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## Why Do Socially Withdrawn Children Tend to Become Heterosexually Active Later than Their Peers? A Mediation Model

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### ABSTRACT

Socially withdrawn children are more likely to be heterosexually inactive in early adulthood. This study aimed to test a three-mediator model. We hypothesized that social withdrawal during childhood would hinder a sense of social competence in early adolescence, limiting other-gender friendships in mid-adolescence, in turn limiting involvement in romantic relationships in late adolescence, and thus favoring a later transition into sexual activity. This mediation model was tested on a sample of 332 participants assessed annually between the ages of 12 and 22. Structural equation modeling revealed a significant indirect effect of social withdrawal on late transition into heterosexual activity through the three tested mediators. The direct effect of social withdrawal on late transition into heterosexual activity was also significant, suggesting a partial mediation.

The transition into a sexually active life is a developmental task achieved by most individuals by late adolescence (Boislard, 2014; Haase, Landberg, Schmidt, Lüdke, & Silbereisen, 2012). While most youth engage in a repertoire of various sexual behaviors during adolescence, research has shown that, among heterosexual youth, the different sexual acts are hierarchized based on their significance and level of intimacy, with genital touching and oral and anal sex being seen as less significant than penile-vaginal intercourse (PVI; Hans & Kimberly, 2011; Sanders & Reinisch, 1999). In fact, heterosexual youth consistently report the first PVI to be the main marker of the transition into sexual activity (compared to other behaviors equated with maintaining one's virginity or sexual abstinence), both in quantitative (Hans & Kimberly, 2011; Sanders & Reinisch, 1999) and qualitative studies (Carpenter, 2002; for an exception, see Pitts & Rahman, 2001), although a third of participants in these studies also considered anal intercourse as "having sex." As such, apart from PVI, most sexual acts have been culturally labeled as "preliminaries" and heterosexual youth continue to consider sexual encounters without PVI as incomplete sexual relations (Sanders & Reinisch, 1999). Given its symbolic and dominant nature, the first coital intercourse remains the marker most often used to define the transition into sexual activity in the heterosexual community (Boislard, 2014; Gesselman, Webster, & Garcia, 2017). In Western cultures, the first PVI most often occurs between the ages of 16 and 18 (Boislard, 2014; Harden, 2014; Zimmer-Gembeck & Helfand, 2008). However, between 40% and 48% of youth in most Western countries, including in the most recent nationally representative data in the US, are still sexually inactive by the end of 12th Grade (Twenge & Park, 2019) and after 18 years of age (Zimmer-Gembeck & Helfand, 2008). By the mid-twenties, this proportion decreases to 5% and 3% for men and women, respectively (Mosher, Chandra, & Jones, 2005).

Sex is an important social activity for many adolescents (Suleiman & Deardorff, 2015). In addition, the more aware adolescents become of their peers' emerging sexual experiences, the stronger their desire to pursue sexual activity in order to maintain good peer group status (Duquet & Quéniart, 2009). Recent studies also reveal that although some youth voluntarily remain sexually inactive (Haydon, Cheng, Herring, McRee, & Halpern, 2014), many do so due to a lack of social opportunities (Haase et al., 2012) related to difficulties in the peer group (Boislard, 2014; Richards-Shubik, 2015) and romantic loneliness (Adamczyk, 2017).

Social withdrawal, which refers to withdrawal, shyness and loneliness (Rubin & Coplan, 2010; Wang, Rubin, Laursen, Booth-LaForce, & Rose-Krasnor, 2013), is one of the most common behaviors associated with problematic peer relationships (Ferguson & Zimmer-Gembeck, 2014; Gazelle & Ladd, 2003). Some research has shown that socially withdrawn individuals tend to avoid developing intimate relationships (Ferguson & Zimmer-Gembeck, 2014). Moreover, social withdrawal in childhood is associated with a higher probability of remaining sexually inactive longer in early adulthood (Boislard, Poulin, Zimmer-Gembeck, & Halpern, 2014). How can this link be explained considering that first coital intercourse usually occurs in late adolescence? The literature on the development of interpersonal relationships from childhood to adulthood might shed some light on this matter.

### *Sullivan's Interpersonal Developmental Model*

According to Sullivan's (1953) model, which was revisited by Buhrmester and Furman (1986), social needs emerge early on in an individual's development and are fulfilled by different

interpersonal relationships. In childhood, participation in play activities with same-gender peers helps to meet the need for companionship and acceptance by others. In early adolescence, friendships with same-gender peers offer young people feelings of validation as well as opportunities and experiences that help them develop intimacy and other social skills (Glick & Rose, 2011). Between early and mid-adolescence, youth initiate their first connections with other-gender peers in the form of friendships that, in some cases, eventually develop into romantic relationships. Finally, in late adolescence, romantic involvement provides a context in which youth are able to meet their needs for both emotional and sexual intimacy.

It is plausible that this normative developmental sequence is partially compromised among individuals who have been socially withdrawn since childhood. Being less well integrated into their peer group, socially withdrawn youth may have fewer opportunities to develop social skills. Perceiving themselves to be less socially competent, they may subsequently be less able to establish friendships, and then romantic partnerships with other-gender peers, resulting in a later transition into sexual activity than is the case for their more socially accepted peers. This sequence suggests the existence of a series of mediators that could account for the observed link between social withdrawal in childhood and a late transition into a sexually active life. This model (shown in Figure 1) is detailed in the following section.

### A Mediation Model

In childhood, social withdrawal, as opposed to sociability and social integration (Zimmer-Gembeck, Siebenbruner, & Collins, 2004), is generally an atypical behavior that is negatively perceived by peers and thus contributes to social exclusion and rejection (Rubin, Bukowski, & Laursen, 2018; Wang et al., 2013). Being more frequently excluded, socially withdrawn children do not learn to interact harmoniously with their peers and solve interpersonal problems (Bohlin, Hagekull, & Andersson, 2005). As a result, they are more likely to lack certain social skills and to feel less socially competent than their more accepted peers (Bohlin et al., 2005; Rubin et al., 2018).

In early adolescence, the perception of social competence (i.e., a person's belief that they are able to engage effectively in social interactions) develops through social experiences (Bédard, Bouffard, & Pansu, 2014; Lee, Hankin, & Mermelstein, 2010). A positive perception of one's social competence is particularly important in early adolescence, as youth are expected to spend more time with their peers and maintain a closer connection to them (Engels, Deković, & Meeus, 2002). While friendships mainly involve same-gender peers during childhood (Kovacs, Parker, & Hoffman, 1996), mixed-gender groups become typical starting in early adolescence and become more common in mid-adolescence (Arndorfer & Stormshak, 2008; Poulin & Pedersen, 2007). Overall, adolescents who have a positive perception of their social competence feel more comfortable reaching out to others (Rubin, Bukowski, & Parker, 1998) and are more likely to form this new type of friendship. However, because the establishment of mixed-gender friendships presents many challenges (Maccoby, 1998), their navigation requires adequate social skills (Kovacs et al., 1996; Miller, 1990). It is postulated that adolescents who perceive themselves as being less socially competent may experience difficulty forming mixed-gender friendships at the same rate as those who feel more socially competent.

In mid-adolescence, the formation of mixed-gender friendships has been shown to facilitate the emergence of romantic relationships (Connolly, Craig, Goldberg, & Pepler, 2004; Connolly, Furman, & Konarski, 2000; Zimmer-Gembeck et al., 2004), as these friendships provide access to potential partners and allow for the acquisition of interpersonal skills that are essential in romantic relationships (Kreager, Molloy, Moody, & Feinberg, 2015). In light of these findings, it is plausible that, compared to peers who are engaged in many other-gender friendships, adolescents who are engaged in few other-gender friendships, and who therefore have limited access to this pool of potential partners, will be less likely to have romantic partners in late adolescence.

By late adolescence, most individuals report having a romantic partner (Carver, Joyner, & Udry, 2003; Connolly et al., 2004). Romantic relationships are differentiated from other types of relationships by their forms of affection and their ability to fulfill sexual needs (Collins, Welsh, & Furman, 2009; Sullivan, 1953).

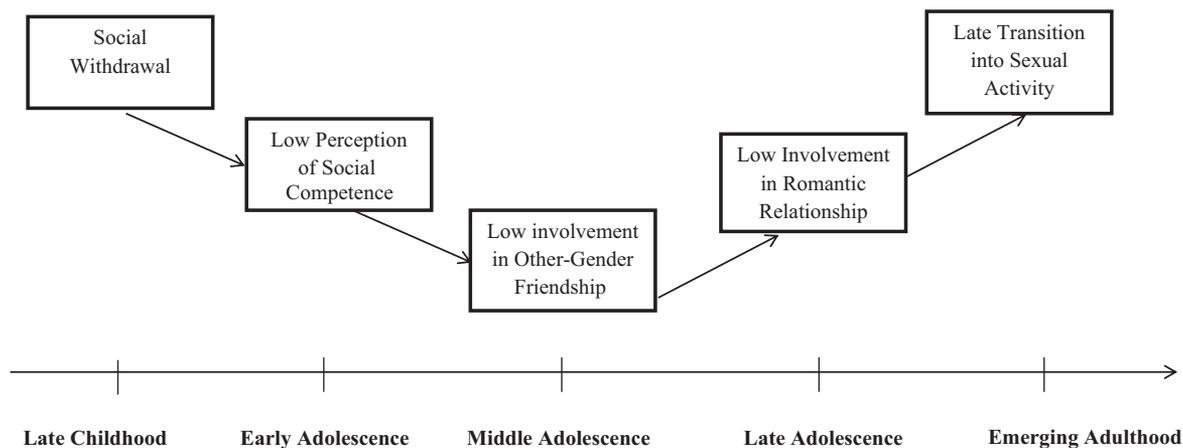


Figure 1. Hypothesized mediation model. Each variable is placed in the developmental period where it is very influential.

Indeed, romantic relationships represent the primary context for adolescents to explore their sexuality given that most individuals report becoming sexually active in the context of a romantic relationship (Boislard, Van de Bongardt, & Blais, 2016; Suleiman & Dearthoff, 2015). Therefore, it is posited that adolescents who are slower to engage in romantic relationships will remain sexually inactive longer than their peers.

### **Gender as a Moderator**

Does this mediation model apply equally to girls and boys? Socially withdrawn behaviors are displayed by both girls and boys in childhood but the effects of such behaviors on subsequent social relationships are likely to vary according to gender. In North America, shyness and social fear are seen more as female concepts, which make parents and teachers more accepting and appreciative of social withdrawal behaviors adopted by girls (Doey, Coplan, & Kingsbury, 2014). Moreover, socially withdrawn girls tend to be more appreciated by their peers and to receive more social support (Lease, Kennedy, & Axelrod, 2002) whereas socially withdrawn boys are more likely to be rejected by their peers (Coplan, Prakash, O'Neil, & Armer, 2004). Social withdrawal among boys tends to be more negatively perceived because it derogates from the male norms of dominance and social assertion (Rubin & Coplan, 2004). As a result, unable to meet these expected norms, it becomes more stressful for boys to be shy and socially withdrawn, making them more prone to develop low self-esteem and suffer the ensuing negative consequences (Doey et al., 2014). These internal states are likely to compromise boys' acquisition of a positive sense of social competence and thus compromise the developmental sequence described above.

### **The Current Study**

The first objective of this study was to test whether the longitudinal association between social withdrawal in childhood and a later transition into heterosexual activity could be accounted for by a series of three mediators, namely perception of social competence, mixed-gender friendships and romantic relationships. More specifically, we aimed to test the hypothesis that social withdrawal in late childhood (age 12) would hinder the acquisition of a sense of social competence in early adolescence (ages 13–14), which would compromise the formation of mixed-gender friendships in mid-adolescence (ages 15–16) and limit the formation of romantic relationships in late adolescence (ages 17–18), which would be associated with a later transition into heterosexual activity in emerging adulthood (ages 19–22). The second objective was to test the moderating effect of gender in this postulated mediation model. It was expected that socially withdrawn boys would perceive themselves as being less socially competent than their female counterparts. On account of this perception, compared to socially withdrawn girls, they would integrate less into mixed-gender groups and be less likely to engage in romantic relationships, which would delay the timing of their transition into heterosexual activity.

## **Method**

### **Participants**

This longitudinal study initially involved 390 Grade 6 students (58% girls,  $M$  age = 12.38 years,  $S. D.$  = 0.42), recruited in eight French-speaking primary schools in the province of Quebec, Canada. Approximately 75% of the available student population participated in this study. Most participants were Caucasian and Canadian-born (90%), while the remaining participants were of Haitian (3%), Latino (3%), Arabic (3%) and Asian (1%) descent. The majority of participants lived with both biological parents (72%) and were from middle-class families ( $M$  income = \$45,000 – \$55,000 CAD). Data were collected each year between age 12 and age 22. Retention rates at each wave varied from 90% to 74%, with 78% of the initial sample still participating at age 22. Only those participants for whom information was available regarding their age at first intercourse (or absence of first intercourse) were included in the analyses ( $n$  = 334 participants). Compared to the excluded participants ( $n$  = 56), those who were retained in the analyses were more likely to be girls ( $\chi^2$  = 12.54,  $p$  = .028). There was no other difference between our subsample and the initial sample on other study variables (i.e. social withdrawal, perception of social competence, other-gender friendships and romantic relationships).

### **Design and Procedure**

From ages 12 to 17, data were collected from questionnaires completed in school under the supervision of research assistants. From ages 18 to 22 (i.e., after high school), the questionnaires were completed in the participants' homes in the presence of a research assistant or, in a few cases (less than 5%), were sent out and returned by mail. Parents' written consent was also obtained annually until the participants reached the age of 18. When majority was reached (18 y.o.), participants gave their own consent. The study was approved by the Institutional Ethics Committee for Research Involving Human Subjects at the authors' university. Participants received financial compensation at each data collection point.

### **Measures**

#### **Social Withdrawal at Age 12**

A peer nomination procedure was administered within Grade 6 classrooms using two items from the Revised Class Play: "Prefers playing alone than with others", and "Is always alone" (Masten, Morison, & Pellegrini, 1985). The rate of participation for this assessment was higher than 65 percent in each classroom, which is sufficient to obtain reliable peer nomination data (Marks, Babcock, Cillessen, & Crick, 2013). In each classroom, the names of the students whose parents had consented to their participation in the study were listed in alphabetical order. Using this list, participants were asked to select up to three fellow participants in their classroom who best fit each descriptor. For each item, participants' scores were created based on the sum of the nominations received from their classmates. These scores were then standardized ( $Z$  score) within each classroom, and the mean of the two items was computed ( $r$  = .89).

### Perception of Social Competence at Ages 13 and 14

A French version of the social competence subscale of Harter's (1985) Self-Perception Profile for Adolescents (Bouffard et al., 2002) was used. This subscale includes five items evaluating the extent to which participants feel accepted and appreciated by their peers, consider themselves to be popular and feel that they have several friends. Each item included two opposing statements (e.g. "Some teenagers find it hard to make friends", and "Some teenagers find it pretty easy to make friends"). Participants were first asked to indicate which statement better reflected them and then to select one of two options indicating the extent to which it did so (i.e., "Really true for me" or "Sort of true for me"). Participants' responses for each item were coded from one to four. Internal consistency of the scale was acceptable ( $\alpha = .82$  at age 13 and  $\alpha = .77$  at age 14).

### Other-gender Friendships at Ages 15 and 16

Participants completed a friendship network inventory in which they wrote down the name of up to 10 of their closest friends (Poulin & Pedersen, 2007). These friends could come from different contexts such as school, the neighborhood, extracurricular activities, or other. On average, participants reported 8.59 (SD = 2.17; range from 3 to 10) at age 15 and 8.41 friends (SD = 2.15; range from 3 to 10) at age 16. Participants were then asked to indicate the gender of each friend. Following Poulin and Pedersen's (2007) procedure, the proportion of each participant's friendship network that was comprised of other-gender friends was computed each year.

### Romantic Relationships at Ages 17 and 18

Participants were asked to indicate the first and last names of all the romantic partners (maximum 5) they had had over the previous 12 months. They were then asked to specify the relationship duration for each partner and the partner's gender. In line with previous studies, only romantic relationships lasting at least one month were retained in the current study (Zimmer-Gembeck, Siebenbruner, & Collins, 2001). Among all the partners listed at ages 17 and 18, 744 out of 749 (99.33%) were not of the same gender as the participant. The number of romantic partners nominated was computed each year. Scores ranged from 0 to 5.

### Transition into Heterosexual Activity

From ages 15 to 22, participants filled out a questionnaire on various aspects of their sexuality each year. For this study, the main question was: "Have you ever had intercourse (i.e., vaginal penetration) with someone of the opposite sex?" Those who answered affirmatively reported how old they were at first intercourse. Eight annual waves were used to validate the reported ages, given the typical discrepancies observed in the reported ages from wave to wave in the rare longitudinal studies assessing youth sexuality (Palen et al., 2008). We found that 58% of our participants reported inconsistent ages. These discrepant ages were managed by establishing rules for data cleaning based on French and Dishion's study (2003) involving two-wave data, and previously published research based on this sample (Boislard & Poulin, 2011; Boisvert, Boislard, & Poulin, 2017). Two independent coders studied each participant's response pattern and applied two

rules to determine the most likely age at first intercourse when there were discrepancies. The *proximal rule* was applied when participants reported two different ages: the earlier age was retained as it was closer to the occurrence of the event. However, when different ages were reported throughout the eight waves of assessment, the *majority rule* was applied: the most frequently reported age was retained. Correlations between the reported ages at first intercourse among these eight waves ranged from .55 to .89, all  $p = .001$ .

At age 22, participants were also asked "Have you ever had a sexual experience, other than kissing, with someone of the same sex?" Among the participants who had never experienced intercourse with someone of the other sex at age 22, only two answered yes to this question. These participants were removed from the analyses because their late transition into heterosexual activity could possibly be explained by their homosexual orientation (final  $n = 332$ ).

Late transition into sexual activity was operationalized as the difference between the reported age at first intercourse and the upper bound of the average age at first intercourse (i.e., 18 years old). Thus, late transition into sexual activity was quantified in terms of the number of years of desynchronization. A value of 0 was attributed to participants who experienced their first intercourse before or at age 18 (86.7% of the sample). A value of 1 was assigned to participants whose first intercourse took place at age 19 (3.9%), a value of 2 to those for whom it was at age 20 (2.7%), a value of 3 to those for whom it was at age 21 (1.5%), a value of 4 to those for whom it was at age 22 (0.3%), and a value of 5 to those who had not yet experienced intercourse at age 22 (4.8%).

## Analyses

To test this mediation model, structural equation modeling was carried out using MPlus 7.31 software (Muthén & Muthén, 1998–2014). In order to process the missing data and address the non-normality of the distribution of certain variables, the maximum likelihood-robust (MLR) estimator was used. To determine the fit of the model, four indices were used: the Chi-square, the comparative fit index (CFI), the root mean square error approximation (RMSEA) and the standard root mean square residual (SRMR). For Chi-square, a  $p$ -value above .05 represents a good model fit (Barrett, 2007). For CFI, a value above .90 is considered adequate (Geiser, 2012). For RMSEA, a value below .08 is considered acceptable while a value below .05 is considered to be better (Geiser, 2012). Finally, for SRMR, a value below .08 is considered adequate (Geiser, 2012). The three mediating variables (perception of social competence, other-gender friendships and romantic involvement) were included in the model as latent variables, each derived from two observed variables over two successive years.

## Results

### Bivariate Correlations between Study Variables

The bivariate correlations between the study variables are presented in Table 1. First, social withdrawal was positively associated with a late transition into sexual activity, while

**Table 1.** Correlations among all variables, means and standard deviations.

Variables	1	2	3	4	5	6	7	8
1. Social withdrawal at 12	-							
2. Perception of social competence at 13	-.39**	-						
3. Perception of social competence at 14	-.37**	.62**	-					
4. Other-gender friendships at 15	-.01	.01	.11	-				
5. Other-gender friendships at 16	-.06	.07	.10	.56**	-			
6. Romantic relationships at 17	-.07	.14*	.23**	.25**	.32**	-		
7. Romantic relationships at 18	-.11	.13*	.15*	.21**	.25**	.42**	-	
8. Late transition into sexual activity	.37**	-.15*	-.16**	-.11	-.21**	-.29**	-.36**	-
M	-0.01	3.24	3.22	0.25	0.27	0.96	1.15	0.39
S.D.	0.92	0.63	0.52	0.20	0.20	0.84	0.94	1.18

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

perception of social competence, other-gender friendships, and romantic relationships were negatively associated with a late transition into sexual activity. Moreover, the two scores for perception of social competence (i.e., at ages 13 and 14) were positively correlated with one another, as were the scores for other-gender friendships and romantic involvement. Furthermore, social withdrawal was negatively associated with perception of social competence. In turn, other-gender friendships were positively associated with romantic involvement, which was negatively associated with a late transition into sexual activity.

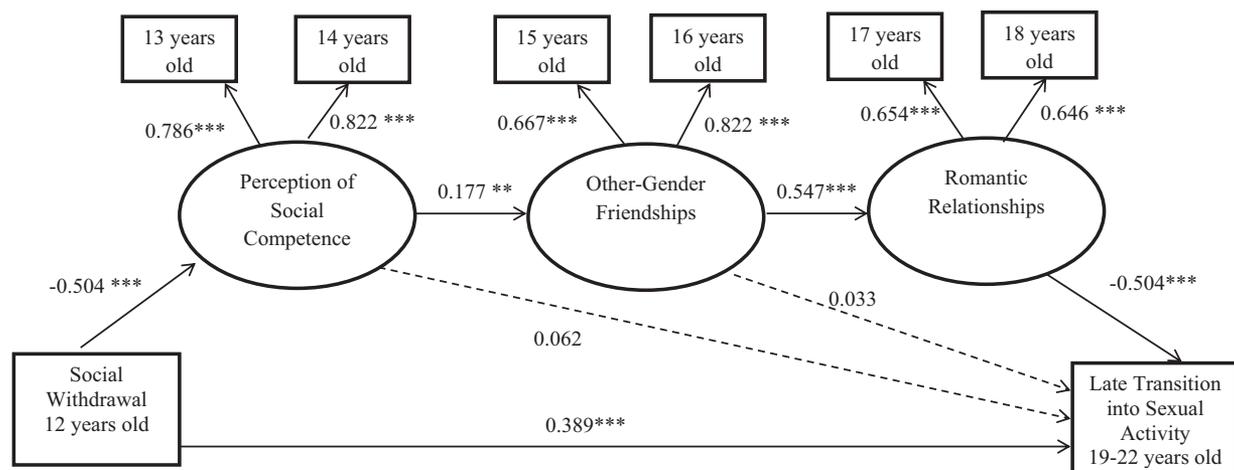
### Results of Structural Equation Modeling

The results of the structural equation modeling are illustrated in Figure 2. The fit indices indicated that the model had an adequate fit to the data [ $\chi^2(15, N = 332) = 20.154, p = .166, CFI = .989, RMSEA = .031, SRMR = .047$ ]. Each of the observed variables significantly contributed to their respective latent variable. Moreover, each variable was significantly associated with the subsequent variable: social withdrawal at age 12 was negatively associated with perception of social competence in early adolescence ( $\beta = -.504, SE = .062, p < .001$ ), which was positively associated with other-gender friendships in mid-adolescence ( $\beta = .177, SE = .078, p = .023$ ), which in turn positively predicted the number of romantic relationships in late adolescence ( $\beta = .547, SE = .087, p < .001$ ). Finally, the number of romantic relationships was negatively associated with a late transition into

sexual activity in emerging adulthood ( $\beta = -.504, SE = .100, p < .001$ ). These significant associations indicate a mediation effect. Indirect effects were simultaneously estimated from the independent variable to the mediating variables, and from the mediating variables to the dependent variable. The indirect effect of social withdrawal on late transition into sexual activity through perception of social competence, other-gender friendships, and romantic relationships, was significant ( $\beta_{Est} = .025, 95\% CI \text{ bootstrap } [.002 \text{ to } .066]$ ). The analyses also revealed a significant direct effect of social withdrawal on late transition into sexual activity ( $\beta_{Est} = .389, 95\% CI \text{ bootstrap } [.195 \text{ to } .582]$ ), revealing a partial mediation. For each of the six links comprising an indirect effect in the model, a moderated mediation model in which that particular link was moderated by gender was estimated, each model after one another. The absence of any moderation effect indicated that the results observed for this mediation model applied to both genders ( $\beta$  ranging from .00 to .05, all  $p \geq .232$ ).

### Discussion

The goal of this study was to better understand why individuals who are socially withdrawn in childhood are more likely to remain sexually inactive longer in emerging adulthood. A mediation model involving a sequence of three mediators was tested using longitudinal data collected from ages of 12 to 22. The results support the postulated model. Specifically, the link between social withdrawal in childhood and a late transition into sexual activity was partially mediated by a lower



**Figure 2.** Mediation model. Values represent standardized path coefficients and factor loadings \*\* $p < .01$ , \*\*\* $p < .001$ .

perception of social competence in early adolescence, which in turn limited the formation of mixed-gender friendships in mid-adolescence, decreasing the formation of romantic relationships in late adolescence, and thus delaying first intercourse. The absence of any moderation effect of gender shows that there was no difference in effect sizes between boys and girls in all the model paths.

### **Mediation Model**

The observed mediation model showed that participants who were socially withdrawn in childhood tended to perceive themselves as being less socially competent than their peers in early adolescence. This finding echoes the work of Rubin et al. (2018) reporting that individuals who remain on the margins of their peer group in childhood and adolescence become less able to develop adequate social skills. Since socially withdrawn children are less exposed to social contexts in which their social skills are likely to unfold and develop, they may come to see themselves as being socially incompetent (Bohlin et al., 2005). Yet, a positive perception of social competence is an important asset in early adolescence, when young people change school environments (i.e., transition from primary school to high school) and form new social relationships (Engels et al., 2002). Hence, children who are already socially withdrawn in primary school and who perceive themselves as being less socially competent in early adolescence are more likely to remain withdrawn after the school transition (Shell, Gazelle, & Faldowski, 2014). Compared to their more socially competent peers, they may be more likely to avoid the new social contexts to which they are exposed in high school, thus exacerbating their childhood social isolation.

Consistent with the formulated hypothesis, young adolescents who perceived themselves to be socially inadequate had a lower proportion of other-gender friends in mid-adolescence, even though this period is typically marked by an increased interest in other-gender peers (Arndorfer & Stormshak, 2008; Poulin & Pedersen, 2007). Young adolescents who feel less socially competent may not only avoid integrating into mixed-gender groups but may be less attractive to their peers (Rubin et al., 2018), further hindering the development of mixed-gender friendships during this period.

Moreover, other-gender friendships foster the emergence of romantic relationships in late adolescence. On the one hand, this friendship context facilitates the acquisition of interpersonal skills that become useful to young people in the context of romantic relationships (Kreager et al., 2015). On the other hand, other-gender friends can become romantic partners themselves (Connolly et al., 2000). Other-gender friends can also expand adolescents' social networks, enabling them and meet potential partners (Kreager et al., 2015). Our findings corroborate those of previous studies suggesting that adolescents with few other-gender friends are less likely to engage in romantic relationships in late adolescence (Connolly et al., 2000; Dunphy, 1963).

Finally, our findings confirm that romantically uninvolved adolescents remain sexually inactive longer than their peers who have been in romantic relationships. Numerous studies have reported that romantic relationships are the most important predictor of the transition into sexual activity (Boislard et al., 2016; Suleiman & Deardorff, 2015). Our study

corroborates what was previously found in the literature: having more romantic partners at ages 17 and 18 significantly predicts less delayed onset of sex. Thus, individuals who are less romantically involved by late adolescence do not have the opportunity to experience their first intercourse at the same time as their peers.

### **Partial Mediation**

The three tested mediators only partially explained the observed link between social withdrawal and a late transition into sexual activity, suggesting that other mechanisms may have come into play. Six possible mechanisms are proposed here. First, it may be that individuals who are socially withdrawn in late childhood continue to be withdrawn in young adulthood. Indeed, social withdrawal is a relatively stable phenomenon from childhood to adulthood (Gest, 1997; Rubin & Burgess, 2001). Thus, in addition to compromising or delaying the completion of certain developmental tasks that usually occur during adolescence, social withdrawal may continue to affect individuals in young adulthood by reducing their opportunities to establish interpersonal relationships with potential romantic and sexual partners. Second, low participation in informal mixed-gender social contexts may also be a mediator that was not evaluated in this study. For example, parties and other festive contexts not only provide mixed-gender socialization contexts but are also conducive to sexualized social activities that may precede sexual intimacy (Dubé, Lavoie, Blais, & Hébert, 2015). Third, it is possible that the increased use of the internet leads several adolescents to reduce face-to-face peer interactions, especially for youth with internet addiction (Ostovar et al., 2016). Fourth, adolescents with depressive symptoms are more likely to stay alone, impeding their social integration (Spithoven et al., 2017). Fifth, Vazsonyi and Jenkins (2010) have shown that youth who have internalized their religion's values tend to have a later transition to sexuality. As a result, religiosity may be another factor that may explain the partiality of this mediation. Sixth, it has been shown that individuals who experience an early puberty tend to have sex earlier (Meschke, Zweig, Barber, & Eccles, 2000). Thus, it is possible to believe that a delayed puberty makes the physical appearance of an adolescent less sexually attractive, which could lead to a later transition to sexuality. All of these factors could come into play and future studies should examine their role and potential cumulative effects.

### **Absence of Moderating Effects of Gender**

The absence of any significant moderating effects of gender suggests that boys and girls are likely to be equally affected by the sequence of the mediators examined, resulting in a late transition into a sexually active life for both. Although social withdrawal among girls has been found to be more socially accepted (Doey et al., 2014), this acceptance does not appear to influence girls' perception of their own social competence, which may explain why no difference was found in this regard between socially withdrawn girls and boys. Indeed, the positive responses received from their social network do not appear to

erase the social difficulties experienced by socially withdrawn girls. However, as they are more likely to develop intimate friendships than their male counterparts, socially withdrawn girls may have more opportunities to confide their interpersonal problems to a close friend than socially withdrawn boys, who often find themselves to be alone (Erath, Flanagan, & Bierman, 2007; Maccoby, 1998; Markovits, Benenson, & Dolenszky, 2001). Such confidences on the part of socially withdrawn girls show their awareness of their own social difficulties, and this awareness may lead them to judge themselves to be as lacking in social competence as socially withdrawn boys. Therefore, although the reactions of their peers may be different, socially withdrawn girls appear just as likely as socially withdrawn boys to develop a low perception of their own social competence, since this type of perception appears to come more from what people feel about themselves than from the responses of their environment. This then also puts a constraint on their integration into mixed-gender peer groups, their subsequent romantic engagement, and their subsequent transition into sexual activity.

Moreover, there is a sexual double standard between men and women (Kreager & Staff, 2009). Indeed, there is great pressure on men not only to become sexually active at a young age, but also to be experienced and sexually successful (Blinn-Pike, Berger, Hewett, & Oleson, 2004; Luster, Nelson, Poulsen, & Willoughby, 2013). These societal expectations may cause them to be afraid to disappoint their friends and to perceive a late transition into sexual activity as a source of stigma and embarrassment (Carpenter, 2002, 2010). Women, on the other hand, are still pressured to maintain modesty in their sexual behavior and number of sexual partners, in order to avoid the risk of being labeled as “easy” (Duquet & Quéniart, 2009). Therefore, although sexual needs are as present among girls as among boys, a late transition into sexual activity among girls is not as negatively perceived by society (Palit & Allen, 2019). Although the present study has shown some social factors that can delay the transition into sexual activity, it would be important to consider this double sexual standard on the psychological well-being of men who become sexually active at a later age and the related consequences.

### **Strengths, Limitations and Future Research**

This study has several strengths. First, a longitudinal design with yearly assessments from ages 12 to 22 is a rare asset, as late transition into sexual activity has generally been examined using cross-sectional or shorter-term data (Haase et al., 2012; Harden, 2014; for an exception, see Zimmer-Gembeck et al., 2004). The use of yearly assessments of sexual activity made it possible to more accurately determine the true age at first intercourse, thus minimizing the recall bias frequently reported in retrospective studies (Boislard & Poulin, 2015). Moreover, each of the tested mediators was measured during the periods of adolescence when they are particularly salient.

However, this study has some limitations. First, all the measures except social withdrawal were self-reported, which may have led to some bias in the associations observed due to shared-method variance. Second, the sample was very homogeneous;

most participants were Caucasian, Francophone and middle class, and lived in the same city. Further studies using a more culturally and ethnically diverse sample are needed, since the importance attributed to a sexually inactive life and the timing of romantic relationships varies from one culture to another (Abboud, Jemmott, & Sommers, 2015). Moreover, culture and religion may influence the formation of friendships and romantic relationships (Bartkowski, Xu, & Fondren, 2011; Windzio & Wogens, 2014). Third, although adolescents explore their sexuality with a partner through multiple behaviors, only coitus was examined in this study, based on the literature reiterating that the first penile-vaginal intercourse continues to be the most consensual marker of the transition into sexual activity among heterosexual youth (Gesselman et al., 2017; Hans & Kimberly, 2011; Sanders & Reinisch, 1999). Fourth, previous studies have shown that children with a history of abuse are more likely to present problematic peer relationships (Turner, Shattuck, Finkelhor, & Hamby, 2017) and compromised sexual development (Seehuus, Clifton, & Rellini, 2015). The current mediation model should thus be replicated in future studies while factoring in child abuse.

This study contributes to the advancement of knowledge on sexual development in many ways. First, although the perception of social competence has been examined as a correlate of friendships and romantic relationships, (Lodder, Scholte, Goossens, & Verhagen, 2017; Rubin et al., 2018), the contribution of perceived social competence to the prediction of late initiation into sexual activity has never before been addressed. This study provides evidence to support the relevance of this factor in the maintenance of sexual inactivity throughout adolescence and into emerging adulthood. Youth's perception of their own social competence appears to influence whether or not they expose themselves to social contexts that can be the source of many social opportunities in adolescence. Considering that initiation into an active sex life can be the result of a series of adopted social behaviors, youth who feel less socially competent may remain sexually inactive longer, as they are less likely to expose themselves to the same social experiences as most of their peers. Second, quantifying late transition into sexual activity as a continuous variable is another contribution of this study. To our knowledge, no other study to date has measured late transition into sexual activity in terms of the number of years of sexual desynchronization, or quantified it. By using this method, we were able to account for the effects of some predictors of a late transition into sexual activity between the ages of 19 and 22 and observe that the greater the extent to which individuals were socially withdrawn, the later their transition into sexual activity.

The findings of the present study open up several possibilities for future research. First, data collected from heterogeneous samples of sexually inactive individuals (Boislard, 2014), as well as several variables unaccounted for in the current study, could shed additional light on a late transition into sexual activity. For example, the intention to remain sexually inactive, especially among individuals who are already in romantic relationships, should be investigated. It is also possible that a late transition into a sexual activity is associated with difficulties in forming attachments to others, or a fear of being disappointed or otherwise emotionally hurt. Importantly, our mediation model was conceptually developed and empirically tested to explain the

association between childhood social withdrawal and later transition into heterosexual activity. Future studies should investigate whether this association also applies to the transition into homosexual activity and, if so, adapt (and test) the mediation model, perhaps by replacing other-gender friendships by same-gender friendships.

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