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Sex as a developmental transition: the direct and indirect roles of peers

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The influence of peers on adolescent sexual behaviours is an important but understudied phenomenon. Past studies have predominantly concentrated on the potential negative influences of peer norms on risky sexual behaviours, but they have seldom investigated the underlying processes behind such influences. This study explored the direct associations between adolescent sexual activity and friends' support, levels of disagreement with friends and friends' modelling for sexual activity. We also investigated the potential mediating role of the perception of peer influence for sexual activity and of the perception of being too young to have initiated sexual activity among these associations. This study was conducted among 328 Italian adolescents (56% female; 30% sexually active; aged 15–19 years; mean age = 16.23 years) using a two-wave longitudinal design. Linear and logistic regression analyses revealed that level of disagreement with friends and sex activity modelling by friends were both positively associated with the presence of sexual activity. Additionally, the perception of being too young to have initiated sexual activity fully mediated the association between the level of disagreement with friends and the presence of sexual activity, and it partially mediated the association between the sexual activity modelling by friends and the presence of sexual activity. Finally, perceived peer influence partially mediated the association between sexual activity modelling by friends and the presence of sexual activity. Implications for intervention development are discussed.

Keywords: sex; peers; mediation

Introduction

The study of adolescent sexuality tends to focus on the potentially negative correlates and consequences associated with this phenomenon. Correlates such as sexual harassment and exploitation, teen pregnancy and sexually transmitted diseases (STDs) have been central topics in this field of research for the past two decades (Graber, Brooks-Gunn, & Galen, 1998). Although the importance of investigating the negative aspects of adolescent sex is clear, other aspects of adolescent sexuality deserve equal attention from investigators. This study is an effort to investigate adolescent sexuality as a normative developmental transition behaviour that is closely associated with the quality and influence of peer relationships.

Adolescent sexual behaviour has been associated with at least three important types of physical and psychological health risks (Brooks-Gunn & Paikoff, 1997). The first is the risk of STDs given the fact that epidemiological studies have shown that one of about

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four sexually active adolescents will contract some form of STDs before the end of high school. The second significant risk associated with adolescent sexual behaviour is precocious pregnancy. The incidence of teen mothers varies between 25% and 55% in the United States and Great Britain to around 7% in most other European countries, including Italy where this study was conducted (Brooks-Gunn & Paikoff, 1997). The third risk, which is generally underestimated, concerns the involvement in sexual activity outside a relation characterised by affection and equality (Furman & Simon, 1998).

Although these issues are of primary concern for the understanding of adolescent health, we risk overlooking many important dimensions of adolescent sexuality by defining adolescent sexual behaviours only in terms of the negative outcomes associated with this behaviour (Coleman & Roker, 1998; Holland & Thompson, 1998). Learning to commit oneself to intimate relationships, being able to match affection and sexuality and avoiding inequality have been acknowledged as some of the more important developmental transitions in contemporary Western societies (Buzwell & Rosenthal, 1996). These acknowledgements, in part, have resulted from changes in the general attitudes towards sex that have occurred among Western societies over the past half century. Nevertheless, it is worth noting that the social approval of sexual behaviours has not been homogenous across genders or among different cultural groups; for example, we know that most of the responsibility for reproduction and contraception still lies with girls (Graber et al., 1998).

Sexual transitions are strongly related to the development of identity and to gaining emotional autonomy from the original family unit (Dowdy & Kliewer, 1998). Within psychologically and physically safe circumstances, dating and sex are two important developmental tasks for adolescents and young adults, which may facilitate the transition towards adulthood (Ciairano, Kliewer, Bonino, Miceli, & Jackson, 2006). However, several competences are required to realise a positive sexual experience. Some important competencies associated with the achievement of a constructive sexual experience include being able to recognise and prevent attempts of manipulation by others; to negotiate solutions with one's partner; to evaluate the consequences of one's own behaviour on both a social level and a reproductive level, and the use of contraception, among others (Beyth-Marom & Fischhoff, 1997). These competencies develop from pubertal maturation (Schulenberg, Maggs, & Hurrelmann, 1997; Silbereisen & Krache, 1997), from environmental opportunities, from contextual experiences and from the acquisition of higher cognitive capabilities that are at least partially mediated by education (Mitchell & Wellings, 1998).

Recently, some authors (see DiClemente, Salazar, & Crosby, 2007; DiClemente et al., 2008) have proposed an ecological perspective of adolescent sexuality that considers the complex web of social relationships in which such phenomenon is embedded. This perspective considers that peer relationships fulfil an important role by offering support, knowledge, acceptance and representative models to emulate. Indeed, a number of studies have concentrated on the potential effects that peer norms may have on adolescent sexual behaviours and on the ways in which educational agencies such as the family may intervene to buffer these effects.

With respect to peers, Sieving, Eisenberg, Pettingell, and Skay (2006) suggested that programmes focused on delaying teenage sexual intercourse should address norms for sexual behaviour among adolescents' close friends as well as the perceptions, skills and behaviours of individual youth. Potard, Courtois, and Rusch (2008) found that the sexual norms of peers influence youths' individual attitudes and behaviours, both in terms of a higher frequency of sexual initiation and of sexual practices considered risky and in terms of commitment to protected sex. However, Markham et al. (2003) showed that family connectedness may be a protective factor related to sexual risk taking, even among high-risk

youth. Also, a recent review by Markham et al. (2010) showed that connectedness, in terms of bonding or emotional attachment and commitment to the family, peer group, school, community or culture, was a protective factor for adolescent sexual and reproductive health outcomes.

Boislard, Poulin, Kiesner, and Dishion (2009) recently showed, among a sample of Canadian and Italian adolescents, that the socialisation model, which posits that youth's learn problem behaviours within friendship networks, was more accurate to predict the emergence of risky sexual behaviours over the selection model, which holds that delinquent youths tend to affiliate with each other. In addition, these authors found a direct effect of parenting practices on number of sexual partners and a full mediation of parenting practices on the effects deviant friends' and problem behaviours on condom use of youth. Similarly, Whitaker and Miller (2000) found that parental communication moderated the relationship between peer norms and adolescent sexual activity and condom use among a sample African American and Hispanic adolescents. This study found that a lack of communication with parents influenced adolescents to turn to peers and that peers in turn might have influenced the adolescents' sexual behaviours. Prinstein, Meade, and Cohen (2003) found that perceptions of best friends' behaviour were significantly associated with adolescents' own oral sex behaviour but not intercourse.

In our opinion, the study of the effects of peers on adolescent sexuality would benefit from the inclusion of other relevant aspects of adolescent peer relationships, such as the quality of the friendships that adolescents establish with their peers. We know that friendships serve human beings in both positive (e.g. validation of interests, hopes and fears, providing affection, support and emotional security) and negative (e.g. conflict, dominance, rivalry, disagreement) ways (Berndt, 2002; Furman, 1996; Rubin, 2004). Indeed, research has shown that people who have higher quality friendships are more likely to be better adjusted (Berndt, Hawkins, & Jiao, 2005; Hartup & Stevens, 1997); and the risks associated with having poor quality friendships have been well documented, especially in terms of their association with adolescent problem behaviours (Burk & Laursen, 2005). However, the quality of adolescent friendships has seldom been explored in relation to sexual behaviour. Our review of the literature uncovered only one study that investigated the association between qualitative aspects of friendship and those of adolescent sex. Precisely, Henrich, Brookmeyer, Shrier, and Shahar (2006) found that supportive friendships and parent connectedness interacted in predicting decreased likelihood of adolescent sexual risk behaviour.

One objective of this study was to explore the nature of the effect of peers and quality of friendship on adolescent sexual activity. Specifically, we wanted to investigate the direct effect of peers on adolescent sexual activity and the potential mediator roles that adolescents' attitudes and perceptions about sex could have on this effect. The exploration of these mechanisms is relevant for both the development of prevention efforts that may take into account these nuances and the general understanding of the role that peer relations play on adolescent sexual activity.

Another important aim of this study was to explore the associations between adolescent sexual activity and peer relations in Italy, a country where new trends in sexual attitudes and behaviours coexist with a long history of conservative and traditional values due to the strong presence of the Catholic religion (Buzzi, 1998). In Italy, the legal use of contraception was only introduced during the 1980s, and limited sexual education in school was introduced no earlier than the late 1990s. Even today, sexual education at school is still very limited in duration and content. It is only recently that more general education programmes based on the improvement of adolescent life skills, problem solving, efficient

communication, mastery of both positive and negative emotions and of stressful conditions have begun to be implemented in the school system. In fact, open information and discussion about sex is still something that the Italian adolescents are more likely to get from family and peer contexts than from other sources. A recent study (Bonino, Cattelino, & Ciairano, 2005) showed that the main source of information about sex is the family (35%), followed by friends (25%). Notwithstanding this poor amount of sexual education information, Italian adolescents have not been shown to be at any particular increased risk for negative sexual behaviour outcomes such as an increased prevalence of teen pregnancy or of STDs (Bonino et al., 2005).

The purpose of this study was to explore how positive and negative friendship qualities and friends' modelling for sexual activity were associated with the adolescent sexual activity. Specifically, we wanted to explore the main effects of quality of friendship (in terms of support and level of disagreement with friends) and friends' sexual activity modelling on the presence of the sexual activity of our adolescent participants. Furthermore, we wanted to explore if these effects were mediated by the adolescents' attitude towards sex (in terms of perceiving themselves to be too young to have commenced sexual activities and perceived peer influence on sex).

First, we hypothesised that the presence of adolescent sexual behaviour would be positively related to both positive and negative friendship qualities and to friends' modelling for sexual activity. Indeed, if positive quality of friendship may provide affection and support, disagreement with friends then may enhance adolescent openness towards sex by granting room for overt discussion. Furthermore, sexual activity modelling by friends may represent a validation of adolescent interest in having sexual activities (Rubin, 2004).

Second, we hypothesised that the role of peers would have a direct effect on the presence of sexual activity and that this association would be mediated by the adolescents' perception of peer influence and/or the thought of being too young to have initiated sexual activities. That is to say, we expected that the association between sexual activity and peer relationships would be mediated by how strong they perceive the influence of their peers and/or if they perceive themselves to be too young to have initiated sexual activities (Jessor, 1998). Specifically, we hypothesised that the perception of peer influence would mediate the effect of peers increasing the likelihood of having had sex; whereas the feeling of being too young would decrease this likelihood. Jessor and colleagues have shown that the perception of being too young can be taken as a protective factor because it represents a personal control against risk behaviour, whereas the perception of influence by friends may represent a social risk opportunity (Costa et al., 2005; Jessor, Turbin, & Costa, 1998; Jessor et al., 2003). Furthermore, these interactions between risk and protective factors posited by Jessor (1998) have been demonstrated previously in a previous study conducted in Italy, which is the country where this study was done (Ciairano, Kliewer, & Rabaglietti, 2009).

Method

Participants

A total of 328 adolescents aged 14–19 years ($M = 16.23$, $SD = 1.39$; 56% female) attending high school (72% a lyceum and 28% a technical high school) participated in this study across two waves (at 6-month intervals) in the north-west of Italy. There was no attrition because we did the administration at school, during normal lessons, within the same school year, which made dropout unlikely. This sample was representative of the population of adolescents attending high school in this part of Italy, where 98% of all adolescents

attend high school following primary school. Regarding relevant structural indicators, our participants appeared to be relatively comparable to the general Italian population (Istituto Nazionale di Statistica, 2009). The unemployment rate in Italy is roughly 10%, whereas among the parents of our participants it was 6% (the unemployment rate in Italy varies a lot with the region from about 5% in the north to 20% in the south). The proportion of divorce was 9% among the parents of our participants versus 11.5% in Italy. Half of the adolescent families consisted of four members and 3% were from one-parent families (same proportion in the national population). With respect to the level of education of the parents, 37% had completed basic school (57% in the global national population), 39% high school (27% in Italy), 10% have some vocational specialisation (6% in Italy) and finally 14% had graduated from university (10% in Italy). The differences with respect to the parental level of education can be explained because the national statistics are calculated on the general population and therefore on much older age groups: the level of education in Italy is higher in the adult (including the parents of our participants) and in adolescent populations with respect to previous generations.

Procedure

This study was conducted in seven high schools in the north-west of Italy. Parents provided written consent for minor students to participate, and students older than 18 years assented to participate in accordance with Italian law and the ethical code of the Professional Psychologists Association in Italy. Students completed questionnaires, which were distributed by trained research staff during classroom time. The questionnaires took approximately 30 minutes to complete. Adolescents were assured of confidentiality and anonymity. Teachers were not present in the classroom during the questionnaire administration. No incentives were offered for participation, 100% of the youth completed the questionnaires.

Measures

We considered predictors and mediators at Wave 1 and outcomes at Wave 2.

Support from friends and level of disagreement with friends

To measure friendship quality, we used 17 items of the Friendship Quality Scale (Bukowski, Hoza, & Boivin, 1994). Items that only applied to younger children (e.g. sharing snacks at snack time) were dropped from the scale. Principal component analysis truncated at eigenvalue > 1 with varimax rotation revealed very similar solutions in both waves. We found two dimensions of friendship instead of the five found by Bukowski et al. (1994), that is, conflict, closeness, companionship, security and helping. The first dimension was linked to support, confidence and sharing. This dimension of support consisted of 14 items regarding spending time together, talking about problems, helping and being helped, sharing funny things together, being happy for his/her successes, finding a solution for conflicts and thinking about him/her even when he/she is not present (Cronbach's $\alpha = 0.92$ at Wave 1 and 0.90 at Wave 2). The second dimension, level of disagreement with friends, consisted of three items reflecting the adolescents' feelings about frequent fighting, being angry even after the fight is over and disagreeing about many things (Cronbach's $\alpha = 0.55$ at Wave 1 and 0.61 at Wave 2). The responses of each item were on a four-point

Likert scale that ranged from (1) 'not at all' to (4) 'very'. We summed up the responses of the items belonging to each dimension and used these as predictors in subsequent analyses.

The third predictor, *sexual activity modelling by friends*, was assessed with one item reflecting the number of the adolescents' friends who had already been involved in sexual activity. Responses ranged on a four-point Likert scale from (1) 'almost none' to (4) 'all'.

The two mediators *perceived peer influence for sexual activity* and *perception of being too young to have initiated sexual activity* were also assessed with one item each. The responses for the item reflecting the perception of peer influence for sexual activity were distributed on a four-point Likert scale that ranged from (1) 'none' to (4) 'all'. The responses for the item reflecting the perception of being too young to have initiated sexual activity were distributed on a four-point Likert scale that ranged from (1) 'not at all' to (4) 'very'.

The outcome *involvement in sexual activity* was assessed with one item reflecting the lifetime involvement with sexual activity; the possible answers were (0) 'never' and (1) 'yes'.

Analytic plan

The proposed mediating role of the perception of peer influence for sexual activity and of the thought of being too young to have initiated sexual activity between the associations of friends' sexual activity modelling, support by friends, comparison with friends and the presence of the adolescent sexual activity was tested using the criteria described by Baron and Kenny (1986) and Holmbeck (1997). To demonstrate the mediation, following conditions had to be met: (1) the predictor variable had to have an effect on the mediator, (2) the mediator variables had to have an effect on the outcome variables when controlling for predictor variables and (3) the effect of the predictor variable on the outcome had to be significantly less when the mediator was included in the model. We included gender and age in each analytic model as covariates. Linear and logistic regression analyses were used to assess mediation.

We conducted the mediation analysis as follows (Hoyle & Smith, 1994): the direct effect of the characteristics of the relationships with friends on sex was first evaluated to verify the influence of the predictor on the outcome variable. If the direct effect was significant, the mediator was included in the analyses.

Theoretically if the mediation does exist, the coefficients of the direct path of the characteristics of the relationships with friends on sex, the paths from the predictor variable to the mediators (the perception of peer influence for sexual activity and thought of being too young to have initiated sexual activity) and the paths from the mediators to the outcome variables (the perception of peer influence for sexual activity and thought of being too young to have initiated sexual activity on the presence of sexual activity) should all be significant and in the predicted directions. A mediation effect is present if, when the mediating paths are included, the overall fit of the model improves and the coefficient from predictor to outcome lowers. If the direct effects between the predictor and the outcome is no longer statistically significant, the mediation is *full*. If the significance of the direct paths are lowered but still significant, the mediation effect is *partial*.

First, the relationship between the characteristics of peer relationships and adolescent sexual activity and peer-related outcomes were investigated by the way of multiple linear regressions. Second, the direct effect of the characteristics of peer relationships on the presence of sexual activity was tested in a model by the way of logistic regressions. After having ascertained the significance of those relationships, we assessed the final model

(characteristics of peer relationships and adolescent sexual activity and peer-related outcomes on the presence of sexual activity) by the way of logistic regressions. With regard to model indices of fit, we used R^2 change in the case of multiple linear regressions and Nagelkerke R^2 change in the case of logistic regressions.

Results

Characteristics of participants

Table 1 presents the characteristics of the sample by gender. Females indicated statistically significant higher levels of support by friends ($\chi = 47.97$ vs. $\chi = 42.37$, $p < 0.0001$) and higher indications of perceptions of being too young to have sex ($\chi = 2.45$ vs. $\chi = 1.99$, $p < 0.0001$). Males, on the contrary, indicated significantly higher levels of disagreement with friends ($\chi = 7.12$ vs. $\chi = 6.38$, $p < 0.0001$).

Table 2 presents descriptive information on and correlations among the study variables. Correlation coefficients were computed to assess the hypothesised relationships between the study variables: predictors, mediators and outcome.

Presence of sexual activity, which involves 30% of our participants, that is $N = 99$, was significantly correlated with all the other variables with the exception of support from friends. Thus, support from friends was excluded from the analysis. Presence of sexual activity was positively related to perceived peer influence for sexual activity, sexual activity modelling by friends and level of disagreement with friends. Presence of sexual activity was negatively related to the perception of being too young to have initiated sexual activity.

With respect to the other intercorrelations, only the one between perceived peer influence for sexual activity and level of disagreement with friends did not reach significance. All the other intercorrelations were significant and in the expected direction: perceived

Table 1. Characteristics of the sample presented by gender.

	Male			Female			
$N = 328$	%	Mean	SD	%	Mean	SD	P
Ages		16.13	1.54		16.30	1.26	NS
Gender	44			56			
Sexual activity involvement (yes/no)							
No	70.63			69.19			NS
Yes	29.37			30.81			
Perceived peer influence for sexual activity		2.76	0.76		2.60	0.75	NS
Perception of being too young to have sex		1.99	1.00		2.45	0.93	<0.0001
Level of disagreement with friends		7.12	2.00		6.38	1.92	<0.0001
Support by friends		42.37	6.43		47.97	6.35	<0.0001
Peer modelling for sexual activity							
None	6.99			10.81			NS
Some	23.08			23.24			
Many	57.34			61.08			
All	12.59			4.86			

Table 2. Intercorrelations among and descriptive information of involvement in sexual activity, adolescents' attitudes towards sex, peer modelling for sexual activity and quality of friendship.

	1	2	3	4	5	6
1. Sexual activity involvement (yes/no)	–					
2. Perceived peer influence for sexual activity	0.21**	–				
3. Perception of being too young to have sex	−0.26**	−0.20**				
4. Peer modelling for sexual activity	0.13*	0.28**	−0.27**			
5. Support by friends	−0.02	0.02	0.04	0.03		
6. Level of disagreement with friends	0.13*	0.06	−0.17**	0.13*	−0.29**	–
M (*N*)	(0.30)	2.67	2.25	2.22	45.53	6.70
SD (%)	(99)	0.76	0.99	0.76	6.96	1.99

Note: *and **Indicate $p < 0.05$ and $p < 0.01$, respectively.

peer influence for sexual activity was positively related with sexual activity modelling by friends and negatively related with perception of being too young to have initiated sexual activity. Additionally, perception of being too young to have initiated sexual activity was negatively related with sexual activity modelling by friends and level of disagreement with friends. Finally, sexual activity modelling by friends was positively related with level of disagreement with friends.

Characteristics of main effects quality of friendship and peer modelling for sexual behaviour on the presence of adolescent sexual activity

Table 3 shows the results from our main effects model. Results showed that peer modelling for sexual activity was positively significantly associated with the presence of sexual activity ($\beta = 0.49$, $p = 0.01$). This indicated that having a greater number of friends who had already been involved in sexual behaviour was associated with the adolescents' personal involvement in sexual activity. Likewise our results also showed that greater indications of perception of peer pressure to have sexual activity were positively significantly associated

Table 3. Standardised regression coefficients (controlling for age and gender) between quality of friendships, peer modelling for sexual activity and adolescents' attitudes towards sex on the presence of adolescent sexual activity.

	Sexual activity involvement (yes/no)		
$N = 328$	β estimate	SE	*P*
Support by friends	0.005	0.023	0.806
Level of disagreement with friends	0.097	0.074	0.187
Peer modelling for sexual activity	0.499	0.204	0.014
Perceived peer influence to have sex	0.436	0.214	0.042
Perception of being too young to have sex	−0.556	0.166	0.000
Gender	−0.407	0.310	0.189
Age	0.009	0.106	0.931

with the adolescents' personal involvement in sexual activity ($\beta = 0.43, p = 0.04$). Finally, our analyses showed a strong negative association between perceiving oneself to be too young to have initiated sexual activities and presently being involved in sexual activities ($\beta = -0.55, p < 0.000$).

Mediation analyses

As indicated, we tested six different mediation models to investigate whether the main effects of quality of friendship (friends' support and level of disagreement with friends) and peer modelling for sexual activity on the presence of sexual activity were mediated by the adolescents' attitude towards sex (in terms of perceiving themselves to be too young to be involved in sexual activities and perceived peer influence to have sexual activity). Only those models with significant mediation are discussed.

Level of disagreement with peers > perception of being too young to have initiated sex > sexual activity involvement

To test whether the indirect effect of the level of disagreement with peers on sexual activity involvement through the mediator perception of being too young to have initiated sex was significantly different from 0, we first established that level of disagreement with peers was associated with perception of being too young to have initiated sex. As expected, the coefficient between the predictor variable and our mediator of interest was significant ($\beta = -0.26, p < 0.002$) while controlling for age and gender. The coefficient for the regression association between level of disagreement with peers (predictor) on sexual activity involvement (outcome) while controlling for age and gender was also significant ($\beta = 0.03$, $p < 0.01$) (see Table 4). Again, as expected, we then observed a decrease in the coefficient once the mediator perception of being too young to have initiated sex was included in the regression model of level of disagreement with peers (predictor) on sexual activity involvement (outcome) while controlling for age and gender ($\beta = 0.02$, $p < 0.06$). Finally, the Sobel test for mediation that determines if this coefficient decrease was significant/reliable indicated that the mediation model was one that was fully mediated ($z = 2.11, p = 0.03$).

Table 4. Unstandardised regression coefficients (controlling for age and gender) between sexual activity involvement (outcome), level of disagreement with friends (predictor) and perception of being too young to have sex (moderator).

	Sexual activity involvement		
	β	SE	*P*
Step 1			
Level of disagreement with friends	0.030	0.012	0.017
Gender	0.029	0.051	0.565
Age	0.042	0.018	0.020
Step 2			
Level of disagreement with friends	0.023	0.012	0.062
Perception of being too young to have sex	−0.117	0.026	< 0.0001
Gender	0.081	0.051	0.114
Age	0.023	0.018	0.200

Peer modelling for sexual activity > peer influence to have sexual activity > sexual activity involvement

We also tested whether the indirect effect of the peer modelling for sexual activity (predictor) on sexual activity involvement (outcome) through the mediator peer influence to have initiated sexual activity was significantly different from 0. As expected, the coefficient between the predictor variable and our mediator of interest was significant ($\beta = 0.24$, $p < 0.0001$) while controlling for age and gender. The coefficient for the regression association between peer modelling for sexual activity (predictor) on sexual activity involvement (outcome) while controlling for age and gender was also significant ($\beta = 0.14$, $p = 0.0001$) (see Table 5). In our next regression step, we observed a decrease in the coefficient once the mediator peer influence to have sexual activity was included in the regression model of peer modelling for sexual activity (predictor) on sexual activity involvement (outcome) while controlling for age and gender ($\beta = 0.12$, $p = 0.001$). The Sobel test for mediation determined that this coefficient decrease was significant; furthermore, it indicated that the mediation model was one that was partially mediated ($z = 2.05$, $p = 0.04$).

Peer modelling for sexual activity > perception of being too young to have initiated sexual activity > sexual activity involvement

Our final significant mediation model tested whether the indirect effect of the peer modelling for sexual activity (predictor) on sexual activity involvement (outcome) through the mediator perception of being too young to have initiated sexual activity was significantly different from 0. We observed that the coefficient between the predictor variable and our mediator of interest was significant ($\beta = -0.17$, $p = 0.0002$) while controlling for age and gender. The coefficient for the regression association between peer modelling for sexual activity (predictor) on sexual activity involvement (outcome) while controlling for age and gender was also significant ($\beta = 0.15$, $p = 0.0001$) (see Table 6). In our final regression step, we observed a decrease in the coefficient once the mediator perception of being too young to have initiated sexual activity was included in the regression model of peer modelling for sexual activity (predictor) on sexual activity involvement (outcome) while controlling for age and gender ($\beta = 0.12$, $p = 0.002$). The Sobel test for mediation

Table 5. Unstandardised regression coefficients (controlling for age and gender) between sexual activity involvement (outcome), peer modelling for sexual activity (predictor) and perception of peer influence to have sex (moderator).

	Sexual activity involvement		
	β	SE	*P*
Step 1			
Peer modelling for sexual activity	0.148	0.038	0.0001
Gender	0.011	0.053	0.8248
Age	0.012	0.020	0.5424
Step 2			
Peer modelling for sexual activity	0.126	0.038	0.001
Perceived peer influence to have sex	0.088	0.037	0.019
Gender	0.024	0.053	0.653
Age	0.009	0.020	0.639

Table 6. Unstandardised regression coefficients (controlling for age and gender) between sexual activity involvement (outcome), peer modelling for sexual activity (predictor) and perception of being too young to have sex (moderator).

	Sexual activity involvement		
	β	SE	P
Step 1			
Peer modelling for sexual activity	0.148	0.038	0.0001
Gender	0.011	0.053	0.8248
Age	0.012	0.020	0.5424
Step 2			
Peer modelling for sexual activity	0.117	0.038	0.002
Perception of being too young to have sex	−0.107	0.028	0.0002
Gender	0.059	0.054	0.270
Age	0.001	0.020	0.925

determined that this coefficient decrease was significant, furthermore it indicated that the mediation model was one that was partially mediated ($z = 2.67$, $p = 0.007$).

Discussion

This study investigated whether positive and negative friendship qualities and sexual activity modelling by friends were associated with the presence of adolescent sexual activity. Additionally, we explored whether the effect of friendship quality and sexual activity modelling by friends was only direct and/or mediated by the adolescents' attitudes towards sex, in terms of perceiving oneself too young to have initiated sex and of perceived peer influence to have sexual activity. We hypothesised that the association among friendship qualities and friends' sexual activity modelling with the presence of adolescent sexual activity was both direct and indirect.

We expected the presence of adolescent sexual activity to be positively related to both positive and negative friendship qualities and to friends' sexual activity modelling. We anticipated that positive quality of friendship would encourage adolescent involvement in sex by providing affection and support, whereas disagreement with friends would enhance adolescent openness towards sexual activity by granting room for overt discussion. We also expected that sexual activity modelling by friends would endorse adolescent sexual activity by offering a validation of adolescent interest in having sex.

With respect to the direct association between friendship quality and sexual activity modelling by friends, we found that level of disagreement with friends and sexual activity modelling by friends were both positively associated with adolescent sexual activity. So far, despite the great diffusion of sexual images and pornography in current Western society (Bonino, Ciairano, Rabaglietti, & Cattelino, 2006), involvement in sex appears to be a quite normative developmental transition that may benefit from the possibility of exchanging opinions with friends and to receive validation of one's own interest in sex by the experiences of same-age peers. However, we also need to note that a positive view of adolescent sexual practices is not easy to find even in recent studies. Some scholars (as Arai, 2009; Tolman, 2002) have already underlined that the difficulties in interpreting adolescent sex as a normative behaviour may be due at the current social construction of adolescent involvement in sex. In fact, adolescent sex, and related issues such as teenage pregnancy, and gender differences in the development sexuality are likely to suffer from a special kind of making and unmaking of social problems.

Unfortunately, due to the number of participants who had already commenced sexual activity in this study, we were not able to perform separate analyses for younger and older adolescents. We were just able to control for age. Future studies will have to investigate whether overt discussion and sexual activity modelling by friends are more important for younger or older adolescents groups. At this stage of the research, we can only discuss the importance of considering adolescent sexual involvement as a behaviour that is strongly embedded in the social networks of adolescent peer relationships. It is clear from these findings that we must involve the entire group of adolescents when introducing health promotion programmes that address the issue of facing the developmental transition of sex with great emotional security.

However, we did not find any relationship between support from friends and adolescent sexual activity involvement. We have no reason to think that support by friends is unimportant in facing adolescent developmental transitions. There are at least two different but not alternative explanations for the lack of the association between friends' support and adolescent sex. First, the level of support perceived by friends is very high in our participants and this might have produced a kind of ceiling effect. It would be interesting to investigate the same association in adolescents who perceive low levels of support by their friends. Second, future studies must take care to investigate whether support, confidence and sharing by friends are more important at earlier stages of adolescent development, when sexual activity may assume more of a meaning of transgression, than later when sexual activity is more normative and expected (Giannotta, Ciairano, Spruijt, & Spruijt-Metz, 2009), than in our late adolescent group of participants.

Second, we hypothesised that the association between friendship quality and sex modelling of friends would be mediated by the adolescent perception of peer influence to have sex and/or of being too young to have commenced sexual activities. That is to say, we expected that the association among the presence of sexual activity and peer relationships would be mediated by some adolescents' attitudes towards sex (Graber et al., 1998). Particularly, on the bases of the Problem Behaviour Theory (Jessor et al., 1998), we anticipated that the perception of peer influence to have sex would mediate the effect of peers increasing the likelihood of having had sex, whereas the feeling of being too young to have initiated sex would decrease this likelihood.

We found that the perception of being too young to have sex fully mediated the relation between level of disagreement with friends and sexual behaviour. Additionally, the perception of being too young to have initiated sex partially mediated the association between sex modelling by friends and the presence of adolescent sexual activity. Finally, the perception of peer influence for sex partially mediated the association between sex modelling by friends and adolescent sex.

In other words, although peers might be helpful when the adolescents face the developmental transition of sex, the ways youths cognitively and emotionally evaluate the effect of their peers contributes to the explanation of why some adolescents are more likely to commence sexual behaviour than others. Our findings indicated that adolescents' attitudes and perceptions are important key factors for understanding the differences in likelihood of being involved in sex. We think that these findings highlight the important contribution of adolescent action and thoughts in drawing completely different developmental paths in sexual behaviours and developmental transitions. Although indirectly, these findings seem to confirm what a number of studies have already underlined about the contribution of selection and influence processes in peer relationships. Namely, that adolescents are not the passive victims of any bad 'company they keep' rather they are likely to select friends exactly on the bases of attitudes and behaviours similar to their own and afterwards to

reciprocally influence their friends (Bukowski, Newcomb, & Hartup, 1996). Distinguishing between the effects of peers selection and influence, that is, differentiation from the similarity or homophily between friends' behaviour before their friendship is established and the increasingly similarity in friends' behaviour due to reciprocal modelling and influence, is a definite subject that certainly needs further elaboration in future studies.

Nevertheless, without disregarding the active role of the adolescent, we must point to the fact that adolescent development takes place in a context (Silbereisen, Eyferth, & Rudinger, 1986) that makes different levels of resources available and that endorses different levels of vulnerability. Health promotion programmes that are aimed at reinforcing individual skills of efficient problem solving and emotional control may help strengthen the emotional security of adolescents with low levels of resources and high level of vulnerability by assisting them in the developmental transition of sex. Few other studies have examined the possible contribution of individual characteristics such as self-regulatory efficacy in contrasting peer influence and modelling for sex. In this study, we highlighted that one of the possible mechanisms involved in this relation might be by adolescents' attitudes and perceptions, which may be meant as belonging to the wide range of competencies that are required to realise positive sexual experience in adolescence as well as beyond.

Strengths and limitations

Two key limitations of this study are the short term of the longitudinal design and the relatively small sample size. The short term of the longitudinal design nature of this study precludes us from investigating the long-term patterns of the above-mentioned relationships. The next step in this line of research is to investigate these associations over a longer period of time and more specifically during the passage from adolescence to young adulthood, when sexual behaviour becomes fully normative and socially approved. The relatively small sample size and the fact that all participants resided in one region of Italy also make it difficult to generalise results to different populations. Moreover, the small sample did not allow us to conduct analyses by age or gender and it also prevented us to fully address the issue of protection (and lack of protection) against the risk of STDs. Finally, despite the fact that previous studies have indicated the importance of communication with parents regarding sexual matters, we did not take this aspect into account in this study. In spite of its limitations, however, this study explicated at least two processes underlying the relationship between peer relationships and adolescents' involvement in sexual activity.

Understanding the role of these mechanisms might be useful in designing programmes to counteract the potential negative effects of peer relationships on risky sexual behaviours, by diminishing the individual perception of peer influence on sex and by reinforcing that of being too young for having sex.

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