

Associations Between Observed Mother–Adolescent Interactions and Adolescent Information Management

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Associations between observed mother–adolescent interactions during a conflict task and adolescents' information management strategies were examined in 108 primarily middle class, European-American adolescents ($M = 13.80$ years, $SD = 1.52$) and their mothers. Teens who communicated more clearly disclosed more about personal and multifaceted activities, lied less about personal activities, and engaged in less avoidance regarding multifaceted and prudential activities. Mothers' clear communication was associated with less adolescent disclosure and more avoidance about personal and multifaceted activities. Teens with more receptive mothers omitted less prudential information but avoided discussing prudential issues more. Maternal warmth was not associated with information management. The results highlight the need to distinguish between parent and teen behaviors and between affective quality and specific communicative behaviors.

Parents' knowledge of adolescents' activities primarily depends on adolescents' decisions to disclose or conceal information (Kerr, Stattin, & Burk, 2010). Accordingly, there has been much recent interest in adolescents' active management of information and its correlates and antecedents. For instance, high-quality parent-adolescent relationships and positive parenting practices such as acceptance and support have been linked with more adolescent disclosure and less adolescent secrecy (see Smetana, 2008, 2011 for reviews).

Adolescents use different strategies to manage information from parents. In addition to full disclosure, adolescents may lie, avoid the subject, or partially disclose by omitting important information that parents would want to know (Darling, Cumsille, Caldwell, & Dowdy, 2006; Smetana, Villalobos, Tasopoulos-Chan, Gettman, & Campione-Barr, 2009). These distinctions have different associations with adolescent adjustment, reasons for nondisclosure, and parenting (Darling et al., 2006; Smetana et al., 2009).

Strategies also vary according to the social domain of the information being managed (Smetana, Metzger, Gettman, & Campione-Barr, 2006; Smetana et al., 2009). Adolescents feel most obligated to disclose about *prudential* activities (acts affecting individuals' health or safety), but often do not disclose them because they fear parental disapproval or punishment (Smetana et al., 2006, 2009). In contrast, adolescents believe they are least obligated to disclose to parents about *personal* issues of privacy, personal choice, and preferences (Smetana et al., 2006), but more than for other activities, teens' disclosure of personal activities is linked with parent-adolescent relationship quality (Smetana et al., 2009). *Multifaceted* activities, or acts that teens consider personal but that parents consider prudential or conventional, fall in-between personal and prudential issues in terms of teens' felt obligation to disclose and their reasons for non-disclosure (Smetana et al., 2006, 2009). They are also at the heart of most adolescent-parent conflicts (Smetana, 2011) and reflect teens' strivings for greater autonomy. As such, teens exert greater control over multifaceted activities with age, but depending on levels of parental understanding and open communication, may do so directly through negotiation with parents or indirectly through nondisclosure of these issues (Smetana, 2008).

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Adolescent disclosure, information management, and their correlates have been examined using self-reports. However, more multi-method approaches are needed, as parent and teen reports of parenting and relationship quality often differ (Laursen & Collins, 2009), and associations among parenting, relationship quality, and information management depend on the informant (Smetana et al., 2006, 2009). We therefore examined associations between mother-adolescent interactions, coded from videotaped dyadic interactions in a semi-structured laboratory task, and adolescents' reports of information management strategies across multiple domains. To allow for more direct comparisons between the present study and previous research using self-reports, we examined observational measures of mothers' and adolescents' receptiveness, warmth, trust, and clear communication, as parental acceptance, responsiveness, warmth, and authoritativeness all have been associated previously with adolescent information management (Darling, Cumsille, Peña-Alampay, & Coatsworth, 2009; Darling et al., 2006; Smetana et al., 2006, 2009; Soenens, Vansteenkiste, Luyckx, & Goossens, 2006).

This previous research led us to hypothesize that greater maternal warmth and receptiveness would be associated with greater adolescent disclosure about all activities. In addition, adolescents disclose more about issues of disagreement when they believe they can change their parents' minds (Darling et al., 2006, 2009). As adolescents and parents have the most divergent opinions about multifaceted issues, we hypothesized that clearer teen communication would be associated with more adolescent disclosure about multifaceted issues.

Among typically developing teens, better quality parent-adolescent relationships and greater parental acceptance are associated with less lying about personal issues (Smetana et al., 2006, 2009) and parental warmth is linked with less lying in situations of disagreement (Darling et al., 2009). We therefore expected that mothers' and teens' clearer communication and greater maternal warmth and receptiveness would be linked with less lying about personal issues and that greater maternal warmth would be associated with less lying about multifaceted issues.

As avoidance is an indirect autonomy strategy (Smetana, 2008), we expected that teens would avoid discussing multifaceted issues less when they and their mothers communicated clearly and when mothers were receptive. Past research

(Smetana et al., 2009) also led us to expect that maternal receptiveness would be associated with less avoidance in discussing personal activities.

Although adolescents commonly omit details when talking with parents, omitting information has not been linked in past research with parenting or relationship quality (Darling et al., 2006; Smetana et al., 2009). Therefore, we examined associations between omitting information and family interactions but did not test specific hypotheses.

Studies have been equivocal about whether gender and age moderate relationships between family patterns and adolescent information management (e.g., Kerr et al., 2010). Recently, however, Keijsers, Branje, Frijns, Finkenauer, and Meeus (2010) showed that links between relationship quality and secrecy are stronger for girls than for boys, and Tilton-Weaver et al. (2010) showed that parental negative reactions led to greater feelings of parental over-control among older than younger adolescents. We therefore examined age and gender as moderators in our analyses but, given the mixed findings, made no specific predictions.

METHODS

Participants

Participants in this study were 108 adolescent-mother pairs. Fifty-one seventh graders ($M_{\text{age}} = 12.27$ years, $SD = .49$, $n = 27$ males) and 57 tenth graders ($M_{\text{age}} = 15.16$ years, $SD = .46$, $n = 27$ males), along with their mothers ($M_{\text{age}} = 42.62$ years, $SD = 4.66$), were drawn from a larger sample of 118 families. As described in detail elsewhere (Smetana et al., 2009), they were primarily European-American, middle-class, two-parent families. Nine families were dropped because adolescents participated only with fathers, and one additional family was dropped because they did not participate in the interaction task. Dropped and retained dyads did not differ significantly in demographic background.

Procedure

Families came from a suburban school district in the Northeastern United States as part of a larger study focusing on parent, adolescent, and sibling relationships. They were recruited through visits to students' homeroom classes and letters mailed home. Interested families participated in a 2-hr lab session that included interviews, questionnaires, and family interaction tasks. They were given \$45 honoraria for their time.

Disclosure Sorting Task

Adolescents sorted 22 stimuli (four prudential, seven personal, six prototypical multifaceted, and five peer multifaceted items; see Smetana et al., 2009 for details) into behaviors they had participated in at least once or had never performed. They then indicated their primary strategy for managing information about the behaviors they had performed; only one response per item was allowed. Consistent with Darling et al. (2006), participants chose among four options: tell all, tell but leave out important details parents would want to know, avoid discussing the issue, or lie. Responses were assigned a 1 if the strategy was chosen and a 0 if it was not. Proportion scores were computed representing the number of responses affirming each strategy in each domain. Peer and prototypical multifaceted items were combined based on their conceptual similarity and to reduce model complexity.

Nearly all participants engaged in the multifaceted and personal activities and thus had strategy scores for these issues. However, 39 participants reported not engaging in any prudential activities and thus had missing data for these issues. We imputed prudential strategy scores for these participants using Full Information Maximum Likelihood (FIML) techniques in AMOS 16.0. To verify that this estimation did not bias results, the results of SEM analyses with prudential data imputed were compared to analyses with these participants omitted. As the findings were highly similar, all participants were retained for all analyses.

Parent-Adolescent Interaction Task

Mother-adolescent pairs participated in a semi-structured family interaction task developed in previous research (Smetana, Yau, Restrepo, & Braeges, 1991). Participants first decided on an issue causing disagreement or conflict between them (3 min) and then discussed the disagreement, working toward a resolution (5 min). Interactions were videotaped without an interviewer present.

Using a revised version of the Smetana et al. (1991) Global Coding System, trained observers watched each tape twice and then rated mothers and adolescents separately on 5-point Likert scales for *clear communication* (coded on four scales: clarity of thought, confidence in stating opinions, requests input from others, and provides explanations), *receptiveness* (coded on five scales for mothers and four scales for adolescents: understanding, recep-

tive to statements by others, tolerates differences, supportiveness, and validation of teen's perspective [mothers only]), and *warmth* (single scale). Mean scores were obtained across the communication and receptiveness subscales. Higher scores represented clearer communication, greater receptiveness, and higher warmth. Cronbach's alphas for clear communication and receptiveness were .89 and .80 for ratings of mothers and .86 and .87 for ratings of adolescents, respectively. Interrater reliability (interclass correlations on 25% of the data) ranged from .80 to 1.0 across all scales.

Mother and adolescent scores for receptiveness and warmth were highly correlated, $r_s(108) = .71$ and $.84$, respectively. Given these high correlations and that our hypotheses for these variables focused on mothers and not adolescents, only ratings of mothers' warmth and receptiveness were included in the path analyses. Observational and demographic variables were normalized as necessary using square root, log, or inverse transformations.

Because strategies were assessed in an interactive task, missing data for these responses were minimal, ranging from zero for most of the disclosure items to 3.7% for one item, what teens do when out with friends. Analyses indicated that data were missing completely at random, $\chi^2(11) = 14.57$, $p > .20$ (MCAR; Little, 1988). There were no missing data for the observation codes.

RESULTS

Descriptive Analyses

Means, standard deviations, and correlations for the study variables are presented in Table 1. Correlations between warmth and receptiveness were moderate and positive, as expected. Neither adolescent nor mother clear communication was significantly correlated with the other interaction variables.

Associations between Mother-Adolescent Interactions and Adolescents' Information Management

Hypothesized associations were examined with a series of structural path models using FIML estimation of missing data. Four separate models, one for each information management strategy, were fit to the data. Models were first constructed with all possible pathways estimated (fully identified; see Figure 1) and gender and grade differences were examined using multigroup analyses. Chi square

TABLE 1
Descriptive Statistics and Zero-Order Correlations Between All Study Variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.
1. T Age		.06	-.08	.35*	-.07	-.02	-.07	-.11	-.01	.09	.07	.13	.02	.09	-.00	.15	.02	-.17
2. T gender (females)			-.28*	-.26*	-.19*	-.08	-.20	.08	.03	.14	-.03	.01	.06	-.01	-.13	.13	-.11	.20*
3. M Comm				.17	.10	.06	.02	-.17	-.25*	-.05	-.03	.06	-.02	.15	.23*	.01	.06	.10
4. T Comm					-.03	.16	.24	.17	.19	-.05	.07	-.01	-.26*	-.18	-.11	.03	-.07	-.22*
5. M Receptive						.33*	.18	.12	.16	-.47*	.01	-.03	.25*	-.15	-.11	-.05	.06	-.15
6. M Warmth							.25*	-.00	.02	-.31*	.02	.01	-.03	-.02	-.01	.01	.05	-.03
7. Pru Tell All								.51*	.34*	-.48*	-.13	-.17	-.59*	-.23	-.08	-.41*	-.26*	-.29*
8. Mult Tell All									.65*	.19	-.15	-.30*	-.30*	-.64*	-.40*	-.20	-.50*	-.29*
9. Pers Tell All										-.17	-.14	-.56*	-.17	-.35*	-.59*	-.14	-.43*	-.35*
10. Pru Omit											.12	.11	-.30*	.08	.11	.01	.02	-.01
11. Mult Omit												.44*	.13	-.53*	-.25*	-.07	-.10	-.04
12. Pers Omit													.13	-.15	-.27*	-.01	.26*	.01
13. Pru Avoid														.14	-.03	.06	.05	.15
14. Mult Avoid															.49*	.03	.07	.18
15. Pers Avoid																.07	.21*	.06
16. Pru Lie																.07	.43*	.26*
17. Mult Lie																		
18. Pers Lie																		
M	13.80	0.50	4.54	4.10	4.15	4.17	0.45	0.31	0.53	0.21	0.23	0.18	0.25	0.37	0.25	0.08	0.10	0.04
SD	1.52	0.50	0.60	0.58	0.46	0.46	0.46	0.26	0.26	0.34	0.19	0.20	0.38	0.26	0.20	0.20	0.13	0.09

Note. T = teen, M = mother, Comm = communication, Pru = prudential, Mult = multifaceted, Pers = personal, Omit = omit information parents would want to know, Avoid = avoid topic. Means and SD are for non-transformed variables.
* $p < .05$.

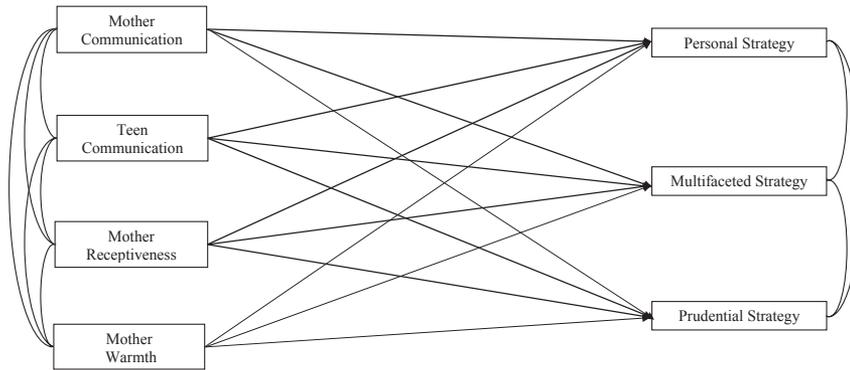


FIGURE 1 Fully identified path model tested for each strategy.

values for the fit of each model with the path coefficients for male participants and female participants (or seventh and 10th graders) constrained to be equal were not significantly higher than values for the corresponding model with path coefficients left unconstrained, indicating that the associations between parent-adolescent interactions and adolescent information management did not differ significantly for male and female participants or for seventh and 10th graders. Because multigroup models compare subgroups of the total sample, their power is lower than in the full sample, and true group differences may go undetected. Consequently, multigroup models were also run on smaller sections of the overall model (interaction behaviors predicting only one strategy per domain at a time) to improve the power to detect group differences. No significant grade or gender differences were found in these smaller models either. Therefore, responses were combined across gender and grade in all analyses.

Next, nonsignificant paths were removed from the fully identified models. Marginal paths were retained in the trimmed models because their dele-

tion led to significantly worse fit. Model fit was determined based on model chi-square, comparative fit index (CFI), and root mean square error of approximation (RMSEA) values. Nonsignificant chi-square values, CFIs greater than .90, and RMSEA values less than .08 indicate adequate fit (Kline, 2005). The trimmed models fit the data well and are discussed below.

Telling All

The trimmed model for adolescent disclosure adequately fit the data (see Figure 2). Adolescents who communicated more clearly disclosed more to their parents about multifaceted issues (as expected), personal issues, and marginally about prudential issues ($p = .052$). In contrast, when mothers communicated more clearly, teens disclosed less about their personal and multifaceted activities. Partially supporting hypotheses, adolescents with more receptive mothers disclosed marginally more about personal activities ($p = .07$, significant in the untrimmed model). Warmth and teen disclosure were not significantly associated.

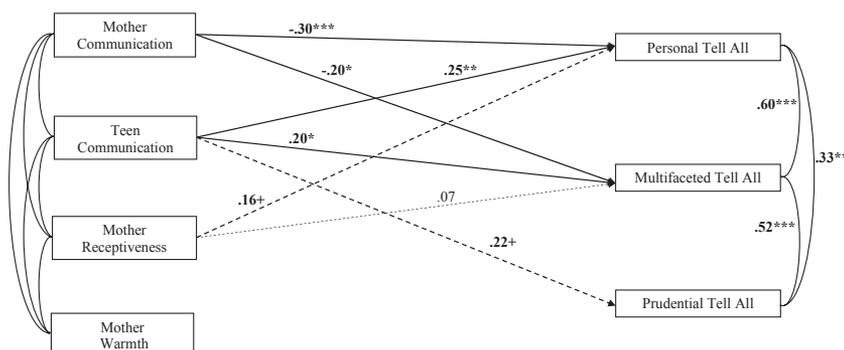


FIGURE 2 Trimmed path model showing standardized associations between interaction behaviors and teen disclosure. Significant paths in bold. $\chi^2(5) = 7.018, p = .22$, comparative fit index = .98, root mean square error of approximation = .06. [†] $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$.

Lying

The trimmed model for lying fit the data well (see Figure 3). As hypothesized, adolescents who communicated more clearly lied less about personal issues. Surprisingly, however, teens lied marginally more about personal activities when their mothers communicated more clearly. Consistent with hypotheses, adolescents with more receptive mothers lied marginally less about personal issues ($p = .051$, significant in the untrimmed model); maternal warmth, however, was not significantly linked with teen lying.

Avoidance

The trimmed model for avoidance fit the data well (see Figure 4). Consistent with hypotheses, adolescents who communicated more clearly were less avoidant in discussing multifaceted, prudential, and marginally, personal issues. Similar to findings for disclosure and lying, when mothers communicated

more clearly, adolescents avoided discussing personal and multifaceted issues more. More receptive mothers had adolescents who engaged in marginally less avoidance about multifaceted issues but more avoidance about prudential issues.

Omitting Information

The trimmed model for omitting information fit the data well, $\chi^2(11) = 5.17$, $p = .91$, CFI = 1.00, RMSEA = .00. The only significant path showed that more receptive mothers had adolescents who omitted less information about prudential issues ($\beta = -.45$, $p < .001$).

DISCUSSION

This study extended prior research on adolescents' strategies for managing information around parents by examining associations between adolescents' reported information management and adolescents' and mothers' behavior in a semi-structured

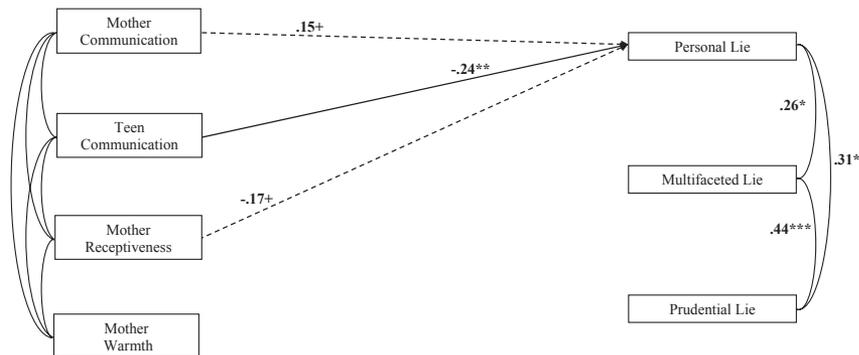


FIGURE 3 Trimmed path model showing standardized associations between interaction behaviors and teen lying. Significant paths in bold. $\chi^2(9) = 3.29$, $p = .95$, comparative fit index = 1.00, root mean square error of approximation = .00. $^{\dagger}p < .10$; $**p < .01$.

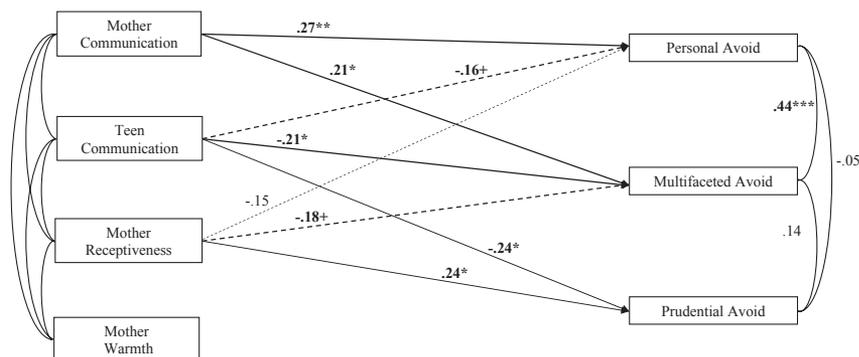


FIGURE 4 Trimmed path model showing standardized associations between interaction behaviors and teen avoidance. Significant paths in bold. $\chi^2(4) = 1.01$, $p = .92$, comparative fit index = 1.00, root mean square error of approximation = .00. $^{\dagger}p < .10$; $*p < .05$; $**p < .01$; $***p < .001$.

laboratory interaction task. We found that adolescents' clear communication and mothers' receptiveness were associated with more adolescent sharing of information, whereas surprisingly, mothers' clear communication was linked with more concealment. These associations varied depending on the information management strategy as well as the domain of the activity considered.

As expected, adolescents who communicated more clearly in their observed interactions with mothers disclosed more about personal and multifaceted activities, avoided discussing multifaceted and prudential activities less, and lied less about personal issues. Thus, adolescents with better communication skills may feel less need to use indirect strategies in negotiating autonomy with parents. In addition, greater comfort with the communication process or having less to hide may encourage more overall disclosure to parents. These alternative hypotheses should be examined in further research; however, clear communication and problem behavior were not significantly associated in our sample, suggesting that adolescents' clearer communication was not simply because adolescents had less to hide.

The findings for maternal communication were surprising and opposite from our predictions. Mothers' clear communication was linked with less disclosure and more avoidance about personal and multifaceted issues. These unexpected associations may be because our assessment included behaviors such as confident speech and providing explanations but did not include affective dimensions. Indeed, neither mothers' nor adolescents' communication was significantly associated with ratings of their warmth. In contrast, most research assesses parent-adolescent communication in terms of participants' self-reported *positive* communication (e.g., IPPA; Armsden & Greenberg, 1987) or only when ideas are expressed in a positive or neutral manner (e.g., IFIRS; Melby & Conger, 2001). When mothers communicate about conflictual issues in a clear and confident but not necessarily positive manner, adolescents may feel that these conversations are dominated by their mothers' opinions. Consistent with findings regarding parental overcontrol (Tilton-Weaver et al., 2010), adolescents may then withhold information (personal and multifaceted, but not prudential issues) that they feel their mothers do not have the legitimate authority to regulate.

Like previous studies (Smetana et al., 2006; Soenens et al., 2006), our findings indicated that there was a trend for adolescents with more receptive mothers to disclose more and lie less about

personal issues and engage in less avoidance about multifaceted issues. These findings reinforce the view that parental understanding and support is important in encouraging adolescent disclosure about issues with personal components. Maternal receptiveness may facilitate adolescents' willingness to reveal the more private aspects of their lives, particularly as they view disclosure about these issues to be discretionary (Smetana et al., 2006). Interestingly, however, maternal receptiveness was not associated with more disclosure about prudential activities; instead it was associated with adolescents omitting less information but avoiding discussing more about prudential issues. Thus, greater maternal receptiveness does not appear to assuage adolescents' fears of negative repercussions of disclosure enough to convince them to tell their parents about their prudential misbehavior (Tilton-Weaver et al., 2010). Rather, adolescents with more receptive mothers merely chose to use a concealment strategy perceived as less wrong (Rote & Smetana, 2011). As receptive mothers are unlikely to condone prudential misbehavior (even if they are more understanding), this finding is not surprising.

Contrary to our expectations, warmth was not significantly associated with adolescent information management. This may reflect differences between observational and self-report measures of warmth, especially because parents and teens can share an understanding of their relationship distinct from outside perceptions (Noller & Callan, 1988). In addition, unlike our observational measure, self-report measures rarely focus on warmth specifically in the context of disagreement, which may alter the impact of warmth on adolescent information management. Alternatively, the lack of significant associations with maternal warmth may be due to the purely affective nature of our measure. Measures of warmth typically combine warmth with acceptance or support (e.g., Darling et al., 2009; Melby & Conger, 2001) when examining links with child behavior; however, receptiveness and warmth were assessed separately and were only moderately correlated in our sample. Consistent with theorizing about parenting style versus context (Darling & Steinberg, 1993), and parental reactions to disclosure (Tilton-Weaver et al., 2010), these results suggest that the general affective nature of the parent-child relationship may impact adolescent information management less strongly than do specific reactions of parents and teens to each other's behavior.

Some limitations of this study should be noted. We were not able to control for adolescents' IQ or language abilities in this study. Therefore, associations between adolescents' disclosure and clear communication could have been influenced by individual differences in intelligence. However, adolescents' grade point average (GPA) was not significantly correlated with their clear communication ($r = .12$), nor did including GPA in the path models change the significance of any of the associations. This gives us confidence that our results are due to adolescents' communication abilities rather than their intellectual functioning.

As the study was cross-sectional, further research is needed to determine the causal direction of the findings. Also, adolescents were only observed interacting with their mothers, and because of the time demands of the sorting task, we did not differentiate between disclosure to mothers and fathers, which has been shown to differ (Laursen & Collins, 2009; Smetana et al., 2006). Therefore, future research should examine associations between dyadic interactions and adolescents' information management separately for each parent. Likewise, associations should be examined in more heterogeneous samples of families from different ethnicities and socioeconomic backgrounds. Finally, our sample was relatively small for the models tested. Although considered a "medium" sample size for SEM path analysis (Kline, 2005), a larger sample would have given us more power, particularly for the multigroup analysis.

Despite these limitations, this study makes a novel contribution by examining associations between observed family interactions and adolescent information management. The results suggest that during conflict discussions, the actions of both interaction partners influence openness in adolescents' communication. More specifically, adolescents' greater clarity in communicating their ideas and mothers' openness and acceptance of their teens' position (but not necessarily their clear communication) were associated with more sharing of information, especially about personal and multifaceted issues.

Observers may not have an "insider" view of family interactions, as they lack an understanding of the dyad's history of interactions (Noller & Callan, 1988). However, observational ratings provide an objective view of interactions that facilitates comparisons across families. In addition, the findings indicated some important new directions for future studies. Although adolescents' disclosure, rather than parental control, primarily predicts par-

ents' knowledge of adolescents' activities (Kerr et al., 2010), research on the correlates and antecedents of disclosure has primarily focused on parenting and relationship quality. Our findings suggest that more attention should be paid to adolescents' behaviors and competencies when predicting their information management, as these may develop as bidirectional, reciprocal interactions. In particular, future research should examine the influence of adolescents' communication abilities and felt efficacy in negotiating with parents, as well as the complex interactions among the domain of the activity, the particular information management strategy, parent-adolescent relationship behaviors, and the context in which they are enacted. Finally, future research should move from global measures of disclosure or secrecy to focusing on the particular information management strategies adolescents employ in different situations.

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