

On Early Starters and Late Bloomers:
The Development of Sexual Behavior in Adolescence Across Personality Types

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Abstract

Little is known about the relation between personality and sexual development among mid adolescents. In the current study, we used a person-centered approach to investigate the relation between personality types and the development of sexual behavior. We hypothesized that undercontrolling adolescents would engage in more advanced, casual, and risky sexual behavior compared to their resilient and overcontrolling peers. Data were used from 407 mid adolescents ($M_{age} = 14.5$) followed across four measurement waves spanning 18 months. Results from latent class analyses (LCA) identified the three classical personality types: resilient, undercontrollers, and overcontrollers. Controlling for perceived pubertal timing and biological sex, latent growth curve analyses in Mplus showed that at baseline, undercontrollers were more sexually experienced and engaged in more casual and risky sexual behavior than resilient and overcontrollers. Although initial levels of sexual behavior differed by personality types, over time increases in sexual behavior occurred at a similar rate across the types. Overall, the current study showed that undercontrolling adolescents are early sexual developers who engage in more advanced, casual, and risky sexual behavior than other adolescents. The implications of these findings for longer term differences in sexual behavior between personality types in later adolescence are discussed.

Keywords: Personality types; Sexual behavior; Longitudinal; Adolescence

Healthy sexual development is one of the developmental tasks of adolescence. While most adolescents seem to make responsible decisions concerning sex (Tolman & McClelland, 2011), others are impulsive-decision makers engaging in potentially risky sexual behaviors (Charnigo, Noar, Garnett, Crosby, Palmgreen, & Zimmerman, 2012). In Western countries there is easy access to condoms and contraceptives, yet 20-30 percent of youth fail to use regular protection, increasing risk of STIs, HIV, and teenage pregnancy (De Graaf, Kruijer, Van Acker, & Meijer, 2012; Fortenberry, Schick, Herbenick, Sanders, Dodge, & Reece, 2011). Despite numerous studies on late-adolescents or young adult sexual development, there still is a lack of knowledge on what factors underlie individual differences in sexual development during the middle adolescent years. As early as the 1970s, the relation between personality characteristics such as extraversion and sexual behaviors among late-adolescents received attention (Eysenck, 1976). However, previous studies often exclusively examined sexual risk-taking among young adult or college age samples, and if they did include younger participants these studies often included only a limited range of behaviors such as holding hands or kissing, or did not assess personality. There is a lack of research that focuses on the role of personality in sexual development during the middle adolescent years. This is surprising given that personality characteristics are organizational constructs that influence how individuals adapt their behavior to meet new developmental challenges (Caspi & Shiner, 2008). The current study addresses this lacuna by investigating how personality dimensions and types are related to a broad range of sexual experiences ranging from initial physical encounters such as kissing to having sexual intercourse in either committed, casual, or risky contexts among mid adolescents.

Personality (Proto) Types and Sexual Behavior

The three most common personality types found across cultures and age groups are undercontrollers, overcontrollers, and resilient (Asendorpf, Borkenau, Ostendorf, & Van

Aken, 2001). These types can be described in their distribution of personality dimensions from the Big Five. The Big Five consists of five personality traits on which individuals can vary. These traits have become a common framework of personality psychology, and are labeled as agreeableness, conscientiousness, openness to experiences, extraversion, and emotional stability (Van Aken, Hutteman, & Denissen, 2010). Agreeableness describes traits that are of a prosocial nature; Conscientiousness describes goal-directed behavior and impulse control; Extraversion includes traits of an outgoing, interpersonal nature; Openness to experience describes the complexity of an individual's mental and experiential life; while Emotional stability refers to the stability of a person's mood in contrast to a broad range of negative affects including sadness, irritability and anxiety (John, Caspi, Robins, Moffitt and Stouthamer-Loeber, 1994). Although adolescents go through an abundance of changes as they mature from pre-pubertal children to young adults, their temperament and personality is relatively stable. It has been suggested that adolescence is not a period in which personality dispositions change most, but rather that the levels fluctuate while rank-order stability of the dimensions is relatively stable (Roberts & DelVecchio, 2006; Van Aken et al., 2010;).

Undercontrolling adolescents are characterized by a relatively low level of agreeableness, conscientiousness, and openness to experiences, and a relatively high level of extraversion and an average level of emotional stability. Overcontrolling adolescents show a relatively high level of agreeableness and conscientiousness, and a relatively low level of emotional stability, openness to experience, and extraversion. Finally, resilient adolescents have a relatively high score on all Big 5 dimensions, allowing them to flexibly adapt to environmental demands (Van Aken et al., 2010; Asendorpf, 2006). In the current study we not only examine the relation between the individual Big Five personality dimensions and sexual behaviors, but we also use a person-centered approach to take into account the internal organization of personality characteristics within a person (i.e., the personality types); that is,

we also examine the relation between personality types and sexual behaviors. In this way we avoid the problem that one specific personality trait might intensify or weaken the effects of other personality traits (Atkins, 2008; Caspi, 1998).

No previous studies have examined the link between adolescents' personality types and their sexual development. However, one study (Atkins, 2008) did examine how child temperament at age 5 or 6, resembled 'proximity' to personality prototypes and used individuals' fit with these prototypes to predict their contraception use and condom use at age 17 or 18. Based on continuous measures of the degree to which an individual fit each of the three prototypes, Atkins used these scores to predict risky sexual behavior. The results showed that those with a close fit to the overcontrolling and resilient prototypes reported less failure to use contraception. In addition, those with a close fit to the overcontrolling prototype reported less sex without a condom. Although this study provided intriguing results, it did not explicitly assess whether adolescents' actual personality types affected their sexual development, instead it showed that a good fit with a personality prototype at a young age predicted less risky sexual behavior in late-adolescence. More importantly, the sample included only sexually experienced adolescents and therefore the link with initiation of a range of sexual behaviors could not be examined. Despite these limitations, however, the results do show that a typological approach to personality may be useful in understanding individual differences in adolescent sexual development and that those with personality profiles fitting resilient or overcontrollers were the least likely to engage in sexual risk behaviors.

Personality has long been studied in relation to sexual behavior. In his now classic book *Personality and Sexuality*, Eysenck (1976) investigated the link between extraversion and neuroticism and a range of sexual thoughts and behaviors. Among university students, those high on extraversion scored higher on sexual behaviors (such as oral sex and sexual

intercourse) and reported relatively higher rates of sexual promiscuity and sexual satisfaction. University students high on neuroticism scored low on promiscuity and satisfaction. Eysenck specified that extraverts may seek stimulation and are less 'sociable', while people high on neuroticism may find sexual (and other social) behavior uncomfortable. Outcomes of a recent meta-analysis corroborated some of these findings, showing that high levels of extraversion were related to more high-risk sexual encounters, while low levels of agreeableness were moderately related to more high-risk encounters, number of sexual partners, and unprotected sex. Conscientiousness was moderately and negatively related to having unprotected sex (Hoyle, Fejfar, & Miller, 2000). Finally, the relation between emotional stability (neuroticism) and sexual risk-behavior was weak and non-consistent across the different risk-behaviors. Since the meta-analysis by Hoyle and colleagues (2000), studies examining the link between personality and sexual risk behavior have replicated and extended these findings. For example, extraversion was found to be related to higher levels of promiscuity, infidelity, substance use during sex (Bogg & Roberts, 2004; Miller, Lynam, Zimmerman, Logan, Leukefeld, & Clayton, 2004; Raynor & Levine, 2009; Schmitt, 2004). Although effect sizes in previous research were small to moderate, they do indicate that there is a clear and systematic link between personality and (risky) sexual behavior that deserves further attention.

Considering personality in relation to general risk behaviors, individuals with low levels of conscientiousness report more risky health-related behaviors such as risky driving and drug use (Bogg & Roberts, 2004), and adolescents with high levels of extraversion show more thrill-seeking behaviors (Gullone & Moore, 2000). Furthermore—taking a typological approach—undercontrolling adolescents are found to report more aggression than overcontrolling and resilient adolescents (Akse, Hale III, Engels, Raaijmakers, & Meeus, 2004).

Adolescent personality types are also likely to show differences in their sexuality development. Undercontrolling adolescents are often described as having trouble with impulse-control, combined with low levels of ego resiliency (comparable to self-regulation) (Block & Block, 1980). Specifically, given that undercontrolling adolescents are characterized by lower levels of conscientiousness and agreeableness, high levels of extraversion and that they engage in more externalizing problem behavior (Akse et al., 2004; Dubas, Gerris, Janssens, & Vermulst, 2002; Van Aken & Dubas, 2004), they may be prone to engage in (riskier) sexual activities at an earlier age. Further, in contrast with undercontrollers, overcontrolling adolescents have relatively high levels of impulse control (Block & Block, 1980), combined with low levels of ego resiliency. They are also characterized by lower levels of extraversion, and higher levels of conscientiousness and agreeableness (Denissen, Asendorpf, & Van Aken, 2008; Meeus, Van de Schoot, Klimstra, & Branje, 2011). The combination of these characteristics would predict that they are less likely to engage in sexual behavior (or start later), and when they do they would be expected to engage in less risky behavior. Finally, because resilient adolescents are described as being able to modify their ego-control as a function of environmental demands (Block & Block, 1980), combined with relative high levels of emotional stability, agreeableness and conscientiousness, and they show higher levels of social competence, and normative timing of their romantic relations (Denissen et al., 2008; Meeus et al., 2011), they would be expected to show a more normative (on-time) pattern of sexual behavior and less risky sexual behavior compared to undercontrolling adolescents.

Pubertal Development and Biological Sex

The onset of pubertal development sparks an interest in sexuality and sexual interactions. Early maturing boys and girls are shown to initiate (risky) sexual behavior earlier than those who develop later (Belsky, Steinberg, Houts, & Halpern-Felsher, 2010; Negriff,

Susman, & Trickett, 2011; Udry, 1979). Research on the link between personality and sexual development may therefore be overestimated if pubertal development is not included as a control variable. During adolescence there are also significant differences in boys and girls concerning sexual interest and behavior, possibly partly due to differences in the hormone testosterone and physical maturation. However, although girls are found to physically mature at an earlier age than boys (Tanner, 1981), U.S. girls also initiate sexual behavior at a later age (Zimmer-Gembeck & Helfand, 2008), and have fewer partners (Tubman, Windle, & Windle, 1996). In the Netherlands, gender differences in age at sexual initiation have not been consistent and differ across the different sexual behaviors (De Graaf, Kruijer, Van Acker, & Meijer, 2012; De Graaf, Meijer, Poelman, & Vanwesenbeeck, 2005), and predictors of making an early sexual debut have also been found to differ across males and females (Udell, Sandfort, Reitz, Bos, & Dekovic, 2010). For example, Dutch 12-14 year old males have more sexual experience than females, but this difference disappears by the ages 15-17 (De Graaf et al., 2012). Given that pubertal timing and sex differences in sexual development have been reported, we included biological sex and perceived pubertal timing as control variables in the analyses.

Present Study

In the current 4-wave longitudinal study among 407 adolescents aged 13-16 years, we examined the relation between personality dimensions and types and the development of sexual behavior. To measure sexual behavior we included a broad conceptualization encompassing three concepts of sexual behavior. The first pertains to general sexual experiences (ranging from kissing to sexual intercourse), the second is casual sexual behavior, whereby we include sexual experiences without an emotional commitment to the person involved; and the third is risky sexual behavior which includes behaviors that may have a

physical or psychological negative impact on adolescents' lives (sex without a condom, giving/receiving a reward for sexual favors, online sexual behavior).

We hypothesized that at baseline *a*) undercontrolling adolescents, compared to resilient and overcontrolling adolescents, would report more sexual experience, more casual sexual behavior, and more risky sexual behavior, *b*) overcontrolling adolescents would report less advanced sexual behavior, and less casual and risky sexual behavior compared to undercontrolling and resilient adolescents, and *c*) resilient adolescents would report levels of sexual behavior and casual and risky sexual behavior that would be in between those reported by either overcontrolling and undercontrolling adolescents.

To our knowledge, no longitudinal study has previously examined the relation between personality and trajectories (rate of development) of sexual behavior, controlling for biological sex and perceived pubertal timing. Concerning developmental trajectories in sexual behavior, we were therefore unable to formulate specific hypotheses based on the literature.

Method

Procedure and Sample Characteristics

Data were collected from seven high schools in The Netherlands. We specifically asked for participation of their 3rd year (9th grade) students, to target an age group of 14-15 year olds. Permission for this study was granted by the ethics board of the Faculty of Social and Behavioral Sciences at Utrecht University. Adolescents were informed of the study and could withdraw at any time. If the adolescents' parents did not contest their participation, and the adolescents themselves agreed, they could participate in the study (three parents did not want their child to take part in the study). Adolescents did not receive compensation for their participation. Items about explicit sexual behavior could be skipped or adolescents could indicate they did not want to disclose the information (i.e., they could fill in "I don't want to answer this question"). Two research assistants were present, introduced the questionnaire,

emphasized that data would be handled confidentially, and remained present during the school hour to answer any questions.

At baseline (T_1) 407 third year (13-16 years old) students filled in the questionnaire. The subsequent waves of data collection took place after six, twelve, and eighteen months, respectively (T_{2-4}). Our baseline measurement wave took place in October 2009, and after the second measurement wave our participants finished their third year and moved into their fourth. In the Dutch secondary school system students are reassigned to different classes across a grade, which makes class composition change. Because of this transition between T_2 and T_3 we were not able to retain all baseline participants. We collected data from classes that at T_3 had at least seven students who had previously participated at T_1 and T_2 (remaining sample at $T_4 = 61\%$, $N_1 = 407$, $N_2 = 351$, $N_3 = 273$, $N_4 = 247$). Our sample at baseline consisted of 407 adolescents aged 13-16 years ($M_{age} = 14.5$, $SD = 0.6$, 215 girls, 52.8%). The dependent variables (sexual experience, casual sexual behavior, and risky sexual behavior) did not predict drop-out between T_1 to T_4 (p 's $> .05$, Nagelkerke $R^2 = .04$). Participants were mostly from a Dutch background (82.8%, $n = 337$; 4.7% Turkish; 3.4% Moroccan; 2.20% Caribbean; 7.6% other), enrolled in vocational education (66.0%, $n = 268$; 26.1% general secondary; 7.4% pre-university) and mostly reported being heterosexual (88%, $n = 358$; 3.5% homosexual; 0.5% bisexual; 5.8% unsure of sexual orientation). It should be noted that our data analysis procedure (FIML – full information likelihood) handles missing data across the waves, therefore our final sample size for this article remains at 407.

Measures

Personality. Personality of adolescents was assessed with the Ten-Item Personality Inventory (TIPI, Gosling, Rentfrow, & Swann Jr., 2003). This scale includes two items for every Big Five personality dimension. Correlation between the two items for every dimension: extraversion, $r = .23$, $p < .001$, agreeableness, $r = .22$, $p < .001$, conscientiousness,

$r = .14, p = .004$, emotional stability, $r = -.15, p = .004$, and openness, $r = -.01, ns$.

Adolescents were presented with two characteristics at a time, and asked to rate how well the characteristics applied to them on a 5-point scale from 1 (*disagree strongly*) to 5 (*agree strongly*). An example item is 'Extraverted, enthusiastic'. Longitudinal autocorrelations between the personality dimensions extraversion, agreeableness, conscientiousness, and openness to experience were relatively high ($r = .44-.72$). Longitudinal autocorrelations between measures of emotional stability across the four measurement waves were relatively low ($r = .30-.51$). As previous studies have shown, personality dimensions and types are highly stable over time (Meeus et al., 2011) therefore we used the T₁ levels of the personality dimensions to form the personality types with a latent class analysis.

Perception of pubertal timing. To assess the perception of pubertal timing, adolescents were presented the item 'Do you have a faster or slower physical development compared to your classmates?' that was rated on a 5-point scale from 1 (*much earlier than my classmates*) to 5 (*much later than my classmates*). Scores on this item showed good convergent validity with an item from the Petersen pubertal development scale (Petersen, Crockett, Richards, & Boxer, 1988) (for males; the relation between growth spurt and perceived pubertal timing; $r = .43, p < .001$; for females; the relation between growth spurt and perceived pubertal timing; $r = .30, p < .001$).

Sexual experience. To assess sexual experience, adolescents were presented with five sexual behaviors and asked how often they had engaged in a specific sexual behavior. Adolescents were asked about their experience with french kissing, petting, 'grinding', oral sex, and vaginal sexual intercourse. Adolescents could indicate the frequency of engagement in such behaviors with three categories (1 = never, 2 = sometimes, 3 = a lot). Considering the unclear distinction between the categories 'sometimes' and 'a lot' and the skewed distribution we decided to combine the categories 'sometimes' and 'a lot', resulting in two categories for

every sexual behavior (0 = no experience, 1 = experience). These items together resulted in one variable that distinguished between novice and advanced sexual behavior (i.e., 0 = inexperienced with all behaviors, 1 = experience with french kissing, petting, and/or grinding, 2 = experience with category 1 behavior and with oral and/or vaginal sexual intercourse). A small part of the sample (1.5-6.9% over the four measurement waves) stated not wanting to answer these items. Cronbach's alpha of these items was .82-.89 across the four time points.

Casual sexual behavior. The level of casual sexual behavior was assessed with two items with which adolescents were asked about the level of emotional commitment to their sexual partner. The items were "Have you ever had sex with someone for the sex, not because you were in love?" and "Have you ever had sex with someone you had just met?".

Adolescents could again rate the frequency of such experiences with three categories (1 = never, 2 = sometimes, 3 = a lot). As with the measure for sexual experience, we combined the answer categories 'sometimes' and 'a lot', resulting in two scores (i.e., 0 = no experience with the specific behavior, 1 = experienced). A sum score of these two items was computed for every adolescent, the minimum score is 0, the maximum score is 2. A small part of the sample (4.7-6.4% over four measurement waves) stated not wanting to answer these items.

Cronbach's alpha of these items was .90-.94 across the four time points.

Risky sexual behavior. The level of sexual risk behavior was assessed with four items with which adolescents were asked how much experience they had with specific sexual behaviors. The items that adolescents were presented with were: "Have you ever given money or something else for having sex?", "Have you ever received money or something else for having sex?", "Have you ever had sex without a condom?" and "Have you ever stripped or done something sexual in front of a webcam?". Adolescents were asked to report the frequency of every behavior with three answer categories (1 = never, 2 = sometimes, 3 = a lot). As was done for the previously described measures, we combined the answer categories

'sometimes' and 'a lot', resulting in two scores (0 = no experience with the specific behavior, 1 = experienced). A sum score was computed based on the four items, with a minimum score of 0 and a maximum score of 4. A small part of the sample (3.4-6.6% over four measurement waves) stated not wanting to answer these items. Cronbach's alpha of these items was .70-85 across the four time points.

Statistical Analyses

To distill personality types from the five separate personality dimensions we conducted a latent class analysis (LCA) in Mplus, version 6 (Muthén & Muthén, 2010). LCA is an analytic strategy that can be used, similar to a cluster analysis, to group individuals into classes.

Classifying individuals into these classes was done based on the analysis of patterns of scores on the personality dimensions. Unlike the classical cluster analysis approach, LCA gives fit statistics and significance tests to assess what number of classes best fit the data, and is model-based (Nylund, Asparouhov, & Muthen, 2007). After assessing the appropriate number of classes, we assigned class membership on the basis of class probabilities (i.e., which personality type fits an individual best). By doing so, we assume an underlying latent variable that determines an individual's class membership, and this procedure takes into account error, and is thus preferred over a cluster analysis (e.g., Reinke, Herman, Petras, & Ialongo, 2008). In the current study we assessed whether the three expected personality types emerge from the first measurement wave of personality dimensions.

Model solutions were assessed with the Vuong-Lo-Mendell-Rubin (VLMR) likelihood ratio test, Bayesian information criterion (BIC), and Bootstrapped Likelihood Ratio Test (BLRT; see Nylund et al. for a detailed description of this method). Better fitting models showed a significant improvement compared to the k-1 model on the VLMR, lowest BIC values and significant BLRT *p*-values (< .05). At each stage, we considered the meaningfulness of the number of classes based on the existing literature on personality types.

Classes were then characterized by looking at the distribution of item means on the personality dimensions. Previous studies have identified three personality types (Asendorpf, Borkenau, Ostendorf, & Van Aken, 2001), therefore our latent class solutions were tested against a three-class solution. After the best fitting model was identified, the most probable class membership of individuals was exported to a data manager (SPSS 18.0), in which dummies were created based on the class membership information. These dummies included two groups of adolescents with two different personality types (i.e., dummy 1 = overcontroller versus resilient; dummy 2 = resilient versus undercontroller; dummy 3 = overcontroller versus undercontroller).

In the first step in our analyses, we specified linear growth models in Mplus version 6 (Muthén & Muthén, 2010), including personality *dimensions* (i.e., extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience), perceived pubertal timing, and biological sex as predictors of sexual experience, casual sexual behavior, and risky sexual behavior. Because of the measurement level of the dependent variables, different growth models were specified: one growth model for ordinal outcome variables (i.e., sexual experiences, logistic ordinal regression analysis), and two growth models with a Poisson distribution for count outcome measures (i.e., casual sexual behavior and risky sexual behavior). After running unconditional models to assess development over time, the predictors were included and assessed (i.e., personality dimensions, perceived pubertal timing and biological sex as covariates). As estimator the Maximum Likelihood for Robust standard errors was used (MLR), with Full Information Maximum Likelihood (FIML) to correct for missing data.

To then test our hypotheses regarding the differences in sexual behavior and development across the three personality *types*, we again specified linear growth models in Mplus version 6 (Muthén & Muthén, 2010), and included and assessed the predictors

(dummies for personality types, perceived pubertal timing (standardized within biological sex), and biological sex.

Results

Latent Class Analysis: From Personality Dimensions to Personality Types

Results from the LCA on mean personality dimension scores at measurement wave 1, indicated that compared to the 2 and 4-class solution, a 3-class LCA provided the best fit to the data (see Table 1). The results from the LCA supported the three-type personality structure underlying the Big 5 personality dimensions (see Figure 1). Class 1 consists of undercontrollers ($n = 74$, 18%), being characterized by high extraversion, average emotional stability, and relatively low openness, agreeableness, and conscientiousness. Class 2 consists of overcontrollers ($n = 69$, 17%), characterized by relatively high conscientiousness and agreeableness, but low openness, extraversion and emotional stability. Finally, class 3 consists of resilient (n = 264, 65%), characterized by relatively high scores on all Big five dimensions. For further analyses we used the most probable class membership at T_1 to create three dummies differentiating the three personality types.

Latent Growth Curve Modeling (LGCM) of Sexual Behavior

We first analyzed three linear unconditional models to examine the development of sexual experience, casual sexual behavior, and risky sexual behavior (see Table 2). Over time, adolescents reported increases in sexual experience, (mean slope = 1.32, $p < .001$), and the tempo of this development varied significantly between adolescents (variance = 2.07, $p = .003$). Reports of casual sexual behavior also increased over time (mean slope = 0.92, $p < .001$), but did not show individual differences in the tempo of development (variance = 0.16, $p = .106$). Adolescents also reported increases in their risky sexual behavior over time (mean slope = .65, $p < .001$), but no individual differences in tempo of development were present (variance = 0.05, $p = .345$). These findings clearly showed a significant increase in

adolescents' sexual experience and their casual and risky sexual behavior over time. Because there were no individual differences in the increase (i.e., slopes) of casual and risky sexual behavior, it was not possible to specify personality dimensions or type as a predictor of slopes for casual and risky sexual behavior in the conditional models.

Sexual experience. To assess whether the personality dimensions were related to sexual experience we conducted a logistic ordinal latent growth model (see Table 3). The results showed that higher levels of extraversion, and lower levels of agreeableness were related to more advanced sexual experiences at the beginning of the study (i.e., intercept). Concerning the development of sexual experiences of time, the results showed that lower levels of agreeableness and higher levels of emotional stability and openness to experience were related to a steeper increase in sexual experience (i.e., slope).

To assess whether personality types predicted baseline levels of and increases in sexual experience over time, we conducted three logistic ordinal latent growth models (see Table 4). The results showed that undercontrolling adolescents reported more advanced sexual behavior than their overcontrolling and resilient peers at baseline. Furthermore, adolescents' personality type was not related to the rate of development of sexual experiences. Pubertal timing and biological sex did not predict the baseline levels and development of sexual experience over time.

Casual sexual behavior. To assess whether the personality dimensions were related to casual sexual behavior we conducted a latent growth curve model (see Table 3). The results showed that higher levels of extraversion and lower levels of agreeableness were related to more casual sexual behavior at the beginning of the study (i.e., intercept). Further, male adolescents reported higher levels of casual sexual behavior at the beginning of the study than females. Because there was no significant variance in the slope of casual sexual behavior—there were no individual differences that could be predicted—we only examined the

association between personality dimensions and beginning levels of casual sexual behavior.

To test the longitudinal relationship between personality types and casual sexual behavior, three latent growth curve models were estimated (see Table 4). Because there was no significant variance in the slope of casual sexual behavior—there were no individual differences that could be predicted—we only examined the association between personality types and beginning levels of casual sexual behavior. The results showed that undercontrolling adolescents engaged in significantly more casual sexual behavior than their resilient and overcontrolling peers, and males engaged in more casual sexual behavior than females at the beginning of the study. Perceived pubertal timing was not related to casual sexual behavior at baseline.

Risky sexual behavior. To assess whether the personality dimensions were related to risky sexual behavior we conducted a latent growth curve model (see Table 3). The results showed that higher levels of extraversion and lower levels of agreeableness were related to more risky sexual behavior at the beginning of the study (i.e., intercept). Because there was no significant variance in the slope of risky sexual behavior—there were no individual differences that could be predicted—we only examined the association between personality dimensions and beginning levels of risky sexual behavior.

To test the hypothesized longitudinal relation between personality types and risky sexual behavior, we conducted three latent growth curve models (see Table 4). There was no significant variance in the slope of risky sexual behavior; hence, we only examined the association between personality types and beginning levels of risky sexual behavior. The results showed that undercontrolling adolescents engaged in significantly more risky sexual behavior than resilient and overcontrolling adolescents. Undercontrolling and overcontrolling adolescents who reported a later perceived pubertal timing reported more risky sexual

behavior than those who reported an earlier perceived pubertal timing. Biological sex was not related to risky sexual behavior at baseline.

Discussion

The results of this study revealed clear differences in sexual behavior between adolescents with different personality types. At the baseline of our 4-wave prospective study, undercontrolling adolescents reported engaging in more advanced, more casual, and more risky sexual behavior than their resilient and overcontrolling peers. With respect to development over time, adolescents' personality type was not related to specific developmental trends in sexual experiences, and casual or risky sexual behavior. The separate personality *dimensions* in relation to sexual behavior corroborated our findings with the personality *types*. That is, extraversion was positively related, and agreeableness was negatively related, to baseline levels of sexual experiences, casual and risky sexual behavior.

We conclude that personality types are not related to the rate of development of sexual experiences, and casual and risky sexual behavior over time during an 18 month span of middle adolescence. Furthermore, for casual and risky sexual behavior we found no individual differences in the development of these behaviors. This means that although baseline levels of casual and risky sexual behaviors differed for mid adolescents, they increased in casual and risky sexual behavior at a similar rate.

Concerning the level of sexual experiences at the beginning of the study, our findings showed that overcontrolling adolescents engage in less sexual behavior (sexual experiences, casual, and risky) in comparison to resilient and undercontrolling adolescents. These results corroborate earlier studies that found that overcontrolling adolescents may have more trouble engaging in social relations in general (Denissen et al., 2008), and intimate or romantic contact in particular (Meeus et al., 2011). This may also suggest that overcontrolling adolescents select different social contexts matching their personality type, in which they

experience fewer or more “distant” types of peer relations (Caspi, Roberts, & Shiner, 2005). Because of a tendency to shy away from intimate contact or to establish intimate bonds, overcontrolling adolescents may have fewer opportunities to engage in sexual behavior, or they may prefer a long-term, supportive and committed relationship before doing so. Future research might examine these contextual or cognitive factors by assessing romantic relationship status and quality, and by investigating how adolescents wish to experience their first sexual encounter.

Undercontrollers are described as having low levels of impulse-control and self-regulation. This may make them more directed to the outside world (i.e., having more friends and being more romantically engaged), while it may also increase their difficulty to cope with environmental demands or their own impulses. Perhaps they interpret situations differently, or do not fully gauge consequences of their behaviors. Our results replicated previous research on the relation between personality and risky sexual behavior (Atkins, 2008; Hoyle et al., 2000; Miller et al., 2004; Schmitt, 2004). Similar to the higher levels of externalizing behavior among these adolescents (Akse et al., 2004; Van Aken & Dubas, 2004), undercontrolling adolescents also engage in more risky sexual behaviors than overcontrolling adolescents.

Nevertheless, we did not find that undercontrollers differ in their tempo of sexual development from resilient and overcontrollers. Over the course of the study (18 months), undercontrolling adolescents seemed to remain at a higher level of sexual behavior than resilient and overcontrolling adolescents. As mentioned, our young sample is just starting their sexual career; which may explain the non-significant variance in development of casual and risky sexual behavior. For future research it would be interesting to follow adolescents from a younger age and for a longer time to examine when differences between adolescent personality types develop, and whether they continue into adulthood. We would then be able

to see whether the differences in sexual behavior become larger because adolescents select different environments in which they are either encouraged or discouraged to engage in certain behaviors, or whether differences become smaller as more adolescents become increasingly exposed to a wider range of opportunities.

In contrast to previous studies (Belsky et al. 2010; Negriff et al., 2011; Udry, 1979; Zimmer-Gembeck & Helfand, 2008) we found that perceived pubertal timing was not related to the baseline level of sexual experiences and casual sexual behavior. However, perceived pubertal timing *was* related to risky sexual behavior. Those who are ‘late-developers’ reported more risky sexual behaviors than those who are ‘early-developers’. Most adolescents in our study will already have gone through the initial stages of pubertal development by the time of the first measurement wave. For future research we would therefore suggest a longitudinal study that begins with younger participants who have not yet initiated pubertal development but whose pubertal development is tracked with a comprehensive measure across the study. In this way, pubertal status, timing and tempo in relation to sexual development could be examined.

Further, we found that there were no gender differences in sexual experiences and risky sexual behavior, although we did find that males engaged in more casual sex behavior than females. As most adolescents had engaged in some form of sexual behavior at the beginning of the study, potential sex differences in the onset of sexual behavior may have dissolved by the time they participated in the study. Moreover, we did not ask the age at which adolescents had their first encounter just whether they had already experienced a particular behavior. Among adult males and females, sex differences in the perception of sexual encounters have been found (Carroll, Volk, & Hyde, 1985; Ellis & Symons, 1990; Sprecher, Barbee, & Schwartz, 1995). For example, female adults report being less inclined to engage in sexual activities without psychological involvement than males do (Carroll et al.,

1985). However, there is very little research on adolescent perceptions of their sexual experiences. Thus, for future research, a sample of adolescents from a broader age range is needed with a focus on whether gender differences exist in how first sexual encounters are experienced.

Despite the addition of studying personality types in an adolescent longitudinal sample and using a broad conceptualization of sexual behavior, the current study has some limitations. Although the current study included a wide range of sexual behaviors, we did not include any measures of how adolescents perceive and experience sexual encounters. Furthermore, an obvious but hard-to-avoid aspect of the current study is the self-report measures. Sexual behavior is a sensitive topic that would be hard to infer from parent- or teacher-reports. However, to avoid shared-method bias it would have been better to have different reporters or different assessment methods for the constructs included in our study. For example it would have been beneficial to include, a behavioral measure of sexual development such as an implicit attitude test or have others report on the adolescents' personality.

Despite these limitations, the current study was one of the first to investigate whether adolescent personality types is a useful factor for understanding individual differences in adolescent sexual behavior. In particular, the current study showed that undercontrolling adolescents show more advanced sexual behavior than resilient and overcontrolling adolescents already at mid adolescence and they are also more likely to show risky sexual behavior. This suggests that undercontrollers may be earlier starters, although that remains to be adequately studied in a younger sample of early or even pre-adolescents. Thus, the current study confirms that personality type is a key individual characteristic that help explain when adolescents engage in initial sexual encounters, and how they develop during middle adolescence.

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Table 1

Percentages of Sexual Experiences and Mean Score of Casual and Risky Sexual Behavior

	Wave 1	Wave 2	Wave 3	Wave 4
	% / <i>M</i> (<i>SD</i>)			
Males				
Sexual experience ^a				
category 0	22.6	13.2	17.1	15.5
category 1	57.2	56.3	46.8	39.8
category 2	20.1	30.6	36.0	44.7
Casual sexual behavior (0-2)	0.19 (0.57)	0.29 (0.66)	0.28 (0.66)	0.41 (0.76)
Risky sexual behavior (0-4)	0.10 (0.34)	0.22 (0.66)	0.18 (0.58)	0.29 (0.70)
Females				
Sexual experience ^a				
category 0	17.5	17.5	12.3	7.3
category 1	64.5	62.6	53.6	48.4
category 2	18.0	19.9	34.1	44.4
Casual sexual behavior (0-2)	0.05 (0.26)	0.07 (0.35)	0.12 (0.43)	0.18 (0.53)
Risky sexual behavior (0-4)	0.12 (0.36)	0.11 (0.35)	0.24 (0.46)	0.33 (0.65)

^aSexual experience was assessed with three categories, category 0 = sexually inexperienced; 1 = experience with kissing, and/or petting; 2 = experience with both category 1 and oral and/or vaginal sexual intercourse.

Table 2

Fit Statistics for Latent Class Analysis Solutions

	VLMR <i>p</i>	BIC	BLRT <i>p</i>
1 class	n/a	4212.92	n/a
2 class	.09	4202.53	< .001
3 class	.63	4212.96	< .001
4 class	.01	4225.52	.013

Note. VLMR = Vuong-Lo-Mendell-Rubin likelihood ratio test. BIC = Bayesian Information Criterion. BLRT = Bootstrapped Likelihood Ratio Test. n/a = not applicable, these statistics look at the k-1 class solutions, these cannot be computed for the 1-class solution.

Table 3

Parameter Estimates of the Conditional Models Including the Big Five Personality Dimensions as Predictors of Sexual Experiences, Casual Sexual Behavior, and Risky Sexual Behavior

	Baseline (intercept)		Growth (slope)		Baseline (intercept)		Baseline (intercept)	
	Sexual experience		Sexual experience		Casual sexual behavior		Risky sexual behavior	
	OR (SE)	Stand. (SE)	OR (SE)	Stand. (SE)	B (SE)	β (SE)	B (SE)	β (SE)
Extraversion	1.95 (0.46)***	0.29 (0.06)***	-.06 (0.19)	-0.04 (0.11)	1.32 (0.39)**	0.32 (0.09)***	1.00 (0.29)**	0.32 (0.09)***
Agreeableness	-1.79 (0.64)**	-0.21 (0.07)**	-0.47 (0.23)	-0.22 (0.11)*	-1.93 (0.34)***	-0.37 (0.06)***	-1.17 (0.30)***	-0.30 (0.08)***
Conscientiousness	-0.58 (0.49)	-0.08 (0.07)	0.15 (0.22)	0.08 (0.11)	-0.35 (0.38)	-0.08 (0.08)*	0.09 (0.32)	0.03 (0.09)
Emotional stability	-0.46 (0.55)	-0.06 (0.07)	0.56 (0.22)**	0.27 (0.12)*	0.56 (0.47)	0.12 (0.10)	0.17 (0.36)	0.05 (0.10)
Openness to experience	-0.57 (0.51)	-0.08 (0.07)	0.51 (0.21)*	0.27 (0.10)**	-0.04 (0.39)	-0.01 (0.09)	0.19 (0.36)	0.06 (0.11)
Pubertal timing	0.56 (0.31)	0.11 (0.06)	0.25 (0.16)	0.19 (0.11)	0.26 (0.27)	0.08 (0.09)	0.30 (0.21)	0.13 (0.09)
Biological sex	-0.55 (0.65)	-.05 (0.06)	-.03 (0.27)	-0.01 (0.11)	-1.71 (0.52)**	-0.27 (0.08)**	-0.07 (0.45)	-0.02 (0.09)

* $p < .05$, ** $p < .01$, *** $p < .001$; two-tailed. Note. OR = odds ratio. Stand. = Standardized odds ratio. Biological sex: male (0), female (1). Sexual experience: Log likelihood = -706.30, AIC = 1452.60, BIC = 1530.43. Casual sexual behavior: Log likelihood = -405.16, AIC = 848.32, BIC = 923.03. Risky sexual behavior: Log likelihood = -497.54, AIC = 1033.08, BIC = 1107.79. Parameter estimates of the relation between personality type and growth of casual and risky sexual behavior are not shown, because the variance of the slopes was non-significant.

Table 4

Parameter Estimates of the Conditional Models for Sexual Experience, Casual Sexual Behavior, and Risky Sexual Behavior

	<i>Baseline (intercept)</i>		<i>Growth (slope)</i>		<i>Baseline (intercept)</i>		<i>Baseline (intercept)</i>	
	<i>Sexual experience</i>		<i>Sexual experience</i>		<i>Casual sexual behavior</i>		<i>Risky sexual behavior</i>	
	OR (SE)	Stand. (SE)	OR (SE)	Stand. (SE)	B (SE)	β (SE)	B (SE)	β (SE)
Model 1								
Resilient (1) vs. overcontrolling (0)	2.49 (1.02)*	0.20 (0.08)*	0.66 (0.39)	0.21 (0.12)	2.76 (1.53)	0.28 (0.14)	1.97 (0.90)*	0.37 (0.14)*
Pubertal timing	0.39 (0.36)	0.08 (0.07)	0.23 (0.18)	0.18 (0.13)	0.36 (0.40)	0.09 (0.10)	0.25 (0.23)	0.11 (0.11)
Biological sex	-0.81 (0.75)	-0.08 (0.07)	0.02 (0.32)	0.01 (0.12)	-3.38 (0.79)***	-0.43 (0.09)***	-0.40 (0.50)	-0.09 (0.11)
Model 2								
Undercontrolling (1) vs. resilient (0)	2.90 (0.16)*	0.22 (0.08)**	-0.57 (0.45)	-0.16 (0.12)	1.88 (0.55)**	0.26 (0.08)**	1.30 (0.45)**	0.26 (0.09)**
Pubertal timing	0.49 (0.37)	0.09 (0.07)	0.26 (0.19)	0.18 (0.12)	0.30 (0.27)	0.10 (0.09)	0.41 (0.21)	0.20 (0.10)
Biological sex	-0.26 (0.77)	-0.02 (0.07)	-0.17 (0.34)	-0.06 (0.12)	-2.08 (0.56)***	-0.34 (0.09)***	-0.15 (0.43)	-0.04 (0.10)
Model 3								
Undercontrolling (1) vs. overcontrolling (0)	4.28 (1.29)**	0.38 (0.10)***	-0.03 (0.40)	-0.02 (0.20)	3.55 (1.11)**	0.68 (0.14)***	2.70 (0.81)**	0.59 (0.12)***
Pubertal timing	0.48 (0.55)	0.08 (0.10)	0.24 (0.23)	0.23 (0.22)	0.34 (0.34)	0.13 (0.13)	0.81 (0.25)**	0.35 (0.11)**
Biological sex	-0.09 (1.17)	-0.01 (0.10)	-0.38 (0.39)	-0.19 (0.20)	-0.59 (0.36)	0.11 (0.12)	0.37 (0.62)	0.08 (0.14)

* $p < .05$, ** $p < .01$, *** $p < .001$; two-tailed. Note. OR = odds ratio. Stand. = Standardized odds ratio. Biological sex: male (0), female (1). Sexual experience: Model 1: Log likelihood = -536.91, AIC = 1097.82, BIC = 1141.14. Model 2: Log likelihood = -535.5, AIC = 1095.90, BIC = 1139.21. Model 3: Log likelihood = -250.64, AIC = 525.29, BIC = 558.33. Casual sexual behavior: Model 1: Log likelihood = -271.21, AIC = 564.43, BIC = 604.29. Model 2: Log likelihood = -358.97, AIC = 739.94, BIC = 779.88. Model 3: Log likelihood = -134.70, AIC = 291.41, BIC = 321.88. Risky sexual behavior: Log likelihood = -331.06, AIC = 684.12, BIC = 723.98. Model 2: Log likelihood = -415.79, AIC = 853.58, BIC = 893.52. Model 3: Log likelihood = -148.34, AIC = 318.67, BIC = 349.15. Parameter estimates of the relation between personality type and growth of casual and risky sexual behavior are not shown, because the variance of the slopes was non-significant. Resilient ($n = 264$), undercontrolling ($n = 74$), overcontrolling ($n = 69$).

