 13–17), questionnaires were completed in the school setting under the supervision of research assistants. However, in some cases, assessments had to be conducted individually at the participant's home (approximately 10 per year) or questionnaires had to be sent by mail (approximately 5 per year). After high school (ages 18 to 22), assessments were conducted during a home visit by a research assistant. Parents provided written consent for their child's participation at each year of the study until the youth were 18. From ages 18 to 22, the participants provided written consent. Youth received a \$20 gift certificate for their participation at each time point.

2.2.3 Measures

Annual number of sexual partners at ages 16 to 22. Participants were provided with a definition of a complete sexual relation as including vaginal intercourse, and following this definition, they were asked with how many partners they had had over the course of the year. The wording of this item was different for males and females and referred to other-sex partners only. Males answered the question “Over the past year, how many different *girls* have you had as a sexual partner?” Females answered the question “Over the past year, how many different *boys* have you had as a sexual partner?” Participants were provided with a line on which to write their number of partners. This question was included each year in the questionnaire from ages 16 to 22. This method is consistent with what has been done in the literature (Huang, Murphy, & Hser, 2012; Lansford et al., 2010; Moilanen, Crockett, Raffaelli, & Jones, 2010).

Pubertal timing at age 13. Pubertal timing was assessed at age 13 using the Pubertal Development Scale (Peterson, Crockett, Richards, & Boxer, 1988; see Verlaan, Cantin, & Boivin, 2001 for French translation). On a scale ranging from 1 (has not begun) to 4

(development completed), the youth indicated the extent to which they had experienced pubertal growth in several domains during the previous 12 months. The total Pubertal Development Scale scores were averaged for each gender. Internal consistency was acceptable for both boys ($\alpha = .63$) and girls ($\alpha = .68$). The pubertal timing classification was created using the procedure recommended in the literature (Ge, Kim, Brody, Conger, Simons, Gibbons, et al., 2003). Girls and boys were classified based on their respective position compared to the other participants in the sample, and rated as early-maturing, on-time, or late-maturing accordingly. Youth whose scores were more than one standard deviation above or below the mean for their own gender were classified as early- or late-maturing, respectively. Youth whose pubertal timing scores fell within one standard deviation of the mean for their own gender were classified as maturing on time. Following this classification procedure, 32 (19.2%) boys and 26 (11.4%) girls were classified as early maturers, 85 (50.9%) boys and 157 (68.9%) girls as on-time maturers, and 32 (19.2%) boys and 23 (10.1%) girls as late maturers. Pubertal status was used as a continuous variable in the analyses with 3 indicating early, 2 indicating on-time, and 1 indicating late pubertal development.

Family structure. When providing demographic information, participants reported whether or not they lived with both biological parents. The responses for this item were dichotomous: yes or no.

All the other predictors were assessed at two time points, namely, when the participants were 14 and 15 years old. When the correlations between the two time points were sufficiently high ($> .40$), the two scores were combined and averaged to create a more reliable variable.

Substance use. Alcohol use was measured using the item: “Over the past month, how many times did you drink alcohol with the intention of getting drunk?” Possible responses ranged from 0 to 10, followed by “11–20,” “21–40,” and “41 or more.”

Marijuana use was measured using the item: “Over the past month, how many times have you used marijuana or hashish?” Response options were the same as for alcohol use. Correlations between marijuana and alcohol use were .54 and .34 at ages 14 and 15, respectively. The mean for marijuana and alcohol use was calculated for each time point. The correlation between substance use at age 14 and age 15 was .50. These two substance use scores were averaged to obtain a global substance use score. Since over 50% of the sample reported either no use at all or less than monthly use, this variable was then split into tertiles with values of 0, 1, or 2. Scores of zero corresponded to non-users (25.9% of the sample) and were coded as 0; scores higher than zero but lower than four (representing substance use four times a month) corresponded to light users (55.6%) and were coded as 1; and scores of four and up (therefore weekly or more often) corresponded to heavy users (18.5%) and were coded as 2.

Antisocial behavior. Participants were asked to report on 16 items measuring antisocial behavior (Metzler et al. 1998; see Poulin, Denault & Pedersen 2011, for French translation), rated on a 6-point Likert scale ranging from 1 (never) to 6 (more than 10 times). Examples of items included lying to parents, vandalizing public property, stealing, and fighting at school. A mean was calculated across the items ($\alpha = .82$ at age 14 and $\alpha = .78$ at age 15). A final score was obtained by averaging the scores for the two time points ($r = .69$).

Internalizing problems. A 26-item French version of the Children’s Depression Inventory (CDI; Kovacs 1981 see Boivin et al. 1994, for French translation) was used to measure internalizing problems 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 2 weeks (e.g., “I am tired sometimes”; “I am tired often”; “I am tired all the time”). Individual item scores ranged from 0 to 2, with higher ratings indicating more severe symptoms. A sum-score across all the items was calculated for each participant for each time point. The CDI has demonstrated good reliability and has been validated

using normative and clinic-referred samples (Finch et al. 1985; Fundulis et al. 1991). Internal consistency was high for this sample (age 14 = .86; age 15 = .85). The final score for internalizing problems was obtained by computing the means for the scores at ages 14 and 15 ($r = .63$).

Social competence. The social competence subscale of the Self-Perception Profile for Adolescents was used to measure this variable (Harter, 1985; see Bouffard et al., 2002 for French translation). Items assessed the extent to which the adolescents knew how to make friends, get others to like them and gain social acceptance. Each item presented the participant with two opposing statements (e.g., “Some teenagers find it hard to make friends” and “Some teenagers find it pretty easy to make friends”). After choosing which statement better reflected themselves, participants were 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. Scores were then averaged, and internal consistency was high at both time points (.77 and .65). A final social competence score was computed by averaging the scores at ages 14 and 15 ($r = .53$).

Academic competence. Academic competence was assessed using the participants’ grades (shown as percentages) in math and French, drawn from their school report cards at ages 14 and 15. All participants were enrolled in the same level of math and French, and grades were averaged to obtain a grade score for each time point ($r = .64$ at age 14 and $r = .62$ at age 15). The final grade score was obtained by averaging the scores for the two time points ($r = .71$).

Parental monitoring. Participants completed Stattin and Kerr’s (2000; see Keijers & Poulin, 2013 for French translation) 9-item scale of parental monitoring knowledge at ages 14 and 15. The questions were scored on a 5-point Likert scale ranging from 1 (never) to 5 (often). These items measured the extent to which the participants’ parents

were aware of their activities, whereabouts, and peer relationships (sample item: “Do your parents know what you do during your free time?”). The items were averaged and internal consistency was satisfactory at both time points (α s .85 and .84). The final parental knowledge score was obtained by computing the mean for the two scores ($r = .63$).

2.2.4 Analytical strategy

The first goal of this study was to identify trajectories of annual number of sexual partners from ages 16 to 22. Non-parametric growth mixture modeling was used to identify multiple trajectory groups (PROC TRAJ in SAS; Nagin, 1999), and semi-parametric group-based modeling was used to model the trajectories. This technique assumes the heterogeneity of a specific variable (in this case, annual number of sexual partners) and sorts the sample into relatively homogenous groups. These groups are defined by their patterns of growth and the probability of group membership is calculated for each participant. The participants are assigned to the trajectory to which they have the greatest probability of belonging and which best fits their personal trajectory.

While there is no standard way of dealing with outliers, one popular method involves identifying scores that fall beyond three standard deviations from the mean (Yates, Moore, & McCabe, 2010). We used this method and identified a maximum value for each time point. The maximum number of partners that could be reported without going beyond three standard deviations from the mean was seven partners. In order to manage outliers in the most conservative way, values of eight or higher were censored at seven partners throughout all seven waves. Scores of eight or higher were thus not disregarded or excluded, but merged at seven partners. In this way, partial information

was retained for the outliers (i.e., that they were greater than seven). Therefore all scores fell between zero and seven. This method allowed for the inclusion of participants who had statistically extreme scores. It would not have been optimal to exclude these participants, as this would have disregarded an important, albeit small, subgroup of our sample. The percentage of participants whose scores were adjusted due to outlying values at each wave ranged from 0.3% to 2%.

Semi-parametric group-based modeling is used to test multiple models that consist of a varying number of trajectories. When it comes to selecting the best model, the Bayesian Information Criterion (BIC) and Akaike Information Criterion (AIC) are the most informative indicators (Nagin, 2005), followed by practical usefulness and theoretical relevance. Models with a good fit are represented by BIC and AIC values close to zero. To identify predictors of sexual trajectory group membership, analyses were carried out in two steps. First, group differences were examined by running univariate ANOVAs. Second, variables that had significant differences between the trajectory groups were entered in the multinomial logistical regression model.

2.3 Results

2.3.1 Identifying the trajectories

We tested two-, three-, four-, five- and six-group models. Inspection of the models' BIC and AIC values (presented in Table 1), as well their practical usefulness and theoretical relevance, resulted in the selection of the four-group model. In addition to showing the greatest BIC and AIC values, the four-group model was also the most coherent with our theoretical framework. As well as identifying the number of trajectories, our analyses also identified the shape of these trajectories, indicating the number of phases of increases or decreases in values (linear, quadratic, cubic). 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. Our final model consisted of four distinct trajectories of annual number of sexual partners (Figure 1). The *abstainers* group (9.1%) reported zero partners throughout the majority of the period, followed by an average increase to one partner at age 22; the *low-increasing* group (30.6%) reported zero partners during the first two years, followed by an increase to one partner; the *medium-increasing* group (53.0%) reported one partner at age 16, followed by a slow increase, stabilizing at two partners; and the *multiple-partners* group (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 that reported by the other groups at all times. All four trajectories had a cubic shape, indicating a common pattern of change.

2.3.2 Descriptive statistics and univariate analyses of trajectory predictors

Descriptive statistics for each predictor as a function of trajectory group are reported in Table 2. Univariate ANOVAs were run for each variable to identify differences among the trajectory groups. Post-hoc analyses using a Bonferroni correction were used to identify where the differences lay. Chi-square analyses were conducted for categorical variables. Several significant trajectory group differences were found and are reported in Table 2.

Males were overrepresented and underrepresented in the abstainers and medium-increasing groups, respectively. Participants in the medium-increasing trajectory reached puberty at a significantly earlier age than those in the low-increasing trajectory.

Participants in the low-increasing trajectory group reported the fewest internalizing symptoms, and were significantly different from the other three groups, whereas the other three groups did not differ significantly from one another in this regard. The abstainers and low-increasing groups reported significantly less antisocial behavior than the medium-increasing and multiple-partners groups, and did not differ from one another in this regard. Participants in the abstainers group reported significantly less substance use than all the other groups. Moreover, the low-increasing group reported significantly less substance use than the medium-increasing and multiple-partners groups, while the latter groups did not differ from each other in this regard. Participants in both the abstainers and low-increasing trajectories reported significantly less social competence than those in the medium-increasing and multiple-partners groups, and did not differ from one another in this regard. Participants in both the abstainers and low-increasing trajectory groups reported significantly higher grades than those in the medium-increasing and multiple-partners groups, and did not differ from each other in this regard. No group differences were found with regard to whether or not the participants came from an intact family. Finally, participants in both the abstainers and low-increasing trajectory groups reported significantly higher levels of parental monitoring than those in the medium-increasing and multiple-partners groups, and did not differ from one another in this regard.

2.3.3 Multinomial logistical regression

To predict trajectory group membership, a multinomial logistical regression was run using all the variables that had significant differences at the univariate level (see Table 3). The same model was run three times using a different trajectory group as the reference each time, allowing every possible comparison to be examined. In the first regression, the multiple-partners group was used as the reference and compared to the

three other groups. Less substance use increased the likelihood of belonging to the abstainers group as compared to the multiple-partners group. Lower levels of social competence also increased the likelihood of belonging to both the abstainers and low-increasing groups. No measures affected the likelihood of belonging to the medium-increasing group versus the multiple-partners group.

The second model compared the abstainers group to the low-increasing and medium-increasing groups. Females were more likely to belong to both the low-increasing and medium-increasing groups than to the abstainers group. Similarly, greater substance use also increased the likelihood of belonging to both the low-increasing and medium-increasing groups.

In the final model, the low-increasing group was compared to the medium-increasing group. Earlier puberty increased the odds of belonging to the medium-increasing group versus the low-increasing group. Moreover, both greater substance use and social competence increased the likelihood of belonging to the medium-increasing group as compared to the low-increasing group.

2.4 Discussion

Adolescents do not all experience sexual development in the same way. For some, early sexual behaviour is associated with potential risks and subsequent health outcomes, such as greater chances of sexually transmitted infections and more condomless sex (Siebenbruner, Zimmer-Gembeck, & Egeland, 2007). For others, early sexual experiences may act as stepping stones to a healthy adult sexuality and can therefore be seen as normative (Tolman & McClelland, 2011). This study had two objectives: to identify and describe sexual trajectories from ages 16 to 22 based on the annual number

of sexual partners, and to examine whether individual and family predictors assessed at ages 13 to 15 predicted trajectory membership. Four distinct trajectories were identified. These trajectories differed with regard to the number of partners reported at age 16 (baseline), as well as the rate of change over time (slope). In short, individual factors (gender, pubertal timing, substance use and social competence) predicted group membership, whereas family factors did not. Below, we describe the study's findings in greater detail and discuss their developmental significance.

2.4.1 Identifying trajectories

Based on Zimmer-Gembeck and Helfand's (2008) multiple-pathways model of sexual development as well as Lansford et al.'s (2010) study, we expected to find three distinct trajectories of the annual number of sexual partners. Four trajectory groups emerged from the analyses. Participants in all trajectories except the abstainers group reported an increase in the number of sexual partners between the ages of 17 and 20. Consistent with Arnett's theory (2000), this may reflect a period of experimentation – including in the sexual domain – in late adolescence and early emerging adulthood, corresponding to the college years for most youth, characterized by more peer and dating involvement and less parental supervision. In the cultural context where this study was conducted, college refers to an educational institution preceding university or labor market entry. There is a growing line of research indicating that hook-ups and short-term sexual encounters are common at this age, and can serve as a context to develop one's sexual preferences and sense of self as a sexual partner (Allison & Risman, 2014; Stinson, Levy & Alt, 2014). In all the trajectories except the abstainers group, this period characterized by an increase in the number of sexual partners was followed by a decrease or stabilization, possibly indicating greater involvement in stable monogamous romantic relationships in the twenties, as well as less time spent

with peers (including new potential sexual partners) when entering the labor market or meeting the higher demands of university studies (Weaver, MacKeigan, MacDonald, 2011).

Our findings present similarities and differences with those reported by Lansford et al. (2010), who covered the same period (ages 16–22) and used a similar assessment of sexual behavior (e.g., number of sexual partners in the previous year). Similar to Lansford et al.'s study, we identified several distinct trajectory groups, which replicated their findings. However, our results also differed from theirs in several respects. First, and importantly, we identified a group of abstainers that contained 9.1% of our sample. This group reported zero partners at six consecutive time points, followed by a mean of less than one partner at age 22. In comparison, Lansford et al.'s least active group was sexually inactive at the first time point only, before reporting a sexual partner at age 17. This stark divergence highlights an important difference in the two samples and brings attention to an important subgroup of the population that remains sexually inactive later than their peers (Boislard et al., 2016). Possible explanations for this finding are discussed further below. Second, at the other end of the continuum, our most active group was quite different from Lansford et al.'s. Our most active group demonstrated an increase in the number of partners from age 16 to age 20, as well as reporting an average maximum of five partners. The most active group in Lansford et al.'s study reported a decrease in the number of partners from age 16 to age 20, and an average maximum of 2.5 partners. Our results are consistent with the 2011 National Health Statistics Report, which found that 31.6% of American females and 26.1% of American males between the ages of 21 and 24 reported between three and six lifetime sexual partners. Moreover, 11.7% of females and 18.1% of males in the same age bracket reported between seven and fourteen partners. It is important to keep in mind that these sex gaps are probably inflated by the well-documented reporting bias in which females consistently tend to under-report, and males to over-report, their lifetime number of sexual partners in surveys (Boislard & Poulin, 2015).

Evidently, having more than three sexual partners is much more prevalent than Lansford's results suggest, and may be represented by our multiple-partners group, which nevertheless constitutes a small proportion of our sample (7.3%). This group is of great interest for public health policies targeting sexual risk-taking among youth, especially with recent data reporting increases in gonorrhoea and HPV in this age group (MSSS, 2010).

The middle two groups also appeared to be qualitatively different from one another, above and beyond their quantitative features with regard to the number of sexual partners. The low-increasing group showed a pattern of initiating sexual relations at the average age of 17 and tending not to have more than one sexual partner over time. The medium-increasing group reported earlier sexual onset but showed the most stable trajectory, with more or less one sexual partner across time. These two groups differed from each other in terms of the timing of sexual onset, which provides additional support for the importance of examining both the trajectory *and* the timing of onset when investigating sexual development among youth.

In summary, the two groups at both ends of the continuum in our study (e.g., abstainers and multiple-partners) were more polarized than Lansford's groups. Although our abstainers and multiple-partners group corresponded to only 9.1% and 7.3% of the sample, respectively, these individuals represented pathways not found in Lansford et al.'s study. In Lansford et al.'s study, the majority of the sample (65.8%) was grouped into a single trajectory whereas our results present a more diverse picture of sexual development. One possible explanation for this divergence between the two studies may be cultural. In Quebec, women have their first child later than in the United States, at a mean age of 28.7 as compared to 26 (Pica et al., 2012). Quebec youth also tend to wait longer before getting married: only 2.9% of individuals between the ages of 20 to 24 and 13.1% between the ages of 25 to 29 were married in 2012 (Pica et al., 2012), as compared to 9.3% and 36.7%, respectively, in the same year in the United States

(United States Census Bureau, 2012). These numbers represent significant differences in demographics among emerging adults, and these differences could begin to emerge during adolescence. Compared to American youth, fewer Quebec youth appear to follow the traditional model of marriage during emerging adulthood. As such, premarital sex is considered normative (Blais et al., 2009). While the traditional institution of marriage remains important for some youth, there appear to be more diverse pathways and relational configurations (Rodrigue et al., 2015), which may correspond to our trajectories at both ends of the continuum. While relatively small in number, these groups of individuals nevertheless experience very different life paths in terms of their sexual development.

2.4.2 Individual and family predictors

We compared our trajectory groups with regard to a series of individual and family predictors measured at a younger age. In a first step, univariate analyses revealed that the abstainers and low-increasing groups reported higher grades, less antisocial behavior and more parental monitoring than the other two groups. Results specific to particular groups also emerged. Adolescents in the medium-increasing group reached puberty earlier than those in the low-increasing group, and were overrepresented by females. This is consistent with research showing that early-maturing adolescents, females in particular, become sexually active at an earlier age than their peers (Zimmer-Gembeck & Helfand, 2008). Interestingly, the participants in this group did not report the most partners over time, thus bringing to light that early onset and multiple sexual partnerships are distinct and not always intertwined.

The low-increasing group reported fewer internalizing symptoms than all the other groups, which lends support to the idea that this group represents a normative pathway

of sexual development. Moreover, while prior research has linked a greater number of partners with internalizing problems, it has also been found that abstainers show internalizing symptoms (Mazzaferro, Murray, Ness, Bass, Tyus, & Cook, 2006). It is possible that greater internalization makes these individuals less likely to approach others, and may indeed make them less attractive to potential mates, although this is speculative and would require further empirical investigation.

In a second step, multinomial logistical regressions were performed with all the variables that were significant in the univariate analyses. Only three of these variables significantly predicted group membership. First, participants who reported greater substance use were more likely to belong to the multiple-partners group than to the abstainers group. These results are consistent with prior literature showing that substance use is associated with earlier-starting adolescents and a greater number of partners (Boislard et al., 2009; Boislard & Poulin, 2011), as well as with the decision to have sex, including casual sex or sex with multiple partners (Cooper, 2002). Adolescents who use more substances may more often find themselves in social contexts with other-sex peers, such as bars or parties, and therefore have more opportunities to encounter potential sexual partners and engage in sexual behavior. Furthermore, sensation-seeking may explain these results as adolescents who have a higher threshold of arousal seek out more intense experiences to gain pleasure (Zuckerman, 1990), and find the novelty of a sexual partner more attractive than individuals who do not present the sensation-seeking trait as strongly (Michel, et al., 2006).

Second, and consistent with our hypotheses and with previous studies (e.g., Zimmer-Gembeck et al., 2004), the two higher groups reported more social competence than the other groups. Although we did not collect information on the reasons the abstainers group remained virgins (i.e., religious reasons, lack of desire, etc.), it can be theorized that a lack of social competence plays a role. A wave of recent research on adult virgins

has found that the majority of them have never been in a romantic relationship and also report themselves as shy or incapable of establishing social connections (Boislard et al., 2016). These findings also lend support to the notion that adolescent sexuality can be viewed as a positive step toward healthy adult sexual and romantic relationships. The groups that reported more partners also reported more social competence. This suggests that there may be some positive characteristics of adolescent sexuality. Adolescents may be able to explore their developing sexuality with the help of social skills that allow them to enter into romantic or sexual relationships. Conversely, adolescents who desire to engage in sexual activity but do not have the appropriate social competence may miss out on romantic or sexual opportunities. Third, sex also predicted membership when the abstainers trajectory was used as the reference group. Females were more likely to belong to the low-increasing and medium-increasing group as compared to the abstainers group. Indeed, females represented 67.6% of the medium-increasing, 57.8% of the low-increasing, and 43.7% of the abstainer groups. Earlier-maturing girls tend to engage in sex at an earlier age than their peers, which could explain why they were overrepresented in one of the groups that already reported a partner during the first wave.

Altogether, our results support Zimmer-Gembeck and Helfand's multiple pathways of sexual development model in that distinct groups were identified and associated with different antecedents. The abstainers group reported less substance use than all the other groups, as well as being overrepresented by males compared to the low-increasing and medium-increasing groups. Overall, the abstainers showed a pattern of "not-doing" that extended beyond the sole domain of sexual activities, as they also abstained from substance use more than those in the other trajectories, a pattern that was also revealed in previous qualitative studies (Mullaney, 2006). The low-increasing group differentiated itself by reporting the fewest internalizing problems, as well as less substance use than the medium-increasing and multiple-partners group, but more substance use than the abstainers. The overall stability of their pattern could be due to

their involvement in a single and lasting romantic relationship with their first partner starting around age 17, which may result from – and consolidate – the absence of internalizing symptoms (Coyne, 1976; 1976b). The medium-increasing group reached puberty earlier than all the other groups, and was over-represented by females. This result is in line with the literature indicating that early-maturing females are also more likely to initiate sexual relations at an earlier age (Boislard et al., 2016), while also adding to our current knowledge by revealing their possible stable involvement with one partner over time. Finally, the multiple-increasing group was characterized by having more than two partners throughout the period under study, as well as a peak of five partners at age 20. Much research has been conducted on youth who are involved in sexual risk-taking such as the participants in this group; yet, they represented a minority (7.3%) among the multiple sexual trajectories that this study brought to light. As such, a new wave of research on adolescent sexuality has attempted to tease apart deviant behaviors from more normative ones, and our results add to this literature. Indeed, our results imply greater diversity in sexual development than proposed in the multiple pathway model since we identified two, albeit relatively small, groups at the two ends of the continuum (abstainers and multiple-partners groups) in addition to two larger and more moderate groups (low-increasing and medium-increasing groups).

2.4.3 Strengths and limitations

The strengths of this research include the longitudinal design and yearly data collection from the ages of 12 to 22 with a low attrition rate. Moreover, most of our predictor variables were averaged over two years, rather than measured at a single time point, resulting in more reliable scores.

This study also had some limitations. First, there was a sexuality bias in that participants were asked only about relations with persons of the other sex and not about potential relations with persons of the same sex. However, the development of sexual identity follows different trajectories for sexual-minority youth as compared to their heterosexual peers (Boislard et al., 2016). Merging all youth regardless of their sexual orientation could have increased the variance but might have created confusion in the interpretation, especially because there may not have been enough same-sex attracted participants to allow further comparisons in the trajectories. Second, participants were not asked to supply the names of their partners. It is possible that some participants had the same partners over multiple time points. This may skew the data in terms of the riskiness of sexual behavior. For example, a participant reporting the same partner over the span of several years does not represent the same level of risk as a participant who reports a different partner each year. Using our methodology, these two participants would be classified in the same group even though they might actually be quite different from one another. The third limitation involves the heavy reliance on youth self-report. Although school report cards (for academic competence) were collected, the other predictors and annual number of sex partners were all based on self-reports. This may artificially inflate estimates because of monomethod bias. Fourth, it would have been instrumental to examine the potential moderating role of gender as prior studies have found interactions between internalizing and antisocial behavior and sexuality in boys but not in girls (Boislard et al., 2013). This analysis was not possible due to our small sample size, and future longitudinal studies with larger samples should be sure to examine this effect. Finally, the current study used a fairly homogenous sample of adolescents from a single geographical area and should be replicated with more ethnically diverse samples.

Now that more research has provided support for the notion that sexual development is not the same across the board for all adolescents, it is important to produce similar studies to replicate these findings. Future studies could also examine the potential

consequences of belonging to these different trajectory groups, such as effects on later sexuality or romantic relationship satisfaction. If early sexual experiences provide a foundation on which individuals learn to navigate healthy sexuality and romantic relationships, it can be speculated that those who have had no experience as well as those with erratic experience may be at a disadvantage during emerging adulthood. Undesired sexual inexperience may produce a variety of negative consequences, such as low self-esteem or depressive symptoms. Conversely, a more turbulent sexual development may contribute to problems with intimacy or attachment within a romantic relationship.

2.4.4 Conclusion

In the same way that early romantic relationships shape later ones, it appears likely that early sexual experiences have an effect on adult sexuality. Much prior research has focused on identifying early risk factors of subsequent sexual risk behavior. It is equally important, however, to identify the strengths and competencies associated with healthy sexual development, which can then be fostered and nurtured in young adolescents.

Youth risky sexual behaviors, commonly operationalized as precocious intercourse, non-systematic condom use, and multiple sexual partners (Boislard-Pépin, Poulin, Kiesner, & Dishion, 2009), are directly involved in the high prevalence rates of STIs, including HIV (Brener, Kann, Lowry, Wechsler, & Romero, 2006). Although research on adolescent risky sexual behavior is of vital importance, over the past two decades, it has been increasingly recognized that the exploration of intimate relationships and sexual behaviors during adolescence and emerging adulthood is not inherently risky per se. Youth sexuality's research agenda is now taking both its normative and risky components into account, focusing on promoting positive sexual health (Diamond,

2006; Zimmer-Gembeck et al., 2011) and preventing sexual health issues such as STIs and HIV, unplanned pregnancies, sexual coercion and abuse, and violence in romantic young people. This is also in line with the World Health Organization's (WHO, 2006) claim that sexual health is not merely the absence of illness or sexual problems, but also encompasses physical, mental, emotional, and social well-being in relation to sexuality.

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Table 2.1 Model Selection Using the Bayesian Information Criterion (BIC) Based on the Number of Participants ($n = 332$) and the Akaike Information Criterion (AIC)

Number of groups	BIC	AIC
2	-3343.95	-3328.73
3	-3259.84	-3235.11
4	-3216.55	-3179.50
5	-3216.70	-3182.46
6	-3209.81	-3167.96

Table 2.2 Means and Standard Deviations for Antecedents, with Comparisons by Sexual Trajectory Group

Variable	Trajectory group				Group comparisons <i>F/ η^2, χ^2/V</i>	Post Hoc
	Abstainers (A; 9.1%)	Low- increasing (L; 30.6%)	Medium- increasing (M; 53%)	Multiple- partners (MP; 7.3%)		
Gender (% male)	56.3	42.2	32.4	52	χ^2 (3, N= 332) = 9.393*, V = .168	
Pubertal timing at age 13	1.90 (0.56)	1.86 (0.58)	2.08 (0.54)	2.04 (0.56)	F (3, 309) = 3.40*, η^2 = .018	L < M
Internalizing problems ages 14 and 15	7.70 (4.28)	7.65 (4.31)	10.07 (6.74)	9.65 (8.30)	F (3, 291) = 3.60*, η^2 = .04	L < A, M, & MP
Antisocial behaviour ages 14 and 15	0.08 (0.07)	0.13 (0.09)	0.20 (0.12)	0.24 (0.15)	F (3, 327) = 10.20**, η^2 = .09	A, L < M, MP
Substance use ages 14 and 15	0.30 (0.47)	0.64 (0.51)	1.14 (0.61)	1.15 (0.67)	F (3, 291) = 26.79**, η^2 = .22	A, L < M, MP ; A < L
Social competence ages 14 and 15	3.05 (0.39)	3.23 (0.43)	3.39 (0.40)	3.57 (0.36)	F (3, 290) = 9.71**, η^2 = .09	A, L < M, MP
Academic competence ages 14 and 15	77.08 (10.18)	73.95 (9.77)	69.73 (9.38)	66.03 (9.53)	F (3, 286) = 8.76**, η^2 = .08	A, L < M, MP
Intact family (%) at age 13	84.4	69.6	67.1	72	χ^2 (3, N= 329) = 3.58, V = .104	
Parental monitoring ages 14 and 15	4.11 (0.63)	4.08 (0.50)	3.70 (0.69)	3.40 (0.82)	F (3, 291) = 11.56**, η^2 = .12	A, L < M, MP

Note. * p < .05, ** p < .01

Table 2.3 Multinomial Regression Predicting Sexual Trajectory Group

Variable	Comparison group					
	Multiple-Partners versus			Abstainers versus		Low-increasing versus
	Abstainers	Low-increasing	Medium-increasing	Low-increasing	Medium-increasing	Medium-increasing
	<i>OR</i>	<i>OR</i>	<i>OR</i>	<i>OR</i>	<i>OR</i>	<i>OR</i>
Male	3.06	0.91	0.56	0.30*	0.18**	0.61
Pubertal timing	0.62	0.67	1.21	1.10	1.98	1.80*
Internalizing problems	1.06	0.99	1.02	0.93	0.97	1.04
Antisocial behavior	0.36	0.23	0.54	3.17	2.10	2.34
Substance use	0.14**	0.48	1.70	3.32*	11.85**	3.57*
Social competence	0.07**	0.10**	0.25	1.58	3.82	2.42*
Academic competence	1.09*	1.05	1.03	0.97	0.95	0.98
Intact family	1.88	0.69	1.03	0.37	0.5	1.37
Parental monitoring	1.26	2.43	2.06	1.92	1.63	0.85

Note. * $p < .05$, ** $p < .01$

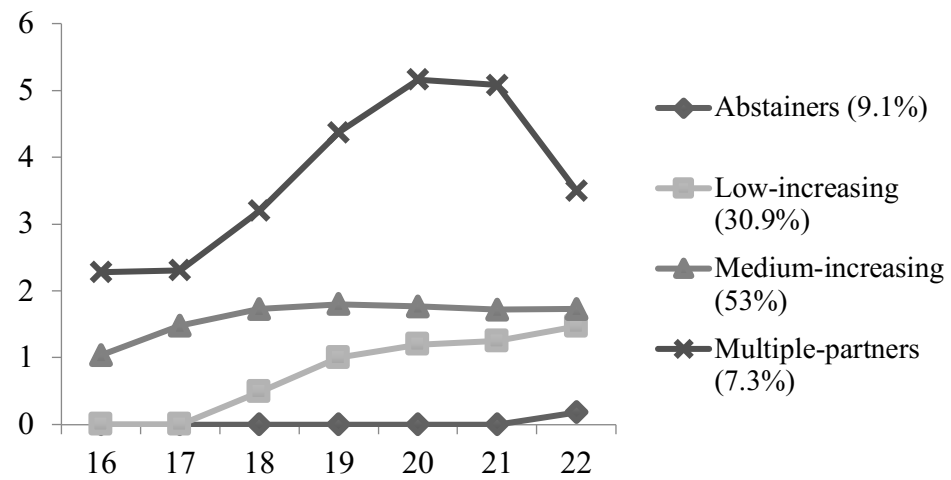


Figure 2.1 Developmental trajectories based on number of sexual partners from ages 16-22

CHAPTER III

SEXUAL TRAJECTORIES DURING ADOLESCENCE AND ADJUSTMENT IN EMERGING ADULTHOOD

Rossi, E., Poulin, F., & Boislard, M-A. (in press). Sexual trajectories during adolescence and adjustment in emerging adulthood. *Emerging Adulthood*, doi: 10.1177/19893550

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.

Key words: sexual development, longitudinal, trajectories, alcohol use/abuse, life course.

3.1 Introduction

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 life course development (McCormick, Kuo & Masten, 2011). Overall, the current research on life course 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 and psychosocial adjustment during EA. Further, only Ashenhurst 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.

3.1.1 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 through 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 (Lancôt & 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).

3.1.2 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 are 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.

3.1.3 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.

3.1.4 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 et al., 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).

3.1.5 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.

3.2 Method

3.2.1 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 ($X^2(387) = -3.24, p = .007$).

3.2.2 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.

3.2.3 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.

3.2.3.1 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 ($\alpha = .83$).

3.2.3.2 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 ($\alpha = .84$ at age 14 and $\alpha = .85$ 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.

3.2.4 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 conducted 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.

3.3 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 ($F(3,323) = 11.12$; $p < .001$, $\eta^2 = .094$) albeit no interaction with gender was found ($F(3,323) = 1.102$; $p = .385$, $\eta^2 = .003$). Prior academic success was used as a covariate and found to contribute significantly to educational achievement ($F(3,323) = 126.71$; $p < .001$, $\eta^2 = .282$). 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 2×2 chi-square analyses were conducted and revealed the medium-increasing trajectory more likely to be employed full-time when compared to the abstainers ($X^2(1) = 4.750$; $p = .029$, $\phi = .158$) and the low-increasing group ($X^2(1) =$

4.888; $p = .027$, $\phi = .137$). 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 ($X^2(3) = 7.97$; $p = .047$, $V = .164$), 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 ($X^2(1) = 5.98$; $p = .014$, $\phi = .180$).

A significant effect of trajectory was found for problematic alcohol use ($F(3,323) = 3.88$; $p = .009$, $\eta^2 = .033$). The covariate (prior alcohol use) was found to significantly contribute to problematic alcohol use ($F(3,323) = 12.43$; $p < .001$, $\eta^2 = .037$). The trajectory effect was qualified by a trajectory by gender interaction ($F(3,323) = 4.11$; $p = .007$, $\eta^2 = .038$), 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 ($F(3,323) = .925$; $p = .428$, $\eta^2 = .017$) and self-esteem ($F(3,323) = 0.490$; $p = .689$, $\eta^2 = .008$), and their covariates were found to significantly contribute to the models ($F(1,323) = 29.05$; $p < .001$, $\eta^2 = .083$ and $F(1,323) = 19.06$; $p < .001$, $\eta^2 = .056$, respectively).

3.4 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.

3.4.1 Discussion by trajectory group

3.4.1.1 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.

3.4.1.2 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 cohabit 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.

3.4.1.3 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.

3.4.2 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.

3.5 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.

3.6 References

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Table 3.1 Descriptive Data and Pairwise Comparisons of ANCOVAs for Outcomes at Age 22 by Sexual Trajectory Group

	Trajectory Group								Pairwise Comparisons
	1. Abstainers (<i>N</i> = 32, 9.1%)		2. Low- Increasing (<i>N</i> = 102, 30.6%)		3. Medium- Increasing (<i>N</i> = 173, 53%)		4. Multiple Partners (<i>N</i> = 25, 7.3%)		
Dependent Variable	<i>M</i> (<i>SD</i>)	95% CI	<i>M</i> (<i>SD</i>)	95% CI	<i>M</i> (<i>SD</i>)	95% CI	<i>M</i> (<i>SD</i>)	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.

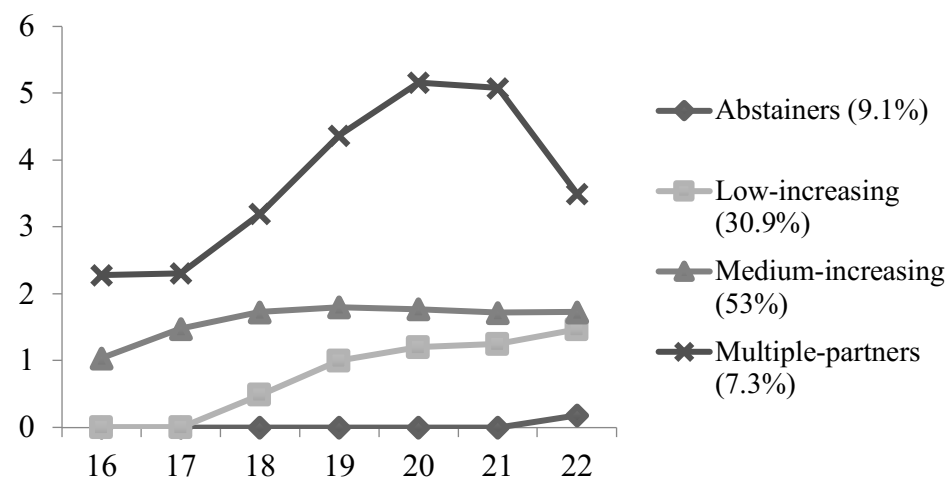


Figure 3.1 Developmental trajectories based on number of sexual partners from ages 16-22

CHAPTER IV

GENERAL DISCUSSION

Sexuality emerges during adolescence and develops into a significant element of one's adult life and identity. Theoretical models that consider adolescent sexual behaviour as inherently deviant (e.g., problem behavior theory; Jessor & Jessor, 1977) have become out-dated and replaced by ones that consider how certain factors can be protective and promote healthy development, such as synchronization with peers (e.g., social clock theory; Lehnart, Neyer, & Eccles, 2010) and meaning-making (Vasilenko et al., 2014). These more nuanced approaches better account for the heterogeneity of sexual development and have resulted in research aiming to identify conditions and characteristics associated with both positive and negative outcomes (Tolman & McClelland, 2011). This doctoral thesis was thus interested in adding to this growing literature by identifying predictors and outcomes associated with shared sexual development pathways.

The first study sought to identify shared pathways of sexual experience based on yearly number of sexual partners between the ages of 16 and 22. Consistent with the multiple pathways model of sexual development (Zimmer-Gembeck and Helfand, 2008), four distinct groups were identified and examined. The groups varied both in number of partners at 16 as well as in rate of change over time. The majority of the sample belonged to two groups: one that reported no partners for the first two years followed by an average of one partner per year (*low-increasing*, 30.9%), and another that

consistently reported between one and two partners (*medium-increasing*, 53%). Two smaller groups emerged; one characterized by abstention (*abstainers*, 9.1%) and another by consistently having the most partners throughout the period as well as having a more dramatic increase over time (*multiple partners*, 7.3%). Individual and family characteristics in early adolescence (ages 14-15) were examined in relation to sexual trajectory groups. In univariate analyses, the least active groups (i.e., *abstainers* and *low-increasing*) reported fewer internalizing problems, less antisocial behaviour, less substance use, less social competence, more parental monitoring, and higher grades than their peers with more sexual partners. Multivariate analyses revealed that social competence increased one's odds of belonging to the *multiple-partners* group as compared to the *abstainers*, who were less likely to report substance use compared to all other groups. These results highlight both the positive (e.g., more social competence) and negative (e.g., greater substance use) characteristics associated with different adolescent sexual experiences, supporting the notion that sexuality develops heterogeneously and that certain pathways may be more normative than others.

The objective of the second study was to examine the impact of adolescent sexual trajectories on functioning during EA, a developmental period characterized by instability and during which, unlike other periods such as adolescence where puberty or attending high school are distinctive characteristics, there are no distinguishing shared experiences: emerging adults are just as likely to be in school full-time living with their parents as they are to be financially independent and starting a family of their own (Arnett, 2001). This study examined psychosocial outcomes (e.g., problems with alcohol, depression, and self-esteem) and markers of developmental task achievement (e.g., educational achievement, full-time employment, and romantic involvement) at 22 years, taking into account pre-existing levels of relevant behaviours and symptoms. Results indicated that greater sexual involvement (i.e., *medium-increasing* and *multiple partners* groups) was associated with less education. An interaction between groups and gender was found for alcohol use, with females in the *multiple-partners* group

reporting the most problematic use. Finally, youth in the *medium-increasing* group were more likely to cohabitate with a romantic partner and work full-time. The groups did not differ on depression or self-esteem. In this final chapter of the thesis, the results and implications of these two studies will be discussed in detail. First, the four identified trajectory groups will each be treated and explored individually in order to present a portrait of their profiles. Their developmental antecedents and outcomes will be described and discussed while being integrated into the literature. Theoretical and practical implications of this thesis will then be explored, followed by a consideration of its limitations. Potential avenues for future research will be proposed followed by final conclusions.

4.1 Main results of the thesis

4.1.1 Abstainers group

The results of our first study were unique in that a significant minority of *abstainers* emerged. This group represented 9.1% of our sample and reported zero partners across all time points. In similar studies that have longitudinally tracked sexual behaviours, including number of sexual partners, none have identified a group defined by abstinence (Lansford et al., 2010; Ashenhurst et al., 2017; Vasilenko et al., 2016, Moilanen et al., 2010). The absence of a group defined by no sexual partners is surprising as research has consistently reported a minority of individuals who delay well past their peers (Haydon et al., 2012). While rates of virginity drop from adolescence into EA, up to 5% of males and 3% of females between the ages of 25 and 29 maintain their virginity (Boislard, van de Bongardt, & Blais, 2016). Looking at

sexuality from a life course perspective (McCormick, Kuo & Masten, 2011), individuals who abstain are of particular interest as they represent a unique experience. Theories of lifespan development postulate that being off time with peers in relation to developmental tasks is maladaptive (Heckhausen, Wrosch, & Schulz, 2010; Elder et al., 2003), making both early and late starters vulnerable to negative outcomes. Romantic relationships are sought out during adolescence and most report first experiences with romantic love by age 17 (Regan, Durvasula, Howell, Ureno, & Rea, 2004). Researchers have proposed that relationship engagement follows a social sexual script in which romantic and sexual experiences are expected and enforced via social customs (Tolman, 2006), making abstention a deviation from the norm. Abstainers appear to be heterogeneous in both their developmental antecedents and reasons for abstaining (Haydon et al., 2014). Sexually inexperienced young adults cite a multitude of reasons for not having sex, including not feeling ready, fear of pregnancy, conservative values, and lack of opportunity (Boislard, van de Bongardt, & Blais, 2016). Abstention might also reflect a personal decision based on a value system or conventional beliefs; in a study using Add Health data, a large scale longitudinal study conducted in the United States, greater psychosocial conventionality was associated with postponing sexual activity (Reese, Choukas-Bradley, Herring, & Halpern, 2014).

In a first step, univariate analyses of developmental antecedents revealed that *abstainers* reported less social competence, less substance use, less antisocial behaviour, later puberty, more academic competence, and more parental monitoring at ages 14 and 15 compared to their peers in the *medium-increasing* and *multiple partners* groups. While similar in many ways, they reported less substance use and more internalizing symptoms than those in the *low-increasing* group. Parental monitoring is associated with parent-child relationship quality (Laird et al., 2003), which has been found to indirectly impact sexual experience through the promotion of self-esteem (van de Bongardt et al., 2015). Further, Lansford et al. (2010) found that parental monitoring significantly impacted the rate of growth of number of partners over time, supporting

the notion that parental monitoring can be protective and influences adolescent sexual experience. Multivariate analyses revealed that during adolescence, this group appears to be at a social disadvantage: less social competence was associated with an increase in one's odds of belonging to the *abstainers* as compared to the *multiple partners* group. Having less social competence might result in fewer opportunities for an individual to enter into a sexual or romantic relationship, denying them the possibility of developing their already lacking social skills. Indeed, later timing of sexual initiation has been associated with poorer social relations (e.g., difficulties finding a romantic partner or a true friend), less well-being, and lower positive affect in EA (Haase et al., 2012). Therefore, initial lower levels of social competence can lead to postponement of sexual initiation from lack of ability and opportunity, thereby making these individuals less likely to develop these skills and enter into relationships, leaving them vulnerable to negative psychosocial outcomes.

This hypothesis was not supported in the second study however, which found no difference in depression or self-esteem among the groups at age 22. This is surprising as a growing literature on adult virgins has revealed this group to be vulnerable to adjustment difficulties, less well-being, and are less likely to be in a romantic relationship (Haase et al., 2012; Vrangalova & Savin-Williams, 2011). This may be due to the stigma attached to being an adult virgin: studies have found that adult virgins report feeling stigmatized for their lack of experience (Gesselman, Webster, & Garcia, 2016) and are more likely to describe themselves as shy and experience negative body image (Donnelly, Burgess, Anderson, Davis, & Dillard, 2001). Because most adolescents engage in sexual behaviour within the context of a romantic relationship (Manning, Longmore, Giordano, 2000), some abstainers may be waiting for a relationship to lose their virginity. However, the longer they wait the more difficult it may be to find a partner: adult virgins are seen as less desirable romantic relationship partners (Gesselman et al., 2017). Research has found adult virgins to report feeling intensely concerned with shedding their virginity, leading them to hide or misrepresent

their sexual experience from peers or potential partners (Carpenter, 2002). They have also been found to feel shame about being different and worry about ‘catching up’ (Donnelly et al., 2001). If, as the literature suggests, abstention is often associated with negative psychological outcomes, why did we not find them compromised at 22 years? Their higher academic involvement could have conceivably served as a protective factor, or perhaps not enough time had elapsed in order for their desynchronization to have an impact on their well-being. In support of the former, the *abstainers* were among the most educated at 22 years, corroborating the literature that has found late starters to achieve more education as young adults (Haase et al., 2012). The association between adolescent sexual involvement and academic engagement has been well documented, although the directionality is unclear. Sexual involvement may represent a distraction from school, making those who abstain more likely to stick to academic goals. Conversely, lower academic performance in high school (e.g., repeating a grade) has been found to decrease males’ chances of belonging to a late starting group (Reese et al., 2014), indicating the possibility that early academic difficulties might lead to a developmental pathway characterized by greater sexual involvement. In a longitudinal study, researchers found a bidirectional relationship between academic goals and achievements and sexual timing (Schvaneveldt et al., 2001). These results suggest that some adolescents postpone sexual initiation to avoid risks that might jeopardize their education (e.g., unwanted pregnancy), while the experiences of those who initiate early might lead to a shift in attitudes and beliefs that prompts them to disengage from academic pursuits. While we found no differences in depression or self-esteem at 22 years, it seems plausible that as they age and the differences from their peers become more dramatic, the *abstainers* might experience the negative outcomes discussed above. Academic involvement might be protective up until a certain point when romantic and sexual involvement take developmental precedence. However this is speculative, and studies spanning later in EA would be needed to verify this hypothesis.

4.1.2 Low-increasing group

Our *low-increasing* group (30.9%) was similar to our *medium-increasing* group (53%) in that both consistently reported about one partner across the study, with the main distinction between them being age of initiation (18 and 16, respectively). The identification of two groups comparable on number of partners but who differ on timing of initiation is unique, making comparisons to the literature less obvious. Lansford et al.s' (2010) *zero-initial* group (65.8%) initiated sex two years earlier than our *low-increasing* group but then demonstrate a similar slope over time. Similarly, Ashenhurst and colleagues' (2017) *single partner* group (43.9%) consistently reported one partner over time, providing a comparison for both our *low-increasing* and *medium-increasing* group, but not allowing for a distinction between them. Finally, Moilanen and colleagues (2010) considered age of initiation, number of partners, and condom use in their identification of sexual risk groups and identified an *increasing risk* group (29%) who, like our *low-increasing* group, showed low risk at 16 and 17 years, followed by an increase in activity from ages 18 to 22.

When psychosocial characteristics at 14 and 15 years were examined in univariate analyses, a pattern of results emerged in which the two least active groups (*abstainers* and *low-increasing*) were often comparable to each other and distinct from the two more active groups (*medium-increasing* and *multiple partners*). One way the *low-increasing* group distinguished themselves from their peers was in their experience of the fewest internalizing symptoms, suggesting that initial lower levels of distress and greater well-being may influence adolescents' decisions to have sex. These results may be understood through social clock theory (Lehnart et al., 2010), which posits that being synchronized on developmental tasks is protective and results in better well-being. Indeed, one study found that adolescents who initiated sex on time with their peers

reported more well-being than early or late starters (Haase et al., 2012). Further, another study found both early and late starting to be associated with negative long-term health outcomes (Sandfort, Orr, Hirsch, & Santelli, 2008). In this way, the absence of internalizing symptoms found in the *low-increasing* group might be reflective of their synchronization with their peers.

Multivariate analyses revealed an interesting effect for substance use: when compared to the *abstainers*, greater substance use made participants more likely to belong to the *low-increasing* group, but when compared to the *medium-increasing* group, their odds of belonging to the *low-increasing* group decreased. Otherwise put, the *low-increasing* group used more substances than the *abstainers*, but less than the *medium-increasing* group. The multiple pathways theory of sexual development (Zimmer-Gembeck and Helfand, 2008) proposes that behaviours such as alcohol or substance use are not necessarily indicative of a problematic pathway, and can be understood as normal experimentation during adolescence. Similarly, Moffitt (1993) distinguishes between those who engage in antisocial behaviour as part adolescent experimentation from those whose behaviours reflect a pattern of deviancy that will continue into young adulthood.

One of the ways the *low-increasing* group may be distinguished from their comparably active peers in the *medium-increasing* group is in their lower social competence at 14 and 15 years, which significantly differentiated group membership. This may place them at a disadvantage when seeking out sexual or romantic relationships. Conversely, their postponed initiation might reflect a decision to wait for a relationship rather than a lack of ability to engage. Indeed, Ashenhurst et al. (2017) found that being in a relationship made their least active group (*rare partner*) more likely to report a sexual partner while it decreased number of partners in their most active group (*multiple partners*). These results suggest that, for those who wait for them, romantic relationships represent an opportunity to have sex, but may be a constraint on sexual

activity for those who do not. Therefore, while similar to the *abstainers* in some ways (e.g., higher grades, more parental monitoring, less social competence), the *low-increasing* group's experimental substance use and sexual synchronization with peers may be two factors that set them apart and upon a normative pathway potentially associated with better outcomes.

At 22 years, and comparable to the *abstainers*, those in the *low-increasing* group were among the most educated. Otherwise, they were no better or worse off on any markers of psychosocial adjustment or EA developmental task achievement. By EA, participants in the *low-increasing* group were as educated as the *abstainers*, but with the advantage of having had sexual experiences and thus opportunities to better develop their sexual and romantic identities. Despite these experiences, this group was not more advanced in terms of their romantic relationship commitment. Cohabitation represents only one facet of commitment, but unlike their comparable counterparts in the *increasing risk* group (Moilanen et al., 2010), our *low-increasing* group were not more likely to cohabit with a romantic partner. Similarly, Lansford et al.'s (2009) *zero initial* group was the least likely to be married at 22. While romantic involvement was not explored beyond cohabitation, the stability of this group's sexual trajectory might be indicative of a lasting romantic relationship or a sequence of relationships. As discussed in the prior section, it is possible that not enough time had elapsed in order for differences among the groups to emerge. Given that their profile is characterized by protective factors during adolescence (e.g., higher grades, more parental monitoring, fewer internalizing symptoms), greater academic achievements during EA, and an absence of negative outcomes (e.g., do not appear more depressed, do not have problems with alcohol), it appears that the *low-increasing* group represents a normative pathway of sexual development characterized by investment in education.

4.1.3 Medium-increasing group

Our largest trajectory was the *medium-increasing* group (53%), who initiated by 16 years and consistently reported about one partner until 22. Lansford et al.'s (2010) *one-initial* group also initiated by 16 and consistently reported one partner, however they represented a much smaller proportion of their sample (14.8%). Similarly, Moilanen and colleagues' (2010) *decreasing-risk* group (10%) reported about one partner per year but was also much smaller than our *medium-increasing* group. Finally, Ashenhurst and colleagues' (2017) *single partner* group (32.7%) was more similar in size and also reported about one partner per assessment. Unlike our study however, they did not identify two moderately active groups, making our exploration of the antecedents and outcomes related to our two majority groups particularly noteworthy.

The similarities between the *low-increasing* and *medium-increasing* groups did not appear to extend beyond their sexual trajectory. At 14 and 15 years, two characteristics were unique to the *medium-increasing* group: (1) participants who achieved earlier puberty were more likely to belong to this group than to the *low-increasing* group, and (2) females were overrepresented as compared to the *abstainers*. Earlier maturing adolescents in the *medium-increasing* group might have been interested in sexual and romantic relationships sooner than their peers in the *low-increasing* group, explaining the difference in their age of initiation. Indeed, earlier puberty, particularly for females, has been consistently associated with earlier sexual initiation and number of partners (Zimmer-Gembeck and Helfand, 2008). Why were females overrepresented in this trajectory, a result mirrored by Ashenhurst et al.'s (2017) predominantly female *single partner* group? Perhaps societal double standards that discourage and shame sexual experimentation for women leads them to limit their partnerships. Another explanation might have to do with romantic involvement: early maturing females tend to affiliate with the other-sex sooner than their peers (Poulin & Pederson, 2007), which might prompt earlier romantic involvement. Moreover, gender norms and stereotypes assert

that females prioritize romantic over sexual relationships (Petersen & Hyde, 2010), providing a model for adolescent females to follow. Therefore they may be more likely to limit their sexual activity and to seek out exclusive relationships.

On all other measures at 14 and 15 years, the *medium-increasing* group was rarely distinguishable from the *multiple partners* group who, in univariate analyses, also reported lower grades, less parental monitoring, more substance use, more social competence, and more antisocial behaviour. A similar pattern is reflected in the literature: Moilanen et al.'s (2010) two more active groups (*decreasing risk* and *high risk*) reported similarly higher levels of delinquency and substance use than their less active *increasing risk* group, and Lansford et al.'s (2010) two most active groups (*one-initial* and *multiple-initial*) reported more externalizing problems and lower grades than their least active group (*zero-initial*). The characteristics of the *medium-increasing* group during adolescence suggest a greater risk of developing psychosocial problems during EA, while their majority status and synchronization with peers might serve as a protective factor. At 22 years, participants in the *medium-increasing* group seem to represent a pathway characterized by an earlier transition into adulthood. Despite their risky behaviours during adolescence (e.g., greater substance use and antisocial behaviour), they were the most likely to be working full-time and living with a romantic partner, two indications of stability. While cohabitation becomes common during EA (Halpern & Kaestle, 2014), 22 years is still young and a comparably high 25% of those in the *medium-increasing* group were cohabitating with a partner as compared to the other groups (3.7%, 16.3%, and 14.3%). How does early sexual behaviour impact later romantic involvement? Researchers have found that adolescents who engage in sex within a romantic relationship are more likely to cohabit or marry by young adulthood (Raley, Crissey, & Muller, 2007), and greater involvement with casual sex during adolescence is associated with casual and non-stable relationships during EA (Shulman et al., 2017). Early sexual encounters may shape later relationships through the development of skills needed to navigate adult sexual and romantic relationships.

Adolescent romantic relationships provide the individual with opportunities to experiment with their sexual identity, disclosure, future planning, and managing disagreements (Diamond, Savin-Williams, & Dubé, 1999). These experiences form models of sexual and romantic relationships that will be carried into adulthood, giving those who have experience an advantage over those who have none. Thus, participants in the *medium-increasing* group appear to be more advanced in terms of their romantic relationships. Our results differ from Vasilenko et al.'s (2016), who identified developmental pathways based on both sexual and dating behaviours and found cohabitation was most common among two groups totalling only 5% of their sample. These results may reflect the cultural context of Quebec's whose inhabitants are more likely than the rest of Canada to cohabit early and without ever getting married (Institut de la Statistique du Québec, 2016).

Along with their peers in the *multiple partners* group, those in the *medium-increasing* group were the least educated at 22 years. However, participants in the *medium-increasing* group were more likely to be working full-time, which, when taking into account their higher rates of cohabitation, supports the notion of an earlier transition into adulthood. While similar in their developmental antecedents during adolescence, over time the participants in the *medium-increasing* group appear to diverge from the *multiple partners* group so that by EA, they are more settled in their adult roles. The *medium-increasing* group can thus be viewed as an alternate normative pathway of sexual development in which adulthood is achieved early.

4.1.4 Multiple partners group

The second minority group we identified consistently reported the most partners and diverged considerably from the other three groups across the examined period. Similar

groups have emerged in other studies and have ranged from representing a significant minority (Ashenhurst et al., 2017, 9.3%) to more substantial groups (Lansford et al., 2010, 19.4%; Moilanen et al., 2010, 37%). Unlike Lansford et al.'s (2010) *multiple initial* group who reported a decrease after 16, the *multiple partners* group demonstrated a significant increase in number of partners over time. Trajectories defined by multiple partners report more unprotected sex (Ashenhurst et al., 2017), substance use, delinquency, and risk proneness (Moilanen et al., 2010), making it salient to explore and identify their developmental antecedents. Consistent with the literature, univariate analyses revealed that participants in the *multiple partners* group reported more substance use and antisocial behaviour at 14 and 15 years, and, combined with their lower grades and lower parental monitoring, appeared to indicate a risky developmental pathway. What makes these individuals more likely to engage in risky behaviour? Certain personality traits and belief systems have been explored as explanations: Moilanen et al.'s (2010) *high risk* group reported less self-regulation and more risk proneness than their peers with fewer partners. Risk proneness is characterized by attraction to excitement and ineffective decision-making and is related to sensation seeking, a personality trait associated with having a greater number of partners (Farley, 1991). Similarly, having more permissive attitudes towards sex has been associated with a greater number of partners (Ashenhurst, et al., 2017). These individuals might therefore be more motivated to engage in behaviours perceived as exciting (such as drinking and going to parties), made easier by the absence of parental monitoring. Indeed, the *multiple partners* group reported more alcohol consumption (included in the measure of substance use), which often overlaps with sexual activity: adolescents report using alcohol as a means of facilitating sexual experiences (Garcia, Reiber, Massey, & Merriwether, 2012).

Multivariate analyses revealed that greater social competence at 14 and 15 years made participants more likely to belong to the *multiple partners* group than to the *abstainers* and *low-increasing* groups. Buhrmester and Furman's neo-Sullivanian theory (1986)

posits that individuals learn to have their social needs met and develop crucial interpersonal skills through specific relationships, and that romantic relationships teach individuals to balance intimacy and sexuality. Traits like social competence, that facilitate such relationships, can therefore be seen as an asset. Social competence might also partially explain the association between antisocial behaviour, substance use, and sexual behaviour. According to Moffitt (1993), adolescents can perceive antisocial behaviour as a sign of independence and thus may seek them out. Adolescents who are drawn to such behaviours might seek out older peers who are more advanced in their development and experimentation; successful integration into an older peer group is likely dependant on one's social skills. Being well equipped to navigate social situations could therefore expose these adolescents to environments in which there is potential for alcohol and substance use and sexual experimentation is common (e.g., parties). Indeed, early sexual initiation has been linked with spending more time with peers and partying (Bingham & Crockett, 1996; Meschke & Silbereisen, 1997). It is possible that less socially competent adolescents (i.e., the *low-increasing* group) do not engage in these behaviours from a lack of opportunity rather than by choice. This is speculative, however, and one's desire to engage in such behaviours would need to be examined in order to explore this possibility.

The characteristics of the *multiple partners* group during adolescence appear to set them up for negative outcomes during EA. Consistent with the literature, participants in the *multiple partners* group were among the least educated at 22 years (Lansford et al., 2010; Moilanen et al., 2010). Unlike our *medium-increasing* group and Moilanen's (2010) *high risk* group who appear to undergo an earlier transition into adulthood as evidenced by higher rates of cohabitation, our *multiple partners* group was not more likely to be employed full time or be cohabitating with a partner. In terms of developmental task achievement during EA, the *multiple partners* group appears to fall behind their peers. Despite this, the only clear negative outcome identified in this group was greater problems with alcohol, and this effect was specific to females. Why do

adolescent females with more sexual partners experience greater problems with alcohol at 22 years? One explanation might have to do with casual sexual experiences (CSEs). Alcohol is a strong predictor of CSEs: one study found that nearly 80% of college students reported that alcohol contributed to the initiation of their most recent CSE (Downing-Matibag & Geisinger, 2009), while another revealed that 35% of men and women reported being very intoxicated and 9% reporting being extremely intoxicated during a recent CSE (Garcia et al., 2012). Individuals might use alcohol to excuse behaviours of which they are embarrassed, and societal double standards that shame females for their sexual experiences might make them more likely to feel the need to justify their behaviour. Indeed, adolescent girls report that an advantage to drinking alcohol is that it facilitates sexual interactions and excuses behaviour (Livingston, Bay-Cheng, Hequembourg, Testa, & Downs 2012). Adolescent girls with a greater number of partners might therefore use more alcohol than their peers, setting them on a path of cumulative risk to develop a problematic relationship with alcohol. In a similar vein, a Quebec study of 2,304 adolescents found that CSEs increased both psychological distress and alcohol use for females, but not males (Dubé et al., 2017). Vasilenko, Lefkowitz, and Welsch's (2014) theory on sexuality and health outcomes posits that internalized negative perceptions of sexual experiences can impact mental health. Therefore, due to societal double standards, adolescent females might be more likely to negatively perceive their CSEs, resulting in psychological distress. Already consuming more alcohol than their peers with fewer partners, they might be vulnerable drinking as a coping mechanism. Should this be the case, we might expect them to report more depressive symptoms, which they did not. One potential explanation for this may be that not enough time has elapsed for consequences of their risky and externalizing behaviours to emerge. As mentioned above, individuals who report more partners tend to be higher in sensation seeking and thus might demonstrate greater externalizing problems in late adolescence and emerging adulthood (e.g., more drinking, riskier sexual practices). These behaviours might not cause immediate problems or concerns for the individual but rather long term consequences that can lead

to later internalizing problems (e.g., unwanted pregnancies, sexual health problems, relationship instability). Though we did not identify more depression or lower self-esteem among this group, EA is characterized by instability and associated with high levels of depression regardless of sexual trajectory (Arnett, 2004). As such, we found very little statistical variability in our measures of depression and self-esteem.

Considering their associated risk factors during adolescence (e.g., more substance use, more antisocial behaviour, lower grades, less parental monitoring), their lack of investment in school or work at 22, and their problematic alcohol use (for females), the *multiple partners* group appears to represent a problematic sexual development pathway.

4.2 Methodological contributions

Several methodological contributions of this thesis should be recognized. First, the use of statistical analyses that identify distinct subgroups based on yearly number of partners allows for a greater understanding of developmental change over time. Owing to the complexity and heterogeneity observed in sexual development, longitudinal person-centered analyses represent the best way of capturing and describing shared pathways and identifying their unique characteristics and outcomes. Many studies have focused on timing of sexual initiation, a static variable, in order to examine outcomes related to sexual and mental health (Haase et al., 2012; Zimmer-Gembeck & Helfand 2008), and, while useful in many ways, these studies are limited in their ability to examine change over time. Longitudinally tracking number of partners to identify shared behavioural pathways allows for a more nuanced exploration of sexual development. Studies which have considered number of partners have used composite

scores of sexual risk (Moilanen et al., 2010), simultaneously considered dating behaviours (Vasilenko et al., 2016), or were assessed over three month periods (Ashenhurst et al., 2017), and have rarely solely focused on number of partners (Lansford et al., 2010).

A second strength of this thesis regards its longitudinal design and the way both predictor and outcome variables were treated. This thesis represents the only longitudinal study that identified common pathways of development based on yearly number of partners during adolescence into EA, predicted group membership by individual and family characteristics measured at 14 and 15 years, and examined psychosocial outcomes at 22 years while controlling for pre-existing characteristics. Spanning a nine-year period and following participants from early adolescence into EA with low attrition rates, this thesis used early measures of individual and family characteristics to predict sexual trajectory groups and to examine their psychosocial outcome at 22 years. Lansford et al. (2010) similarly identified predictors of groups based on yearly number of partners, however their examination of outcomes was limited and they did not factor in pre-existing behaviours and characteristics in their analyses. To ensure that differences in outcomes at 22 years were indeed due to sexual trajectory group and not pre-existing traits or behaviours, this thesis factored in characteristics measured during early adolescence. Thus, conclusions about the increased risk of developing problems with alcohol for females in the *multiple partners* group and the relationship between number of partners and educational attainment can be confidently drawn. Finally, this is the only longitudinal study of sexual pathways based on number of partners conducted on a Canadian sample, the importance of which is highlighted by the difference in the number and composition of our groups as compared to similar studies of American populations (Lansford et al., 2010; Ashenhurst et al., 2017).

4.3 Theoretical Contributions

This thesis contributes to the advancement of knowledge on adolescent sexual development and how it impacts functioning during EA in several ways. Importantly, it addresses the issue of normative versus nonnormative sexual development. The recent literature on sexual development has emphasized the importance of looking beyond negative outcomes and to considering normal and positive elements of adolescent sexuality (Tolman & McClelland, 2011). The multiple pathways model proposes that, for some, adolescent sexual behaviour follows a normative trajectory associated with positive characteristics, and predicts a group for whom sexual development is associated with other risky or deviant behaviour (Zimmer-Gembeck & Helfand, 2008). This thesis bolsters this theoretical model as four groups were identified and their unique characteristics can be seen as representing normative or nonnormative developmental pathways. To facilitate a discussion on overall trends and patterns, the groups are considered as relatively homogenous, though it should be kept in mind that results represent averages and within group differences exist. Comprising 83.9% of our sample, the *low-increasing* and *medium-increasing* groups appear to represent two different normative pathways of development. As young adolescents, the *low-increasing* group did well in school, had the fewest internalizing symptoms, and their parents were more aware of their activities and whereabouts. As suggested by their pattern of one partner per year as of age 18, they appear to be engaged in romantic relationships despite their early lower levels of social competence. At 22 years, these individuals were among the most educated and did not demonstrate any negative outcomes. During adolescence, the *medium-increasing* group achieved physical maturation sooner than their peers, did not perform as well in school, reported more substance use and antisocial behaviour, and were socially competent. As young adults this group was the most likely to be living with a romantic partner and to be working

full-time, indicating an earlier transition to adulthood. Their absence of negative outcomes at 22 years, particular in terms of alcohol use, support the notion that some experimentation with substances and deviant behaviour during adolescence is normative and not reflective of long-term behaviours or problems (Zimmer-Gembeck & Helfand, 2008; Moffitt, 1993). At 22 years, these groups are quite different from one another: the *low-increasing* group are more involved in school and thus may have to postpone certain adult roles and responsibilities (like getting married or having children), while the *medium-increasing* group appear to have already transitioned into adulthood. These results are supported by Arnett's (2001) theory of EA, which identifies a developmental period characterized by instability, exploration of the self, and which has few to no universally shared characteristics. Supporting the social clock theory (Lehnart et al., 2010), both groups were in sync with the majority of their peers and did not demonstrate negative outcomes. Thus, this thesis identified that investment in school or entering the work force early represent features of two different normative pathways, neither more adaptive than the other.

The *abstainers* and *multiple partners* groups can be considered nonnormative developmental pathways by their characteristics during adolescence and EA as well as in their desynchronization and differentiation from their peers. The literature consistently reports that adolescents tend to begin having sex between 16 and 18 years (Zimmer-Gembeck & Helfand, 2008), making the *abstainers* group distinct and nonnormative. As adolescents however, they demonstrated several positive qualities: they did well in school, reported the least substance use, engaged in little antisocial behaviour, and reported high parental monitoring. However, Buhrmester and Furman's neo-Sullivanian theory (1986) would consider their deficit of social competence a disadvantage in terms of social development, and their abstinence may reflect a difficulty in this arena. At 22 years, the *abstainers* were similar to the *low-increasing* group in their high levels of education, but without the advantage of sexual experience, and by extension, romantic experience. Early sexual and romantic experiences inform

later relationships, thus making inexperience a potential liability. Though we did not identify negative outcomes for the *abstainers* group, their desynchronization with their peers, atypical experience, and informed by the literature on adult virginity (Gesselman et al., 2017), we propose this group to represent a nonnormative pathway of development that might experience negative outcomes later during EA. The *multiple partners* group appears to reflect the more problematic pathway of development proposed by the multiple pathways model (Zimmer-Gembeck & Helfand, 2008). As adolescents, they did not do as well in school, their parents monitored them less, and they reported substance use and antisocial behaviour, though they did report higher social competence. At 22 years they did not appear professionally or romantically advanced, and females in this group reported significantly more problems with alcohol. Their high number of partners strongly suggests more CSEs, which limits opportunities to model healthy adult romantic relationships and is associated with poorer romantic outcomes in adulthood (Shulman et al., 2017). Considering the absence of positive psychosocial outcomes, the *multiple partners* group appear to represent a nonnormative pathway that might be more prone to risk and problem behaviours. As they get older, their greater substance use might lead to health and social problems, and their lack of education and professional postponement might result in fewer career choices and less earning potential in terms of salary. Thus, this thesis was both supported by and advanced theoretical models that propose distinct pathways of sexual development (Zimmer-Gembeck & Helfand, 2008) that highlight the role of synchronization with peers (Elder et al., 2003) and the diversity of experience during EA (Arnett, 2001).

Furthermore, this thesis represents the first longitudinal examination of adolescent sexual trajectories and their associated antecedents and outcomes, in a Quebec sample. The identification of cultural differences in sexual development is pertinent: while culturally similar in many ways, Canada, and more specifically Quebec, might reflect different sexual values and behaviours from the more sexually conservative United

States (as evidenced by their abstinence-based sexual education programs and legislation on birth control and reproductive rights; Weaver, Smith, & Kippax, 2005). Indeed, when compared to the methodologically similar study by Lansford and colleagues conducted on an American sample, significant differences emerge when looking at our most active groups. Specifically, our *multiple partners* group represents a significant distinction from Lansford's *multiple-initial* group in two important ways: greatest number of partners reported (more than five in our sample, less than three in Lansford's), and in change over time (our *multiple partners* reported an increase over time while the multiple-initial group decreased).

4.4 Practical implications

The results of this thesis can be practically applied to help foster positive sexual and romantic development during adolescence and EA. Three applications will be discussed: (1) sexual and romantic education in primary and high school, (2) training programs or workshops for adolescents with poor social skills, and (3) considerations for therapists working with adolescents and emerging adults. Sexual education programs that advocate for abstinence or that solely focuses on negative health outcomes associated with sexual behaviour have been criticized as ineffective and problematic. Indeed, a meta-analysis revealed that sexual education aimed at decreasing number of partners had much smaller effect sizes than those targeting safer practices (Noar, 2008), and youth who receive pragmatic and comprehensive sexual education have better sexual health outcomes than those whose education is abstinence-based (Weaver, Smith, & Kippax, 2005). Informed by the trends in sexual development research, Quebec's ministry of education launched an expansive sexual education curriculum in 2018 that spans from kindergarten through high school. Corresponding to the literature, Quebec's new curriculum does not propose postponement or

avoidance of sexual behaviour; rather, it equally covers both the risks and potential negative outcomes of sex as well as healthy sexual and romantic practices. The content of the curriculum is presented in age appropriate ways and covers a spectrum of important topics: body image, cultural messages about sex, safe sexual practices, consent, sexual violence, emotional intimacy, among others (Gouvernement du Québec, 2018). Results of this thesis could be used to inform and bolster this curriculum in two important ways. First, the role of alcohol in sexual experiences, how it impacts one's ability to advocate for one's sexual health, and how it can lead to later problems should be highlighted. Our results indicate that young females with more sexual partners are at risk of developing problems with alcohol, thus sex education should include discussions of how and why alcohol is often used with sex, and encourage adolescents to consider their personal use. Similarly, gender stereotypes and double standards should be targeted in order to decrease the likelihood that females use alcohol more than males in order to justify their sexual behaviour. Second, because communication with a partner is less likely in casual encounters (Lehmiller, VanderDrift, & Kelly, 2014), the potential impact of casual sex should be explored. Youth should be encouraged to consider what they are seeking through these experiences: if they are searching for intimacy or validation in a maladaptive way, it may be helpful for them to understand how CSEs are associated with poorer romantic outcomes.

A second way that the results of this thesis can be practically applied pertains to the *abstainers* group, particularly those who abstain from lack of opportunity rather than by choice. A certain amount of sexual and romantic involvement is expected and normalized during adolescence (Brown, 1999; Zimmer-Gembeck & Helfand, 2008) and adults who are involuntarily celibate report negative self-esteem and body image, and have poor romantic outcomes (Gesselman et al, 2017). Adolescents who have limited social skills might benefit from programs or workshops aimed at increasing their abilities to engage in social situations, thus facilitating romantic and sexual

relationships. While local private programs aimed at improving social communication exist, such as the Kiddo Active Pediatric Therapy in Montreal, Quebec does not have a public program aimed at helping these individuals improve their social skills.

Finally, therapists working with adolescents and emerging adults can consider their client's sexual trajectory and development as a way of informing directions of therapy. In order to disseminate this information to clinicians, workshops on sexual development from adolescence into emerging adulthood could cover key variables that are consistently associated with sexual behaviour and development. Clinicians can be taught to identify risk factors (e.g., lower parent-child relationship quality, antisocial behaviour) and try to limit their impact while also fostering the growth of protective factors (e.g., family warmth, educational investment, self-esteem). For instance, *abstainers* report feeling shy and ashamed of their sexual status (Donnelly et al., 2001). Their therapists could therefore initiate discussions on sexuality, body image, confidence, and loneliness, while also highlighting their strengths and identifying protective factors (i.e., academic achievement). Similarly, a therapist working with an adolescent female who reports multiple sexual partners would be wise to explore their client's alcohol use, as well as providing them with psychoeducation on the association between higher number of partners and later problems with alcohol. Finally, clients who report a history of multiple sexual partners might benefit from career counselling and an exploration of their professional aspirations.

4.5 Limitations and future research

Despite the methodological and theoretical contributions of this thesis, some limitations should be identified. Elaborated in each article, a summary of the principal limitations of this thesis will be presented. First, our sample came from one

geographical region and was relatively homogenous in terms of ethnicity and socioeconomic status, limiting the potential generalizability of our results. Further, despite low rates of attrition, our sample remained relatively small and thus our minority groups consisted of 32 and 25 participants, limiting the statistical power of our analyses. Indeed, while our effect sizes were small, this is consistent with similar research (Haase et al., 2012; Spriggs & Halpern, 2008). Related to sampling issues, our trajectories begin at the age of 16 when 60% of participants had already initiated sex. Timing of sexual debut has been associated with other sexual behaviours and patterns, and thus we might have gained further insight had we included earlier time points in the analyses. However, results of family studies suggest that the negative health outcomes associated with early initiation can be accounted for by familial factors (e.g., genetics, living in an unstable household, parental traits; Roche, Mekos, Alexander, Astone, Bandeen-Roche, Ensminger, 2005), and twins who initiate at different times are comparable on several health outcomes including alcohol abuse/dependence, current depressive symptoms, and criminal offending (Donahue, Lichtenstein, Langstrom, & D'Onofrio, 2013). The decision to begin the trajectories at 16 years was logistical and not theoretical, however, as in all longitudinal studies we were limited to what had been already collected.

The operationalization of our primary variable of interest, number of sexual partners, generated three important limitations. First, we did not ask participants to name their partners and thus cannot know whether they are reporting the same or different partners every year. Thus, an individual with the same partner every year – likely indicating a romantic relationship - was considered alongside one who had a different partner every year. These two individuals might represent qualitatively different pathways of sexual development and further research should consider tracking partners over time. Second, participants were asked about ‘complete’ sexual experiences (defined by vaginal penetration) with members of the other sex, introducing the potential of heteronormative biases. An unfortunate reality of longitudinal research in this field lies

in the collection of data during periods that were not yet considering the experiences of sexual-minority youth, and thus we were limited to a heteronormative lens. Though we did not specifically ask about same-sex partnerships in the identification of the trajectories, we retroactively conducted analyses in order to consider the impact of this exclusion. However, future research should consider sexual orientation and same-sex partnerships as it is possible that LGBTQ youth experience different sexual developmental pathways than hetero-normative youth. And third, defining sexual partnerships by vaginal penetration disregards those who engaged in non-penetrative sex, creating a potentially arbitrary division. Most of our measures were self-reported which could have led to a bias in the results. As such, future research could include teacher (e.g., social competence in the classrooms) and parental assessments (e.g., internalizing symptoms, antisocial behaviour, parental monitoring).

Moreover, our measures related to alcohol (frequency of use at 14 and 15 years and problems with alcohol at 22 years) were not validated instruments. When participants were adolescents, our interest was in frequency of use and thus we felt it appropriate to use one item from a battery of questions about their substance use. Similarly, though our measure of problems with alcohol at 22 years contained items related to dependence and abuse, it was not intended to diagnose but rather provide a general picture of difficulties participants may have encountered associated to their drinking. While we believe these measures to be adequate in capturing a sense of our participants' alcohol use, future studies should use validated measures in order to eliminate potential biases. Finally, our examination of outcome variables did not extend beyond the period covered by the sexual trajectories, thereby potentially overlooking differences that may emerge in later years.

Future research should include follow up assessments later during EA in order to allow potential effects time to develop and emerge. Further, follow up studies could use a different statistical approach to broaden and deepen our understanding of our results.

For instance, supplementing our trajectory analyses with a second set of parametric analyses could be informative in elucidating the associations we identified between certain variables and number of sexual partners. For example, we found that those in the multiple partners group reported more social competence; 6 curve analyses could be applied to further explore how an individual's initial levels and change over time in social competence is related to their number of partners. Related to the identification of antecedents of sexual trajectory groups, it would be interesting to include social variables in addition to individual and family characteristics. It is well known that adolescents are influenced by their friends' attitudes and behaviours, making it pertinent to explore how their social relationships might impact their sexual experiences. Gender composition of friendship network, whether or not close friends are sexually active, sexual communication, and attitudes about sex are variables that future researchers can consider in exploring social correlates of sexual development trajectories.

Additionally, researchers should consider examining motivations to have sex. This could provide a differentiation among the *abstainers* and might shed light on the role of social competence in sexual involvement. Exploring motivations to have sex might also be an avenue in which to identify normative from nonnormative pathways, as those motivated by external or negative factors (e.g., pressure from a partner) might experience their sexuality differently from those who are intrinsically motivated (e.g., pleasure or intimacy with partner). Similarly, sexual abuse and unwanted experiences could be examined in relation to sexual trajectory and intimate partner violence. While these topics were beyond the scope of this thesis, they were examined as potential confounds in supplemental analyses and no differences among our groups were identified. Future research might also consider the mechanisms by which sexual involvement is associated with academic disinvestment. To do so, academic and professional aspirations can be measured and tracked alongside sexual experience. Romantic and sexual outcomes should be considered in order to explore how early

sexual and romantic experiences might provide positive learning opportunities or set up negative patterns of involvement. More specifically, relationship quality and healthy sexual practices could be examined, and individuals can be asked how they believe they have learned specific skills (e.g., communicating one's needs, conflict resolution, advocating for use of protection).

CONCLUSION

Interest in understanding adolescent sexual development has evolved in recent years to include positive and normative elements of experience. This thesis sought to add to the growing literature that explores differential pathways and characteristics of sexual behaviour associated with favourable or negative outcomes. The results of this thesis help to advance our theoretical understanding of what might be considered normative sexual development. To do so, yearly number of partners was used to identify distinct behavioural trajectories from adolescence into EA, and developmental antecedents and outcomes were explored. The identification of four unique groups, two considered normative and two nonnormative, demonstrates the heterogeneity of sexual development and the importance of considering multiple facets of behaviours and experiences. We identified two distinct pathways of normal development distinguished by their characteristics in EA: one that appears to prioritize school and another that

experienced an early transition into adulthood. Contrary to early research on sexual development and sexual education programs that highlighted negative consequences of sexual behaviour, our results indicate that, when it comes to sexual development, one size does not fit all. Our nonnormative groups represent two very different ways that individuals can deviate from their peers, one characterized by its complete lack of involvement and the other by its over-involvement. The identification of two unique pathways associated with both normative and nonnormative experience add nuance to the literature and bolsters the multiple pathways model of sexual development (Zimmer-Gembeck & Helfand, 2008). Moreover, it lends support to social clock theory and the concept of synchronization with one's peers as the two normative groups represented the majority of our sample (Elder et al., 2003; Lehnart et al., 2010). Finally, the results of this thesis can be practically applied to sexual education in childhood and adolescence as well as in therapeutic interventions during EA.

Despite its contribution to our understanding of sexual development, certain limitations of this thesis should be considered. A homogenous sample, the use of self-reported measures, and the absence of tracking the names of partners limit generalizability and the conclusions that can be drawn. Future research should focus on identifying the mechanisms by which these pathways differentiate from one another as well as follow participants over a longer period of time in order to examine psychosocial outcomes that might emerge later during EA.

APPENDIX A

CONSENT FORM



FORMULAIRE DE CONSENTEMENT

Je, soussigné(e), ai pris connaissance du projet de recherche mené sous la direction de François Poulin de l'Université du Québec à Montréal. Il s'agit de la poursuite d'un projet auquel je participe depuis 2001 et se déroulera selon les mêmes conditions. Les objectifs de ce projet sont: 1) de mieux comprendre les façons dont les jeunes adultes choisissent d'occuper leur temps libre et d'examiner l'impact de ces activités sur leur développement et 2) d'examiner les liens entre ces activités, les relations familiales, amicales et les habitudes de vie au début de l'âge adulte.

Par la présente, j'accepte de prendre part à une entrevue téléphonique et de répondre à des questionnaires au printemps 2010. L'entrevue téléphonique et les questionnaires porteront sur mes activités de loisir, mes habitudes de vie, mon comportement et mes relations familiales et amicales et prendront en tout environ une heure de mon temps. De plus, j'autorise les responsables du projet à compiler tous mes résultats scolaires du secondaire, du cégep et de l'université en consultant les dossiers du Ministère de l'éducation du Québec.

Suite à ma participation au projet, je recevrai un montant de 40\$ et je participerai au tirage de 4 ipod.

L'information recueillie restera strictement confidentielle et ne servira qu'aux fins du présent projet. Toute l'information sera recueillie à partir d'un numéro de code qui servira à m'identifier. Les données recueillies pendant cette recherche seront analysées seulement par les responsables de l'équipe de recherche. Seulement des statistiques de groupe feront l'objet d'interprétations. Aucune analyse individuelle ne sera menée. Enfin, il m'est possible en tout temps de me retirer du projet sans que cela me cause préjudice.

Ce projet de recherche a reçu l'approbation du Comité institutionnel d'éthique de la recherche avec des êtres humains de l'UQAM (CIÉR). Dans une situation d'inobservance des engagements des chercheurs à mon égard, je peux faire valoir ma situation auprès du Président du CIÉR, Dr. Joseph Josy Lévy. Il peut être joint au numéro 987-3000 # 4483 ou par l'intermédiaire du secrétariat du Comité au numéro 987-3000 # 7753.

Prendre note que toute question peut être adressée au laboratoire de François Poulin (514-987-3000 poste 3555), Département de psychologie, Université du Québec à Montréal

J'ACCEPTE de participer au projet de recherche selon les conditions formulées dans la présente lettre.

Votre nom (en lettres moulées) : _____

Votre signature

Date

APPENDICES B

QUESTIONNAIRES

- B.1 Number of yearly sexual partners, ages 16 - 22
- B.2 Pubertal timing, 13 years
- B.3 Family structure, 14 years
- B.4 Substance use, 14 and 15 years
- B.5 Antisocial behaviour, 14 and 15 years
- B.6 Internalizing symptoms, 14 and 15 years
- B.7 Social competence, 14 and 15 years
- B.8 Academic performance, 14 and 15 years
- B.9 Parental Monitoring, 14 and 15 years
- B.10 Highest education, 22 years
- B.11 Full time employment, 22 years
- B.12 Cohabitation with romantic partner, 22 years
- B.13 Problems with alcohol, 22 years
- B.14 Depressive symptoms, 22 years
- B.15 Self-esteem, 22 years

B.1 Number of yearly sexual partners, ages 16 – 22

For girls:

3a. As-tu déjà eu une relation sexuelle complète (**avec pénétration vaginale**) avec un garçon? 1 Non 2 Oui

3e. **Au cours de la dernière année**, combien de garçons différentes as-tu eu comme partenaire(s) sexuel(s)? _____ garçon(s)

For boys:

3a. As-tu déjà eu une relation sexuelle complète (**avec pénétration vaginale**) avec une fille? 1 Non 2 Oui

3e. **Au cours de la dernière année**, combien de filles différentes as-tu eu comme partenaire(s) sexuelle(s)? _____ fille(s)

B.2 Pubertal timing, 13 years

Échelle de développement physique (garçons)

Tous les garçons changent et se développent physiquement, mentalement et émotionnellement avec l'âge. À l'adolescence, la croissance et le développement de ton corps est une étape importante vers l'âge adulte. Il est normal que ces changements physiques arrivent à différents moments selon les personnes. Nous sommes intéressés à savoir quels sont les changements qui se produisent habituellement chez les garçons de ton âge. Nous aimerions que tu répondes à quelques questions au sujet de ta croissance et de ton développement physique.

En répondant à ces questions, il est important de te souvenir que tes réponses resteront confidentielles. Aucun(e) de tes ami(e), professeurs ou autre personne ne connaîtront tes réponses. Donc, soit le plus honnête possible, cela nous aidera à en connaître plus au sujet des garçons de ton âge.

Souviens-toi de bien lire les directives et chacune des questions attentivement.

N'OUBLIE PAS : TOUTES TES RÉPONSES RESTERONT SECRÈTES

COMMENT RÉPONDRE AUX QUESTIONS

SECTION 1 : Pour chaque question, encercle le chiffre correspondant à la réponse qui décrit le mieux ce qui t'arrive. S'il te plaît, n'encercle qu'une réponse par question.

1. **Dirais-tu que l'augmentation de ta taille (grandeur) :**
 1. N'a pas encore débuté.
 2. A à peine débuté.
 3. A définitivement débuté.
 4. Semble complété.
2. **Et au sujet de la poussée de ton poil (en dessous des bras, sur le pubis (autour des organes génitaux). Dirais-tu que :**
 1. Ton poil n'a pas encore commencé à pousser.
 2. Ton poil a à peine commencé à pousser.
 3. Ton poil a définitivement commencé à pousser.
 4. La poussée de ton poil semble complétée.
3. **As-tu remarqué des changements au niveau de ta peau? (apparition de boutons d'acné)**
 1. Pas encore de changement.
 2. Les changements commencent à peine.
 3. Les changements ont vraiment débuté.
 4. Les changements semblent terminés.
4. **As-tu remarqué si le ton de ta voix a changé (plus grave)?**
 1. Elle n'a pas encore commencé à changer.
 2. Elle a à peine commencé à changer.
 3. Elle a vraiment commencé à changer.
 4. Le changement de la voix semble terminé.
5. **As-tu commencé à avoir des poils sur le visage?**
 1. Les poils n'ont pas encore commencé à pousser.
 2. Les poils ont à peine commencé à pousser.
 3. Les poils ont vraiment commencé à pousser.
 4. La poussée des poils semble terminée.

SECTION 2 : Pour répondre à chaque question, complète l'espace avec la meilleure réponse que tu peux donner.

1. **Quelle taille (grandeur) as-tu?**
Grandeur : _____ (en mètre) ou _____ (en pieds)
2. **Quel est ton poids?**
Poids : _____ (en kilogrammes) ou _____ (en livres)

Échelle de développement physique (filles)

Toutes les filles changent et se développent physiquement, mentalement et émotionnellement avec l'âge. À l'adolescence, la croissance et le développement de ton corps est une étape importante vers l'âge adulte. Il est normal que ces changements physiques arrivent à différents moments selon les personnes. Nous sommes intéressés à savoir quels sont les changements qui se produisent habituellement chez les filles de ton âge. Nous aimerions que tu répondes à quelques questions au sujet de ta croissance et de ton développement physique.

En répondant à ces questions, il est important de te souvenir que tes réponses resteront confidentielles. Aucun(e) de tes ami(e), professeurs ou autre personne ne connaîtront tes réponses. Donc, soit le plus honnête possible, cela nous aidera à en connaître plus au sujet des filles de ton âge.

Souviens-toi de bien lire les directives et chacune des questions attentivement.

N'OUBLIE PAS : TOUTES TES RÉPONSES RESTERONT SECRÈTES

COMMENT RÉPONDRE AUX QUESTIONS

SECTION 1 : Pour chaque question, encercle le chiffre correspondant à la réponse qui décrit le mieux ce qui t'arrive. S'il te plaît, n'encercle qu'une réponse par question.

1. **Dirais-tu que l'augmentation de ta taille (grandeur) :**
 1. N'a pas encore débuté.
 2. A à peine débuté.
 3. A définitivement débuté.
 4. Semble complété.
2. **Et au sujet de la poussée de ton poil (en dessous des bras, sur le pubis (autour des organes génitaux) Dirais-tu que :**
 1. Ton poil n'a pas encore commencé à pousser.
 2. Ton poil a à peine commencé à pousser.
 3. Ton poil a définitivement commencé à pousser.
 4. La poussée de ton poil semble complétée.
3. **As-tu remarqué des changements au niveau de ta peau? (apparition de boutons d'acné)**
 1. Pas encore de changement.
 2. Les changements commencent à peine.
 3. Les changements ont vraiment débuté.
 4. Les changements semblent terminés.
4. **Est-ce que ta poitrine a commencé à se développer?**
 1. Elle n'a pas encore commencé.
 2. Elle a à peine commencé.
 3. Elle a vraiment commencé.
 4. Le développement de la poitrine semble terminé.
5. **As-tu commencé à avoir tes menstruations ?**
 1. Oui.
 2. Non.

Si ta réponse est oui, quel âge avais-tu lors de tes premières menstruations?

Âge : ____ ans et ____ mois.

SECTION 2 : Pour répondre à chaque question, complète l'espace avec la meilleure réponse que tu peux donner.

6. **Quelle taille (grandeur) as-tu?**

Grandeur : _____ (en mètre) ou _____ (en pieds)

7. **Quel est ton poids?**

Poids : _____ (en kilogrammes) ou _____ (en livres)

B.3 Family structure, 14 years

Qu'est-ce qui décrit le mieux la **situation actuelle de tes parents biologiques** ?

- ☐ Mes parents vivent ensemble et ne sont pas séparés ni divorcés.
- ☐ Mes parents sont divorcés ou séparés et tous les deux vivent seuls.
- ☐ Mes parents sont divorcés ou séparés et ma mère vit avec un nouveau conjoint.
- ☐ Mes parents sont divorcés ou séparés et mon père vit avec une nouvelle conjointe.
- ☐ Mes parents sont divorcés ou séparés et tous les deux vivent avec de nouveaux conjoints.
- ☐ Mon père est décédé.
- ☐ Ma mère est décédée.
- ☐ Mes deux parents sont décédés.
- ☐ Autre situation (précise) : _____

B.4 Substance use, 14 and 15 years

3. Combien de fois as-tu bu des consommations alcoolisées (ex: bière, vin, fort, etc) dans le but de te saouler au cours du DERNIER MOIS?

0 1 2 3 4 5 6 7 8 9 10 11-20 21-40 41 et plus

-
4. Combien de fois as-tu pris de la *marijuana ou du haschich* au cours du DERNIER MOIS?

0 1 2 3 4 5 6 7 8 9 10 11-20 21-40 41 et plus

B.6 Internalizing symptoms, 14 and 15 years

Il arrive que les jeunes n'aient pas toujours les mêmes sentiments et les mêmes idées. La prochaine section te donne une liste par groupe de sentiments et d'idées. Dans chaque groupe, choisis UNE phrase, celle qui décrit le mieux ce que tu as fait, ressenti ou pensé au cours des DEUX DERNIÈRES SEMAINES. Il n'y a pas de bonne ou de mauvaise réponse. Choisis seulement la phrase qui décrit le mieux ta manière d'être des derniers temps. Noircis la case qui correspond à la phrase que tu as choisie. Souviens-toi, choisis la phrase qui décrit tes sentiments et tes idées au cours des DEUX DERNIÈRES SEMAINES. (1 choix par question).

-
- | | |
|----|--|
| 1. | <input type="radio"/> Je suis triste de temps en temps.
<input type="radio"/> Je suis triste très souvent.
<input type="radio"/> Je suis triste tout le temps. |
|----|--|
-
- | | |
|----|--|
| 2. | <input type="radio"/> Rien ne marchera jamais bien pour moi.
<input type="radio"/> Je ne suis pas sûr(e) que tout marchera bien pour moi.
<input type="radio"/> Tout marchera bien pour moi. |
|----|--|
-
- | | |
|----|---|
| 3. | <input type="radio"/> Je réussis presque tout ce que je fais.
<input type="radio"/> Je rate beaucoup de choses.
<input type="radio"/> Je rate tout. |
|----|---|
-
- | | |
|----|--|
| 4. | <input type="radio"/> Des tas de choses m'amuse.
<input type="radio"/> Peu de choses m'amuse.
<input type="radio"/> Rien ne m'amuse. |
|----|--|
-
- | | |
|----|--|
| 5. | <input type="radio"/> Je suis désagréable tout le temps.
<input type="radio"/> Je suis souvent désagréable.
<input type="radio"/> Je suis désagréable de temps en temps. |
|----|--|
-
- | | |
|----|---|
| 6. | <input type="radio"/> De temps en temps, je pense que des choses désagréables vont m'arriver.
<input type="radio"/> J'ai peur que des choses désagréables m'arrivent.
<input type="radio"/> Je suis sûr(e) que des choses horribles vont m'arriver. |
|----|---|
-
- | | |
|----|--|
| 7. | <input type="radio"/> Je me déteste.
<input type="radio"/> Je ne m'aime pas.
<input type="radio"/> Je m'aime bien. |
|----|--|
-
- | | |
|----|---|
| 8. | <input type="radio"/> Tout ce qui ne va pas est de ma faute.
<input type="radio"/> Bien souvent, ce qui ne va pas est de ma faute.
<input type="radio"/> Ce qui ne va pas n'est généralement pas de ma faute. |
|----|---|
-
- | | |
|----|---|
| 9. | <input type="radio"/> J'ai envie de pleurer à tous les jours.
<input type="radio"/> J'ai souvent envie de pleurer.
<input type="radio"/> J'ai envie de pleurer de temps en temps. |
|----|---|
-
- | | |
|-----|---|
| 10. | <input type="radio"/> Il y a tout le temps quelque chose qui me tracasse / travaille.
<input type="radio"/> Il y a souvent quelque chose qui me tracasse / travaille.
<input type="radio"/> Il y a de temps en temps quelque chose qui me tracasse / travaille. |
|-----|---|
-
- | | |
|-----|--|
| 11. | <input type="radio"/> J'aime bien être avec les autres.
<input type="radio"/> Souvent, je n'aime pas être avec les autres.
<input type="radio"/> Je ne veux jamais être avec les autres. |
|-----|--|
-
- | | |
|-----|---|
| 12. | <input type="radio"/> Je n'arrive pas à me décider entre plusieurs choses.
<input type="radio"/> J'ai du mal à me décider entre plusieurs choses.
<input type="radio"/> Je me décide facilement entre plusieurs choses. |
|-----|---|

13. ☐ Je me trouve bien physiquement.
☐ Il y a des choses que je n'aime pas dans mon physique.
☐ Je me trouve laid(e).
-
14. ☐ Je dois me forcer tout le temps pour faire mes devoirs.
☐ Je dois me forcer souvent pour faire mes devoirs.
☐ Cela ne me pose pas de problèmes de faire mes devoirs.
-
15. ☐ J'ai toujours du mal à dormir la nuit.
☐ J'ai souvent du mal à dormir la nuit.
☐ Je dors plutôt bien.
-
16. ☐ Je suis fatigué(e) de temps en temps.
☐ Je suis souvent fatigué(e).
☐ Je suis tout le temps fatigué(e).
-
17. ☐ La plupart du temps, je n'ai pas envie de manger.
☐ Souvent, je n'ai pas envie de manger.
☐ J'ai plutôt bon appétit.
-
18. ☐ Je ne m'inquiète pas quand j'ai mal quelque part.
☐ Je m'inquiète souvent quand j'ai mal quelque part.
☐ Je m'inquiète toujours quand j'ai mal quelque part.
-
19. ☐ Je ne me sens pas seul(e).
☐ Je me sens souvent seul(e).
☐ Je me sens toujours seul(e).
-
20. ☐ Je ne m'amuse jamais à l'école.
☐ Je m'amuse rarement à l'école.
☐ Je m'amuse souvent à l'école.
-
21. ☐ J'ai beaucoup d'amis.
☐ J'ai quelques amis, mais je voudrais en avoir plus.
☐ Je n'ai aucun ami.
-
22. ☐ Mes résultats scolaires sont bons.
☐ Mes résultats scolaires ne sont pas aussi bons qu'avant.
☐ J'ai de très mauvais résultats dans des matières dans lesquelles j'avais l'habitude de bien réussir.
-
23. ☐ Je ne fais jamais aussi bien que les autres.
☐ Je peux faire aussi bien que les autres si je veux.
☐ Je ne fais ni mieux, ni plus mal que les autres.
-
24. ☐ Personne ne m'aime vraiment.
☐ Je me demande si quelqu'un m'aime.
☐ Je suis sûr(e) que quelqu'un m'aime.
-
25. ☐ Je fais généralement ce qu'on me dit.
☐ La plupart du temps, je ne fais pas ce qu'on me dit.
☐ Je ne fais jamais ce qu'on me dit.
-
26. ☐ Je m'entends bien avec les autres.
☐ Je me bagarre souvent.
☐ Je me bagarre tout le temps.

B.7 Social competence, 14 and 15 years

The social competence subscale of the Self-Perception Profile for Adolescents (Harter, 1985) is comprised of the following items: 2, 5, 8, 11, and 14.

SECTION 4: QUI SUIS-JE

Indique jusqu'à quel point les énoncés suivants sont semblables ou non à toi. Tout d'abord, identifie quel groupe de jeunes te ressemble le plus (ceux de droite ou ceux de gauche) à chacune des questions. Ensuite, indique s'ils sont « tout à fait » ou « un peu » comme toi. ATTENTION ! Il est important de ne pas cocher des deux côtés pour une même question. Il faut qu'il y ait une seule réponse par question et tu peux changer de côté d'une question à l'autre.

TOUT A FAIT comme moi	UN PEU comme moi
--------------------------------	------------------------

UN PEU comme moi	TOUT A FAIT comme moi
------------------------	--------------------------------

Fais comme dans l'exemple qui suit :

		MAIS				
TOUT A FAIT comme moi	UN PEU comme moi			UN PEU comme moi	TOUT A FAIT comme moi	
<input type="radio"/>	<input type="radio"/>	Certains jeunes préfèrent aller au cinéma dans leur temps libre.		D'autres préfèrent aller à des événements sportifs.	<input type="radio"/>	<input type="radio"/>
1. <input type="radio"/>	<input type="radio"/>	Certains jeunes trouvent qu'ils sont aussi intelligents que les jeunes de leur âge.	MAIS	D'autres jeunes n'en sont pas si sûrs et se demandent s'ils sont aussi intelligents.	<input type="radio"/>	<input type="radio"/>
2. <input type="radio"/>	<input type="radio"/>	Certains jeunes trouvent difficile de se faire des ami(e)s.	MAIS	D'autres jeunes trouvent très facile de se faire des ami(e)s.	<input type="radio"/>	<input type="radio"/>
3. <input type="radio"/>	<input type="radio"/>	Certains jeunes sont souvent déçus d'eux-mêmes.	MAIS	D'autres sont passablement satisfaits d'eux-mêmes.	<input type="radio"/>	<input type="radio"/>
4. <input type="radio"/>	<input type="radio"/>	Certains jeunes sont très lents à finir leurs travaux d'école.	MAIS	D'autres jeunes peuvent faire leurs travaux rapidement.	<input type="radio"/>	<input type="radio"/>
5. <input type="radio"/>	<input type="radio"/>	Certains jeunes ont beaucoup d'ami(e)s.	MAIS	D'autres jeunes n'ont pas beaucoup d'ami(e)s.	<input type="radio"/>	<input type="radio"/>
6. <input type="radio"/>	<input type="radio"/>	Certains jeunes n'aiment pas la façon qu'ils mènent leur vie.	MAIS	D'autres jeunes aiment la façon qu'ils mènent leur vie.	<input type="radio"/>	<input type="radio"/>
7. <input type="radio"/>	<input type="radio"/>	Certains jeunes réussissent très bien leurs travaux scolaires.	MAIS	D'autres jeunes ne réussissent pas très bien leurs travaux scolaires.	<input type="radio"/>	<input type="radio"/>
8. <input type="radio"/>	<input type="radio"/>	Certains jeunes sont un peu plus difficiles à aimer	MAIS	D'autres sont vraiment faciles à aimer.	<input type="radio"/>	<input type="radio"/>

TOUT A FAIT comme moi	UN PEU comme moi				UN PEU comme moi	TOUT A FAIT comme moi
9. <input type="radio"/>	<input type="radio"/>	Certains jeunes sont la plupart du temps contents d'eux-mêmes.	MAIS	D'autres sont souvent mécontents d'eux-mêmes.	<input type="radio"/>	<input type="radio"/>
10. <input type="radio"/>	<input type="radio"/>	Certains jeunes ont de la difficulté à solutionner des problèmes présentés en classe.	MAIS	D'autres jeunes peuvent presque toujours solutionner les problèmes présentés en classe.	<input type="radio"/>	<input type="radio"/>
11. <input type="radio"/>	<input type="radio"/>	Certains jeunes sont populaires auprès des autres jeunes de leur âge.	MAIS	D'autres jeunes ne sont pas très populaires.	<input type="radio"/>	<input type="radio"/>
12. <input type="radio"/>	<input type="radio"/>	Certains jeunes aiment le genre de personne qu'ils sont.	MAIS	D'autres jeunes aimeraient être quelqu'un d'autre.	<input type="radio"/>	<input type="radio"/>
13. <input type="radio"/>	<input type="radio"/>	Certains jeunes trouvent qu'ils sont pas mal intelligents.	MAIS	D'autres se questionnent à savoir s'ils sont réellement intelligents.	<input type="radio"/>	<input type="radio"/>
14. <input type="radio"/>	<input type="radio"/>	Certains jeunes se sentent acceptés par les autres.	MAIS	D'autres jeunes souhaiteraient que plus de personnes de leur âge les acceptent.	<input type="radio"/>	<input type="radio"/>
15. <input type="radio"/>	<input type="radio"/>	Certains jeunes sont très heureux d'être comme ils sont.	MAIS	D'autres jeunes voudraient être différents.	<input type="radio"/>	<input type="radio"/>

B.8 Academic performance, 14 and 15 years

Schools provided us with records of participants' grades.

B.9 Parental Monitoring, 14 and 15 years

Les prochaines questions portent sur toi et tes parents. N'oublie pas, il n'y a pas de bonne ou de mauvaise réponse. Prends bien le temps de lire TOUTE la phrase avant de répondre. Encerle la réponse qui correspond le plus à ta situation.

	Jamais ou presque jamais 1	Occasionnellement 2	Quelquefois 3	Souvent 4	Toujours ou presque toujours 5
1. Est-ce que tes parents savent ce que tu fais dans tes temps libres ?	1	2	3	4	5
2. Est-ce que tes parents savent qui sont les amis que tu fréquentes durant tes temps libres ?	1	2	3	4	5
3. Est-ce que tes parents savent quel genre de devoir tu dois faire habituellement ?	1	2	3	4	5
4. Est-ce que tes parents savent comment tu dépenses ton argent ?	1	2	3	4	5
5. Est-ce que tes parents savent quand tu as un examen ou un travail à remettre ?	1	2	3	4	5
6. Est-ce que tes parents savent comment tu réussis à l'école ?	1	2	3	4	5
7. Est-ce que tes parents savent où tu vas quand tu sors le soir avec des amis ?	1	2	3	4	5
8. Est-ce que tes parents savent où tu vas après l'école et ce que tu fais ?	1	2	3	4	5
9. Dans le dernier mois, est-ce qu'il est arrivé que tes parents n'aient aucune idée de l'endroit où tu étais le soir ?	1	2	3	4	5

B.10 Highest education, 22 years

SECTION 4 : Cheminement scolaire**1a. Quel est le dernier (plus récent) diplôme d'étude que tu as obtenu?**

- ☐ Aucun diplôme
- ☐ DEP (Diplôme d'études professionnelles)
- ☐ ASP (Attestation de spécialisation professionnelle)
- ☐ DES (Diplôme d'études secondaires)
- ☐ AEC (Attestation d'études collégiales)
- ☐ DEC (général)
- ☐ DEC (technique/professionnel)
- ☐ Certificat/mineure universitaire
- ☐ Majeure universitaire
- ☐ Autre (préciser niveau + nb de crédits ou nb d'heures): _____

B.11 Full time employment, 22 years

Quel est ton statut d'emploi?

- | | |
|--|---|
| <input type="checkbox"/> Travailleur(se) autonome | <input type="checkbox"/> Mis(e) à pied temporairement |
| <input type="checkbox"/> Travailleur(se) à temps plein | <input type="checkbox"/> Homme / femme au foyer |
| <input type="checkbox"/> Travailleur(se) à temps partiel | <input type="checkbox"/> Etudiant(e) (sans emploi) |
| <input type="checkbox"/> Travailleur(se) saisonnier | <input type="checkbox"/> Autre (spécifiez) : _____ |
| <input type="checkbox"/> Sans emploi | |
| <input type="checkbox"/> Invalide | |

B.12 Cohabitation with romantic partner, 22 years

Est-ce que tu **as présentement** un chum / une blonde ?

1. Non

2. Oui

Si oui, inscris son nom ici :

Est-ce que tu habites avec cette personne?

1 Oui

2 Non

B.13 Problems with alcohol, 22 years

Les prochaines questions concernent ta consommation de *n'importe quel alcool*. Pense à toutes les fois où tu as consommé de l'alcool, PAS SEULEMENT DANS LES TROIS DERNIERS MOIS. Il est possible que certaines questions ne s'appliquent pas, mais nous devons tout de même les poser.

	Jamais	1 fois	2 fois	3 à 5 fois	Plus de 5 fois
16. Combien de fois as-tu bu 5 consommations en ligne?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. Combien de fois as-tu bu 3 ou 4 consommations en ligne?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17a. Combien de fois as-tu bu 12 consommations ou plus en ligne?					
18. As-tu déjà essayé d'arrêter de consommer de l'alcool pour te rendre compte que tu n'étais pas capable?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. Es-tu déjà allé(e) à l'école ou au travail lorsque tu étais soûl(e)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. As-tu déjà été soûl(e) dans une place publique?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. As-tu déjà eu des problèmes à l'école ou au travail à cause de l'alcool? (manquer à tes obligations)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. T'es-tu déjà évanoui(e) à cause de l'alcool?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. As-tu déjà vomi à cause de l'alcool?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. As-tu déjà perdu ou brisé des choses sous l'effet de l'alcool?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24a. Est-ce que quelqu'un près de toi t'a déjà dit qu'il/elle était inquiet à cause de ta consommation d'alcool?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24b. T'es-tu déjà fait arrêté parce que tu conduisais en état d'ébriété?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24c. As-tu déjà eu des difficultés psychologiques à cause de ta consommation d'alcool?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24d. Est-ce que ta consommation d'alcool a déjà nui à tes relations avec ta famille?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24e. As-tu l'impression que la même quantité d'alcool a maintenant moins d'effet sur toi?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24f. Est-ce que ta consommation d'alcool a déjà nui à une de tes amitiés ou à ta relation amoureuse?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24g. As-tu déjà parlé de ta consommation d'alcool à un intervenant?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24h. Est-ce que ta consommation d'alcool a nui à ta santé physique?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

B.14 Depressive symptoms, 22 years

DIRECTIVES: Pour chacune des affirmations suivantes, noircis le cercle qui décrit le mieux à quelle fréquence tu t'es senti(e) de cette façon au cours de la DERNIERE SEMAINE.

Au cours de la DERNIERE SEMAINE...	Rarement ou jamais (0-1 jour)	Quelques fois ou peu souvent (1-2 jours)	A l'occasion ou de façon modérée (3-4 jours)	La plupart du temps ou tout le temps (5-7 jours)
1. J'étais embêté(e) par des choses qui d'habitude ne me dérangent pas.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Je n'ai pas eu envie de manger; je n'avais pas beaucoup d'appétit.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Je sentais que j'étais incapable de sortir de ma tristesse même avec l'aide de ma famille et de mes amis.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Je me sentais aussi bon que les autres gens.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. J'avais de la difficulté à me concentrer sur les choses que je faisais.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Je me sentais déprimé(e).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Je sentais que tout ce que je faisais me demandait un effort.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. J'avais de l'espoir face à l'avenir.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Je pensais que ma vie était un échec.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. J'étais craintif(ve).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. J'avais un sommeil agité.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Je me sentais heureux (se).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. Je parlais moins que d'habitude.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Je me sentais seul (e).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. Les gens étaient peu aimables avec moi.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. Je prenais plaisir à la vie.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. J'ai eu des crises de larmes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. Je me sentais triste.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. J'avais l'impression que les gens ne m'aimaient pas.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. J'avais de la misère à "démarrer".	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

B.15 Self-esteem, 22 years

Les énoncés qui suivent décrivent les sentiments que les gens peuvent parfois ressentir. Indique la fréquence à laquelle tu ressens les sentiments suivants. Pour chacun des énoncés suivants, indique la réponse qui te convient le mieux.

	Tout à fait en désaccord	Plutôt en désaccord	Plutôt d'accord	Tout à fait d'accord
1. Je pense que je suis quelqu'un de valable, du moins que je vaud autant que les autres.	0	1	2	3
2. Je pense que je possède un certain nombre de belles qualités.	0	1	2	3
3. Tout bien considéré, j'ai tendance à penser que je suis un(e) raté(e).	0	1	2	3
4. Je suis capable de faire les choses aussi bien que les autres.	0	1	2	3
5. J'ai peu de raisons d'être fière de moi.	0	1	2	3
6. J'ai une attitude positive envers moi-même.	0	1	2	3
7. Dans l'ensemble, je suis satisfait(e) de moi.	0	1	2	3
8. J'ai de la difficulté à m'accepter comme je suis.	0	1	2	3
9. Parfois je me sens vraiment inutile.	0	1	2	3
10. Il m'arrive de penser que je suis une bon(ne) à rien.	0	1	2	3

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