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Structural relations between sources of parental knowledge, feelings of being overly controlled and risk behaviors in early adolescence

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ABSTRACT

In this study, we have investigated parental knowledge and its sources, namely adolescent disclosure, parental control, and parental solicitation; and how they relate to adolescents' feelings of being overly controlled, and to three types of adolescent risk behaviors, namely bullying, substance use, and delinquent behavior. This was studied in a sample of 1520 Swedish early adolescent boys and girls (*M* age = 13.0). A structural equation path model showed that adolescent disclosure and parental control were positively associated with parental knowledge, which in turn related to all three risk behaviors. Adolescent disclosure was related to lower levels of risk behaviors, while parental solicitation was linked to higher levels of adolescent engagement in risk behaviors, especially for boys, through feelings of being overly controlled. The findings support the idea of a functional role of open communication, as well as adequate levels of autonomy granting, for managing boys' and girls' risk behavior.

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Parental knowledge;
disclosure; control;
adolescent autonomy;
gender

During adolescence, many young people take part in a wide range of risk behaviors and activities, such as smoking, drinking or fighting with peers. For example, aggressive behaviors such as fighting or repeatedly excluding and labeling others are widespread among adolescents (Niemelä et al., 2011). In addition, alcohol and drug use is often initiated during adolescence, as well as delinquent behavior, which involves vandalism and theft (Andershed, Kerr, & Stattin, 2001). Even though such risk behaviors may be adolescent-limited (Johansson & Lalander, 2012; Moffitt, 1993), they may prevail into life-course-persistent disruptive behaviors (Jessor, 1991) that call for early attention.

Positive interaction between adolescents and their parents is one of the key aspects of adolescent development as well as of engagement with risk behaviors, where parental knowledge of adolescent whereabouts is predictive of reduced engagement in adolescent problematic behaviors (Laird, Marrero, & Sentse, 2010). However, the research is inconsistent with respect to how parents gain their knowledge of adolescents' whereabouts. There is also a lack of research on how the parental strategies on obtaining knowledge are perceived by adolescents and what the links to adolescent risk behavior may be. In

an attempt to help close these gaps of knowledge, this study focuses on associations between parental knowledge, and sources thereof, that is adolescent disclosure, parental solicitation, and parental control, as well as links to adolescent feelings of being overly controlled, and the associations to adolescent involvement in the types of risk behaviors, namely bullying, delinquent behavior, and substance use.

Parental knowledge, sources of knowledge, and adolescent risk behavior

Parental knowledge is consistently pointed out as protective against adolescent risk behaviors, including delinquency (Barnes, Hoffman, Welte, Farrell, & Dintcheff, 2006), alcohol and drug use (Chuang, Ennett, Bauman, & Foshee, 2005), and aggression and harassment (Bailey, Hill, Oesterle, & Hawkins, 2009). The more parents know about their adolescents' lives, the more they are able to protect them. However, during the period when adolescent secrecy increases (Keijsers, Branje, VanderValk, & Meeus, 2010) and parental knowledge declines (Masche, 2010), the question is *how* parents in fact gain knowledge of their adolescent's activities. Kerr and Stattin (2000) brought attention to different sources of parental knowledge, namely parents' active efforts, such as control (e.g. behavioral control by setting rules and regulations), solicitation (actively asking the adolescent and his/her friends for information), and adolescents' voluntary disclosure, where parents gain information from spontaneous reporting by adolescents. They and colleagues found that voluntary disclosure is the best predictor of parental knowledge, and that parental efforts have little or no effect on parental knowledge (Kerr, Stattin, & Burk, 2010). Other studies have reported that parents who implement rules and regulations are knowledgeable of their adolescents' activities if the adolescent perceive the parenting style as authoritative (Sorokhabi & Middaugh, 2014). Thus, when parental style is authoritative, the control and solicitation may be viewed as concern, while when adolescents perceive their parents as authoritarian, the parental efforts to gain knowledge may be seen as intrusive.

The evidence for the association between parental solicitation and parental knowledge is inconsistent. Some studies report that solicitation has a rather low, yet, significant association to parental knowledge (Keijsers et al., 2010). These scholars argue that parents' solicitation may be seen by adolescents as an act of caring and investment in parent-child relationship, which may lead to voluntary disclosure from the adolescents, and thereby parental knowledge (Keijsers et al., 2010). Other studies contradict such ideas, in showing that parental solicitation neither does elicit more disclosure nor contribute to parental knowledge over time (Kerr et al., 2010). The inconsistencies in the findings call for more research, in particular with a focus on how the specific sources of parental knowledge may associate to adolescent behavioral outcomes.

A number of researchers have examined the relations between parental knowledge and adolescents' risk behaviors. Taken together, the results imply that parental knowledge is the strongest protective factor of adolescent delinquency (Keijsers et al., 2010; Kerr et al., 2010), alcohol use (Stavrinides, Georgiou, & Demetriou, 2010), and other externalizing behaviors (Kerr & Stattin, 2000), and that adolescent disclosure is the most important predictor of parental knowledge.

The function of parental efforts in gaining parental knowledge on adolescent risk behaviors is less consistent. For example, parental control has been shown to have both an indirect, through parental knowledge, and direct association to lower levels of substance

use and delinquent behaviors (Fletcher, Steinberg, & Williams-Wheeler, 2004). Adolescents seem less likely to engage in such behaviors when parents impose higher levels of behavioral rules and regulations. Stattin and Kerr (2000) instead suggest that while parental control may relate to adolescent behavioral outcomes, it may depend on how much adolescents spend time in unstructured activities. They argue that the links between parental control and adolescent behavioral outcomes may be stronger for adolescents who are lacking adult supervision. Another explanation of the inconsistencies may be the differences in the measures of parental control. Even though Fletcher et al. (2004) intended to reflect the Stattin and Kerr (2000) parental control measure, the scale used by Fletcher et al. consisted of items measuring control over specific behaviors (e.g. whether or not I can drink alcohol), while the items in the Stattin and Kerr paper were more general in terms of parents having rules of adolescent being out at night or weekends.

While it is likely that parents ask questions about adolescent activities to be able to support them, parental solicitation, on the contrary, is related to higher levels of adolescent delinquency over time (Kerr et al., 2010). Parents' persistent questions may lead to adolescents perceiving their parents as intrusive, and the adolescents may react in the opposite manner than was intended by parents. Contrary to findings by Kerr et al., another study shows that parental solicitation in fact relates to reduced bullying over time (Stavriniades, Nikiforou, & Georgiou, 2014). Because much of bullying behavior happens in school, when adolescents are away from parents' direct supervision, parents' solicitation may be of particular importance in order to prevent engagement in such behavior (Laird et al., 2010).

Adolescent feelings of being overly controlled

Another important component of parental knowledge is adolescents' perception of parents' active efforts to gain knowledge. Kerr and Stattin (2000) point out that parental control is linked to adolescents' feelings of being overly controlled, which in turn leads to poorer, not better, adjustment. Such feelings are likely to be age-related. It is therefore important to consider adolescents' developmental stages, depending on which adolescents could be more sensitive or accepting of the parental involvement (Eccles et al., 1991). Independent of culture or intellectual ability (Holmbeck et al., 2002), early adolescence is a period of disequilibrium in the family context, where the child is on a merge toward an autonomous stage of life, often questioning parental rules and routines, pushing for more symmetrical relationship with their parents. If the parents do not renegotiate their restrictions and rules, the asynchrony between parents and their children becomes stronger. Sometimes parents' 'over-management' of their children's activities may be perceived by adolescents as inappropriate as well as intrusive (Galambos, Barker, & Almeida, 2003), especially in families with distinctively coercive parenting where adolescent-parent conflict is high (Sorkhabi & Middaugh, 2014). Consequently, adolescents may try to escape such intrusiveness and react by getting involved in behaviors that parents do not approve of, which, in turn, may help the adolescents to regain their sense of autonomy (Kakihara, Tilton-Weaver, Kerr, & Stattin, 2010). Such avenues are not always positive for healthy development, because they may include hanging out on the streets or seeking contexts where adults are not present, which may relate to more serious delinquent behaviors (Kerr & Stattin, 2000). Such links may be relevant for older adolescents, who are more prone to resistance, while there are indications that early adolescents, who

more easily conform, may not necessarily interpret parental control as intrusive (Kakihara et al., 2010).

Adolescent gender

Although the importance of parents' gaining information of adolescent engagement in risk behaviors is evident, parenting practices may differ depending on adolescents' gender. For example, parental monitoring and parent-adolescent communication are more enhanced in girls than in boys (Stattin & Kerr, 2000). There is a possibility that parents are more protective of girls, because of the traditional values in upbringing of boys and girls, where girls, more often than boys, are taught to be caring and conforming individuals (Fontaine, Carbonneau, Vitaro, Barker, & Tremblay, 2009). There is empirical evidence that it is mainly the trust between parents and their child that is protective in regard to girls' behavioral outcomes, while parents of boys in particular need to be informed of their adolescent children's whereabouts in order to protect them (Borawski, Ievers-Landis, Lovegreen, & Trapl, 2003). Boys also seem to be more sensitive to overprotectiveness from parents (Kakihara et al., 2010), which consequently may relate to more involvement in risk behaviors.

Current study

Adolescence is the time when involvement in risk behaviors increases, yet is also a period when parents are required to support and guide their children to make healthy developmental trajectories possible. Parental support is needed throughout adolescence, which in general is prolonged (Arnett, 2006), and therefore, the understanding of parent-child interactions and parents' contribution to healthy development is an essential issue to consider in research. Given that studies on monitoring and adolescents' risk behavior often focus on middle or late adolescence (Keijsers et al., 2010; Stattin & Kerr, 2000; Stavrinides et al., 2010), it is necessary to investigate the parental knowledge in early adolescents who are entering a period of heightened risk for engagement in different risk behaviors (Collins, Madsen, & Susman-Stillman, 2002). Adolescents of different ages interpret parental efforts of control and solicitation differently and feel more or less over controlled by parents, which, in turn, may relate to more or less engagement in risk behaviors. Therefore, adolescents' feelings of being overly controlled needs to be addressed. Researchers tend to study only one type of adolescent behavior in relation to parental knowledge (Stavrinides et al., 2010). But, the associations between parental knowledge and its sources and adolescent adjustment may differ depending on the risk behavior that is studied (Criss et al., 2015). In this study, we first examined the associations between parental knowledge and its sources, adolescent disclosure, parental control, and parental solicitation. We tested how adolescent disclosure and parental control and solicitation relate to adolescents' feelings of being overly controlled. Finally, we studied the relations from parental knowledge and its sources, and feelings of being overly controlled, to three types of risk behavior in adolescence, bullying; delinquent behavior; and substance use (see Figure 1). Based on the empirical evidence of differences in parenting of boys and girls (Borawski et al., 2003), we also tested for moderation effects in the relations between sources of parental knowledge, feelings of being overly controlled and parental knowledge, and their associations to adolescent risk behaviors.

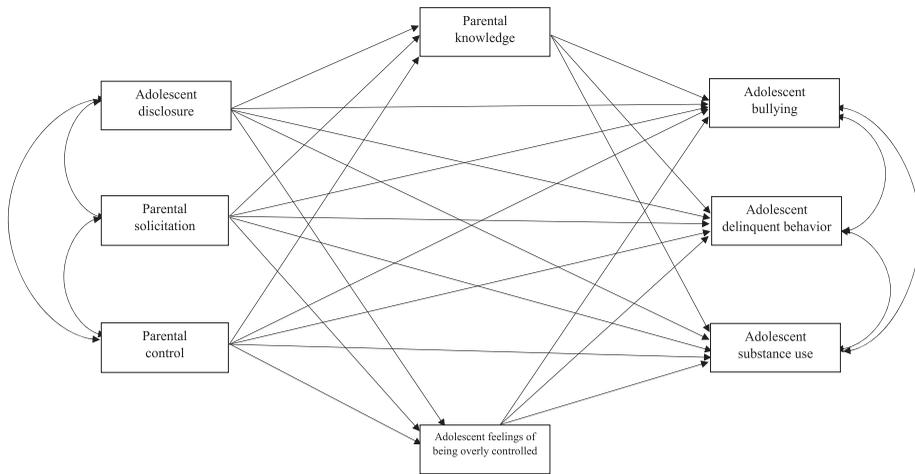


Figure 1. Conceptual saturated model of the relations between parental knowledge and sources thereof, adolescent feelings of being overly controlled and adolescent risk behaviors.

In sum, the aim of this study is to investigate the relations between sources of knowledge (adolescent disclosure, parental solicitation, and parental control), parental knowledge, adolescents' feelings of being overly controlled and how these are associated to three of the most common forms of boys' and girls' risk behavior, namely bullying, delinquent behavior, and substance use.

Method

Participants

The study is based on self-reported data from 1520 adolescents in sixth (51.5%) and seventh (48.5%) grade. The mean age was 13.0 (± 0.59), and the sample was fairly evenly divided by gender, 751 boys (49.4%) and 769 girls (50.6%). Six percent were born outside of Sweden and 14% spoke languages other than Swedish at home.

The study is part of an ongoing research program called Longitudinal Research on Development In Adolescence (LoRDIA), which investigates adolescents' health, school functioning, social networks, and substance use. In 2013, all students in sixth and seventh grade in four municipalities were invited. The students are to be followed through repeated surveys until they reach 11th grade (second grade in high school), when they are 18 years old. In this study, we used data from the first wave only.

The four municipalities, with 9000–36,000 inhabitants each, are situated in the south of Sweden. Two of the municipalities are classified as 'Product manufacturing municipalities', where 34% or more of the adult population are working in manufacturing. One is classified 'Suburb to larger city', where 50% of the adult population are commuting to a large city and one is a 'Commuting municipality' where 40% of the people commute to another municipal (SKL, 2016). Higher education of adult population (21%) and number of foreign-born persons (12%) in the municipalities were slightly below the Swedish average (26% and 16%, respectively, SCB, 2016).

Procedure

Before the recruitment of the participants, we notified school administrators about the project and sent letters with information about the study to parents and teachers. The letter to parents was translated into 32 different languages and explained the nature of the survey, and informed about opt-out consent. In other words, the parents were given the opportunity to decline their child's participation (as were the children). The research program and data collection details were approved by the Regional Research Ethical Review Board in Gothenburg (No. 362-13; 2013-09-25).

The LoRDIA research team administered paper surveys to all students in their classrooms after having explained the purpose of the survey, voluntary nature of participation, and confidentiality of answers. Since a cohort study should aspire to include the whole population that belongs to the cohort (Kazdin, 2002), an adapted form of the questionnaire was available for students with intellectual impairment or other cognitive disabilities, such as reading, writing, or attention deficiencies. By including both students with and without such disabilities in the research program, the generalizability of the findings increases. Both versions of the questionnaire were tested in pilots: first, using a read-aloud method to ensure the students' understanding of the questions and second, in full class to test the questionnaires psychometric properties. The adapted questionnaire, chosen by 119 students (7.8% of the total target/analytical sample), included the same items and questions as the regular one, although response alternatives were reduced from 5-point to 3-point Likert scales. The survey took 60–90 minutes to complete. Students with cognitive disabilities were given up to 30 more minutes to complete the survey.

Out of 2021 adolescents invited in the first wave, 318 opted out (202 due to parental decisions and 116 were children's own decision). Thus, the study population was 1703 in the first wave. Another 206 students who did not opt out were absent at the time of the data collection. Consequently, a total of 1520 adolescents participated. Of these, 1378 adolescents responded using the regular questionnaire and 142 using the adapted version. Representativeness of participants in the first wave compared to all others in the study population invited was checked by comparing available register data on demographics (gender and immigration status, as indicated by studying Swedish as second language) and school performance (absenteeism and merit points based on grades). There were no significant differences in gender (girls: 50.7% vs. 46.7%; $p = .26$) or immigrant status (9.7% vs. 13.6%; $p = .13$). Participants, however, differed from non-participants in school performance; they were more seldom absent (% absent hours/year: 6.0 [SD = 6.2] vs. 7.9 [SD = 7.7]; $p = .008$) and had higher merit points (207.7 [SD = 43.1] vs. 186.8 [SD = 57.2]; $p = .000$). It should be noted that absent hours include all absence – both excused and unexcused.

Measures

Substance use

The scale is based on questions modified from The Swedish Council for Information on Alcohol and Other Drugs (Gripe, 2015) yearly survey on substance use among ninth graders. The scale measured if participants had ever tried alcohol, drugs, cigarettes, inhalants, or snuff, with yes/no response ($\alpha = .62$).

Delinquent behavior

The scale is a brief version (12 items) of an original 24-item scale on delinquent behavior from the Swedish Crime Survey (Ring, 2013) used among ninth graders. The questions assessed adolescents' involvement in delinquent acts by asking, for example how many times during past 12 months the adolescent had stolen from a shop or from someone's pocket, vandalized, carried a knife, or threatened others. The ratings ranged from 1 (*never*), 2 (*once or twice*), to 3 (*three times or more*). The internal consistency was satisfactory ($\alpha = .80$).

Bullying

The scale is based on four items from Özdemir and Stattin (2011) such as 'Have you beaten, kicked, or assaulted anyone in an unpleasant way at school or on the way to or from school?' with ratings from 1 (*never*), 2 (*once or twice*) to 3 (*once a week or several times a week*). Another two questions measuring adolescent verbal or physical aggression in regard to physical appearances or sexuality were added to the measure with the same rating principle. The internal consistency was satisfactory ($\alpha = .73$).

Parental solicitation and control, adolescent disclosure, parental knowledge and adolescent feelings of being overly controlled

To measure adolescent perspectives of parental knowledge and sources thereof, the scales developed by Kerr and Stattin (2000) were used, although here slightly modified (from 5-point to 3-point Likert scales). The ratings for all measures were 1 (*never*), 2 (*sometimes*), and 3 (*often/always*). Parental solicitation ($\alpha = .68$), measured how often parents ask about their adolescents' unsupervised time. Six items were included, with questions such as 'How often do your parents talk with your friends when they come to your home (ask what they do or what they think and feel about different things)?' Parental control ($\alpha = .74$), assessed in what way parents control adolescents' whereabouts, using five questions such as 'Do you have to tell you parents where you are at night, who you are with, and what you do together?' Adolescent disclosure ($\alpha = .72$) assessed adolescents' voluntary and spontaneous disclosure to their parents about their activities during free time. Five questions, such as 'If you are out at night, when you get home, do you tell what you have done that evening?' Parental knowledge ($\alpha = .70$) assessed information about how much parents know about their children's activities, whereabouts and associations. Six items were included in the scale, with questions such as 'Do your parents know what you do during your free time?' Feelings of being overly controlled ($\alpha = .69$) had five items with questions such as 'Does it feel like you can't keep anything to yourself, because your parents want to know everything?'

Statistical analyses

First, the factor structures of all relevant index scales for the study were investigated and found to be the same in both versions of the questionnaire, with similar loadings, and acceptable internal consistency. After that, the data were merged into one data file. Thus, all 5-point Likert scales in the regular version of the questionnaire were reduced to the 3-point scales of the adapted version (as described above), by having the median value unchanged, while the values below or above were replaced by one lower and one

higher value, respectively. For example, the 5-point scale with the following reply options *Very much/rather much/ somewhat/ just a little/ not at all*, would be collapsed to the 3-point scale of the adapted version *Much/Somewhat/Little* or *not*.

Differences between boys and girls regarding parental knowledge and adolescent risk behaviors were tested by independent sample *t*-tests. In order to examine the paths between the factors, where multivariate relations are studied, we applied path analyses within structural equation modeling using AMOS 21.0. Because of missing responses to items in the measures, full-information maximal likelihood was chosen to produce unbiased parameter estimates as well as bias-corrected confidence intervals, since the condition of missing at random was satisfied. Because of non-normal distribution of the data, Bollen-Stein bootstrap with 2000 algorithms was conducted to obtain bias-corrected chi-square *p*-values, and bootstrapping methods with 200 algorithms were used in order to obtain bias-corrected *p*-values for the estimation of the direct and indirect paths in the model (Byrne, 2010). The goodness of fit was determined using chi-square ($p > .05$), Tucker Lewis index (TLI $< .95$), comparative fit indices (CFI $> .90$), and root mean square error of approximation (RMSEA $< .08$) (Hair, Black, Babin, & Anderson, 2010). We conducted a multi-group analysis, with nested model comparison, in order to analyze the gender moderation between the variables in the model. A significant χ^2 difference value ($p > .05$) indicates that one or more paths are not operating equivalently across the two groups (Byrne, 2010).

Results

Descriptive statistics

Table 1 presents descriptive statistics of girls' and boys' engagement in risk behaviors and their reports of knowledge, sources of knowledge, and feelings of being overly controlled. In addition, statistically significant differences between boys and girls are displayed. *t*-test analyses showed that there were significant differences between boys' and girls' engagement in various risk behaviors where boys showed higher involvement in risk behaviors. Further, girls rated higher parental knowledge and higher adolescent disclosure, parental solicitation, and parental control than boys. There were no significant differences between boys' and girls' feelings of being overly controlled.

Table 1. Mean differences in boys' and girls' involvement in risk behaviors and their perceptions of parental knowledge, adolescent disclosure, parental solicitation, parental control, and adolescent feelings of being overly controlled.

Variable	Boys ($n = 739$)			Girls ($n = 763$)			<i>p</i>
	<i>M</i>	<i>SD</i>	Min–Max	<i>M</i>	<i>SD</i>	Min–Max	
Bullying	1.25	.33	1.00–2.80	1.20	.26	1.00–2.80	<.01
Delinquent behavior	1.03	.11	1.00–2.67	1.01	.07	1.00–2.33	<.01
Substance use	0.32	.76	0.00–6.00	0.22	.68	0.00–6.00	.06
Parental knowledge	2.69	.36	1.17–3.00	2.78	.33	1.00–3.00	<.01
Adolescent disclosure	2.42	.46	1.00–3.01	2.56	.46	1.00–3.01	<.01
Parental solicitation	2.09	.47	1.00–3.00	2.23	.48	1.00–3.00	<.01
Parental control	2.14	.56	1.00–3.00	2.28	.51	1.00–3.00	<.01
Feelings of being overly controlled	1.60	.49	1.00–3.00	1.59	.52	1.00–3.00	.66

Structural equation modeling

The baseline model of associations between sources of knowledge, parental knowledge, and adolescent risk behaviors was estimated. First, we allowed the exogenous variables, adolescent disclosure, parental solicitation, and parental control, to be correlated, as well as the residuals to the endogenous variables social risk behavior, delinquent behavior, and substance use (Table 2). Next, parental knowledge and adolescent feelings of being overly controlled were entered as mediators between the exogenous sources of knowledge and the outcome risk variables. Further, we estimated the associations between the parenting variables and risk behaviors. To obtain the best fit and the most parsimonious model, Akaike's information criterion (AIC) was applied. The model with the lowest AIC reflects the best balance between goodness of fit and parsimony in the model (Byrne, 2010). The paths that did not significantly contribute to the model were therefore removed. Finally, the hypothesized model was judged to have a good fit $\chi^2(df = 7) = 11.677, p = .189$; TLI = .993; CFI = .998; RMSEA = .021, and was used for further interpretation (see Figure 2).

The model demonstrated, that adolescent disclosure and parental control, but not parental solicitation, were sources associated with parental knowledge. Further, the model indicated that parental control and parental solicitation were positively, and adolescent disclosure negatively, related to adolescent feelings of being overly controlled. Next, parental knowledge was negatively associated with adolescents' engagement in all three types of risk behaviors. Disclosure by the adolescents was negatively associated with their bullying behavior, whereas feelings of being overly controlled was positively related to bullying.

Some significant indirect associations between the parenting variables and adolescent risk behavior were found. Adolescent disclosure was indirectly and negatively related to adolescent bullying ($\beta = -.135, p < .05$), adolescent delinquent behavior ($\beta = -.137, p < .05$), and adolescent substance use ($\beta = -.165, p < .05$). Parental control was indirectly and negatively related to adolescent delinquent behavior ($\beta = -.029, p < .05$), and adolescent substance use ($\beta = -.035, p < .05$). Parental solicitation was indirectly and positively related to adolescent bullying ($\beta = .016, p < .05$).

Gender as a moderator

The moderating role of gender was tested by means of a multi-group model. In the first model, the path estimates were constrained to be equal between boys and girls, and in

Table 2. Summary of bivariate correlations (Pearson *R*) for scores on the parental knowledge, adolescent disclosure, parental solicitation, parental control, adolescent feelings of being overly controlled, and adolescent risk behaviors.

Measure	2	3	4	5	6	7	8
1. Parental knowledge	.61**	.35**	.28**	-.06*	-.26**	-.30**	-.35**
2. Adolescent disclosure		.49**	.27**	-.10*	-.24**	-.26**	-.27**
3. Parental solicitation			.33**	.14**	-.08*	-.07*	-.10**
4. Parental control				.32**	-.03	-.10**	-.17**
5. Adolescent feelings of being overly controlled					.12**	.05*	.01
6. Adolescent bullying						.30**	.26**
7. Adolescent delinquent behavior							.49**
8. Adolescent substance use							

* $p < .05$.

** $p < .01$.

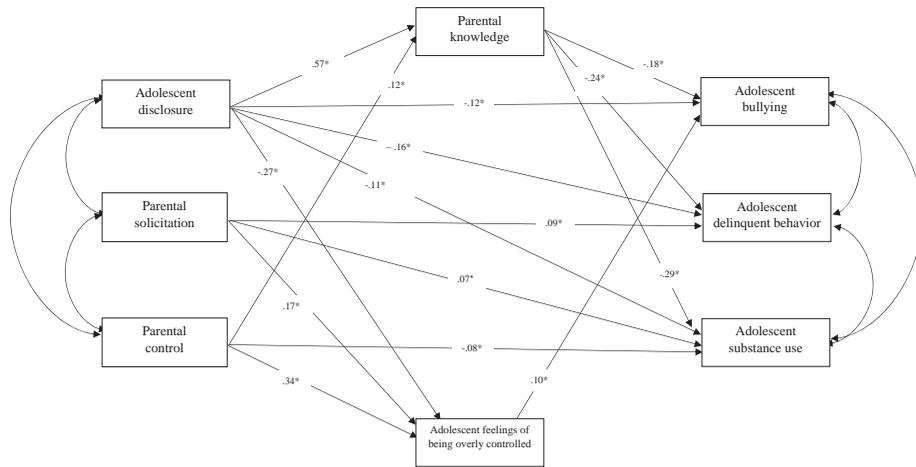


Figure 2. Structural equation model showing standardized parameter beta estimates for the final model. Bias-corrected p -values. * $p < .05$. For simplicity, only significant paths are shown.

the second model, all the paths were unconstrained. A χ^2 difference test showed a significant worsening of the overall model fit by restrictions in the original model, $\Delta\chi^2(15) = 33.399$, $p < .05$, thus indicating gender moderation in the model.

Next, several path constraining episodes were performed in order to evaluate the gender differences in paths. Gender moderation was evident in four paths. The positive path between adolescent feelings of being overly controlled and adolescent bullying $\Delta\chi^2(1) = 4.279$, $p < .05$ was significant for boys ($\beta = .133$, $p < .05$) but not for girls ($\beta = .058$, $p > .05$). The negative path between adolescent disclosure and delinquent behavior $\Delta\chi^2(1) = 11.085$, $p < .001$ was significant for boys ($\beta = -.219$, $p < .05$), but not for girls ($\beta = -.049$, $p > .05$). The positive path between parental solicitation and delinquent behavior $\Delta\chi^2(1) = 4.401$, $p < .05$ was significant for boys ($\beta = .125$, $p < .05$), but not for girls ($\beta = .045$, $p > .05$). The negative path between parental knowledge and adolescent substance use $\Delta\chi^2(1) = 13.941$, $p < .001$ was significantly stronger for girls ($\beta = -.403$, $p < .05$) than for boys ($\beta = -.188$, $p < .05$).

To summarize, significant gender differences in the relations between parental knowledge and adolescent risk behaviors were found in the following paths: The paths between adolescent feelings of being overly controlled and adolescent bullying, adolescent disclosure, and delinquent behaviors, and between parental solicitation and delinquent behavior, were significant for boys but not for girls, whereas the path between parental knowledge and substance use was stronger for girls than for boys.

Discussion

In this study, we examined the relations between parental knowledge and sources thereof, and adolescent feelings of being overly controlled, and the relations of these to adolescent risk behaviors in early adolescence. First, we investigated how adolescent disclosure and parental solicitation and control relate to parental knowledge. Then, we examined in what way these parenting factors relate to adolescent feelings of being overly controlled. Next, we investigated the associations between all parenting factors and adolescent

bullying, delinquent behavior, and substance use, and tested for gender moderation in the links between the parenting factors and adolescent risk behaviors.

The relations between adolescent disclosure, parental solicitation and control and parental knowledge

The results show that only adolescent voluntary disclosure and parental control contributed to parental knowledge of adolescents' whereabouts. In agreement with previous research on parental knowledge, adolescent disclosure seems to be the best predictor of parents' obtaining information about their adolescents' activities (Kerr & Stattin, 2000; Kerr et al., 2010; Stattin & Kerr, 2000), regardless of the reporter. Open communication between parents and their children is a fundamental element of interdependence between family members, where adolescents' active agency in parent-child communication may contribute to parents having information about their adolescent children's activities. Also, in families where parents' demands of and support to adolescents are high, parents' rules and regulations may be perceived as relevant and helpful, and not intrusive (Sorkhabi & Middaugh, 2014).

In what way parents' asking questions contributes to their knowledge of adolescent activities is somewhat unclear. While Keijsers et al. (2010) show that solicitation is positively associated to parental knowledge, other studies with students in early and mid-adolescence found that it did not (Criss et al., 2015; Kerr et al., 2010). The current findings indicate that parental solicitation does not contribute to parental knowledge. Instead of being perceived as a sign of parental concern, adolescents may perceive parental efforts as intrusive. When parents actively search for information that is not willingly disclosed by adolescents, that may instead contribute to secrecy or conflict between adolescents and their parents (Smetana, Metzger, Gettman, & Campione-Barr, 2006). Even though the adolescents in our sample were rather young, it is likely that having control over what information is to be told is an important element in the process of autonomy seeking from parents. The positive associations between parental control and solicitation and adolescent feelings of being overly controlled are indicative of sensitivity in adolescents' interpretation of parental efforts. Parents usually adjust their controlling efforts as their children enter adolescence and are in need to gain own personal control (Steinberg & Silk, 2002). However, it is likely that in families where parents are not attuned to the autonomy needs of their adolescents, adolescents may perceive the parental efforts as intrusive. Person-environment fit theory indicates that the level of parental controlling efforts must be modulated depending on the developmental stage of the child (Eccles et al., 1991). Depending on the developmental stage, children may perceive that they have little opportunities for personal control in family, and therefore may seek avenues for reasserting their autonomy.

Parental knowledge and its sources, adolescent feelings of being overly controlled and adolescent risk behaviors

In line with previous research on early and mid-adolescents (Keijsers et al., 2010; Kerr et al., 2010; Stavrinides et al., 2010), the structural model showed that parental knowledge relates to all studied risk behaviors (i.e. bullying, delinquent behavior, and substance use). This suggests that adolescents are less involved in risk behaviors when parents are aware of

their whereabouts. As early adolescents are at an increasing risk for getting involved in risk behaviors, in order for parents to protect them and guide them, parents need to be aware of their adolescents' activities. The current findings revealed that adolescent voluntary sharing of information to parents is protective of their engagement in all studied risk behaviors, both indirectly, via parental knowledge, but also directly. Established trust between parents and adolescents may explain such finding (Brown & Bakken, 2011). Having a trusting relationship where adolescents feel free to share information about their activities gives parents opportunities to give guidance in a non-intrusive way. Open communication may benefit adolescents in their socialization as well as protect them from engaging in behaviors that are harmful for their development.

In addition, our findings showed that parental solicitation was associated with higher levels of involvement in delinquent behavior and substance use and that adolescent feelings of being overly controlled was related to higher levels of adolescent bullying. Although the effects were rather small (Coe, 2002), the findings may, on the one hand, indicate that the adolescents who perceived their parents as being intrusive, reacted by engaging in behaviors that they know their parents would not approve of. On the other hand, it could be that the adolescents who engage in these behaviors elicit parental solicitation. Although possibly harmful for adolescents' future psychological and social development, engagement in risk behaviors may be a strategy to regain a personal sense of control (Parkin & Kuczynski, 2012) in the settings where parents are not present. Finding a balance between involvement and intrusiveness is not an easy task for parents. During childhood, parents have more authority over their children's behavior and activities and may hesitate to let go of that control when their children enter adolescence (Steinberg & Silk, 2002). Too much control from parents may evoke distress in adolescents, while on the other hand, too little parental control, may turn them to search for support in peers, because of perceived parental neglect and non-interest in their lives. Thus, adolescents' needs for autonomy and personal control grow, and in order for parents to encourage pro-social development, they need to gradually relinquish control and try to fit or match adolescents' changing levels of autonomy (Eccles et al., 1991).

Does gender moderate the process between parenting and adolescent risk behavior?

Consistent with previous research (Moffitt & Caspi, 2001), we found that boys were more involved in risk behaviors than girls were. Other studies have indicated that girls get more engaged in risk behaviors as they grow older (Fontaine et al., 2009) and that gender differences are diminishing, especially regarding adolescent alcohol use (Moss, Chen, & Yi, 2014). Further, girls in early and mid-adolescence often score higher on parental knowledge, own disclosure, and parental active parenting efforts than boys of the same age do (Keijsers et al., 2010; Kerr & Stattin, 2000). We found the same here. As proposed by Oetting and Donnermeyer (1998), functional family socialization for teaching pro-social norms is often gender-related, where girls are more protected by parents, here indicated by higher values of control and solicitation for girls than for boys. Despite that, the findings did not reveal any significant gender differences regarding feelings of being overly controlled by parents. An explanation may be that girls are being more controlled from an early age and socialized to adjust to that.

The structural model revealed that the associations between the parenting factors and adolescent risk behaviors differed across gender. More specifically, the paths from adolescent disclosure to delinquent behaviors, from adolescent feelings of being overly controlled to adolescent bullying, and from parental solicitation to delinquent behavior, were significant for boys but not for girls. Adolescent disclosure seems to be protective of boys' engagement in delinquent behaviors. Perhaps boys perceive parental soliciting efforts as intrusive (Kakihara et al., 2010) because they are more secretive than girls, who are taught to be more responsive to bonding with parents (Keijsers et al., 2010). The results indicate that they also are more likely than girls to engage in risk behaviors when they feel overly controlled by parents. It should, though, be noted that boys' involvement in bullying and delinquency may play a part in parents' over-control of their adolescents' behavior. Because of the cross-sectional design of the study, the causality in the process is, however, still unknown.

Limitations and strengths

There are some limitations in this study. First, the cross-sectional nature of the data makes inference concerning the path directions impossible. When studying developmental processes, scholars need to be aware of the transactional processes where not only parents affect their children, but also children affect their parents and their parental practices (Kuczynski & De Mol, 2015). Longitudinal data could offer a multi-directional and transactional perspective, explaining transactional paths in parent-child relationship and the socialization processes. That will be possible in future studies using LoRDIA data. Next, some of the measures were re-coded from 5-point to 3-point Likert scales. This was inevitable for including the information from the adapted forms to adolescents with intellectual impairments. Reliability was, however, not affected by this procedure and found to be acceptable. Further, in order to be able to understand processes between parenting and adolescent risk behaviors and adolescent feelings of being overly controlled in particular, the measures of parental knowledge were from adolescents' reports, not parental reports. Adolescent reports were chosen here, since their perceptions of the parent-child communication is relevant for its possible influence on risk behaviors (Janssens et al., 2015). Nonetheless, it is possible that parents or other family members may perceive parental behavior differently, which is why a forthcoming study will focus on parental reports. Another possible limitation is the sample attrition, either because of non-consent from parents, own will, or due to absence during data collection. According to the attrition analyses, there were no differences in gender or immigration status between the participants and those who dropped out, but those who did not participate had, on average, 2% of hours of school absence a year more than the participants and somewhat lower merit points. This, however, is not considered to be a problem indicator for generalizability of the results. In addition, the education level in the chosen municipalities is comparable to rest of Sweden, and considering the high response rates of the adolescents, we consider the results reliable and not hindering generalizability of the results.

Despite these limitations, the current study has several advantages. The study builds on large representative sample and focuses on early adolescence which is a crucial developmental transition (Steinberg & Silk, 2002). Furthermore, we studied the paths from parenting factors to three types of risk behaviors in adolescence and showed both direct

and indirect effects in the paths. In terms of implications for practices, it should be noted that open communication between parents and adolescents, where adolescents willingly share information about their activities, may give parents opportunity to give advice and guidance in a way which adolescents do not perceive as intrusive. When adolescents perceive too strict parental control, that may provoke more, instead of less, engagement in risk behaviors. Being explicit and clear about one's rules and values at the same time as maintaining open and respectful communication, may be an adequate way for parents to support healthy development throughout adolescence.

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