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Information Management Strategies in Early Adolescence: Developmental Change in Use and Transactional Associations With Psychological Adjustment

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Adolescents use various strategies to manage their parents' access to information. This study tested developmental change in strategy use, longitudinal associations between disclosing and concealing strategies, and longitudinal associations linking disclosing and concealing strategies with antisocial behavior and depressive symptoms. Self-report data (n = 218; 49% female; 49% European American, 47% African American) following Grades 5 (M age = 11 years, 11 months), 6, and 7 show that the use of disclosing strategies (e.g., telling all, telling if asked) following misbehavior declined while use of concealing strategies (e.g., omitting details, keeping secrets, lying) increased over time. Longitudinal links between strategies suggest a transactional process wherein infrequent disclosing is a gateway to concealment but concealment also predicts subsequent rank-order reductions in disclosure. Infrequent disclosing was associated with more subsequent antisocial behavior and depressive symptoms, whereas more antisocial behavior was associated with more subsequent concealment. Although absolute declines in disclosure and increases in concealment are normative, individual differences show that adolescents reporting low levels of disclosure, rather than high levels of concealment, appear to experience the most adjustment problems.

Keywords: information management, disclosure, secrecy, early adolescence

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Researchers have consistently documented associations between parental monitoring and adolescents' behavior problems (for reviews see Crouter & Head, 2002; Dishion & McMahon, 1998). However, much of this research has labeled parents' knowledge of adolescents' whereabouts and activities as parental monitoring (Crouter & Head, 2002). Several cross-sectional and longitudinal studies have now demonstrated that parents' knowledge of adolescents' whereabouts, activities, and companions is more strongly associated with adolescents' willingness to provide information than with parents' efforts to obtain information (Keijsers, Branje, VanderValk, & Meeus, 2010; Kerr, Stattin, & Burk, 2010; Stattin & Kerr, 2000). Other research shows that adolescents use a number of different strategies to manage the flow of information to their parents (e.g., Darling, Cumsille, Caldwell, & Dowdy, 2006; Marshall, Tilton-Weaver, & Bosdet, 2005). Although a developmental decrease in the amount of accurate information shared with parents is likely to be normative and may reflect an expansion of privacy and an increase in emotional autonomy, individuals who regularly conceal more information from their parents than do their peers at a given point in development may be at risk for maladjustment. The purposes of this study are to describe developmental trajectories of early adolescents' use of individual information management strategies, to describe connections between disclosing and concealing strategies, and to test longitudinal links between the use of disclosing and concealing strategies and adolescents' antisocial behavior and depressive symptoms.

A constellation of structural, cognitive, and socioemotional changes occur during early adolescence, which makes early adolescence a key developmental period for studying changes in the use of information management strategies. Specifically, early adolescents typically spend increasing amounts of time alone or away from home (Larson, Richards, Moneta, Holmbeck, & Duckett, 1996) and outside of direct parental supervision (Laird, Pettit, Dodge, & Bates, 1998). As a result, parents must rely more heavily on adolescents to provide information about their activities and behavior when unsupervised. Moreover, early adolescents increase their claims of personal jurisdiction and privacy (Smetana & Asquith, 1994). In doing so, adolescents may actively or passively challenge parents' authority to impose rules regulating adolescents' behavior and may selectively reveal information to parents in the service of privacy expansion (Smetana, Daddis, & Chuang, 2003). Therefore, over the course of early adolescence, a reduction in the amount of accurate information provided to parents is expected.

A relatively small number of strategies can be effectively used to manage information in close interpersonal relationships. Ado-

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lescents may completely disclose information to their parents voluntarily or following parental solicitation, omit controversial details, attempt to avoid disclosure by changing the topic or focus of the conversation, or provide inaccurate information in an attempt to deceive their parents (Bakken & Brown, 2010; Buller & Burgoon, 1994; Mazur & Hubbard, 2004; Petrino, 1994). A distinction can be made between disclosing (e.g., telling all) and concealing (e.g., keeping secret) strategies, although some strategies contain elements of both disclosure and concealment (e.g., telling only if asked, omitting details). Of course, adolescents can also directly refuse to provide information requested by their parents. However, information management is often used to minimize parent–adolescent conflict or to avoid parental disappointment or punishment (Bakken & Brown, 2010; Darling et al., 2006; Marshall et al., 2005; Smetana, Villalobos, Tasopoulos-Chan, Gettman, & Campione-Barr, 2009), and therefore, direct refusal to provide information is unlikely to achieve the adolescents' goals.

Our approach to assessing information management strategies differed from previous studies in two key ways. First, we asked adolescents to independently report their use of five information-management strategies in each of five scenarios, rather than asking adolescents to choose the strategy most likely to be used in each scenario. Second, we asked adolescents to report strategies they would use to manage information in situations when they violated their parents' rules or expectations. Previous studies have assessed information management regarding disagreements with parents (Darling et al., 2006) or daily activities (Smetana et al., 2009; Tasopoulos-Chan et al., 2009). From a parenting perspective, it is probably more important for parents to learn about rule violations or misbehavior (so they can respond appropriately) than about daily activities or disagreements. Furthermore, asking about information management following misbehavior for all participants assesses information management while holding misbehavior constant. This approach differs from many previous studies of secrecy and lying, in which the assessment of secrecy or lying is confounded with misbehavior and with the amount of misbehavior adolescents have to conceal.

Developmental Change in the Use of Information Management Strategies

Developmental reductions in disclosure and increases in concealment may be normative as adolescents spend more time unsupervised. However, no previous study has independently assessed the use of a broad range of information management strategies in the context of a longitudinal study. The first goal of the current study was to describe developmental trajectories of the strategies early adolescents use to manage information following misbehavior.

In cross-sectional studies, age differences in strategy use appear to be small and most often nonsignificant (e.g., Bakken & Brown, 2010; Darling et al., 2006; Smetana et al., 2009), although adolescents have reported lying more often (and viewing lying as more acceptable) than have college students (Jensen, Arnett, Feldman, & Cauffman, 2004). In contrast, longitudinal research on secrecy shows that secrecy increases over the course of early adolescence, particularly for boys (Keijsers, Branje, Frijns, Finkenauer, & Meeus, 2010). Results from information management studies (e.g., Darling et al., 2006; Tasopoulos-Chan et al., 2009) converge with other research on disclosure (e.g., Daddis & Randolph, 2010; Hargie, Tourish, & Curtis, 2001) in demonstrating that girls disclose more to their parents than do boys. However, gender differences in the use of concealing strategies are inconsistent even within studies using very similar methodologies (e.g., Darling et al., 2006; Smetana et al., 2009; Tasopoulos-Chan et al., 2009).

Although early adolescents are expected to increasingly restrict their parents' access to information over time, it is currently unknown whether there are normative increases in both avoidance-oriented (e.g., leave out details) and deception-oriented (e.g., lie) concealing strategies and whether there are decreases across the various degrees of disclosure. Therefore, our analyses test developmental change in the use of five information management strategies as well as gender differences in Grade 5 strategy use and change in strategy use from Grades 5 to 7. The use of two disclosing strategies (i.e., spontaneous disclosure and disclosure following solicitation) was expected to decrease over time, whereas the use of three concealing strategies (i.e., omit details, try to keep it a secret, lie about it) was expected to increase over time. Boys were expected to decrease their use of disclosing strategies and increase their use of concealing strategies more than girls.

Links Between Disclosing and Concealing Strategies

Although disclosure and concealment can be thought of as contrasting information management strategies, the strategies are not opposite ends of a single continuum (Frijns, Keijsers, Branje, & Meeus, 2010; Laird & Marrero, 2010). Adolescents can elect to not disclose information or misbehavior without having to make any specific efforts to conceal the information. Few studies have independently assessed the use of disclosing and concealing strategies, and thus, potential connections between the strategies is unknown. The second aim of the current study was to test longitudinal links between individual differences in disclosing and concealing strategies to determine whether infrequent disclosure antecedes rank-order increases (i.e., relatively greater increases, or smaller decreases in use, compared with others within the sample) in concealment, or vice versa.

There are two possibilities for links between the two types of strategies. First, infrequent disclosure may serve as a gateway to the use of concealing strategies in the future. Adolescents may initially avoid revealing misbehavior by disclosing only in response to parental inquiries and by hoping that parents fail to ask the right questions. As adolescents become more experienced at minimizing disclosure they may begin to more actively attempt to manage information by omitting relevant details or by lying to their parents. Second, the use of concealing strategies, such as lying, may require minimizing disclosure to cover one's back. Secrecy and lying are cognitively and emotionally demanding forms of concealment. Individuals must be vigilant and proactive to avoid providing opportunities for others to discover their secrets or lies (Lane & Wegner, 1995; O'Hair & Cody, 1994).

Although the gateway and cover-one's-back hypotheses are not inconsistent or mutually exclusive, they do emphasize different directions of effects (i.e., negative effects from disclosure to concealment for the gateway hypothesis and negative effects from concealment to disclosure for the cover-one's-back hypothesis). Significant lags from less use of disclosure at one time point to

more use of concealment at the next time point are consistent with the gateway hypothesis. Significant lags from more use of concealing strategies at one time point to less use of disclosing strategies at the next time point is consistent with the cover-one's-back hypothesis. Significant lags in both directions indicate that both processes are occurring simultaneously. Gender differences in associations between concealment and disclosure were tested, although we had no a priori hypotheses.

Information Management and Psychosocial Adjustment

Normative reductions in the amount of information shared with parents may be a sign that early adolescents are developing a sense of privacy and expanding emotional autonomy. However, individual differences in levels of disclosure, secrecy, and lying are associated with various behavior problems and signs of maladjustment (e.g., Darling et al., 2006; Keijsers, Branje, Frijns, et al., 2010). Thus, the third goal of the current study was to examine the implications of individual differences in strategy use at different ages with the subgoal of evaluating the independent effects of disclosing and concealing strategies. Infrequent use of disclosing strategies may not be problematic once the use of concealing strategies is taken into account, but few previous studies have been able to test independent effects of nondisclosure and concealment, because assessments of nondisclosure and concealment are combined (e.g., Stattin & Kerr, 2000) or confounded due to methodology (Darling et al., 2006).

Individual differences in the use of information management strategies have been linked with adolescents' psychosocial adjustment. Cross-sectional associations consistently show that more disclosure is linked with better psychosocial adjustment and that more lying is linked with worse psychosocial adjustment (Darling et al., 2006; Engels, Finkenauer, & van Kooten, 2006; Smetana et al., 2009; Tasopoulos-Chan et al., 2009). Two longitudinal studies demonstrated that associations between disclosure and delinquency are bidirectional (Keijsers, Branje, VanderValk, & Meeus, 2010; Kerr et al., 2010). However, Stattin and Kerr's (2000) disclosure measure was used in both studies, and the measure combines items that assess disclosure with items that assess secrecy. Frijns et al. (2010) demonstrated that the secrecy and disclosure items were distinct via confirmatory factor analysis and found that secrecy, but not disclosure, was bidirectionally associated with delinquency in middle to late adolescence. It remains unclear whether infrequent use of disclosing strategies and frequent use of concealing strategies are only associated with adjustment problems because assessments of secret keeping and lying confound individual differences in use of the information-management strategies with individual differences in misbehavior and the need to manage information.

In terms of antisocial behavior, and consistent with the previously discussed cover-one's-back hypothesis, more antisocial behavior problems may entice adolescents to restrict parents' access to information in an effort to avoid punishment (Marshall et al., 2005). As such, high levels of antisocial behavior are hypothesized to predict rank-order increases in the subsequent use of concealing strategies. On the other hand, and similar to the gateway hypothesis, adolescents who more actively limit their parents' access to information may find that they have more opportunities to misbehave or fewer disincentives to avoid misbehavior. More frequent use of concealing strategies is hypothesized to predict subsequent rank-order increases in antisocial behavior. Links between antisocial behavior and the use of disclosing strategies are expected to be nonsignificant after controlling for the use of concealing strategies.

Several previous studies have found that secret-keeping and lying predict increases in depressive symptoms (Engels et al., 2006; Finkenauer, Engels, & Meeus, 2002; Frijns & Finkenauer, 2009). In the only test of bidirectional effects, secrecy predicted increases in depressive symptoms and depressive symptoms predicted decreases in disclosure, but the links were only significant in one of the three lags tested in the longitudinal cross-lagged model (Frijns et al., 2010). Restricting parents' access to information may increase depressive symptoms as adolescents withdraw from sources of emotional support. Therefore, more frequent use of concealing strategies was hypothesized to predict subsequent rank-order increases in depressive symptoms. However, depressed adolescents also may restrict parents' access to information. Therefore, high levels of depressive symptoms were also hypothesized to predict rank order increases in the use of concealing strategies. Links between depressive symptoms and the use of disclosing strategies are expected to be nonsignificant after controlling for the use of concealing strategies.

As with connections between strategies, hypothesized associations between strategy use and psychological adjustment differ in the proposed direction of effects. Therefore, we tested cross-lagged associations among disclosure, concealment, antisocial behavior and depressive symptoms to test both directions of effects simultaneously. Significant lags from more use of concealing strategies to more antisocial behavior and depressive symptoms indicate that concealment may lead to antisocial behavior and depressive symptoms. Significant lags from more antisocial behavior or depressive symptoms to more use of concealing strategies indicate that information management may be a symptom of, or reaction to, adolescents' behavioral and psychological adjustment. Gender differences in associations linking information management strategies with antisocial behavior and depressive symptoms were tested, although we had no a priori hypotheses.

In sum, the first aim of the current study was to describe normative developmental trajectories of information management strategies with the trajectories expected to show a substantial developmental reduction in the amount of accurate information shared with parents. The second aim was to test longitudinal connections between individual differences in the use of disclosing and concealing strategies. Although infrequent disclosure does not require frequent concealment, bidirectional associations were expected to link individual differences in disclosure with individual differences in concealment. The final aim was to test bidirectional links between information-management strategies and antisocial behavior and depressive symptoms. Individual differences in the use of concealing strategies were expected to be bidirectionally linked with both antisocial behavior and depressive symptoms, but low levels of disclosure were not expected to be linked with antisocial behavior and depressive symptoms after controlling for the use of concealing strategies.

Method

Participants

Participating adolescents completed home interviews during the consecutive summers following Grades 5 ($n = 218$), 6 ($n = 182$), and 7 ($n = 162$). Most adolescents were 11 years old at the time of the grade five interviews (M age = 11 years, 11 months; Range = 10 years, 7 months to 13 years, 9 months). The sample was 51% female, and 73% of the adolescents lived in a two-parent home when the data were collected. Most of the adolescents were European American, non-Hispanic (49.1%) or African American (47.2%; 2.8% were Asian, and 1% was Hispanic). Mother education level varied with 2.8% not having completed high school, 10.1% having a high school diploma, 39.4% having attended college or technical school, 27.5% having a bachelor's degree, and 19.7% having a graduate degree. Participating families were recruited from 20 schools in the public school system serving citizens of Baton Rouge, Louisiana (population about 400,000). The demographic characteristics of the sample generally correspond to those of the community and schools from which they were recruited. Specifically, U.S. Census Bureau (2000) data showed that 68% of the households in the community with children 6–17 years old were headed by married couples, and enrollment figures from the National Center for Education Statistics (2003) indicated that the great majority of students in the schools are of European American (47.2%) or African American (49.6%) background.

Complete data were available for 68% of the sample with an additional 22% of the sample providing data in two of the three grades. Demographic characteristics of the four participation patterns are provided in Table 1. Chi-square analyses or analyses of variance were used to compare the four participation patterns in terms of demographic characteristics and Grade 5 variables included in this report. In terms of demographic variables, attrition was higher for males than females following Grade 6 and higher for African American than European American participants following Grade 5. Participants who dropped out after Grade 5 reported using the *tell all* strategy less than participants who continued to participate in Grades 6 and 7. Participants who dropped out after Grade 6 had lower levels of parent-reported rule-breaking behavior than participants who dropped out after Grade 5 or who participated in all three waves. The participation groups were not found to differ in terms of single parent status or mother education level or on any other Grade 5 variable described in this report. Bivariate correlations (see the online supplemental materials) are based on pair-wise deletion with varying sample sizes. All analyses reported in this article used missing data procedures and are based on the full sample ($n = 218$).

Procedure

Following Institutional Review Board approval, information letters were distributed to students by graduate and undergraduate student research staff members during school visits in the late spring to individual classrooms or Grade 5 assemblies. Interested parents returned a postcard to the researchers or a form to the adolescent's school indicating their willingness to participate and were contacted to schedule a home interview. Postcards or forms were returned by 20% of the Grade 5 students enrolled in the schools and interviews were completed with 94% of the families contacted via telephone. This participation rate is comparable to the 27%–33% reported by Smetana, Metzger, Gettman, and Campoine-Barr (2006) for adolescents recruited in schools who took home questionnaire packets, completed them, and returned them to the school. Each participant was compensated $25, $35, and $45 for completing the interviews following Grades 5, 6, and 7, respectively.

Families were provided an overview of the interview procedure before mothers provided informed consent and adolescents provided written assent. To ensure privacy and reduce social desirability bias, participants were interviewed in separate private locations within the home and privately recorded their responses to the questions on an answer sheet. The structured interviews lasted about 45 min and focused primarily on parent–adolescent interactions and relationships.

Measures

Information management strategies. The procedure used to assess information management strategies is a modification of the

Table 1
Participant Characteristic and Grade 5 Variable Means (and Standard Deviations) by Attrition Group

Variable	All three grades ($n = 148$)	Grades 5 and 6 ($n = 34$)	Grades 5 and 7 ($n = 14$)	Grade 5 only ($n = 22$)	p
% Female	$46\%_{a}$	$71\%_{b}$	$57\%_{a,b}$	$55\%_{a,b}$	.07
% African American	$44\%_{a}$	$53\%_{a,b}$	$64\%_{a,b}$	$73\%_{b}$	.04
% Single parent	26%	24%	29%	41%	.50
Mother education	6.56 (1.0)	6.44 (0.99)	6.14 (1.4)	6.50 (1.0)	.55
Tell all	2.61_{a} (0.81)	2.69_{a} (0.93)	2.79_{a} (0.80)	2.15_{b} (0.73)	.06
If asked	2.93 (0.82)	2.98 (0.78)	2.79 (0.67)	2.67 (0.82)	.46
Omit details	1.77 (0.62)	1.85 (0.77)	1.64 (0.45)	1.84 (0.54)	.73
Keep secret	1.58 (0.72)	1.71 (0.88)	1.54 (0.51)	1.71 (0.65)	.72
Lie	1.39 (0.53)	1.37 (0.58)	1.26 (0.32)	1.53 (0.51)	.49
Teen-reported antisocial behavior	0.21 (0.23)	0.17 (0.19)	0.12 (0.07)	0.19 (0.27)	.39
Teen-reported depressive symptoms	2.58 (0.80)	2.75 (0.95)	2.95 (0.80)	2.60 (0.83)	.31
Parent-reported rule-breaking behavior	1.88_{a} (0.61)	1.56_{b} (0.44)	$1.69_{a,b}$ (0.39)	2.02_{a} (0.77)	.02
Parent-reported depressive symptoms	2.58 (0.80)	2.75 (0.95)	2.95 (0.80)	2.60 (0.89)	.33

Note. Means within a row with different subscripts differ via least-significant-difference post-hoc comparisons at $p < .05$.

procedures used by Darling et al. (2006) and Smetana et al. (2009). During each interview, adolescents were presented with five scenarios in which they had misbehaved or broken a family rule (i.e., "when you watch a TV show or movie you are not supposed to watch," "when you spend your free time in a way your parents would not like," "when you visit a friend's house when no adult is there," "when you do things with your friends that your parents do not like," and "when you spend time with people your parents do not want you to be friends with"). Scenarios were selected to depict commonly occurring transgressions that were developmentally appropriate to early adolescence. Adolescents who reported that they never engaged in one or more of the transgressions presented in the scenarios were instructed to skip the particular scenarios and data were treated as missing with scores computed as the mean of the completed scenarios. Five or fewer participants skipped any particular scenario. Laird and Marrero (2010) provided detailed comparisons of responses across scenarios in the Grade 6 interviews. For each scenario, adolescents were asked to indicate how likely they were to respond in five ways (i.e., "by telling everything without their parents asking, by telling everything only after their parents asked, by leaving out important details, by trying to keep it secret, and by making up a story or lying"). A 4-point response scale (1 = *never* to 4 = *always*) was used for each question. At each time-point, separate scores for *tell all* (without being asked), *tell if asked, omit details, keep secret,* and *lie* were computed as the mean response across the five scenarios (αs = .79 to .91, $M\alpha$ = .87). Consistent with the confirmatory factor analysis of the Grade 6 data reported by Laird and Marrero (2010), at each time-point, a composite *disclosure* score was computed as the mean of the *tell all* and *tell if asked* scores. Likewise, at each time point, a composite *concealment* score was computed as the mean of the *omit details, keep secret,* and *lie* scores (αs = .77 to .86).

Antisocial behavior. During each interview, adolescents reported their antisocial behavior using the Problem Behavior Frequency Scale (PBFS; Farrell, Kung, White, & Valois, 2000). The PBFS includes 26 items that assess physical and nonphysical aggression; delinquency; and alcohol, tobacco, and drug use during the last month of the school year. Adolescents responded to each of the 26 items on a 5-point scale ranging from 0 (*never*) to 4 (*7 or more times*). At each time point, *adolescent-reported antisocial behavior* scores were computed as the mean response across the 26 items (αs = .91 to .93). The antisocial behavior scores were skewed (2.06 to 2.99) and kurtotic (2.68 to 13.51) and, thus, were log transformed, which improved the skew (1.35 to 1.84) and kurtosis (1.52 to 3.80).

Parents' reported their adolescents' rule-breaking behavior using the Teen Conflict Survey (Bosworth & Espelage, 1995). The six items measure the frequency of rule-breaking behavior at home, school, and other contexts and how often the child has been in trouble at home, school, and other contexts. Items are scored on a 5-point scale ranging from 0 (*never*) to 4 (*7 or more times*). At each time point, *parent-reported rule-breaking* scores were computed as the mean of the six items (αs = .76 to .80).

Depressive symptoms. During each interview, adolescents reported their depressive symptoms using the six-item Modified Depression Scale (MDS; Orpinas, 1993). Parents also reported the depressive symptoms of their adolescents using the same items. The MDS is based on the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM–IV*; American Psychiatric Association, 1994) scale for depression and assesses past 30-day frequency of six depressive symptoms (i.e., sadness, irritability, hopelessness, sleep disturbance, difficulty concentrating, and eating problems; Dahlberg, Toal, Swahn, & Behrens, 2005). In previous studies, the MDS has been found to be internally consistent and to be associated with several well-documented risk factors for depression (Goldstein, Walton, Cunningham, Trowbridge, & Maio, 2007; Orpinas, 1993; Tandon & Solomon, 2009). Each item was scored on a 5-point scale from 0 (*never*) to 4 (*7 or more times*). At each time point, *adolescent-reported* and *parent-reported depressive symptom* scores were computed as the mean of the six items (αs = .71 to .75).

Results

Two sets of analyses were conducted. The first set of analyses focused on describing developmental patterns in the use of individual information management strategies. The second set of analyses focused on testing cross-lagged associations between disclosing and concealing strategies and between disclosing and concealing strategies and adolescents' antisocial behavior and depressive symptoms.

Developmental Change in Information Management Strategies

The sample means for *tell all* and *if asked* strategies appear to decline over time, whereas the sample means for the *omit details*, *keep secret*, and *lie* strategies appear to increase over time (see Figure 1). With the exception of *tell all* and *omit details* in Grade 7, the use of each strategy differed significantly (i.e., $p < .05$) from the use of all other strategies within each time-point via paired *t* tests. Unconditional and conditional latent growth curve models were fit to each information management strategy. The unconditional model was specified so that the Grade 5 assessment served as the intercept and the slope indexed the rate of annual change in strategy use. In the conditional model, the intercept and slope factors were regressed on gender to test for gender differences in strategy use in Grade 5 and for gender differences in the rate of

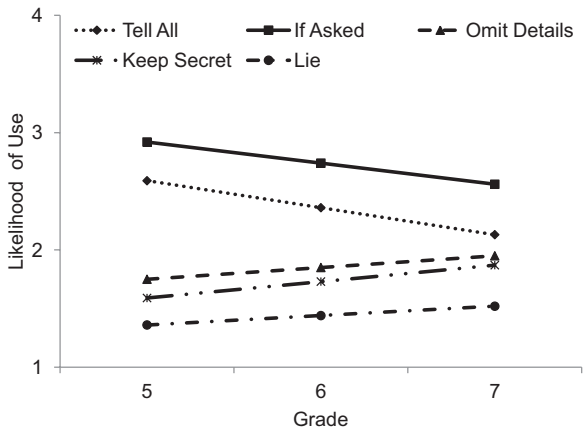

Figure 1. Developmental trajectories of each information-management strategy.

change in strategy use. Latent growth curve modeling was conducted with all available data at each time point ($n = 218$) and models were fit using MPLUS with full information maximum-likelihood estimation, which is recommended over list-wise and pair-wise deletion of missing data (Schafer & Graham, 2002).

As shown in Table 2, the latent growth curve models showed significant linear reductions in the use of *tell all*, and *tell if asked* strategies with significant variability in the rate of decline in the use of the *tell all* strategy but not in the use of the *tell if asked* strategy. There were significant linear increases in the use of the *omit details*, *keep secret*, and *lie* strategies with significant variability in the increase of the *keep secret* strategy. All developmental trajectories indicate decreases over time in the amount of accurate information provided to parents. All gender effects were nonsignificant.

Longitudinal Associations Between Information-Management Strategies and Psychological Adjustment

Two longitudinal autoregressive cross-lagged models were fit to assess predictive bidirectional links between disclosing and concealing strategies and between disclosing and concealing strategies and psychosocial adjustment. One model used depressive symptoms as the index of maladjustment, and the other model used antisocial behavior as the index of maladjustment. Each model included measures of disclosure, concealment, parent-reported maladjustment and teen-reported maladjustment at three time points. Initially, autoregressive paths and cross-lagged paths were specified such that all Grade 6 measures were regressed on the set of Grade 5 measures and all Grade 7 measures were regressed on the set of Grade 6 measures. Covariances were estimated between concurrent measures at each time-point. The basic cross-lagged antisocial behavior, $\chi^2(16) = 29.92$, $p = .02$, comparative fit index (CFI) = .982, root-mean-square error or approximation (RMSEA) = .063, and depressive symptoms, $\chi^2(16) = 37.62$, $p = .002$, CFI = .958, RMSEA = .079, models provided an acceptable fit to the data. The basic cross-lagged model was modified by adding autoregressive paths from Grade 5 to Grade 7 (McArdle, 2009). The additional paths significantly improved the fit of the antisocial behavior, $\Delta\chi^2(4) = 15.46$, $p = .004$, and depressive symptom models, $\Delta\chi^2(4) = 19.79$, $p < .001$. To test the temporal equality of the cross-lagged paths, constraints equating the paths from Grade 5 to Grade 6, with the analogous paths from Grade 6 to Grade 7, were added to the model. Paths constrained to be equal have the same number designation in Figure 2. A comparison of models with and without the temporal constraints tests the hypothesis that the cross-lag paths are temporally invariant (i.e., the effect from Grade 5 to Grade 6 is equal to the effect from Grade 6 to Grade 7). The set of temporal invariance constraints did not harm the fit of the antisocial behavior, $\Delta\chi^2(12) = 14.37$, $p = .27$, or depressive symptoms model, $\Delta\chi^2(12) = 8.58$, $p = .74$. The final model with the additional autoregressive paths and temporal constraints is shown in Figure 2. The final antisocial behavior, $\chi^2(24) = 28.90$, $p = .22$, CFI = .994, RMSEA = .031, and depressive symptoms, $\chi^2(24) = 26.40$, $p = .33$, CFI = .995, RMSEA = .021, models provided a good fit to the data.

As shown in Table 3, disclosing and concealing strategies were reciprocally associated. Consistent with the gateway hypothesis, adolescents reporting less frequent use of disclosure strategies in Grades 5 and 6 reported rank-order increases in the use of concealing strategies in Grades 6 and 7. Consistent with the cover-one's-back hypothesis, adolescents reporting more frequent use of concealing strategies in Grades 5 and 6 reported rank-order decreases in the use of disclosing strategies in Grades 6 and 7.

Information management and adjustment also were reciprocally associated. Consistent with the cover-one's-back hypothesis, more adolescent-reported antisocial behavior in Grades 5 and 6 was associated with rank-order increases in the use of concealing strategies in Grades 6 and 7. Consistent with the gateway hypothesis, even when controlling for the use of concealing strategies, less frequent use of disclosing strategies in Grades 5 and 6 was associated with rank-order increases in adolescent-reported antisocial behavior and in both adolescent-reported and parent-reported depressive symptoms in Grades 6 and 7.

To test moderation by gender, multigroup models were specified. The fit of models with and without constraints equating the cross-lagged path across the gender groups were compared as a test of the

Table 2
Parameter Estimates (PEs) for Latent Growth Curve Models

	Tell all		If asked		Omit details		Keep secret		Lie	
Model parameter	PE (*SE*)	*p*	PE (*SE*)	*p*	PE (*SE*)	*p*	PE (*SE*)	*p*	PE (*SE*)	*p*
Unconditional latent growth curve model										
Intercept mean	2.59 (0.06)	.001	2.92 (0.05)	.001	1.75 (0.04)	.001	1.59 (0.05)	.001	1.36 (0.04)	.001
Slope mean	−.23 (.03)	.001	−.18 (.04)	.001	.10 (.03)	.001	.14 (.04)	.001	.08 (.03)	.006
Variance of intercept	.44 (.10)	.001	.11 (.09)	.248	.16 (.06)	.003	.31 (.07)	.001	.10 (.04)	.013
Variance of slope	.13 (.04)	.003	.03 (.05)	.604	.03 (.03)	.319	.13 (.04)	.001	.05 (.03)	.058
Conditional latent growth curve model										
Intercept mean	2.68 (0.08)	.001	2.92 (0.07)	.001	1.71 (0.06)	.001	1.52 (0.07)	.001	1.33 (0.05)	.001
Slope mean	−.19 (.05)	.001	−.15 (.05)	.003	.11 (.04)	.012	.12 (.05)	.017	.06 (.04)	.146
Variance of intercept	.42 (.10)	.001	.11 (.09)	.249	.16 (.06)	.003	.31 (.07)	.001	.10 (.04)	.014
Variance of slope	.13 (.04)	.004	.02 (.05)	.648	.03 (.03)	.334	.12 (.04)	.001	.05 (.03)	.062
Gender on intercept	−.19 (.11)	.077	−.01 (.10)	.922	.09 (.08)	.271	.14 (.10)	.138	.05 (.07)	.426
Gender on slope	−.06 (.07)	.390	−.06 (.07)	.427	−.01 (.06)	.837	.03 (.07)	.667	.04 (.06)	.526

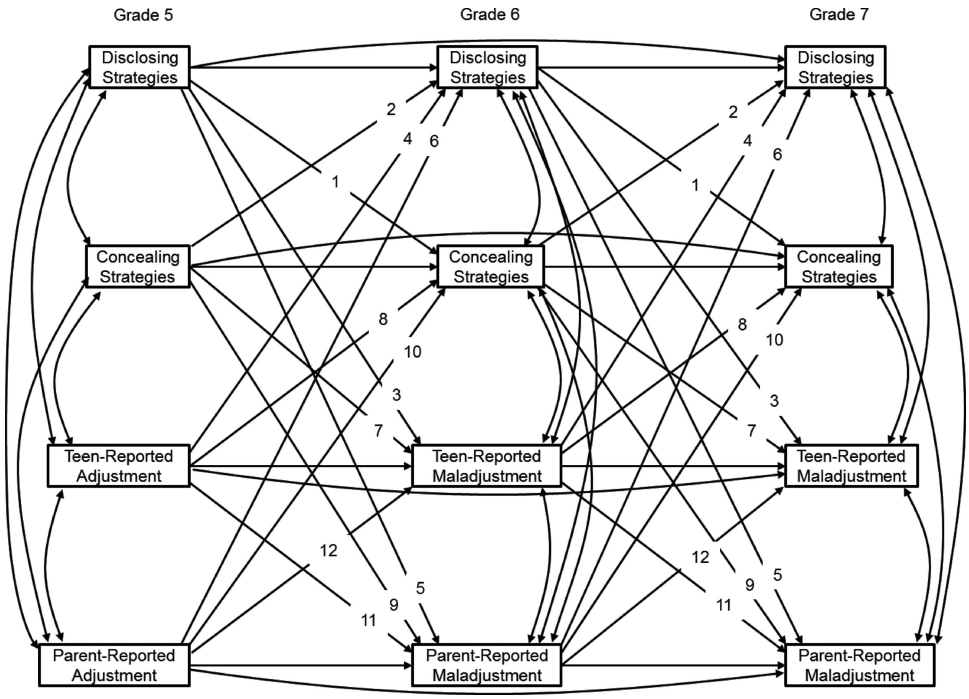

Figure 2. Information management and maladjustment cross-lagged model. Paths with the same number were constrained to be equal.

hypothesis that the cross-lagged paths are moderated by gender. There was no evidence of gender moderation, as the fit of the models with equality constraints did not differ from the fit of the models without the constraints, $\Delta\chi^2(12) = 7.98$ and 9.77, *p*s = .79 and .64 for depressive symptoms and antisocial behavior, respectively.

Discussion

The purposes of the current study were to describe developmental change in the use of five information-management strategies during early adolescence, to test longitudinal connections between disclosing and concealing strategies, and to test longitudinal associations between the use of disclosing and concealing strategies and two indices of adolescents' psychological adjustment. Use of both disclosing strategies (i.e., *tell all* and tell *if asked*) declined from Grade 5 to Grade 7, whereas the use of all three concealing strategies (i.e., *omit details*, *keep secret*, *lie*) increased from Grades 5 to 7 suggesting an overall shift toward more active restriction of parents' access to information following misbehavior. Longitudinal connections suggest that infrequent use of disclosing strategies

Table 3
Model Summary and Standardized Path Estimates for Cross-Lagged Paths

	Antisocial behavior		Depressive symptoms	
Path	G5 → G6	G6 → G7	G5 → G6	G6 → G7
1. Disclosure → Concealment	−.24***	−.20***	−.23***	−.20***
2. Concealment → Disclosure	−.20***	−.19***	−.21***	−.20***
3. Disclosure → T.R. Maladjustment	−.08*	−.08*	−.11*	−.12*
4. T.R. Maladjustment → Disclosure	.01	.01	.03	.03
5. Disclosure → P.R. Maladjustment	−.05	−.06	−.09*	−.10*
6. P.R. Maladjustment → Disclosure	−.04	−.04	−.01	−.01
7. Concealment → T.R. Maladjustment	.02	.02	.02	.02
8. T.R. Maladjustment → Concealment	.12*	.10*	−.06	−.04
9. Concealment → P.R. Maladjustment	−.01	−.01	−.01	−.01
10. P.R. Maladjustment → Concealment	−.02	−.01	.04	.03
11. T.R. Maladjustment → P.R. Maladjustment	.03	.03	−.03	−.03
12. P.R. Maladjustment → T.R. Maladjustment	−.05	−.05	.03	.03

Note. T.R. = teen reported; P.R. = parent reported. Path numbering corresponds to path numbers in Figure 2. Path G5 → G6 is from Grade 5 to Grade 6 and G6 → G7 is from Grade 6 to Grade 7. Temporal constraints equate unstandardized paths from Grade 5 to Grade 6 with paths from Grade 6 to Grade 7.
* $p < .05$. *** $p < .001$, one-tailed.

may be a gateway to relatively more frequent use of concealing strategies and that more use of concealing strategies may relatively decrease subsequent disclosure. In terms of associations between strategies and behavior problems, relatively high levels of disclosure appear to minimize subsequent antisocial behavior and depressive symptoms, whereas relative increases in the use of concealing strategies appears to follow from, rather than to precede, involvement in antisocial behavior.

Previous cross-sectional studies reported weak and inconsistent age differences in strategy use (Bakken & Brown, 2010; Darling et al., 2006; Smetana et al., 2009). In contrast, findings from the current longitudinal study are very consistent in showing developmental decreases in the use of disclosing strategies and developmental increases in concealing strategies. Nonetheless, developmental changes are relatively modest and the relative rank-order of the different strategies remains constant over time. Adolescents report that they are most likely to tell parents about their transgressions but that they typically wait for the parents to ask for the information. This finding is important because Stattin and Kerr's (2000) demonstration that disclosure rather than solicitation or control is the source of parents' knowledge has been followed by interpretative slippage in the literature with modifiers added to suggest that Stattin and Kerr measured "voluntary disclosure" (Darling et al., 2006; Keijsers, Branje, VanderValk, & Meeus, 2010; Shek, 2006), "spontaneous disclosure"(de Graaf et al., 2010; Frijns et al., 2010), or "unsolicited disclosure" (Waizenhofer, Buchanan, & Jackson-Newsom, 2004), despite the inability of Stattin and Kerr's items and methodology to distinguish between disclosure preceding or following parental questioning. Findings from the current study suggest that adolescent disclosure of misbehavior more often follows than precedes parental questioning and serves as a reminder that information management is an inherently dyadic process.

Connections between disclosing and concealing strategies are consistent with a transactional process through which relatively low levels of disclosure serve as a gateway to relatively more use of concealing strategies, and, in turn, relatively high use of concealing strategies decreases the use of disclosing strategies as well. Note that, in contrast to previous studies of information management, we did not ask adolescents to select their preferred strategy, and thus, our assessment approach did not force adolescents to select a concealing strategy to replace their use of a disclosing strategy. Therefore, the increases in concealment predicted by low levels of disclosure are not methodological artifacts of a zero-sum assessment procedure.

Similar transactional processes were expected to underlie associations between information-management strategies and antisocial behavior. Across strategies, results were generally consistent with findings from previous studies documenting transactional associations between misbehavior and disclosure (e.g., Keijsers, Branje, VanderValk, & Meeus, 2010) or secrecy (Frijns et al., 2010). However, in contrast to our expectations, there were substantial differences in terms of which strategies appear to be most involved in each part of the transactional process. Links between disclosure and antisocial behavior were consistent with the gateway hypothesis as infrequent use of disclosing strategies predicted subsequent rank-order increases in adolescent-reported antisocial behavior. Frequent use of concealing strategies did not predict subsequent increases in antisocial behavior, as we expected. Moreover, high levels of antisocial behavior did not predict subsequent rank-order declines in disclosure. Instead, links between high levels of concealment and antisocial behavior were consistent with the cover-one's-back hypothesis as relatively high levels of antisocial behavior predicted subsequent rank-order increases in concealment. In early adolescence, infrequent disclosure of transgressions may be a gateway to increases in antisocial behavior. In contrast, concealing transgressions appears to follow relatively high levels of involvement in antisocial behavior, perhaps as adolescents attempt to avoid discovery and punishment or because adolescents have more to hide (Darling et al., 2006; Smetana et al., 2009). High levels of disclosure appear to be a promotive factor and inhibit antisocial behavior, whereas high levels of concealment appear to be a side-effect of involvement in antisocial behavior.

Associations between information-management strategies and depressive symptoms also were expected to be bidirectional. In contrast to expectation, all significant cross-lagged effects were in the same direction. Consistent with previous studies (Finkenauer et al., 2002; Frijns & Finkenauer, 2009; Frijns et al., 2010), more restrictions on the flow of information predicted increases in depressive symptoms. Relatively low levels of disclosure, but not high levels of concealment, predicted rank-order increases in parent-reported and adolescent-reported depressive symptoms. Perhaps restricting information limits parents' abilities to serve as sources of support (Frijns & Finkenauer, 2009). One previous study also reported a link between depression and lying (Engels et al., 2006), and another found a link between secrecy and depression (Frijns et al., 2010), so it is surprising that in our study concealment did not also predict more depressive symptoms. Our focus on information management following misbehavior functionally controlled for individual differences in misbehavior which may underlie the concealment–depression link. Likewise, it is surprising that depressive symptoms did not also predict subsequent reductions in the flow of information, as found by Frijns et al. (2010). Depressed adolescents may restrict parents' access to information about their feeling and experiences, but our assessment approach did not capture such variability in information management because we focused exclusively on misbehavior.

There was no evidence of gender differences in information-management strategy use and no evidence that gender moderated links between strategies and antisocial behavior or depressive symptoms. Previous studies provided inconsistent evidence of gender differences in strategy use with the only replicated finding being that girls disclose more than boys (Darling et al., 2006; Tasopoulos-Chan et al., 2009). In our study, girls did report marginally more use of the *tell all* strategy than boys, and girls in the current study do report significantly more disclosure than boys when disclosure is assessed using Stattin and Kerr's (2000) measure (Laird & Marrero, 2010; Laird, Marrero, & Sentse, 2010). Perhaps by measuring information management following misbehavior, which simultaneously controls for level of misbehavior and the content of the disclosure, the current study minimized gender differences in information management.

Findings from the current study should be viewed in light of several limitations. The biggest limitation is that we relied on adolescents' reports of their own information management. Although only the adolescents themselves know the extent to which they conceal information from their parents, the extent to which adolescents honestly report their avoidance and deception to re-

searchers is unknown. Although links between disclosing strategies and depressive symptoms were significant for both parent-reported and adolescent-reported depressive symptoms, associations linking antisocial behavior with disclosing and concealing strategies were only significant for adolescent reports of antisocial behavior. The pattern of findings suggests an informant effect but may also be due to the different approaches used to assess antisocial behavior. Adolescents were asked to report on their own involvement in a range of antisocial behaviors, whereas parents were asked to report how often adolescents got in trouble for misbehavior. Given that the focus of the current study was on strategies for covering up misbehavior, we would be remiss not to acknowledge that adolescents who successfully use concealing strategies are likely to avoid getting in trouble and are likely to have parents who substantially underestimate the degree to which their children are engaged in antisocial behavior. Using other data from the current sample, Laird and Weems (2011) addressed the challenge in differentiating method variance from differences in perspective.

There are also several general limitations of the data set. Although families are generally representative of the area from which they were recruited, well-educated parents are overrepresented in the sample, and via the low participation rate, the sample is likely biased toward well-functioning families, due in part to the desire to collect information through personal interviews in the families' homes. Furthermore, although the longitudinal design is a key strength, some participants dropped out of the study or elected not to provide data at one of the time points. Participants who infrequently used the tell all strategy in Grade 5 were most likely to drop out, again suggesting that well-functioning families and disclosing adolescents may be overrepresented in the retained sample.

In summary, normative developmental patterns show decreases in the amount of information shared with parents. Although disclosure and concealment are not opposite ends of a single continuum, they are longitudinally linked in a bidirectional manner. Consistent with the gateway hypothesis, individuals who infrequently used disclosing strategies reported rank-order increases in the use of concealing strategies. Consistent with the cover-one's-back hypothesis, individuals who frequently used concealing strategies reported rank-order decreases in the use of disclosing strategies. Although there is a normative decrease in the use of disclosing strategies, individuals who infrequently used disclosing strategies experienced rank-order increases in antisocial behavior and depressive symptoms also consistent with the gateway hypothesis. Rank-order increases in the use of concealing strategies followed from, rather than preceded, high levels of antisocial behavior consistent with the cover-one's-back hypothesis. In contrast to our expectation, the failure to disclose misbehavior, rather than efforts to explicitly conceal misbehavior, appears to be a unique risk factor for psychosocial maladjustment leading to rank-order increases in concealment, antisocial behavior, and depressive symptoms.

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