

A Longitudinal Analysis of Disclosure and the Psychosocial Outcomes of Adolescent Information Management

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Summary

The primary role attributed to parents in the prevention of problem behavior has been scrutinized since first publication of Stattin and Kerr's (2000) influential findings highlighting the crucial contribution adolescents make to their own development through their management of information with parents about their behavior. This thesis presents three short-term longitudinal studies which aim to enhance understanding of these issues. For studies one and two, data were collected from 463 adolescents (268 boys, $M_{\text{age}} = 13.97$ years at T1). The first of these examined the collective contribution of mother, adolescent and mother-adolescent interaction factors to spontaneous youth disclosure across social domains of behavior. Openness in communication with mothers was shown to be positively associated with teens' willingness to divulge all types of activities, while stronger disclosure self-efficacy beliefs contributed specifically to the likelihood they would reveal contentious behaviors. In study two, the concept of "pressured information management" was advanced to account for adolescents who feel they have no choice but to engage in secrecy and disclosure. The findings indicated that pressured information management with mothers has gender-specific consequences for teens' emotional functioning. Study 3 investigated the longitudinal contribution of congruence and discrepancy between mother-adolescent reports of disclosure to youth problem behavior using polynomial regressions with response surface analyses. Data were collected from 193 mother-adolescent dyads (113 boys, $M_{\text{age}} = 13.82$ years at T1), with results indicating that both mothers and teens play an important mutual role in determining delinquent trajectories. Collectively, the findings suggest that strict adherence to either a parent- or youth-driven perspective of adolescent information management and its contribution to youth adjustment provides inadequate insight. Rather, it is proposed that a family-oriented process inclusive of conjoint parent-teen influences, such as the degree of openness between a mother and child, offers a better explanation for these findings.

Certification by Candidate

I certify that this thesis is all my own work and has not been submitted for a higher degree to any other university or institution. Approval for all aspects of the research presented in this thesis was obtained from the Macquarie University Human Research Ethics Committee (reference number: HE25SEP2009-D00140).

Josephine Kearney

Date:

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Chapter 1

General Introduction

Thesis Overview

It has long been a foregone conclusion that parental knowledge of children's behavior is an important determinant of positive developmental trajectories. Indeed, many studies have demonstrated that children whose parents are well informed about their whereabouts and daily activities are less likely to engage in delinquency and other forms of problem behavior (e.g., Crouter, Bumpus, Davis, & McHale, 2005; Lahey, Van Hulle, D'Onofrio, Rodgers, & Waldman, 2008; Laird, Pettit, Bates, & Dodge, 2003; Laird, Pettit, Dodge, & Bates, 2003; Waizenhofer, Buchanan, & Jackson-Newsom, 2004). Prior to publication of Stattin and Kerr's (2000; Kerr & Stattin, 2000) seminal findings over a decade ago which called into question the primary role that has been attributed to parents in the acquisition of parental knowledge, this was believed to occur chiefly through parental efforts to monitor their children's activities (e.g., Dishion & McMahon, 1998; Dishion, Patterson, Stoolmiller, & Skinner, 1991; Loeber & Dishion, 1983; Loeber & Stouthamer-Loeber, 1986; Patterson & Dishion, 1985; Patterson & Stouthamer-Loeber, 1984). Stattin and Kerr's (2000; Kerr & Stattin, 2000) findings, however, challenged these deeply entrenched views by demonstrating that of the different ways caregivers access information about teens' behavior, spontaneous disclosure from youths represents not only the most important source of parental knowledge, but is more highly associated with adolescent adjustment than any other mechanism.

Spontaneous disclosure from children to parents about their behavior is likely to be of paramount importance during adolescence, a period when youths actively seek to renegotiate their relationship with parents, spending progressively less time with caregivers while engaging in an increasing number of unsupervised activities with peers outside the family home (Laird, Marrero, & Sentse, 2010; Larson, Richards, Moneta, Holmbeck, & Duckett, 1996; Smetana, 2008; Steinberg, 1990). Parents thus come to rely on adolescents' willingness to keep them apprised of their behavior throughout the teenage years. This is important because it is these disclosures that afford parents the opportunity to provide adolescents with

the guidance and support they need to navigate high-risk situations at a time during the developmental period when they are most likely to confront these challenges for the first time (Crouter & Head, 2002; Darling, Cumsille, Caldwell, & Dowdy, 2006; Dishion & McMahon, 1998).

Identifying factors that may increase the likelihood youths will spontaneously disclose information to parents about their behavior is thus crucial. Furthermore, there exists increasing awareness in the literature that research in this area would benefit by moving away from merely elucidating circumstances that augment disclosure to investigating how sharing information with others under different conditions yields differential associations with adjustment and maladjustment (Kelly & McKillop, 1996; Smetana, 2008). These imperatives have led to a plethora of studies which often advocate either parent- or adolescent-driven models of influence. More recently, however, there has been growing recognition that the ways caregivers and teens both contribute to youths' willingness to divulge information to parents about their behavior, as well as the psychosocial implications of adolescent information management, warrants further investigation (Low, Snyder, & Shortt, 2012; Racz & McMahon, 2011; Willoughby & Hamza, 2011).

These issues are explored in Chapters 2 to 4 of this thesis. Three short-term longitudinal studies are described that aimed to identify from a diverse array of mother, adolescent and mother-adolescent interaction factors those that boost spontaneous youth disclosure and those which influence teen psychosocial outcomes following their management of information with mothers. Although the work of Stattin and Kerr (2000; Kerr & Stattin, 2000; Kerr, Stattin, & Burk, 2010) suggests that maternal knowledge derives primarily from youths' self-initiated efforts to reveal their activities, it was postulated that individual adolescent, maternal and mother-adolescent interaction factors would function collectively to elicit this disclosure and influence teens' susceptibility to different outcomes following their use of various information management strategies.

Prior to outlining these studies, a background literature review addressing the key issues underpinning the present research is provided in this chapter. The definitional and theoretical considerations that guided its development are first described. This includes a discussion of the different pathways to parental knowledge, as well as proposed interconnections between current theories of adolescent information management and social cognitive theory (SCT; Bandura, 1986; 2001). The methodological issues which influenced the course of this research are then explicated. This is followed by an overview of the literature investigating predictors of youth disclosure, with a specific focus on those factors considered most pertinent to the studies comprising this thesis. These include the impact of parenting, communication and self-efficacy on youth disclosure, as well as potential gender and age effects. Following this is an outline of the reasons that guide adolescents' decisions to tell or not to tell, along with a discussion of the evidence which suggests teens' use of these information management strategies may yield differential associations with adjustment and maladjustment. Chapter 1 concludes with a detailed description of the three studies offered in the subsequent chapters of this thesis.¹

Study one, presented in Chapter 2, investigates the collective contribution of various individual mother, adolescent and mother-adolescent interaction factors to teens' willingness to engage in disclosure. The psychosocial outcomes associated with adolescent information management are then explored in Chapters 3 and 4. In study two (Chapter 3), the gender-specific emotional consequences of engaging in "pressured information management" are shown, while study three (Chapter 4) demonstrates the important conjoint role adolescent and maternal perceptions of youth disclosure play in curbing delinquent trajectories. The final chapter, Chapter 5, provides an overview of the key findings and implications of this research, as well as its strengths and limitations. Suggestions for future research are also offered.

¹ This thesis is presented in non-traditional research thesis by publication format as outlined and recommended by the Macquarie University Higher Degree Research Unit. It is comprised of five chapters consisting of three individual papers prepared for publication and an overall introduction and discussion. As a result of the thesis' structure, there is some unavoidable repetition across chapters.

Background Literature Review

Spontaneous adolescent disclosure

Recognition of the contribution adolescents make to their own development via spontaneous disclosure to parents about their whereabouts and daily activities was virtually non-existent prior to the ground-breaking studies published by Stattin and Kerr (2000; Kerr & Stattin, 2000). Indeed, earlier conceptions of the prevention of youth problem behavior tended to focus exclusively on the role of parental monitoring as a protective factor against adverse psychosocial outcomes for teens. Defined by Dishion and McMahon (1998) as “a set of correlated parenting behaviors involving attention to and tracking of the child’s whereabouts, activities and adaptations” (p. 61), parental monitoring was thus touted as a necessary, albeit not sufficient, condition for both effective parenting and optimal adolescent adjustment. These ideas flourished, supported by an impressive body of empirical studies that over a period of twenty years demonstrated robust linkages between parental monitoring behaviors and a whole host of positive youth outcomes (for reviews, see Crouter & Head, 2002; Dishion & McMahon, 1998), including fewer instances of juvenile delinquency (Cernkovich & Giordano, 1987; Weintraub & Gold, 1991), less substance use (Dishion & Loeber, 1985; Flannery, Vazsonyi, Torquati, & Fridrich, 1994), reduced involvement in risky sexual behaviors (Metzler, Noell, Biglan, Ary, & Smolkowski, 1994), higher self-esteem (Parker & Benson, 2004) and improved academic functioning (Crouter, MacDermid, McHale, & Perry-Jenkins, 1990).

The interpretation of these findings has, however, been questioned by Stattin and Kerr (2000; Kerr & Stattin, 2000; Kerr et al., 2010),² who posited that measures of parental monitoring routinely used in the literature are too broad to capture the specific concept of parental monitoring and instead reflect the more general construct of parental knowledge. Defined as the acquisition of information by caregivers about their children’s daily activities,

² As this thesis was prepared in a non-traditional thesis by publication format, ‘et al.’ is used to indicate the remaining authors on repeat citations within each chapter, rather than across the thesis as a whole.

parental knowledge encompasses both the details parents actively procure through parental monitoring, as well as those passively acquired when youths choose to freely divulge their involvement in different behaviors. Stattin and Kerr (2000; Kerr & Stattin, 2000; Kerr et al., 2010) thus advocated for the use of measures that clearly differentiate between these divergent sources of parental knowledge. Subsequently, they demonstrated in a series of cross-sectional (e.g., Kerr & Stattin, 2000; Stattin & Kerr, 2000) and longitudinal studies (e.g., Kerr et al., 2010) that of these different pathways, spontaneous disclosure from teenagers is both the most important pathway of parental knowledge and is more strongly associated with adolescent adjustment than any other source.

These findings provided the impetus for a wealth of research concerned with the identification of various parent, adolescent and reciprocal parent-teen influences that may contribute to the disclosure process. Moreover, whether adolescents' management of information with parents yields differential associations with adjustment and maladjustment depending on the context in which those strategies are used has become of increasing interest to researchers (Smetana, 2008). These issues are important as they not only inform how caregivers may best come to equip themselves with knowledge about their children's behavior, and hence, steer teens towards more adaptive life choices, but also under what conditions the consequences of adolescent information management might be amplified. This thesis aimed to address both these issues by investigating factors that influence youths' disclosure to mothers, as well as exploring the psychosocial implications of adolescent information management across different circumstances.

An important conceptual distinction is, however, first necessary. Consistent with the definitions provided by Stattin and Kerr (2000; Kerr & Stattin, 2000) the term adolescent disclosure as used in this thesis refers to teens' willingness to spontaneously and without prompting inform parents about their daily activities. While at times used interchangeably in the literature, it should be noted that adolescent disclosure about their behavior is not

synonymous with *self*-disclosure, which involves sharing one's thoughts, feelings and concerns (Buhrmester & Prager, 1995). This is because unlike self-disclosure, the intention of divulging information about one's whereabouts and daily activities to parents is not necessarily to build intimacy, nor is it usually expected that such disclosures will be reciprocated (Marshall, Tilton-Weaver, & Bosdet, 2005). Although perhaps a seemingly subtle distinction, it is a crucial one as the features of these two diverse processes may differ. This thesis was thus primarily concerned with the predictors and projected outcomes of teens' willingness to spontaneously disclose information about their behavior to parents. However, in the interests of providing a complete overview of the research and theory that guided its development, certain studies addressing ideas that would be considered more consistent with the concept of self-disclosure have been referred to throughout.

Theoretical considerations: The nexus between pathways to parental knowledge, adolescent information management and social cognitive theory

As highlighted by Stattin and Kerr (2000), spontaneous disclosure from adolescents is only one of the pathways through which parents can ascertain knowledge about their teens' whereabouts and behaviors. Other sources include *parental solicitation* of this information, which involves asking children, their friends and friends' parents directly about teens' activities, and the use of *parental control* strategies that restrict adolescents' freedom to come and go as they please (Kerr & Stattin, 2000). These more active mechanisms of parental knowledge capture what is usually meant when the term 'parental monitoring' is used (Dishion & McMahon, 1998) and can be distinguished from situations where caregivers passively access this information via spontaneous adolescent disclosure. Although a series of studies have begun re-examining the importance of these more deliberate parental efforts to keep track of and monitor adolescents' behavior (e.g., Brody, 2003; Laird et al., 2010; Waizenhofer et al., 2004; Willoughby & Hamza, 2011), teens' willingness to divulge this

information is still widely considered the chief way that caregivers come to learn of these activities (Kerr & Stattin, 2000; Kerr et al., 2010; Stattin & Kerr, 2000).

How teens' judiciously regulate the information they do and do not share with parents about their whereabouts and behavior is thus important to consider and referred to as 'adolescent information management' (Marshall et al., 2005; Tilton-Weaver et al., 2010; Tilton-Weaver & Marshall, 2008). The theoretical underpinnings of this process derive from Goffman's (1959) sociological paradigm of dramaturgy, which views interpersonal interactions as dependent on the context in which they transpire. An individual therefore presents themselves to others in light of relevant cultural norms, as well as the mutual understanding that exists between the 'actor' and 'audience' (in this case, adolescents and their parents) about their social roles. The aim of this carefully considered performance is for the audience to view the actor as he or she wants to be perceived, and similarly, a key function of teens' regulation of information with parents is considered to be impression management. Adolescents are thus regarded as active agents who make judicious decisions about the details they do and do not share with parents (Marshall et al., 2005; Tilton-Weaver et al., 2010; Tilton-Weaver & Marshall, 2008).

This view that youths make strategic decisions about what it is they tell parents about their behavior is consistent with the agentic role ascribed to teens as architects of the own development within social cognitive theory (SCT; Bandura, 1986; 2001; 2006a). Guiding SCT is the central tenet that through the exercise of personal agency, individuals can influence their own functioning and life circumstances (Bandura, 2006a). Adolescents are no different and thus considered active contributors to their development, as opposed to objects of unidirectional parental influence (Bandura, 1997). The conception of human agency in SCT is however extended to the consideration of 'collective agency' (Bandura, 2001). Some positive outcomes may be more achievable when collective agency is exercised; that is, when individuals pool their knowledge, resources and work together (Bandura, 2001; Bandura,

2006a; Caprara, Regalia, Scabini, Barbaranelli, & Bandura, 2004). From these principles, it can therefore be intimated that parents and teens may play a mutual role in influencing developmental trajectories. This research thus aimed to enhance current understanding of the disclosure process by considering how mothers and adolescents both individually and conjointly influence youths' willingness to divulge information about their behavior, and relatedly, the psychosocial outcomes associated with adolescent information management.

Assessing adolescent disclosure: Measurement issues

Various methods have been used to assess adolescents' use of different information management strategies with parents. These include the provision of daily diaries (e.g., Smetana, Villalobos, Rogge, & Tasopoulos-Chan, 2010), as well as directly observing teens' use of disclosing strategies during live or pre-recorded exchanges between parents and adolescents (e.g., Metzger et al., in press; Poulin, Nadeau, & Scaramella, 2012; Rote, Smetana, Campione-Barr, Villalobos, & Tasopoulos-Chan, 2012). These observational paradigms offer a number of intriguing possibilities, including the potential to obtain objective perspectives of parent-child interactions and access information about the conversational context in which disclosure occurs (Metzger et al., in press; Rote et al., 2012). Others, however, have criticized the use of these observations by outsiders, arguing such observers may not interpret parent-child interactions in the same way as participants owing to a lack of understanding of how these exchanges fit within the broader milieu of the family (Noller & Callan, 1988). Alternatives which may provide more nuanced perspectives of these communication processes that researchers may not otherwise be privy to include focus group discussions (e.g., Tokić & Pećnik, 2010) and the use of other qualitative research paradigms (e.g., Bakken & Brown, 2010; Hunter, Barber, Olsen, McNeely, & Bose, 2011; Marshall et al., 2005; Tilton-Weaver & Marshall, 2008).

The most widely used methodology for examining adolescent disclosure to parents, however, remains the use of self-report measures—that is, directly asking teenagers and their

parents to rate teens' willingness to divulge information about their daily activities and behaviors. These self-report measures offer a number of obvious advantages, including ease of administration, convenience, cost-effectiveness and structure. They also have the potential to offer invaluable insight about the history in which these communication processes occur, as well as teens' subjective and changing experiences within the family. According to Steinberg (1990), this is important given much of the readjustment in family relations that occurs for teenagers and their parents during adolescence happens intrapsychically. While qualitative procedures can also capture these changing images that parents and teens have of each other, self-report measures allow for comparisons across diverse groups (e.g., gender, ethnic and age-related comparisons), with respect to different targets (e.g. mothers and fathers), between multiple informants (e.g., mother-adolescent reports) and at different time points as in longitudinal research to be conducted in a more straightforward way. Nonetheless, their use within the disclosure literature has been plagued by a number of conceptual and methodological issues that warrant further discussion. These are outlined in the remainder of this section. Included is a discussion of the confounding between measures of spontaneous youth disclosure and other constructs in the literature, a synopsis of the issues associated with the use of multi-informant data, and finally, an overview of research which suggests the who and what of youth disclosure is important to consider when examining adolescents' management of information with parents about their behavior.

Disclosure versus parental knowledge. Stattin and Kerr (2000; Kerr & Stattin, 2000) were instrumental in highlighting the potential confounding that had previously, and alas, continues to occur in the literature between measures of active parental monitoring and those which actually assess the more passive construct of parental knowledge (Anderson & Branstetter, 2012). While a number of studies purport to measure parents' active efforts to track their teens' whereabouts and activities, the item content of the scales used is often more reflective of the concept of parental knowledge. Specifically, these measures tend to ask teens

to rate the extent to which they perceive their parents are knowledgeable about their behavior (e.g., “*How much do your parents really know about what you do in your free time?*”; Brown, Mounts, Lamborn, & Steinberg, 1993) without also verifying *how* parents obtained that information. Therefore, the possibility that parents accessed these details via means other than their active efforts to monitor their child’s behavior, such as where teens spontaneously reveal this information, cannot be ruled out. This use of measures masking the contribution of spontaneous youth disclosure as active parental monitoring efforts ultimately led to a devaluing in the literature of the active role adolescents play in their own development (Kerr & Stattin, 2000; Soenens, Vansteenkiste, Luyckx, & Goossens, 2006; Stattin & Kerr, 2000; Tilton-Weaver & Marshall, 2008). Stattin and Kerr (2000; Kerr & Stattin, 2000) thus advocated that researchers should use measures that clearly distinguish between these distinct pathways to parental knowledge.

Nonetheless, the measure of youth disclosure developed by Stattin and Kerr (2000; Kerr & Stattin, 2000) has also encountered criticism for confounding teens’ use of this information management strategy with items that also assess secrecy (Marshall et al., 2005). Once considered opposite ends of the same continuum, there is now robust evidence to suggest that secrecy and disclosure comprise two distinct, albeit related, constructs (Almas, Grusec, & Tackett, 2011; Finkenauer, Engels, & Meeus, 2002; Frijns, Keijsers, Branje, & Meeus, 2010; Laird & Marrero, 2010). In this way, non-disclosure is considered distinct from secrecy, a process that entails the active and deliberate inhibition of disclosure (Finkenauer et al., 2002; Frijns et al., 2010). This is different from non-disclosure which can occur without effort and the intention to conceal information, such as when an adolescent simply forgets to reveal certain details to parents (Marshall et al., 2005).

Multi-informant data. Only recently has the importance of considering the conjoint influence of adolescent-reported disclosure and parental perceptions of this disclosure on youth psychosocial outcomes been recognized (De Los Reyes, Goodman, Kliewer, & Reid-

Quiñones, 2010; Reidler & Swenson, 2012). Previous research investigating associations between adolescent disclosure and adjustment has instead opted for more simplistic conceptualizations based primarily on reports of disclosure from teenagers or their parents, but rarely both. Although informative, these studies are limited in their capacity to provide a comprehensive picture of these processes as they undervalue the complex and reciprocal nature of parent-child interactions. The analysis of data provided by multiple informants is thus important for understanding the dynamic interplay that exists between spontaneous disclosure from teens, parental perceptions of this disclosure and adolescent adjustment.

Nonetheless, the use of multi-informant data in disclosure research is controversial owing to the often low correlations that occur between the reports provided by teens and their parents (De Los Reyes, Goodman, Klierer, & Reid-Quíñones, 2008; De Los Reyes et al., 2010; Kerr & Stattin, 2000; Stattin & Kerr, 2000). Historically, such discrepancies were regarded as methodological ‘nuisances’ that reflected nothing more than measurement error or the perceptual biases of the respective informants and thus needed to be remedied, or otherwise obscured the true relationship between two variables (De Los Reyes, 2011; De Los Reyes et al., 2010; De Los Reyes, Henry, Tolan, & Wakschlag, 2009; Reidler & Swenson, 2012).

More recently, however, the importance of multi-informant discrepancies for shedding light on a number of important family and developmental processes that affect youth adjustment has been increasingly acknowledged (Bell, Rychener, Munsch, 2001; De Los Reyes, 2011; De Los Reyes & Kazdin, 2005). For instance, a multitude of studies have reported evidence to suggest discrepancies between mother-child reports of juvenile behavioral and emotional problems (e.g., Ferdinand, van der Ende, & Verhulst, 2004), various parenting behaviors (e.g., Feinberg, Howe, Reiss, & Hetherington, 2000; Gaylord, Kitzmann, & Coleman, 2003; Guion, Mrug, & Windle, 2009), the quality of the mother-adolescent relationship (e.g., Pelton & Forehand, 2001) and parent-imposed restrictions on risky

behaviors such as teen driving (e.g., Beck, Hartos, & Simons-Morton, 2005) are predictive of a range of adverse psychosocial outcomes for youths.

Although minimal agreement between mother-adolescent ratings of disclosure is consistently reported (De Los Reyes et al., 2008), few studies have addressed whether these discrepancies contribute to youth adjustment. A rare example, albeit examining adolescents' willingness to engage in self-disclosure, as opposed to the act of divulging their daily activities, is a study by Reidler and Swenson (2012) which found the magnitude of discrepancy between mother-adolescent reports of disclosure contributes to the prediction of externalizing behaviors among teens.

A study by De Los Reyes et al. (2010) is also suggestive, indicating that the direction of multi-informant discrepancies for reports of youth disclosure may further play a role in determining outcomes for teens. These authors examined the longitudinal relationship between delinquency and mother-adolescent reporting discrepancies for parental monitoring behaviors, in which they included reports of teens' willingness to disclose their activities, as well as parental solicitation of this information and the more general concept of parental knowledge. Three discrete discrepancy groups were identified using exploratory latent profile analysis on standardized difference scores for these three parental monitoring behaviors. These groups represented cases where mothers over-reported monitoring relative to their child, under-reported monitoring relative to their child and provided ratings that were in alignment with their child. Subsequent analyses comparing these groups found that compared to dyads with ratings in alignment, the adolescents of mothers who at baseline over-estimated parental monitoring relative to their child also reported more delinquency two years later. Interestingly, the individual reports provided by mothers and teens did not contribute to the longitudinal prediction of adolescents' involvement in delinquent activities. Rather, it was the presence or absence of discrepant parental monitoring reports that was predictive.

These findings are supported by those obtained by Lippold, Greenberg and Feinberg (2011) who in a subsequent cross-sectional study similarly created discrepancy groups based on mother-adolescent reports of maternal knowledge using median splits: those above the median were categorized as high and those below the median were categorized as low. They found that the teens of mothers who overestimated their knowledge of adolescents' behavior reported more delinquency and substance use than teens who along with their mothers reported high levels of maternal knowledge. Collectively, these studies highlight that mother-adolescent reporting discrepancies may yield important insight about the psychosocial functioning of teens, over and above the information garnered from individual reports alone.

While this research represents a significant and necessary shift in attitudes towards the utility of multi-informant discrepancies, the methods used have recently come under considerable scrutiny. An example is the interaction approach, which was adopted in the study by Reidler and Swenson (2012). This procedure involves determining whether reports of disclosure provided by mothers and adolescents interact to influence youth adjustment. Whereas lauded by some as preferable to the use of other approaches (Holmbeck & O'Donnell, 1991; Zuckerman, Gangé, Nafshi, Knee, & Kieffer, 2002), the interaction method has also met with criticism for reducing the complex three-dimensional relationship that exists between data provided by two informants and an outcome to a two-dimensional view in which congruence between mother-adolescent reports of disclosure is represented by a single point only (e.g., Edwards, 2001; Shanock, Baran, Gentry, Pattison, & Heggstad, 2010). This prohibits the examination of more complex agreement effects, such as where mothers and adolescents agree that disclosure is high, versus where mothers and adolescents agree disclosure is low.

Although a popular alternative, the difference score method (e.g., De Los Reyes et al., 2010) has also been challenged (see Edwards, 2002, for a review). For example, it has been argued that where a difference score is created from two component measures, greater weight

is assigned to the component measure with the larger variance and thus may account for any significant findings that are obtained. Similarly, difference scores are thought to capture little more than the combined effects of the separate measures used to create them, which are confounded when these are reduced to a single coefficient. Akin to the interaction method, it has been further suggested that difference scores reduce what is essentially a three-dimensional relationship between data provided by two informants and a specified outcome to a two-dimensional plane that oversimplifies their association. Subgrouping approaches (c.f., De Los Reyes et al., 2010; Lippold et al., 2011), especially when based on difference scores, have also been criticized for heightening this loss of information (Edwards, 2001).

A viable alternative that ameliorates many of these methodological issues derives from organizational psychology, which favors the use of polynomial regressions with response surface analyses to investigate the impact of multi-informant discrepancies (e.g., Gentry, Ekelund, Hannum, & de Jong, 2007; Harris, Anseel, & Lievens, 2008; Ostroff, Atwater, & Feinberg, 2004). This sophisticated statistical technique pioneered by Edwards and Parry (1993) uses the coefficients from polynomial regressions that comprise the individual reports supplemented by higher order terms to generate three-dimensional surface graphs that represent the relationship between two paired variables (e.g., mother- and adolescent-reported disclosure) and an outcome (e.g., delinquency in teens). In this way, the conceptual integrity of the individual reports is retained, while permitting hypotheses regarding the implications of congruence and discrepancy between multi-informant reports to be tested directly (Edwards, 2001). These tests correspond to potential linear and curvilinear relationships between multi-informant agreement and a specified dependent variable, as well as the role played by the direction and magnitude of multi-informant discrepancies. Only recently has the potential value of polynomial regressions for examining the impact of multi-informant reporting discrepancies on adolescent outcomes been recognized within the developmental literature by Laird and De Los Reyes (2013). The results of this cross-sectional

study provides direct evidence to suggest that compared to difference scores, polynomial regressions allow for a more comprehensive and valid test of the relationship between multi-informant data and youth outcomes and were thus used in concert with response surface analyses in study three.

Target of disclosure. While some studies explicitly ask teens to rate their willingness to divulge information to parents separately for mothers and fathers (e.g., Smetana, Metzger, Gettman, & Campione-Barr, 2006; Tasopoulos-Chan, Smetana, & Yau, 2009; Yau, Tasopoulos-Chan, & Smetana, 2009), others assess their use of this information management tactic with parents more generally (e.g., Keijsers, Branje, VanderValk, & Meeus, 2010; Keijsers, Frijns, Branje, & Meeus, 2009; Kerr & Stattin, 2000; Soenens et al., 2006; Stattin & Kerr, 2000). There is, however, ample evidence to suggest that when parents from the same family are compared, their knowledge of their children's behavior differs substantially (Crouter & Head, 2002). It has thus been argued that asking teens to rate the degree to which they engage in spontaneous disclosure with parents in general, hence obscuring the identity of the intended target, may be flawed (Crouter et al., 2005). This research thus focused on adolescent information management with mothers only, owing to the results of previous studies which suggest mothers are not only more knowledgeable than fathers when it comes to the behavior of their children (Bumpus, Crouter, & McHale, 2001; Crouter & Head, 2002; Smetana et al., 2006), but are also a key source through which fathers acquire this information (Waizenhofer et al., 2004).

Context of disclosure: Social domain theory. The majority of studies examining adolescents' willingness to divulge information to parents about their whereabouts and activities have done so in a broad and non-specific way when it comes to the issues targeted for disclosure. There is however an emergent body of literature to suggest variations may exist depending on the type of behavior that is being disclosed (Darling et al., 2006).

The most notable contributions to this area of research have been made by Smetana and colleagues (e.g., Rote et al., 2012; Smetana et al., 2006; Smetana, Villalobos, Tasopoulos-Chan, Gettman, & Campione-Barr, 2009; Tasopoulos-Chan et al., 2009; Yau et al., 2009), who report substantial disparities in adolescents' disclosure of information about their involvement in activities belonging to different domains of behavior as defined by social domain theory (Turiel, 1983, 2006). This structural-developmental framework for understanding how children interpret the diverse aspects of their social world is guided by the key tenet that youths through their qualitatively different social interactions come to construct different types of social knowledge systems, or domains of social knowledge (Smetana, 1999; Turiel, 1983, 2006). In this way, social domain theory does not consider the social world of children to be unitary (Smetana, 1999). Rather, it consists of discrete conceptual and developmental systems from which youths generate these broad social concepts as they strive for autonomy from caregivers and which reflect the dynamic interplay that occurs between children's developing competencies and their conceptions of the social world (Nucci, Killen, & Smetana, 1996; Smetana, 2006; Turiel, 1983, 2006). This model has been used to facilitate understanding of children's early moral development, as well as their relations with peers and caregivers, as it provides a useful rubric for conceptualizing how youths evaluate complex situations and organize their experiences (Smetana, 1999). Social knowledge and activities are thus classified within social domain theory (Turiel, 1983, 2006) as those issues considered by teens to be *prudential* (relating to an adolescents' health, safety, comfort or potential to come to harm), *personal* (involving one's control over their body, privacy and personal preferences), *moral/conventional* (concerning justice, arbitrary norms and contextually relevant rules for behavior), or *multifaceted* (comprising issues for which there is overlap between the personal and either prudential or moral/conventional domains; Smetana et al., 2006; Smetana et al., 2009; Turiel, 2006).

Smetana et al. (2006) used these categories to differentiate between instances of adolescent disclosure and found that teens tend to reveal more to parents about their prudential behavior (operationalized using questions about their performance at school) than they do personal or peer-related multifaceted issues. Moreover, teens reported disclosing more to parents about these multifaceted concerns than they did behaviors belonging to the personal domain. However, no differentiation was made in this study between adolescents who engaged in certain behaviors but elected not to disclose their involvement to parents, versus teens who reported a willingness to disclose those same activities but had not actually engaged in them and thus had nothing to reveal or conceal. Assessments of disclosure were thus limited to everyday but common issues, such as school work and peer relationships. This precluded the investigation of those activities that entail greater risk to adolescents, and hence, are of most concern to parents (Smetana, 2008). To alleviate this confound, Smetana et al. (2009) instead used a card sorting task adapted from the work of Darling et al. (2006) that first asked adolescents to specify whether they had engaged in each behavior and subsequently only provide a disclosure rating for activities they endorsed having engaged in at least once. This enabled the examination of a broader range of issues, including teen smoking and alcohol-related behaviors. They found that relative to multifaceted issues, adolescents tended to disclose more to parents about their prudential and personal activities.

As well as disparities in mean levels of disclosure across social domains, differences in teens' attitudes towards divulging information to parents as a function of issue type have also been demonstrated. For example, in their cross-sectional study of lower middle-class ninth and twelfth graders, Smetana et al. (2006) found that adolescents felt more highly obligated to divulge information to parents about their prudential behavior, followed by multifaceted and then moral/conventional activities. In contrast, the disclosure of personal activities was viewed as more discretionary than any other issue. Importantly, these perceived obligations to share information with parents were positively related to teens' actual

disclosure, as well as their beliefs about the legitimacy of parental authority over those issues. This is consistent with the results of other research that has similarly demonstrated adolescents' beliefs about their obligation to disclose information to parents and the legitimacy of parental authority are associated with increased parental knowledge and spontaneous disclosure from teens (e.g., Cumsille, Darling, & Martínez, 2010; Darling et al., 2006; Darling, Cumsille, Peña-Alampay, & Coatsworth, 2009).

Clearly, a comprehensive understanding of teens' willingness to reveal information to parents necessitates the use of measures that enable such cross-domain comparisons of disclosure to be made. Despite this, no consensus measure for this purpose appears to exist, nor does it seem the multidimensional structure of the scales used in previous studies has been statistically validated. The current research therefore aimed to address this issue.

Predictors of adolescent disclosure

The contribution of a variety of influences to teens' willingness to engage in spontaneous disclosure with caregivers has been investigated by a plethora of studies. Factors which have been examined to date include parenting attributes (e.g., Almas, et al. 2011; Blodgett Salafia, Gondoli, & Grundy, 2009; Cumsille et al., 2010; Darling et al., 2006; Darling et al., 2009; Hunter et al., 2011; Smetana et al., 2006; Soenens et al., 2006; Tokić & Pećnik, 2010; Urry, Nelson, & Padilla-Walker, 2011), parental reactions to youth disclosure and non-disclosure (e.g., Smetana et al., 2009; Tilton-Weaver et al., 2010; Tilton-Weaver & Marshall, 2008; Tokić & Pećnik, 2010), self-efficacy beliefs (e.g., Bandura, Caprara, Barbaranelli, Regalia, & Scabini, 2011; Hunter et al., 2011) and those pertaining to the legitimacy of parental authority or teens' obligations for disclosure (e.g., Cumsille et al., 2010; Darling et al., 2006; Smetana & Metzger, 2008; Smetana et al., 2006), youth problem behaviors (e.g., Cumsille et al., 2010; Keijsers, Branje, VanderValk et al., 2010), communication (e.g., Bandura et al., 2011; Metzger et al., in press; Rote et al., 2012), trust

(e.g., Smetana & Metzger, 2008; Smetana et al., 2006) and the quality of the parent-adolescent relationship (e.g., Smetana et al., 2009).

Although each of these factors convey some importance for encouraging teens to divulge their involvement in various behaviors to mothers, a chief aim of this thesis was to conduct a focused investigation into the specific role played by a select group of mother, adolescent and mother-adolescent interaction factors. These included three maternal attributes, namely maternal warmth/responsiveness and mothers' use of behavioral and psychological control with youths, which together comprise the three defining features of authoritative parenting (Gray & Steinberg, 1999). Itself predictive of disclosure (e.g., Darling et al., 1996), authoritative parenting refers to a democratic and child-centered style of parenting that combines the articulation of clear standards of behavior with parental warmth and psychological autonomy-granting (Baumrind, 1991). These three characteristics are thus important to consider together. Also included were other factors that may prove influential though have yet to be granted sufficient research attention, such as teens' beliefs about their self-efficacy for disclosure, openness in communication with the target of disclosure and teens' self-reported interpersonal communication competence. A brief overview of the pre-existing literature that guided the inclusion of these factors is provided here, as well as a discussion of the research demonstrating age and gender differences in youth disclosure.

Parenting influences. Following publication of Stattin and Kerr's (2000; Kerr & Stattin, 2000) influential findings, some researchers came to view their results as having underestimated the role of parents in the prevention of problem behavior (e. g., Brody, 2003; Capaldi, 2003; Fletcher, Steinberg, & Williams-Wheeler, 2004). Others, however, have countered this view, arguing that Stattin and Kerr's (2000; Kerr & Stattin, 2000) findings should not be considered mutually exclusive with the perspective that parenting plays a crucial role in creating a warm and responsive family climate that in turn may increase the likelihood teens will freely divulge information about their activities and behavior (Smetana,

2008; Soenens et al., 2006; Stattin & Kerr, 2000). The continued examination of the contribution parents make to spontaneous adolescent disclosure is thus important.

Three parenting attributes that have received sizeable research attention as determinants of youth adjustment are the three aforementioned features of authoritative parenting (Gray & Steinberg, 1999): warmth/responsiveness, behavioral control and psychological control. Indeed, robust associations have been found between these parenting dimensions and a number of adolescent psychosocial outcomes, including youths' academic performance, their social competence, evidence of psychological symptoms and degree of behavioral problems (Lamborn, Mounts, Steinberg, Dornbusch, 1991; Maccoby & Martin, 1983; Simons, Simons, Burt, Brody, & Cutrona, 2005; Steinberg, Lamborn, Dornbusch, & Darling, 1992).

In the context of youth disclosure, the impact of parental warmth/responsiveness on teens' willingness to divulge information to caregivers about their behavior has been demonstrated consistently across a multitude of studies using cross-sectional (e.g., Cumsille et al., 2010; Darling et al., 2006; Darling et al., 2009; Smetana et al., 2006; Soenens et al., 2006), longitudinal (e.g., Blodgett Salafia et al., 2009) and qualitative data (Tokić & Pećnik, 2010). Defined as the extent to which an adolescent experiences a sincere and affectionate relationship with his or her parent, warmth/responsiveness is thought to create a safe and accommodating environment that both encourages and supports disclosure (Soenens et al., 2006). This is because such parents are considered more likely to demonstrate acceptance and empathy towards their child's choices, interests and needs (Crouter & Head, 2002).

The associations reported in the literature between parental behavioral or psychological control and teens' willingness to divulge information to parents tend to be less consistent than those reported for maternal warmth/responsiveness. This is in line with Barber, Stolz, and Olsen (2005), who argue such variability is relatively common in research examining the impact of parental control on youth outcomes and often reflects the lack of

consensus that exists in the literature regarding the operationalization of these constructs, as well as methodological limitations associated with the studies that try to capture them.

Nonetheless, with regard to behavioral control, Soenens et al. (2006) have posited that adolescents whose parents are more active in controlling their behavior should be more inclined to engage in spontaneous disclosure with caregivers about their activities. This is because such parents tend to communicate their expectations for youths' behavior more clearly and provide a structure within which teens can more easily discern how these expectations relate to their conduct. While Kerr and Stattin (2000) and Soenens et al. (2006) both found evidence which supports this assertion, other studies have only been able to replicate these findings within specific cultures (e.g., Hunter et al., 2011) or for the disclosure of certain issues (e.g., Smetana et al., 2009). The results of a study by Darling et al. (2009) are further contradictory, finding no evidence that higher levels of parental behavioral control are related to increased disclosures from teens. This inconsistency between studies is considered indicative of the confusion and ambiguity in the literature as to how the construct of behavioral control should be conceptualized, and therefore measured (Anderson & Branstetter, 2012; Barber et al., 2009; Racz & McMahon, 2011). Specifically, some widely used measures of behavioral control (e.g., Lamborn et al., 1991) include items that confound these deliberate parental efforts to regulate and supervise their adolescents' activities with the more passive construct of parental knowledge (Kerr & Stattin, 2000; Kerr et al., 2010; Kerr, Stattin, & Özdemir, 2012; Stattin & Kerr, 2000). Furthermore, while certain studies including this research define behavioral control as active but *reasonable* parental strategies to seek knowledge about their adolescents' activities (Soenens et al., 2006), others use measures that are suggestive of a more domineering and overprotective type of behavioral control (e.g., Fletcher et al., 2004; Kerr & Stattin, 2000; Kerr et al., 2010; Stattin & Kerr, 2000). This has lead to a proliferation of studies that often report conflicting findings, depending on whether behavioral control has been operationalized in this negative light, or instead, as an optimal

and age-appropriate strategy to regulate youth behavior. When conceptualized less negatively, positive associations with adolescent adjustment are more consistently reported, including teens' willingness for disclosure (Barber et al., 2009; Soenens et al., 2006). Conceptual clarity is thus essential when selecting measures of behavioral control and was considered as part of this research.

In contrast to the results of studies examining reasonable parental efforts to control teens' behaviors, the use of psychological control by caregivers has been found to yield a negative relationship with disclosure (e.g., Soenens, et al., 2006; Urry et al., 2011). This is because an adolescent with a psychologically controlling parent, or who uses manipulative and intrusive strategies such as guilt, shaming and love withdrawal (Barber, 1996), may refrain from disclosure to avoid being exposed to these aversive parenting techniques (Soenens et al., 2006). A study by Zimmer-Gembeck, Madsen, and Hanisch (2011) supports this interpretation, finding that parental use of psychological control undermines adolescents' voice with parents. This differs, however, from the findings of Hunter et al. (2011), who failed to obtain evidence that parental psychological control impairs youth disclosure. Further contradictory are the results of Smetana et al. (2006), who found higher levels of parent-reported psychological control were associated with adolescents' increased willingness to reveal information about their personal activities. One explanation offered for these findings was that adolescents with psychologically controlling parents may feel subtly coerced to engage in spontaneous disclosure with caregivers about these issues. Evidently, the relationship between parents' use of control strategies and teens' willingness to divulge information about their behavior warrants further investigation.

Communication processes. Compared to the extensive research examining the influence of parenting on adolescent disclosure, there exists a paucity of studies investigating the contribution of communication. Nonetheless, according to Snoek and Rothblum (1979), it is important to consider the communicative quality of the family environment when

examining factors that may enhance disclosure. This is consistent with the stance taken by Kerr and Stattin (2000) that an open and interactive environment within the family is essential for spontaneous disclosure from adolescents to parents. It has been suggested that this is because openness in communication is an important marker of high-quality parent-adolescent relationships (Barnes & Olson, 1985), itself a robust predictor of teens' willingness to disclose information to parents (Smetana et al., 2006). While some evidence supportive of a relationship between teens' perceptions of open communication with parents and their willingness for disclosure has been found, these studies have either confounded measures of communication with trust (e.g., Smetana et al., 2009), itself an established correlate of disclosure (Kerr, Stattin, & Trost, 1999; Smetana et al., 2006), failed to consistently demonstrate this relationship for both boys and girls (e.g., Bandura et al., 2011), or examined these issues in relation to youth disclosure for a certain issue (e.g., Metzger et al., in press). Additional clarification as to the impact of openness in communication on adolescents' willingness to engage in spontaneous disclosure with parents is therefore needed.

Teens who believe they are competent communicators may also be more likely to engage in disclosure with parents owing to positive beliefs they hold about their ability to reach desired goals from communicating with caregivers. Consideration of the role played by adolescents' self-perceived interpersonal communication competence in facilitating these disclosures is thus warranted. Defined as the judgment an individual makes about their ability to manage communication in interpersonal relationships (Rubin & Martin, 1994), appraisals of communication competence involve an individuals' perceptions about the appropriateness and effectiveness of their communication. In this way, perceived communication competence represents a cognitive process and is thus distinct from the construct of communicative performance, which is more behavioral and skills-based (Larson, Backlund, Redmond, & Barbour, 1978; McCroskey, 1982; Rubin, Martin, Bruning, & Powers, 1993). Accordingly, self-report measurement as opposed to the observation of actual communication behavior is

considered most appropriate when it comes to assessing communication competence. This is particularly in light of the often trivial correlation that exists between what people believe and what they do (McCroskey, 1997). Previous research examining individuals' self-perceived communication competencies via questionnaires have found that these beliefs can have a direct bearing on a person's rewarding and satisfying interactions with others (Rubin et al., 1993). It is thus conceivable that such beliefs may also yield a relationship with adolescent disclosure. Despite this, there are no studies examining this issue. Albeit taking a skills-based approach, the results of Rote et al. (2012) are, however, suggestive, finding that teens rated by trained observers as communicating more clearly with mothers, also disclosed more to mothers about their personal and multifaceted activities.

Disclosure self-efficacy. It has long been established that dialogue between parents and children is more likely when a child feels able to communicate his or her concerns to that parent (Fagot, Luks, & Poe, 1995). This implicates the role of self-efficacy in facilitating teens' willingness to spontaneously reveal information to parents about their behavior. According to Bandura (1986; 2001), self-efficacy refers to an individuals' belief that they possess the capacity to effectively accomplish or demonstrate a behavior in a particular situation. The foundation of human agency within SCT (Bandura, 1986; 2001), these self-efficacy beliefs guide individuals' regulation of their own behavior to meet desired goals. The consideration of self-efficacy processes during adolescence thus accords with the increasingly agentic role that has been ascribed to teens in selecting and constructing their own life circumstances (Bandura, 2006a; Caprara, Pastorelli, Regalia, Scabini, & Bandura, 2005). This includes the way adolescents manage information with parents about their whereabouts and daily activities (Marshall et al., 2005; Tilton-Weaver et al., 2010; Tilton-Weaver & Marshall, 2008). Teens' self-efficacy beliefs for disclosing information to mothers about their behavior may therefore influence whether they then divulge those details. Consistent with this is the view advanced by Bussey (2010), who posits an individual's self-belief in their capacity for

disclosure may enable it, while self-doubts about one's ability to reveal information, particularly when of embarrassing or difficult content, could lead to the inhibition of disclosure.

However, surprisingly little research has been directed at this issue. Closest are the findings of Hunter et al. (2011), who found teens' self-efficacy for self-assertiveness correlated positively with disclosure to mothers across certain cultures for either boys or girls. According to the authors, these findings indicate adolescents who initiate interactions with peers and adults outside the home are also more likely to engage in spontaneous disclosure with mothers, which is further suggestive of a positive adolescent profile of social interactions inclusive of proactive disclosure. This relationship between teens' self-beliefs about their capabilities and their propensity for disclosure has also been demonstrated in research examining self-efficacy in other domains. For example, in a study by Caprara et al. (1998), high self-regulatory efficacy, or an individual's belief in their ability to ward off negative peer influences yielded a positive association with open communication between parents and teens about activities engaged in outside the home. Moreover, other studies have investigated the relationship between filial self-efficacy, openness in communication and parental monitoring (e.g., Caprara et al., 2004). Filial self-efficacy refers to teens' self-perceived ability to relate effectively with parents and includes the consideration of two processes likely to be relevant to disclosure. These are adolescents' beliefs they can effectively discuss personal problems with parents, even when things are tense, and that they can engender understanding from caregivers about their point of view on contentious issues (Caprara et al., 2004). The results indicated teens' filial self-efficacy beliefs play a crucial role in fostering open communication with parents and enabling parental monitoring (Bandura et al., 2011; Caprara et al., 2005; Caprara et al., 2004).

While these findings regarding the contribution of adolescents' self-efficacy beliefs across different spheres of functioning are informative, the situation specificity inherent in

Bandura's (1986; 2001) definition of self-efficacy implicates the importance of domain-linked knowledge structures in determining outcomes. The investigation of whether teens' self-efficacy for disclosure specifically influences the likelihood they will engage in disclosure is therefore warranted and was thus included in the current research.

A word on the adolescent discloser profile: Gender and age differences. The role played by the gender and age of an adolescent in predicting youth disclosure has been subjected to extensive investigation, and hence, was not the focus of this research but accounted for statistically where this was necessary. Nonetheless, in line with Noller and Callan (1990), who assert that such factors are important to consider when addressing issues of parent-child communication, the research examining these aspects of the adolescent discloser profile is reviewed in this section.

Previous studies have consistently demonstrated that, with respect to sex differences in disclosure, female adolescents tend to disclose more information to parents about their behavior than their male counterparts (e.g., Darling et al., 2006; Keijsers et al., 2010; Kerr & Stattin, 2000; Soenens et al., 2006; Stattin & Kerr, 2000; Willoughby & Hamza, 2011). This appears to be especially true for adolescent disclosure to mothers (Noller & Bagi, 1985; Noller & Callan, 1990; Tasopoulos-Chan et al., 2009; Vieno, Nation, Pastore, & Santinello, 2009). These findings are consistent with the view that girls experience closer, more supportive and intimate relationships with mothers than do boys (Noller & Callan, 1990; Youniss & Smollar, 1985). Gender differences have also been reported with respect to disclosure across social domains of behavior, with some studies reporting that girls tend to divulge more of their personal activities to mothers than boys reveal (Smetana et al., 2006; Yau et al., 2009). Congruent with this is the view that autonomy-seeking during adolescence occurs differently for boys and girls and that these sex differences often reflect the important role relationships and connectedness play in female development (Zimmer-Gembeck & Collins, 2003). Interestingly, while Daddis and Randolph (2010) found that female

adolescents were more likely than their male counterparts to disclose information about their broader romantic involvement to parents, no sex differences were obtained in relation to their disclosure of sexual behaviors and unsupervised romantic activities. However, these findings are somewhat at odds with those reported by Yau et al. (2009) who found that boys tend to divulge more to parents about their involvement in prudential activities than girls reveal.

Findings regarding age-related differences in adolescent disclosure tend to be even more inconsistent. While cross-sectional studies have typically documented nil age-related differences in disclosure (e. g., Darling et al., 2006; Smetana et al., 2006; Soenens et al., 2006), a gradual decrease in teens' willingness to divulge information to parents with age has been reported using longitudinal data (Keijsers, Frijns, Branje, & Meeus, 2009; Laird, Marrero, Melching, & Kuhn, 2013). This is consistent with research and theory indicating that adolescents' perceived obligations to disclose information to parents and their beliefs about the legitimacy of parental authority decline over time owing to increasing desires for autonomy and the re-definition of boundaries of personal control (Smetana, 2008; Smetana et al., 2006; Trost, Biesecker, Stattin, & Kerr, 2007). Reports of domain-specific age differences in disclosure also tend to be inconsistent, with some studies reporting that older teens tend to divulge less than younger adolescents to parents about their multi-faceted activities (e.g., sexual behaviors; Daddis & Randolph, 2010), while others have indicated they reveal relatively more (e.g., peer relationships; Smetana et al., 2006).

More recently, studies in this area have moved towards considering whether developmental changes in disclosure over the adolescent period follow gender-specific trajectories. The results suggest that while age-related declines in adolescent disclosure may be a relatively normative phenomenon, these may be more pronounced for boys than they are for girls (Keijsers, Branje, Frijns, Finkenauer, & Meeus, 2010). Providing further insight as to the specific developmental course of disclosure patterns for boys versus girls are the results of a recent large-scale longitudinal study by Keijsers and Poulin (in press). This research used

latent growth curve modeling to demonstrate that while disclosure to parents decreased for both boys and girls in early adolescence, for girls only it intensified again during the mid-teen years. This is consistent with other research which suggests that while adolescent males seem to continue along a course of individuation and separation from caregivers from early adolescence, mid-to-late adolescent females rely more strongly on their parents for support and thus re-engage the disclosure process more readily than boys do (De Goede, Branje, & Meeus, 2009). These findings offer considerable support for the view that from early adolescence, teenagers strive for realignment and renegotiation of the parent-child relationship, which can manifest as a reduced willingness to inform parents about every aspect of their lives at different stages of the developmental period (Steinberg, 1990).

To tell or not to tell: The motivations guiding teens' information management choices

The impetus to recognize that adolescents are active agents who make strategic decisions about the information they do and do not share with parents (Marshall et al., 2005; Tilton-Weaver & Marshall, 2008) has led researchers to investigate the reasoning teens use to justify their information management choices. These studies have shown that teens' decisions to engage in secrecy and disclosure are fuelled by multiple considerations that can be crudely distinguished as reflecting either self- or other-focused reasons for using these information management tactics with parents.

Teenagers' choices to keep secrets from mothers about their activities may, for example, be underscored by a belief they have no option but to conceal that information. According to Finkenauer et al. (2002), this view may arise where teens experience a poor relationship with parents, thereby undermining the likelihood they will confide in parents. Also supportive are the results of longitudinal research which indicate that negative parental reactions to youth disclosure erode the degree to which adolescents feel connected to parents, and in turn, predicts less subsequent disclosure from teens (Tilton-Weaver et al., 2010). This suggests adolescents who expect negative parental reactions to disclosure may feel more

inclined to conceal details from parents. This other-focused pressure to withhold information from parents can be distinguished from instances where teens' choices to engage in secrecy are predicated by self-focused reasons. These include concerns about privacy and parental jurisdiction (Darling et al., 2006; Marshall et al., 2005; Smetana et al., 2009), the desire for emotional and physical autonomy from parents (Darling et al., 2006; Finkenauer, Engels, & Kubacka, 2008; Finkenauer et al., 2002; Marshall et al., 2005; Trost et al., 2007) or believing that disclosure in a particular circumstance is unnecessary owing to the negligible risk of harm (Smetana et al., 2009).

Although studies examining teens' motivations for disclosure are by comparison scarce, the available evidence suggests adolescents' reasons for divulging information to parents can similarly be categorized according to self- and other-focused preferences. When driven by the former, there is often some instrumental need the teenager hopes to fulfill via disclosure. This includes telling to receive support, validation and protection, express pent up emotions, increase intimacy with the target of disclosure or to meet impression management goals (Buhrmester & Prager, 1995; Bussey & Grimbeek, 1995; Finkenauer et al., 2008; Hunter et al., 2011; Marshall et al., 2005). At other times, while it may appear that adolescents have chosen to spontaneously reveal information to parents about their behavior in the sense that parents have not explicitly asked for these details first, it is possible certain teens may be driven to do so because of an underlying belief they have little choice but to provide these details. Teens may decide the costs of not telling far outweigh the risk of disclosure given the negative parental reactions and attitudes to non-disclosure they anticipate owing to their history of interactions with caregivers. Consistent with this view are studies which suggest teens may reveal information to parents because they feel they have to 'tell or else', or alternatively that they cannot get away with non-disclosure (Marshall et al., 2005). In these cases, while adolescents may ostensibly offer details about their lives in the absence of direct parental solicitation and thus, spontaneously, the degree to which such disclosures can

be regarded as truly voluntary warrants consideration. This is because teens' decisions to divulge details to parents about their behavior may at times reflect other-focused pressure to engage in this information management strategy.

Therefore, while teens' do ultimately play an agentic role in deciding whether to adopt different information management strategies, the parent-child relational context underpinning these choices may also be crucial and have specific implications for adolescent adjustment (Keijsers & Laird, 2010; Laird & Marrero, 2010; Tilton-Weaver et al., 2010). While the psychological impact of choosing to engage in disclosure or secrecy on the basis of particular reasons is not yet well understood, there is a wealth of research concerning the psychosocial outcomes associated with teens' use of these different information management choices. This literature is reviewed in the following section.

Linking adolescent information management with psychosocial outcomes

Although much attention has been directed towards identifying factors that may augment teens' willingness to divulge information to parents about their behavior, an increasing body of research has focused on determining whether such disclosures are actually beneficial for youths. Examining the implications of adolescents' use of different information management strategies under diverse conditions thus constitutes an important line of inquiry and is consistent with the view that healthy versus unhealthy disclosure needs to be more clearly differentiated (Kelly & McKillop, 1996; Smetana, 2008).

Relations with adjustment. The association between adolescents' willingness to engage in spontaneous disclosure with parents about their behavior and positive psychosocial outcomes has been consistently demonstrated. Previous studies have shown that teens who freely divulge information to parents about their whereabouts and activities tend to experience better psychological functioning, including lower depressed mood (e.g., Kerr & Stattin, 2000; Laird & Marrero, 2010; Laird et al., 2013; Smetana et al., 2009), higher self-esteem (e.g., Kerr & Stattin, 2000) and the use of more positive coping strategies (e.g., Almas et al., 2011).

Associations with improved academic adjustment have also been demonstrated, using both cross-sectional (e.g., Kerr & Stattin, 2000) and longitudinal data (e.g., Cheung, Pomerantz, & Dong, 2013). Better parent-child relationships have also been reported with more disclosure from teens (Kerr & Stattin, 2000; Smetana et al., 2009; Tasopoulos-Chan et al., 2009). Longitudinal linkages between higher levels of adolescent disclosure and decreased involvement in delinquent or antisocial activities are also evident (Keijsers, Branje, VanderValk et al., 2010; Keijsers et al., 2009; Kerr et al., 2010; Laird et al., 2013; Stavrinides, 2011; Willoughby & Hamza, 2011). Teens' willingness to engage in disclosure with parents is believed to convey such benefits because it affords adolescents the opportunity to receive advice and support about managing high-risk situations (Crouter & Head, 2002, Darling et al., 2006; Dishion & McMahon, 1998). It also builds connectedness, closeness and intimacy in the parent-child relationship, thereby fulfilling an important interpersonal function (Buhrmester & Prager, 1995; Frijns, Finkenauer, & Keijsers, 2013). It has been further posited that since girls tend to strive for closeness in their relationships with mothers to a greater degree than do boys (Cauce et al., 1996; Smetana et al., 2006; Youniss & Smollar, 1985), daughters compared to sons may reap more benefits from sharing previously withheld information with maternal caregivers (Frijns et al., 2013).

Not all studies have, however, reported evidence supportive of a positive association between spontaneous disclosure and better adolescent adjustment, with some reporting no relationship (e.g., Frijns, et al., 2010; Smetana & Metzger, 2008; Waizenhofer et al., 2004). Other research indicates the story may be more complex, entailing a dynamic interplay between adolescent disclosure and other factors such as parental knowledge, adolescents' legitimacy beliefs, and aspects of the parent-child relationship that function conjointly to curb problematic outcomes for teens (e.g., Laird & Marrero, 2010; Laird et al., 2010; Marshall et al., 2005; Soenens et al., 2006; Vieno et al., 2009).

Although less common, some advantages of keeping secrets from parents during the teenage years have been reported and implicate the importance of autonomy-seeking processes in supporting optimal adolescent adjustment (Buhrmester & Prager, 1995; Finkenauer et al., 2008; Finkenauer et al., 2002; Zimmer-Gembeck & Collins, 2003). In these studies, secrecy is believed to contribute to youths' separation and individuation from parents, which is crucial to the development of emotional autonomy, and by extension, more positive psychosocial well-being (Finkenauer et al., 2008; Finkenauer et al., 2002). These findings contradict the extensive body of research that suggests poor adolescent outcomes are more likely when teens engage in secrecy with parents. It is possible that these inconsistencies are attributable to the widespread use of secrecy measures that do not distinguish between concealment that occurs on the basis of self-guided principles, versus where adolescents feel driven to keep secrets because of other-focused pressure to do so. Reports of concealment in these studies may therefore have confounded instances of secrecy based on these two different motivational processes, thus leading to findings of both positive and negative outcomes following teens' decisions to withhold information from parents. The literature concerning these negative correlates of secret-keeping as an information management strategy during adolescence is reviewed below.

Secrecy-maladjustment link. Studies supportive of a relationship between adolescents' willingness to disclose information about their behavior and negative psychosocial consequences are scarce, leading to the commonly asserted viewpoint that spontaneous disclosure from teens is a robust predictor of positive outcomes for youths. Contrary to this, however, is the view espoused by Frijns et al. (2010), who argue that the relationship between disclosure and adjustment can actually be explained by a secrecy-maladjustment link. This was based on their findings that disclosure and secrecy comprise two conceptually distinct constructs, with longitudinal linkages with depression and delinquency found in relation to secrecy only. That keeping secrets from parents is associated

with a host of negative emotional, physiological, psychological and relational outcomes is supported by the results from an array of studies. For example, concurrent and longitudinal relationships between teens' use of secrecy with caregivers and increased depressive symptoms has been well-established (Finkenauer et al., 2002; Frijns, Finkenauer, Vermulst, & Engels, 2005), as have poorer quality parent-child relationships (Keijsers, Branje, Frijns et al., 2010; Smetana et al., 2010), more problem behavior (Frijns et al., 2005; Smetana et al., 2010) and negative coping strategies (Almas et al., 2011). Teens who willfully withhold information from caregivers have also been reported to experience more physical complaints (Finkenauer et al., 2002), as well as increased stress levels, lower self-esteem and less self-control over time (Frijns et al., 2005).

These negative consequences of secret-keeping are considered to derive from the immense psychological and physiological toll concealing information from another person exacts on the secret-keeper (Larson & Chastain, 1990; Pennebaker, 1989). It requires constant active monitoring and inhibition of one's thoughts, feelings and behaviors to avoid inadvertently reveal the concealed information (Frijns et al., 2010; Karpel, 1980). Furthermore, consciously withholding information from others is commonly associated with having something shameful to hide, leading to maladaptive thinking patterns as well as negative emotional states such as shame and guilt (Bok, 1989; Karpel, 1980). Secret-keeping can also yield adverse relational consequences, such as undermining intimacy, communicating separateness and creating distance with the person from whom the secret is kept (Buhrmester & Prager, 1995; Finkenauer et al., 2008; Finkenauer et al., 2002). Adolescents who withhold information from parents additionally deny themselves the opportunity to challenge the content of their thoughts with respect to parental input and may thus ruminate on potentially distorted perceptions (Frijns et al., 2010). Most importantly, the teen who keeps secrets from parents is not afforded the chance to obtain support and advice as to how they might best navigate high-risk situations.

Similar to disclosure, gender differences in the psychosocial consequences of keeping secrets from parents have been well-documented and relate to girls' enhanced need for emotional support, reciprocity, connectedness and intimacy with parents, in particular, mothers (Field, Lang, Yando, & Bendell, 1995; Youniss & Ketterlinus, 1987; Youniss & Smollar, 1985). Consistent with this, Keijsers, Branje, Frijns et al. (2010) reported stronger concurrent and longitudinal linkages between girls' use of secrecy with parents and poorer quality parent-child relationships than was found for boys. Also supportive are the results of Frijns et al. (2013) who found keeping a private secret was more strongly associated with somatic complaints and depressive mood for girls than it was for boys. This issue of gender-specific consequences of adolescent information management is further explored in study two of this thesis, which is presented in Chapter 3. The objectives of this and the other studies comprising this thesis are outlined next.

The Present Research

The above literature review highlighted research which has shown that of all the different pathways to parental knowledge, spontaneous disclosure from youths is both the most important source and determinant of psychosocial adjustment for teens (e.g., Kerr & Stattin, 2000; Kerr et al., 2010; Stattin & Kerr, 2000). The identification of factors that may increase these disclosures, as well as augment the benefits of adolescent information management, is therefore crucial.

Although an impressive body of pre-existing research indicates a broad range of predictors are associated with youth disclosure, the majority of these studies have tended to focus on attributes relevant to one or either party in the parent-adolescent dyad with few incorporating parent, teen and parent-teen interaction processes. Individual adolescent characteristics are however crucial to consider alongside factors at the parent and parent-adolescent level, given increasing awareness in the literature that youths constitute active agents in their own development and the way they manage information with parents (Darling

et al., 2006; Marshall et al., 2005; Tilton-Weaver et al., 2010). While awareness that mothers and teens both play a role in these processes has indeed grown (e.g., Low et al., 2012; Racz & McMahon, 2011; Willoughby & Hamza, 2011), research in this area is still only in its infancy. The aim of this thesis was thus to contribute to this emergent body of literature by examining in a series of three studies how mothers and their teens both influence youths' willingness for disclosure (Chapter 2), as well as the emotional (Chapter 3) and behavioral (Chapter 4) consequences that follow adolescents' management of information with parents in different contexts. These studies were generated from a short-term longitudinal study with data collected at two time points seven months apart. For studies one and two, the sample consisted of 463 teenagers drawn from middle-class schools (268 male, $M_{\text{age}} = 13.97$ years at T1). Of the students who participated in these first two studies, 193 mother-adolescent dyads also took part in a third study (113 male, $M_{\text{age}} = 13.82$ years at T1).

Study one, presented in Chapter 2, investigated the contribution of a diverse array of mother, adolescent and mother-adolescent interaction factors to youths' willingness to engage in disclosure across social domains of behavior (Turiel, 1983, 2006). Previous research has stressed the importance of spontaneous disclosure from youths in supporting optimal adolescent adjustment (e.g., Kerr & Stattin, 2000; Kerr et al., 2010; Stattin & Kerr, 2000). Illuminating the factors that may foster teens' willingness to divulge information to caregivers about their behavior is thus critical. Possible concurrent and longitudinal associations between spontaneous youth disclosure and three maternal attributes (maternal warmth/responsiveness, behavioral control, and psychological control) were thus explored using the Teen Overall Level of Disclosure Scale (TOLDS). Also investigated were potential longitudinal linkages between teens' willingness for disclosure and their disclosure self-efficacy, self-perceived interpersonal communication competence and perception of open communication with mothers.

The importance of identifying factors that may bolster adolescents' willingness to engage in spontaneous disclosure with the objective of enhancing youth outcomes cannot be overstated. However, to do so without also establishing whether the implications of adolescent information management vary when these strategies are used with parents under different conditions may be premature. The aim of studies two and three, presented in Chapters 3 and 4 respectively, was thus to investigate these issues.

Study two examined potential gender differences in the emotional consequences associated with engaging in a process coined "pressured information management". This theoretical innovation was advanced with a view to refining understanding of how the parent-adolescent relational context may influence youths' information management decisions. It refers to situations where teens feel compelled to disclose or conceal information because of the reactions and attitudes to disclosure or non-disclosure they anticipate from the intended target of these information management choices; in this case, mothers. Although related concepts have been advanced in previous research (e.g., Darling et al., 2006; Marshall et al., 2005; Smetana et al., 2006; Smetana et al., 2009; Tilton-Weaver et al., 2010), no study to date has synthesized these ideas to offer a single construct that encapsulates the degree to which adolescents feel they must participate in disclosure ("pressured disclosure") or keep secrets ("pressured secrecy") from parents. Moreover, the psychological impact of engaging in information management strategies for specific relational reasons is not yet well understood. Study two aimed to bridge these gaps by offering a new pathway through which information management strategies may become manifest. This was assessed using the so-called Pressured Information Management Scale (PIMS). Teens' psychological responses were also examined.

How mothers and teens conjointly influence youth outcomes following adolescent information management was further investigated in study three, but this time with respect to behavioral outcomes. More specifically, the longitudinal contribution of congruence and discrepancy between mother-adolescent reports of disclosure to the development of

delinquency in youths was explored using polynomial regressions with response surface analyses. The use of this advanced statistical procedure enabled a more complex examination of the relationship between mother-reported disclosure, adolescent-reported disclosure and delinquency than would have been possible using other more common but flawed methodologies. Whether these associations varied as a function of the social domain for which reports of disclosure were provided was also explored. This was owing to past research which indicates the context of parent-child reporting discrepancies may play a crucial role in determining their socio-emotional consequences for youths (De Los Reyes & Kazdin, 2005).

Chapter 2

The Longitudinal Influence of Self-Efficacy, Communication and Parenting on Spontaneous Adolescent Disclosure

Abstract

This study involving 463 adolescents examined the impact of parent, teen and parent-teen interaction processes on spontaneous adolescent disclosure to mothers. High openness in communication and stronger disclosure self-efficacy beliefs were associated with more disclosure at follow-up. Although a positive relationship was also found for maternal warmth/responsiveness when it was considered together with other parenting attributes, its unique contribution to the disclosure process was attenuated once openness and self-efficacy beliefs were taken into account. Domain-specific predictors of disclosure were also explored. Open communication was important for the disclosure of all activities, while self-efficacy beliefs were beneficial for revealing difficult information. These findings underscore the importance of fostering an open environment in families that nurtures adolescents' confidence to engage in disclosure with parents.³

³ Manuscript submitted for publication. In subsequent chapters this study is referred to as "Kearney, J., & Bussey, K.. (2013). *The longitudinal influence of self-efficacy, communication and parenting on spontaneous adolescent disclosure*. Manuscript submitted for publication.

Introduction

Parental knowledge of adolescents' daily activities and behavior constitutes an important determinant of positive outcomes for teenagers as it enables parents to provide youths with the support and guidance they need to navigate high-risk situations (Crouter & Head, 2002; Darling, Cumsille, Caldwell & Dowdy, 2006; Dishion & McMahon, 1998). It has been further shown that of the different types of parental knowledge, spontaneous disclosure from teens to parents is the most important source and correlates with adolescent adjustment more highly than any other mechanism (Kerr & Stattin, 2000; Kerr, Stattin, & Burk, 2010; Stattin & Kerr, 2000). The identification of factors that may facilitate spontaneous sharing of information from teenagers to their parents is therefore crucial and has become the focus of much research attention. Accordingly, the aim of this study was to examine the unique contribution of individual and mother-adolescent interaction factors to the disclosure process.

This approach differs from most research which has focused on factors specific to one member of the parent-adolescent dyad, with few studies advancing a comprehensive model of adolescent disclosure that incorporates parent, teen and parent-teen interaction processes. However, individual adolescent and conjoint parent-teen influences are important to consider in concert with the impact of parenting given increasing awareness that youths are active agents in their management of information to parents (Darling et al., 2006; Marshall, Tilton-Weaver, & Bosdet, 2005; Tilton-Weaver et al., 2010). This view that adolescents make strategic decisions about the information they do and do not share with parents is consistent with the agentic role ascribed to teens in their own development by social cognitive theory (SCT; Bandura, 1986; 2001; 2006a). Recent advances in SCT suggest some positive outcomes may be more achievable when individuals pool their knowledge and resources and work together via a process referred to as 'collective agency' (Bandura, 2001; Caprara, Regalia, Scabini, Barbaranelli, & Bandura, 2004). This study therefore examined the

collective influence of mother, adolescent and mother-adolescent interaction factors on teens' willingness to engage in spontaneous disclosure with mothers. These included three maternal attributes (warmth/responsiveness, behavioral control and psychological control), two communication factors (adolescents' perceptions of openness in communication with mothers and their interpersonal communication competence) and teens' ratings of their disclosure self-efficacy.

The impact of parental attributes such as warmth/responsiveness, behavioral control and psychological control on adolescent disclosure to parents has received much research attention and is therefore important to consider when developing an understanding of factors that collectively contribute to the disclosure process. For example, past studies, whether cross-sectional (e.g., Cumsille, Darling, & Martínez, 2010; Darling, Cumsille, Peña-Alampay, & Coatsworth, 2009; Smetana, Metzger, Gettman, & Campione-Barr, 2006; Soenens, Vansteenkiste, Luyckx, & Goossens, 2006) longitudinal (e.g., Blodgett Salafia, Gondoli, & Grundy, 2009), or qualitative (e.g., Tokić & Pećnik, 2010), have commonly found that the extent to which an adolescent experiences a sincere and affectionate relationship with their parent (i.e., perceives them to be warm/responsive) is associated with their willingness to divulge information to that parent. This is consistent with the view that parents who are warm/responsive elicit spontaneous disclosure from adolescents by virtue of demonstrating acceptance and empathy towards their child's choices, interests and needs (Crouter & Head, 2002; Soenens et al., 2006). A positive relationship between maternal warmth/responsiveness and adolescent disclosure was therefore expected in this study.

The associations between behavioral control and adolescent disclosure that have been reported in past studies tend to be less consistent. However, both Kerr and Stattin (2000) and Soenens et al. (2006) reported a positive relationship between these variables. These findings are congruent with the view that children with parents who are behaviorally controlling are more likely to engage in disclosure as their parents actively solicit information, clearly

communicate expectations and provide a structure through which their child understands the link between their behavior and these expectations (Soenens et al., 2006). Other studies have similarly found that teenagers who rate parents as higher in behavioral control report more disclosure, but only in some cultures (Hunter, Barber, Olsen, McNeely, & Bose, 2011) and when disclosing certain issues (Smetana, Villalobos, Tasopoulos-Chan, Gettman, & Campione-Barr, 2009). Meanwhile, Darling et al. (2009) did not find evidence of any relationship between parental behavioral control and disclosure. It has been argued that such inconsistencies are due to a lack of consensus regarding how the construct of behavioral control should be conceptualized and therefore measured (Barber et al., 2009; Racz & McMahon, 2011). In this study, behavioral control was defined as active attempts made by parents to seek knowledge about their adolescents' daily activities in relation to *reasonable* constraints set for behavior (Soenens et al., 2006). It was thus considered a positive force in the socialization of children (Barber et al., 2009), which can be contrasted with studies that have used measures suggestive of a more domineering and overprotective type of behavioral control (Soenens et al., 2006; e.g., Fletcher, Steinberg, & Williams-Wheeler, 2004; Kerr & Stattin, 2000; Kerr et al., 2010; Stattin & Kerr, 2000). When conceptualized in a less negative way, positive relationships between behavioral control and disclosure have been consistently found (Barber et al., 2009; Soenens et al., 2006) and were thus anticipated in this study.

Psychological control refers to the use of manipulative and intrusive parental strategies, including guilt, shaming and love withdrawal (Barber, 1996). A child with a psychologically controlling parent is therefore expected to refrain from disclosure in order to avoid being exposed to the use of these techniques (Soenens et al., 2006). This is consistent with research showing that parental psychological control serves to undermine adolescents' voice with parents, including their articulation of personal experiences (Zimmer-Gembeck, Madsen, & Hanisch, 2011). Whereas some studies have found evidence consistent with a negative relationship between parental psychological control and a child's willingness to

share information (e.g., Soenens, et al., 2006; Urry, Nelson, & Padilla-Walker, 2011), others have reported no such relationship (e.g., Hunter et al., 2011). Further contradictory are the findings of Smetana et al. (2006), which suggest higher psychological control predicts greater adolescent disclosure to parents about personal issues. Although the authors posit this could be because adolescents with psychologically controlling parents feel subtly coerced to disclose information to parents without them overtly asking, it should also be noted that ratings of psychological control in this study were based on parent-report only. According to Barber and Harmon (2002), adolescents may be the best informants of psychologically controlling behavior from parents and its impact on their development. Teens' perceptions of these parental behaviors and how they shape their willingness to share information with parents are thus important to consider and were thus the focus of this study.

While Gray and Steinberg (1999) argue that warmth/responsiveness, behavioral control and psychological control contribute to adolescent development in synergistic, as well as independent ways, most studies have not examined the collective impact of these three defining features of authoritative parenting on the disclosure process. One exception is research conducted by Soenens et al. (2006), which found high responsiveness, high behavioral control and low psychological control to be independent predictors of adolescent disclosure. The current study aimed to replicate these results. In addition, the present study sought to extend the cross-sectional findings of Soenens et al. (2006) by examining whether these hypothesized relations would hold over time, thereby clarifying the direction of these previously obtained associations.

The communicative quality of the early family environment is also considered influential over an adolescent's decision to engage in disclosure and is therefore vital to examine alongside the affective climate of a family that is cultivated by the parenting strategies adopted (Snoek & Rothblum, 1979). Despite this, few studies have explored the impact of different communication processes on adolescent disclosure. The current study

bridged this gap by considering how adolescents' perceptions of openness in communication with mothers and their own perceived level of interpersonal communication competence contribute to their willingness for disclosure.

Although previous research is supportive of an association between adolescent perceptions of openness in communication with parents and their disclosure to parents, these studies have either confounded measures of communication with trust (e.g., Smetana et al., 2009), itself an established correlate of disclosure (Kerr, Stattin, & Trost, 1999; Smetana et al., 2006), or failed to consistently demonstrate this relationship for both boys and girls (e.g., Bandura, Caprara, Barbaranelli, Regalia, & Scabini, 2011). Further investigation of this issue is therefore warranted. Consistent with past research, it was hypothesized that higher reported openness in communication with mothers in this study would lead to more disclosure to mothers over time. This is because perceptions of openness in communication typically signify a free flowing exchange of both factual and emotional information in the relationship that is without constraint and occurs in the presence of mutual understanding (Barnes & Olson, 1982).

The examination of interpersonal communication competence in the context of adolescent disclosure is also important, given past research indicates that an individual's self-perceived communication competence can have a direct bearing on rewarding and satisfying interactions with others (Rubin, Martin, Bruning, & Powers, 1993). There is, however, a lack of research regarding how adolescents' perceptions of their interpersonal communication competencies impact their interactions with parents, specifically, their propensity for disclosure. Communication competence is defined as the judgment one makes about their ability to manage interpersonal relationships with respect to communication (Rubin & Martin, 1994). It refers to an individual's perception of the appropriateness and effectiveness of their communication and in this way can be distinguished from communicative performance, which is skills-based (Larson, Backlund, Redmond, & Barbour, 1978; McCroskey, 1982;

Rubin et al., 1993). It is conceivable that adolescents who perceive themselves as more competent communicators may be more likely to disclose information to parents owing to the positive beliefs they hold about their capacity to reach desired goals from such communication. While no study to date has examined this issue explicitly, recent research by Rote, Smetana, Campione-Barr, Villalobos and Tasopoulos-Chan (2012) is suggestive. Albeit taking a skills-based approach, this study found that teens rated by trained observers as communicating more clearly with mothers, also disclosed more to mothers about personal and multifaceted issues. Accordingly, adolescents in the current study with high self-perceived interpersonal communication competence were also expected to disclose more to mothers over time.

In addition to adolescents' self-perceived capacities to communicate interpersonally, the impact of their self-efficacy for disclosing information to mothers specifically is important to examine with respect to factors that may influence their decision to tell or not to tell. Within SCT (Bandura, 1986; 2001), self-efficacy is considered the foundation of human agency and refers to an individual's belief in their ability to effectively accomplish or demonstrate a behavior in a particular situation. Disclosure self-efficacy beliefs are thus crucial to consider when investigating the agentic role adolescents play in their own development; in this case, their propensity for disclosure. According to Bussey (2010), an individual's self-belief in their capacity for disclosure (i.e., their disclosure self-efficacy) may enable it. This is supported by research indicating that self-efficacy for self-assertiveness is positively correlated with self-disclosure to mothers across cultures (Hunter et al., 2011). While these findings are informative, the situation specificity inherent in Bandura's (1986; 2001) definition of self-efficacy warrants the investigation of whether self-efficacy for disclosure specifically can influence disclosure behavior. For these reasons disclosure self-efficacy was included in the current study. It was anticipated that adolescents with stronger

beliefs in their ability to disclose information about their behavior to mothers (i.e., higher disclosure self-efficacy) would disclose more to mothers about their behavior over time.

As well as differences due to parent, teen and parent-teen interaction processes, there has been extensive research showing that adolescents' disclosure of information fluctuates according to the type of behavior considered (e.g., Rote et al., 2012; Smetana et al., 2006; Smetana et al., 2009; Tasopoulos-Chan, Smetana, & Yau, 2009; Yau, Tasopoulos-Chan, & Smetana, 2009). Social domain theory (Turiel, 1983, 2006) is often used as an organizing framework for understanding teen behavior, classifying adolescent activities as either *prudential* (issues regarding health, safety, comfort or potential to come to harm), *personal* (pertaining to control over one's body, privacy and personal preferences), *moral/conventional* (concerning justice, welfare or rights and contextually relevant rules or norms for behavior), or *multifaceted* (comprising the overlap between personal and either prudential or moral/conventional behaviors; Smetana et al., 2006; Smetana et al., 2009; Turiel, 1983, 2006). It is possible that correlates of disclosure may also vary according to the social domain being divulged. Hypothesized predictors of disclosure were thus examined both across domains and at the domain level using the Teen Overall Level of Disclosure Scale (TOLDS). This new measure was developed for the present research in recognition of the fact that no consensus instrument for assessing adolescent spontaneous disclosure to mothers over social domains appears to exist. According to Kerr and Stattin (2000), an open and interactive environment is essential for adolescent disclosure. It was thus expected that higher perceived openness in communication with mothers, along with more maternal warmth, behavioral control and lesser psychological control, would be associated with increased disclosure from teens for all types of behavior. Conversely, higher disclosure self-efficacy and communication competence beliefs were expected to enhance teens' willingness to divulge prudential and moral/conventional violations, but not necessarily their personal activities. This is because

self-doubts about one's ability to reveal information may be especially detrimental when embarrassing or difficult content warrants disclosure (Bussey, 2010).

In summary, this study aimed to contribute to the understanding of mother, adolescent and mother-adolescent interaction factors that collectively facilitate teens' willingness to engage in spontaneous disclosure by testing a model inclusive of all these factors. Consistent with previous studies (e.g., Smetana, Crean, & Daddis, 2003; Smetana & Daddis, 2002), the focus was on adolescents' relationships with mothers as opposed to parents more generally. This was owing to past research which suggests when parents from the same family are compared, knowledge of their adolescents' behavior differs, with teens typically disclosing more to mothers than they do fathers (Crouter & Head, 2002; Smetana et al., 2006).

It was hypothesized that positive associations between adolescent disclosure to mothers and two maternal attributes (warmth/responsiveness, behavioral control) would be found both concurrently and with longitudinal data. A negative association, however, was expected between adolescent disclosure and a third maternal attribute (psychological control). If found, these associations between parenting and disclosure would replicate and provide further support for those obtained in past research (i.e., Soenens et al., 2006). In addition, it was anticipated that higher perceived openness in communication with mothers, interpersonal communication competence and disclosure self-efficacy would be associated with more information being shared with mothers over time. Predictors of domain-specific disclosure were also considered. While parenting and openness in communication were expected to yield associations with teens' willingness to divulge details about their involvement in all behaviors, it was anticipated that adolescents' disclosure self-efficacy and communication competence would be predictive of prudential and moral/conventional disclosure only.

In light of past research which suggests disclosure from teens may vary according to the sex or age of the adolescent (e.g., Smetana et al., 2006; Daddis & Randolph, 2010; Keijsers, Frijns, Branje, & Meeus, 2009; Yau et al., 2009), potential gender and grade

differences were taken into account in all analyses. It is further possible the degree to which an adolescent engages in certain activities may impact their disclosure of those activities. The extent to which adolescents were involved in the behaviors targeted for disclosure was thus also accounted for in domain-specific analyses.⁴

Method

Participants

The sample consisted of 463 (268 male, 195 female, $M_{\text{age}} = 13.97$, $SD = 1.43$, range: 12-17 years) Australian students from middle-class backgrounds in grades 8 and 11. Students participated in a longitudinal study. They were tested at Time 1 (T1) and again seven months later at Time 2 (T2). While data were collected from a total of 567 adolescents at T1, only the data of the 463 students who completed the questionnaire at T1 and T2 were included in this study. This is in line with the strategy that has been employed in similar research (e.g., Marshall et al., 2005). A series of mixed multi-level analyses were conducted comparing the responses of participants with complete data for both waves of data collection and those who were only present for a single time point on the key variables of interest. The linear mixed model procedure was adopted due to the specific advantage associated with this statistical method for handling ‘unbalanced’ analyses, as was the case with these data (Affleck, Zautra, Tennen, & Armeli, 1999; SPSS, 2005). The results of these analyses indicated there were no substantially significant differences between students who participated in both or one wave of data collection.

Approximately 82% of the sample was White, 10% Asian, 3% Middle-Eastern, and the remaining 5% were from other ethnic groups. Parental consent for students to participate in the study was obtained using active consent. Written assent was also obtained from each adolescent prior to participation.

⁴ Although not included in the article submitted for publication, a pictorial depiction of these hypothesized models for overall and domain-specific disclosure are shown in Appendix E to provide additional clarity.

Measures⁵

The Teen Overall Level of Disclosure Scale (TOLDS). Adolescents' spontaneous disclosure to mothers was measured using the TOLDS, a 9-item instrument that was created for the current study and uses three items to assess adolescents' spontaneous disclosure to mothers across each of three domains from social domain theory (Prudential, Personal and Moral/Conventional issues; Turiel, 1983, 2006).

A series of steps were taken in developing this measure. An initial pool of 20 items was first collated with five items representing one of four domains from social domain theory: prudential, personal, moral/conventional, and multifaceted issues. These were drawn either directly or adapted from those used in previous research (Darling et al., 2006; Hasebe, Nucci, & Nucci, 2004; Smetana et al., 2009; Yau et al., 2009). This larger initial pool was then reduced to three items per domain, selected on the basis of feedback provided by a panel consisting of fifteen experts in the field of child psychology who rated items with respect to how well they embodied the domain that item was intended to reflect. For each domain the experts also indicated the one item they would exclude and the one item they considered best assessed adolescent disclosure to mothers for that area of behavior. The wording of items was also modified on the basis of feedback provided by these experts. After revisions were made, a focus group of four teenagers drawn from the same age group and background as adolescents who participated in this study was held in order to pilot the final questionnaire with respect to item relevance and interpretability.

The resulting instrument was administered to students and consisted of 12 items organized according to four domains of behavior: prudential (3 items; e.g., riding in a car with a teenage driver), personal (3 items; e.g., how teenagers spend their allowance or money earned from a part-time job), moral/conventional (3 items; e.g., breaking a promise or lying to someone) and multifaceted (3 items; e.g., watching a movie that contains explicit sex or

⁵ Items used in the studies outlined in Chapters 2-4 are shown in Appendix A. Where pre-existing measures were adapted for use in the present research the original scales have also been provided for the purpose of comparison.

violence in it) activities. Participants were asked to consider how often they usually tell their mother, without her having to ask, about their engagement in each of the activities or behaviors listed using a 6-point Likert scale, ranging from 1 (*never tell*) to 6 (*always tell*). A response was requested from all participants, regardless of their current involvement in the activity as their level of engagement was statistically controlled in domain-specific analyses. Therefore, participants were further instructed that even if they had never performed the activity or behavior listed, not even once, they should consider how often they would tell their mother without her having to ask if they did do it and provide a response on the same 6-point Likert scale.

To examine the factor structure of this version of the instrument administered to students an exploratory factor analysis using oblimin rotation was conducted on T1 data and yielded a two-factor solution, not the intended four-factor solution. A second exploratory factor analysis was run, specifying four factors. Items with factor loadings lower than .30 were eliminated. This resulted in one multifaceted item being excluded. The remaining items were subjected to a third exploratory factor analysis, again specifying four factors. An additional multifaceted item had high cross-loadings across two factors. This item was also eliminated, leaving a single item, initially conceptualized as part of the prudential domain, loading on the fourth factor (*If you ride in a car with a teenage driver*). This item was identified as confusing for adolescents during testing sessions as it was unclear who they should or should not include as a teenage driver (e.g., siblings and cousins) and was therefore eliminated due to concerns that it may not have been answered consistently by respondents. The last multifaceted item (*If you watch a movie that has explicit sex or violence in it*) loaded moderately with all remaining prudential items and was thus retained given the conceptual overlap inherent between these domains, as well as growing concerns in the literature regarding the impact of exposure to violent and sexually explicit media on the socio-emotional adjustment of adolescents (Brown et al., 2006; Brown & L'Engle, 2009; Villani,

2001). The remaining nine items were subjected to a final exploratory analysis, forcing three factors. This factor analysis resulted in a conceptually meaningful three-factor solution that accounted for 68.2% of the variance, including prudential issues, personal activities and moral/conventional behaviors.⁶

The final TOLDS therefore comprises nine items, with three items assessing three domains derived from social domain theory: prudential ($T1\alpha = .79$; $T2\alpha = .77$), personal ($T1\alpha = .68$; $T2\alpha = .72$) and moral/conventional behaviors ($T1\alpha = .76$; $T2\alpha = .79$; see Appendix A for final scale). Reliability alphas for the complete TOLDS were .85 at T1 and .87 at T2.

Disclosure self-efficacy. Adolescents' self-efficacy for spontaneous disclosure to mothers was measured using an adaptation of the TOLDS. Each item stem was changed to reflect the construct of self-efficacy as defined by self-efficacy theory and consistent with the phrasing used to measure these beliefs in previous research (Bandura, 1986, 2001, 2006b; Caprara et al., 2004). A practice item was also provided to further demonstrate and facilitate understanding of the concept. Participants were then asked to imagine they had engaged in each of the behaviors described by the TOLDS and rate their disclosure self-efficacy [e.g., *'How well can you tell your mother (without her having to ask)... that you went to a party where other teens were drinking alcohol'*] on a 6-point Likert scale, ranging from 1 (*not well at all*) to 6 (*extremely well*). The reliability alphas for the 9-item measure of adolescents' disclosure self-efficacy were .81 at T1 and .84 at T2.

Assessment of behavioral engagement. Adolescents' behavioral engagement in the activities targeted for disclosure was measured using a 9-item scale devised for this study. For this measure, participants' rated how many times they have engaged in each of the behaviors listed in the TOLDS (e.g., *'How many times have you... Gone to a party where other teens were drinking alcohol'*) on a 4-point Likert scale ranging from 1 (*never*) to 4 (*lots of times—4*

⁶ This final exploratory factor analysis is shown in Appendix B. A confirmatory factor analysis replicating the proposed three-factor solution of the TOLDS was also conducted. Although not included in the manuscript submitted for publication, a discussion of the results, as well as additional supportive analyses, are provided.

or more). The reliability alpha for this measure of behavioral engagement at T1 was .73 and .70 at T2.

Perceived maternal warmth/responsiveness. The acceptance subscale of the shortened Child's Report of Parent Behavior Inventory (CRPBI-30; Schludermann & Schludermann, 1988) was used to assess adolescents' perceptions of maternal warmth/responsiveness. It consists of 10 items rated on a 3-point Likert scale, ranging from 1 (not like her) to 3 (a lot like her), that measure two parenting qualities considered to define the construct of parental support: responsiveness (e.g., 'My mother is a person who... smiles at me very often'), and warmth (e.g., 'My mother is a person who... makes me feel better after talking over my worries with her'; Soenens et al., 2007). This valid and reliable subscale has been used widely in previous research as a measure of parental support and its dimensions (Barber, Stolz, & Olsen, 2005; Soenens, Duriez, Vansteenkiste, & Goossens, 2007; Soenens et al., 2006). Schludermann and Schludermann (1988) provided evidence for the unidimensional factor structure of the acceptance subscale of the CRPBI-30 and adequate internal consistency ($\alpha = .75$). In this study, the reliability alpha at T1 was .91 and .92 at T2.

Perceived maternal psychological control. Adolescent perceptions of maternal psychological control were measured using the mother version of the Psychological Control Scale Youth Self-Report (PCS-YSR; Barber, 1996). This 8-item scale assesses perceived intrusions by mothers on the psychological and emotional development of their child (e.g., *'My mother is a person who... is always trying to change how I feel or think about things'*) using the same 3-point Likert scale as used in the CRPBI-30. Barber (1996) provided evidence for the unidimensional factor structure of the PCS-YSR and high internal consistency for reports of psychological control from mothers ($\alpha = .83$). The reliability alphas in this study were .83 at T1 and .84 at T2.

Perceived maternal behavioral control. The parental monitoring of behavior subscale of the Parental Regulation Scale (PRS; Barber, 2002) was used to assess adolescent

perceptions of maternal behavioral control. Items on this self-report measure (e.g., *'My mother is a person who... checks on me in reasonable ways to see if I am behaving like she wants me to'*) are answered using the same 3-point Likert as used in the PCS-YSR and CRPBI-30.

Based on the recommendations of B. Soenens (personal communication, December 14, 2011), two items were deleted from the original 10-item measure offered by Barber (2002). This was on the basis that one item, *'My mother is a person who... is aware of whether or not I'm behaving like she wants me to'*, was considered more consistent with the broader construct of passive parental knowledge of child behavior, rather than active parental monitoring, an oft highlighted criticism of measures typically used in the literature and that purport to tap into this more specific construct (Kerr & Stattin, 2000; Kerr et al., 2010; Stattin & Kerr, 2000). The second item, *'My mother is a person who... goes overboard in checking on my behavior'*, was also deleted due to concerns that it did not measure behavioral control in the same way as other items (B. Soenens, personal communication, December 14, 2011). Indeed, the remaining eight items appear to assess a less intrusive and less overprotective type of parental control than is characterized by this item and other more traditionally used measures of active parental monitoring (e.g., Capaldi & Patterson, 1989; Stattin & Kerr, 2000; Steinberg, Fletcher, & Darling, 2004). However, this more favorable perspective regarding the positive role of parental behavioral control in the socialization of children is consistent with how the construct has been conceptualized and measured in other studies (e.g., Barber et al., 2009; Soenens et al., 2006; Soenens et al., 2007).

In this study, confirmatory factor analyses were run in order to verify the unidimensional subscale structure of the PRS suggested by Soenens et al. (2006) using this 8-item version of the parental monitoring subscale and comparing model fit with that achieved by the original 10-item measure. In line with the recommendations of Cole, Ciesla, and Steiger (2007), the errors of reverse-scored items were permitted to correlate. Model fit was

assessed using three goodness-of-fit indices: Root Mean Square Error of Approximation (RMSEA; Steiger & Lind, 1980), Comparative Fit Index (CFI; Bentler, 1990) and Tucker-Lewis Index (TLI; Tucker & Lewis, 1973). According to Hu and Bentler (1999), a cut-off value close to or below .06 for the RMSEA and close to or above .95 for the TLI and the CFI suggests good model fit. The fit indices yielded for the 8-item configuration of the parental monitoring subscale of the PRS provided a better fit for the data [$\chi^2(19, N = 463) = 50.26, p < .001$, CFI = .92, TLI = .88, RMSEA = .06, 95% CI [.04, .08]] than the original 10-item subscale [$\chi^2(32, N = 463) = 99.18, p < .001$, CFI = .88, TLI = .84, RMSEA = .07, 95% CI [.05, .08]]. The use of these eight items to measure maternal behavioral control is also in line with the approach that has been employed by previous research (Soenens et al., 2007), where the subscale was reported to have moderate internal consistency ($\alpha = .68$). In this study, the reliability alpha for the 8-item measure at T1 was .64 and .65 at T2.

Openness in communication. Openness in communication with mothers was measured using the open family communication subscale of the Parent-Adolescent Communication Scale (Barnes & Olson, 1982). This self-report measure assesses the extent to which adolescents believe they can discuss issues with mothers in an open and supportive way. The scale consists of 10 items that are rated on a 5-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Items were worded such that the parent targeted was the adolescent's mother (e.g., *I find it easy to discuss problems with my mother*). Barnes and Olson (1982) reported evidence indicative of a unidimensional open family communication subscale with high internal consistency ($\alpha = .87$). The reliability alphas for adolescents' perceptions of open communication with mothers in this study were .92 at T1 and .93 at T2.

Interpersonal communication competence. The 10-item short form of the Interpersonal Communication Competence Scale (ICCS-SF; Rubin & Martin, 1994) was used to assess adolescents' perceptions of their general interpersonal communication competence. This scale assesses a person's judgment about their ability to manage interpersonal

relationships across 10 different domains of communicative skill on a 5-point Likert scale, ranging from 1 (*almost never*) to 5 (*almost always*). Four items from the original scale were re-worded as they were identified by either the expert panel or teen focus group as difficult to understand. One of these items and the only reverse-scored item (‘*When I talk to someone, the conversation tends to be all about me*’) was found to load poorly on a single interpersonal communication competence factor, the suggested factor structure of the ICC-SF (Rubin & Martin, 1994). This item was subsequently deleted. The reliability alpha for the resultant 9-item scale at T1 was .72 and .79 at T2. This was higher than the reliability estimate for the ICCS-SF originally provided by Rubin and Martin (1994; $\alpha = .63$).

Missing Data

There were small amounts of missing data at the individual item level (range 0.0–1.7%). Multiple imputation with 20 completed datasets produced using the EM (expectation-maximization) algorithm in IBM SPSS Statistics 19 was used to handle missing data for individual items and the results of analyses were pooled in line with the recommendations offered by Rubin (1987). This procedure imputes values for missing data without introducing bias and has been repeatedly shown to be superior to other common methods of handling item nonresponse, including list-wise deletion, pair-wise deletion and mean substitution (Allison, 2001; Enders, 2001; Schafer & Graham, 2002).

Procedure

Schools agreeing to take part in the current study were asked to forward consent forms to the parents of all students eligible for participation. Given it was not possible to obtain data regarding how many families were actually forwarded these forms, an accurate response rate cannot be calculated. However, of those forms returned, the proportion of parents/guardians who provided their consent was approximately 76.0%.

Participants completed the same pen-and-paper questionnaire during the first part of the school year, and again seven months later. This interval between T1 and T2 was similar to

that reported in other studies also examining adolescents' management of information (e.g., Frijns & Finkenauer, 2009; Stavrinides, 2011). Two versions of the survey were distributed that counterbalanced the order in which scales were presented. These were administered by trained research assistants on school premises during group testing sessions lasting approximately 40-50 minutes. The chief investigator was present during all testing sessions in order to answer questions as required and provide a verbal explanation of instructions that were presented in written form. Respondents were asked to answer the questionnaire in relation to their mother, or the person who had acted as their mother. Participants were assured that their individual responses were confidential and would not be seen by parents, teachers or peers. It was also explained that there were no right or wrong answers to questions in the survey and that they should simply answer honestly.

Results

Analytic Strategy

A multi-faceted analytic strategy was adopted using Mplus 6 (Muthén & Muthén, 2010) where appropriate, or otherwise IBM SPSS Statistics 19, to conduct analyses. Given the data presented are hierarchical in nature, with students nested within grades within schools, preliminary analyses were conducted to examine the potential effect of clustering in schools on analyses using the linear mixed modeling procedure. A random intercept model predicting disclosure across all domains, as well as domain-specific disclosure, from each independent variable with school as a random factor was performed at each time point. The random factor was not significant for all analyses and the intraclass correlations obtained ranged from .01 to .07, indicating no significant clustering effect of schools. Therefore, the hierarchical effect of schools was not accounted for in subsequent analyses. Potential clustering effects of grade were accounted for by including grade as a predictor for all regression and structural path analyses.

Results are outlined in three parts. First, partial correlations between all major variables at T1 and T2 are presented, along with the relevant means and standard deviations. Secondly, a series of analyses examining the hypothesized relationships between parenting, communication, self-efficacy and disclosure are described. These include a cross-sectional regression analysis with T1 parenting variables as predictors of T1 disclosure and grade and gender as covariates that was conducted to replicate the findings of Soenens et al. (2006). To determine whether these relationships held over time, a longitudinal regression analysis was performed with T1 parenting variables as predictors of T2 disclosure, controlling for the effects of grade, gender and disclosure at T1. Then, to examine the relative contribution of parenting, communication and self-efficacy to the disclosure process over time, T1 communication variables, followed by self-efficacy at T1, were added sequentially to the longitudinal regression model as predictors of disclosure at T2. Finally, path analyses examining predictors of domain-specific disclosure are also presented. These path analyses were conducted simultaneously using the multivariate multiple regression procedure. T1 parenting and communication variables, as well as domain-specific self-efficacy, were considered as predictors of prudential, personal and moral/conventional disclosure at T2. Grade, gender, domain-specific disclosure at T1 and domain-specific behavioral engagement at T1 were also included as covariates.

Partial correlations between variables

Partial correlations between all independent variables involved in this study and level of disclosure at T1 and T2, controlling for grade and gender, are presented in Table 1. Of the relationships between disclosure and its hypothesized predictors, correlations with maternal warmth/responsiveness, openness in communication and disclosure self-efficacy were strongest and positive for both time points. For partial correlations at the domain level, the impact of behavioral engagement for each disclosure domain was also taken into account. The results are depicted in Tables 2 and 3.

Table 1

Partial correlations, means and standard deviations at T1 and T2, controlling for grade and gender

Variable	T1 Means (<i>SD</i>)	T2 Means (<i>SD</i>)	1	2	3	4	5	6	7
1. Disclosure	3.71 (1.08)	3.52 (1.11)		.58***	.35***	-.28***	.17***	.49***	.28***
2. Disclosure self-efficacy	3.16 (.88)	3.18 (.97)	.56***		.24***	-.19***	.09	.39***	.29***
3. Warmth/responsiveness	2.60 (.44)	2.56 (.48)	.40***	.25***		-.60***	.11*	.73***	.27***
4. Psychological control	1.46 (.45)	1.50 (.47)	-.23***	-.20***	-.54***		.11*	-.57***	-.19***
5. Behavioral control	2.23 (.36)	2.23 (.36)	.21***	.09*	.14**	.08		.04	.08
6. Openness in communication	3.88 (.80)	3.80 (.85)	.50***	.36***	.75***	-.58***	.11*		.34***
7. Communication competence	3.91 (.53)	3.96 (.58)	.36***	.34***	.38***	-.18***	.11*	.33***	

Note. Partial correlations between T1 variables are presented above the diagonal and partial correlations between T2 variables are presented below the diagonal.

* $p < .05$ ** $p < .01$ *** $p < .001$.

Table 2

Partial correlations, means and standard deviations for domain-specific disclosure and domain-specific disclosure self-efficacy with all other major variables at T1, controlling for grade, gender, and behavioral engagement

Variable	Means (<i>SD</i>)	T1 Warmth/ responsiveness	T1 Psychological control	T1 Behavioral control	T1 Openness	T1 Communication competence
T1 Domain-specific level of disclosure						
Prudential	3.60 (1.57)	.27***	-.20***	.15**	.38***	.24***
Personal	4.39 (1.05)	.31***	-.31***	.14**	.39***	.21***
Moral/conventional	3.16 (1.25)	.28***	-.17***	.15**	.40***	.23***
T1 Domain-specific disclosure self-efficacy						
Prudential	2.69 (1.24)	.19***	-.17***	.08	.30***	.21***
Personal	4.35 (1.09)	.25***	-.21***	.08	.40***	.25***
Moral/conventional	2.44 (1.03)	.13**	-.08	.06	.24***	.21***

Note. Relevant domain-specific measure of behavioral engagement at T1 used for each analysis.

** $p < .01$ *** $p < .001$.

Table 3

Partial correlations, means and standard deviations for domain-specific disclosure and domain-specific disclosure self-efficacy with all other major variables at T2, controlling for grade, gender, and behavioral engagement

Variable	Means (SD)	T2 Warmth/ responsiveness	T2 Psychological control	T2 Behavioral control	T2 Openness	T2 Communication competence
T2 Domain-specific level of disclosure						
Prudential	3.40 (1.52)	.31***	-.17***	.18***	.41***	.27***
Personal	4.18 (1.12)	.41***	-.25***	.14**	.48***	.37***
Moral/conventional	3.00 (1.28)	.28***	.14**	.21***	.36***	.27***
T2 Domain-specific disclosure self-efficacy						
Prudential	2.76 (1.31)	.21***	-.18***	.09	.31***	.24***
Personal	4.25 (1.15)	.31***	-.23***	.07	.42***	.36***
Moral/conventional	2.52 (1.15)	.11*	-.11*	.06	.17***	.23***

Note. Relevant domain-specific measure of behavioral engagement at T2 used for each analysis.

* $p < .05$ ** $p < .01$ *** $p < .001$.

Table 4 displays the cross-time partial correlations between hypothesized predictors of disclosure at T1 and disclosure ratings at T2.⁷ Maternal warmth/responsiveness, openness in communication and disclosure self-efficacy at T1 were moderately and positively correlated with disclosure at T2, while all other hypothesized predictors demonstrated weak correlations. Also evident was a strong positive relationship between T1 and T2 disclosure, indicating that disclosure was stable over time.

Table 4

Partial correlations between disclosure at T2 and predictors of disclosure at T1, controlling for grade and gender

Variable	T2 Disclosure
T1 Disclosure	.70***
T1 Disclosure self-efficacy	.49***
T1 Warmth/responsiveness	.33***
T1 Psychological control	-.24***
T1 Behavioral control	.16***
T1 Openness in communication	.45***
T1 Communication competence	.22***

Note. *** $p < .001$

Predicting adolescent disclosure

For path analyses involving disclosure across all domains, fit indices could not be reported as the resultant models were just identified with 0 degrees of freedom. In addition, adolescents' behavioral engagement in the activities targeted for disclosure could not be controlled appropriately given the multi-domain structure of these scales. It was therefore included as a varying covariate in domain-specific analyses only.

To examine the hypothesized relationship between parenting and overall disclosure and to replicate the findings of Soenens et al. (2006) a path analysis using cross-sectional data was conducted regressing disclosure at T1 on perceived maternal warmth/responsiveness, psychological control and behavioral control at T1, with gender and grade as covariates (see Table 5). For disclosure across all domains, the results indicated that adolescents who rated

⁷ For clarity, partial correlations between domain-specific/cross-domain disclosure and disclosure self-efficacy at T1 and T2 are shown separately in Appendix C.

mothers as higher in maternal warmth/responsiveness ($\beta = .24, z = 4.49, p < .001$) and behavioral control ($\beta = .16, z = 3.67, p < .001$) at T1, reported that they disclosed more to mothers, while adolescents who rated mothers as more psychologically controlling at T1 ($\beta = -.15, z = -2.72, p = .006$), reported less disclosure to mothers at T1. This model explained only 19% of the variance in T1 disclosure.

Table 5

Cross-sectional path analysis regressing T1 disclosure on parenting, controlling for grade and gender

Variable	Estimate	Std. Error	Z-score
Model: Parenting (Cross-sectional)			
T1 Gender → T1 Disclosure	.20***	.04	4.80
T1 Grade → T1 Disclosure	.01	.02	.11
T1 Warmth/responsiveness → T1 Disclosure	.24***	.05	4.49
T1 Behavioral control → T1 Disclosure	.16***	.04	3.67
T1 Psychological control → T1 Disclosure	-.15**	.05	-2.72
T1 Disclosure – unexplained variance	.82***	.03	25.00

Note. $R^2 = .19^{***}$.

** $p < .01$ *** $p < .001$.

To determine whether these relationships held over time, the analysis was re-run utilizing longitudinal data (see Table 6 for the results of all longitudinal analyses predicting T2 disclosure). Disclosure at T2 was regressed on perceived maternal warmth/responsiveness, psychological control and behavioral control at T1, controlling for gender and grade. Disclosure at T1 was also included as a control variable to account for the stability of disclosure across time. Unlike the cross-sectional results, perceived maternal behavioral and psychological control were not associated with adolescents' disclosure to mothers across time. However, adolescents who rated mothers as more warm/responsive at T1 still reported more disclosure to mothers at T2 ($\beta = .09, z = 2.05, p = .040$).

In order to investigate the impact of communication factors on subsequent disclosure, after accounting for the effects of parenting and covariates, openness in communication with mothers and perceived communication competence at T1 were added to the longitudinal

model as predictors of disclosure at T2. Perceived maternal warmth at T1 no longer predicted disclosure at T2, over and above the influence of communication variables. While adolescents' ratings of their own communication competence were not related to their disclosure to mothers over time, higher perceived openness in communication with mothers at T1 was associated with more disclosure to mothers at T2 ($\beta = .14$, $z = 2.59$, $p = .009$).

Table 6

Longitudinal path analyses sequentially regressing T2 disclosure on hypothesized predictors, controlling for grade, gender and initial disclosure.

Variable	Estimate	Std. Error	Z-score
Model 1: Parenting			
T1 Gender → T2 Disclosure	.11**	.03	3.30
T1 Grade → T2 Disclosure	.08**	.03	2.61
T1 Disclosure → T2 Disclosure	.66***	.03	22.66
T1 Warmth/responsiveness → T2 Disclosure	.09*	.04	2.05
T1 Behavioral control → T2 Disclosure	.03	.03	1.02
T1 Psychological control → T2 Disclosure	-.01	.04	-.15
T2 Disclosure – unexplained variance	.47***	.03	14.67
Model 2: Parenting and Communication			
T1 Gender → T2 Disclosure	.11**	.03	3.42
T1 Grade → T2 Disclosure	.08**	.03	2.65
T1 Disclosure → T2 Disclosure	.62***	.03	18.93
T1 Warmth/responsiveness → T2 Disclosure	.01	.05	.27
T1 Behavioral control → T2 Disclosure	.04	.03	1.22
T1 Psychological control → T2 Disclosure	.02	.04	.41
T1 Openness → T2 Disclosure	.14**	.05	2.59
T1 Competence → T2 Disclosure	-.00	.03	-.02
T2 Disclosure – unexplained variance	.46***	.03	14.55
Model 3: Parenting, Communication, Self-efficacy			
T1 Gender → T2 Disclosure	.11**	.03	3.34
T1 Grade → T2 Disclosure	.07*	.03	2.06
T1 Disclosure → T2 Disclosure	.57***	.04	14.57
T1 Warmth/responsiveness → T2 Disclosure	.02	.05	.04
T1 Behavioral control → T2 Disclosure	.04	.03	1.25
T1 Psychological control → T2 Disclosure	.01	.04	.34
T1 Openness → T2 Disclosure	.16*	.05	2.22
T1 Competence → T2 Disclosure	-.01	.03	-.40
T1 Self-efficacy → T2 Disclosure	.11**	.04	2.80
T2 Disclosure – unexplained variance	.45***	.03	14.43

Note. Model 1 $R^2 = .53***$; Model 2 $R^2 = .54***$; Model 3 $R^2 = .55***$.

* $p < .05$ ** $p < .01$ *** $p < .001$.

To examine the impact of disclosure self-efficacy on subsequent disclosure after accounting for the contribution of parenting, communication and covariates, disclosure self-efficacy at T1 was included in the model. The pattern of path coefficients for all factors already included in the model did not change with the inclusion of adolescents' ratings of their disclosure self-efficacy at T1, which was related to more disclosure at T2. Therefore, the results from the final model suggested that adolescents who perceived more openness in communication with mothers ($\beta = .16, z = 2.22, p = .027$) and scored higher on disclosure self-efficacy ($\beta = .11, z = 2.80, p = .005$), disclosed more to mothers about their behavior over time. This model explained more of the variance in T2 disclosure (55%) than the models that did not include self-efficacy as a predictor or included parenting only.

Predicting domain-specific disclosure

To examine how the direct effects model obtained for disclosure across all domains compared to the disclosure of domain-specific behaviors, a series of path analyses were conducted simultaneously using the multivariate multiple regression procedure. T1 parenting and communication variables, as well as domain-specific self-efficacy, were considered as predictors of prudential, personal and moral/conventional disclosure at T2, controlling for gender, grade, adolescents' domain-specific level of disclosure at T1 and engagement in the behaviors specified at T1. The model fit the data well [$\chi^2 (18, N = 463) = 45.29, p < .001$, CFI = .97, TLI = .92, RMSEA = .06, 95% CI [.04, .08]]. Results are outlined in Table 7. Higher perceived openness in communication with mothers was associated with more disclosure to mothers over time about prudential ($\beta = .16, z = 2.94, p = .003$), personal ($\beta = .12, z = 2.01, p = .045$) and moral/conventional ($\beta = .16, z = 2.86, p = .004$) issues. Moreover, adolescents who reported more self-efficacy for the disclosure of prudential ($\beta = .08, z = 2.06, p = .040$) and moral/conventional behaviors ($\beta = .18, z = 5.01, p < .001$) also disclosed more to mothers about their involvement in these activities at T2.

Table 7

Longitudinal path analyses simultaneously regressing T2 domain-specific disclosure on hypothesized predictors, controlling for grade, gender and domain-specific behavioral engagement and disclosure at T1.

Variable	Estimate	Std. Error	Z-score
Prudential issues			
T1 Gender → T2 Prudential disclosure	.10**	.04	2.78
T1 Grade → T2 Prudential disclosure	.07	.04	1.65
T1 Prudential behavioral engagement → T2 Prudential disclosure	.06	.04	1.41
T1 Prudential disclosure → T2 Prudential disclosure	.52***	.04	13.48
T1 Warmth/responsiveness → T2 Prudential disclosure	.01	.06	.23
T1 Behavioral control → T2 Prudential disclosure	.06	.04	1.66
T1 Psychological control → T2 Prudential disclosure	< -.01	.05	-.03
T1 Openness → T2 Prudential disclosure	.16**	.06	2.94
T1 Competence → T2 Prudential disclosure	< -.01	.04	-.05
T1 Self-efficacy → T2 Prudential disclosure	.08*	.04	2.06
T2 Prudential disclosure → unexplained variance	.54***	.03	15.86
Personal issues			
T1 Gender → T2 Personal disclosure	.17***	.04	4.49
T1 Grade → T2 Personal disclosure	.07	.04	1.95
T1 Personal behavioral engagement → T2 Personal disclosure	-.08*	.04	-2.13
T1 Personal disclosure → T2 Personal disclosure	.38***	.04	9.04
T1 Warmth/responsiveness → T2 Personal disclosure	.07	.06	1.23
T1 Behavioral control → T2 Personal disclosure	.05	.04	1.37
T1 Psychological control → T2 Personal disclosure	-.02	.05	-.48
T1 Openness → T2 Personal disclosure	.12*	.06	2.01
T1 Competence → T2 Personal disclosure	.03	.04	.82
T1 Self-efficacy → T2 Personal disclosure	.06	.04	1.49
T2 Personal disclosure → unexplained variance	.63***	.04	16.07

Moral/Conventional issues			
T1 Gender → T2 Moral/Conventional disclosure	.11**	.04	2.96
T1 Grade → T2 Moral/Conventional disclosure	.01	.04	.34
T1 Moral/Conventional behavioral engagement → T2 Moral/Conventional disclosure	.01	.03	.38
T1 Moral/Conventional disclosure → T2 Moral/Conventional disclosure	.48***	.04	12.68
T1 Warmth/responsiveness → T2 Moral/Conventional disclosure	-.04	.06	-.73
T1 Behavioral control → T2 Moral/Conventional disclosure	.05	.04	1.30
T1 Psychological control → T2 Moral/Conventional disclosure	.02	.05	.46
T1 Openness → T2 Moral/Conventional disclosure	.16**	.06	2.86
T1 Competence → T2 Moral/Conventional disclosure	-.03	.04	-.65
T1 Self-efficacy → T2 Moral/Conventional disclosure	.18***	.04	5.01
T2 Moral/Conventional disclosure → unexplained variance	.56***	.04	16.07

Note. Prudential $R^2 = .46^{***}$; Personal $R^2 = .37^{***}$; Moral/conventional $R^2 = .44^{***}$.

* $p < .05$ ** $p < .01$ *** $p < .001$.

Discussion

This study examined the unique contribution of mother, adolescent and mother-adolescent interaction processes to disclosure from teens. Although youths' perceptions of maternal attributes and their own interpersonal communication competence did not contribute to spontaneous disclosure to mothers over time, perceived openness in communication with mothers and adolescents' self-efficacy for disclosure were related to the amount of information that was subsequently shared. These results highlight the importance of certain adolescent and parent-adolescent interaction factors to disclosure that until now have been essentially unexplored. In addition, these findings support the view that more attention regarding the active role adolescents' play in their own development is warranted (Bandura, 2006a; Darling et al., 2009; Marshall et al., 2005; Tilton-Weaver et al., 2010).

Although not uniquely related to disclosure over time, adolescent perceptions of maternal warmth and behavioral control were positively associated with the level of information divulged to mothers concurrently, consistent with the findings reported by past research (e.g., Darling et al., 2009; Hunter et al., 2011; Kerr & Stattin, 2000; Smetana et al., 2006; Smetana et al., 2009; Soenens et al., 2006). Furthermore, adolescent perceptions of maternal psychological control were negatively associated with concurrent ratings of disclosure, which also aligns with past research (e.g., Soenens et al., 2006; Urry et al., 2011). Collectively, the findings regarding these maternal attributes, considered the three defining features of authoritative parenting (Gray & Steinberg, 1999), replicate those reported in Soenens et al.'s (2006) cross-sectional study. However, when these associations were examined in the context of longitudinal data to clarify the direction of the relationships observed, adolescent perceptions of maternal behavioral and psychological control were not associated with spontaneous disclosure to mothers over time. In contrast, higher ratings of maternal warmth/responsiveness were related to subsequent disclosure. This was in line with the longitudinal findings reported by Blodgett Salafia et al. (2009) and supports the notion

that of the three parenting attributes that define authoritative parenting, warmth/responsiveness is most relevant to disclosure (Soenens et al., 2006).

A more comprehensive understanding of factors that contribute to the disclosure process other than parenting was acquired by adding teens' perceptions of openness in the mother-child relationship and their self-efficacy for disclosure to the longitudinal model. Higher ratings of openness in communication with mothers were associated with more disclosure to mothers over time, which is similar to past research (e.g., Bandura et al., 2011; Smetana et al., 2009). Consistent with the view espoused by Kerr and Stattin (2000), these findings highlight the importance of creating an interactive family climate which fosters openness in communication in eliciting disclosure from teens.

Higher ratings of adolescents' disclosure self-efficacy were also related to more disclosure to mothers over time. These findings are in line with those that have been reported in past research, suggesting that teens who possess the confidence to initiate interactions, also disclose information to parents (Hunter et al., 2011). Employing a more specific measure of disclosure self-efficacy than has been used previously, this study found these self-efficacy beliefs were associated with subsequent adolescent disclosure.

In contrast, the results indicated that teens' perceptions of their general interpersonal communication competence were not associated with their subsequent disclosure to mothers. This is inconsistent with the view that adolescents who believe they are competent communicators will engage in more disclosure owing to positive beliefs they have about the effectiveness of their communication. However, these findings further underscore the importance of factors more specific to the disclosure situation, such as an adolescent's belief in their ability to engage in disclosure specifically (e.g., their disclosure self-efficacy), and the relationship teens have with the target of their disclosure (e.g., the degree of openness in communication shared). Believing one is in general a competent communicator may not be sufficient to convince an adolescent that they can expect a positive outcome or reaction from

parents in divulging information about their behavior, a key factor in teens' decision-making regarding whether to tell or not to tell (Darling et al., 2006; DePaulo & Kashy, 1998; Marshall et al., 2005; Smetana, 2008; Smetana et al., 2009; Tilton-Weaver et al., 2010).

When the communicative quality of the parent-adolescent relationship was taken into account, teens' perceptions of maternal warmth/responsiveness no longer contributed uniquely to adolescents' ratings of subsequent disclosure to mothers. These findings suggest that maternal warmth/responsiveness is less important for eliciting disclosure than the level of openness in communication perceived. Although a possible alternative explanation is that the interval between data collections was too short to counter the stability of disclosure over time, this is unlikely given maternal warmth/responsiveness predicted subsequent disclosure when considered with the other parenting variables. This effect disappeared only when the impact of communication was also taken into account. However, open communication between mothers and adolescents may in part derive from the degree of maternal warmth/responsiveness that is present. It is thus conceivable that adolescent perceptions of openness partially contribute to the association between maternal warmth/responsiveness and subsequent disclosure that has been found in previous studies (e.g., Blodgett Salafia et al., 2009). In support of this assertion are the high correlations between maternal warmth/responsiveness and youths' perceptions of openness in communication with mothers that were obtained in this study. Further examination of this issue employing longer intervals between data collections would provide additional insight as to the subtleties of the interplay that exists between parent and parent-adolescent interaction processes in facilitating disclosure from teens.

Contrary to expectations, maternal behavioral and psychological control were not related to adolescent disclosure over time in this study. According to Soenens et al. (2006), behavioral control is expected to predict adolescent disclosure as parents who display this attribute are likely to actively *solicit* information from their child. The emphasis on

spontaneous disclosure in this study may therefore account for the results obtained. A lack of robustness in the measure used to assess behavioral control may also be implicated, with the subscale being found to possess only moderate internal consistency, even after scale improvements were made. However, it is curious why higher ratings of maternal behavioral control and lower ratings of maternal psychological control were associated with more disclosure cross-sectionally. This raises the possibility that the direction of the relationships between these maternal attributes and disclosure may be opposite to those investigated here, with parents reacting to adolescent disclosure with changes in their parenting. Specifically, a teen who reveals information to parents may be confronted with increased boundary-setting once these parents are armed with knowledge about their child's behavior. Likewise, the parents of adolescents who choose to share information with caregivers about their daily activities may not feel as compelled to engage in manipulative parenting techniques to acquire this information (i.e., be psychologically controlling). These notions are consistent with studies that have found adolescent disclosure can influence subsequent parenting behavior and provide further support for the view that the exploration of bidirectional models is crucial (Keijsers, Branje, VanderValk, & Meeus, 2010; Kerr & Stattin, 2000; Kerr et al., 2010; Racz & McMahon, 2011; Stattin & Kerr, 2000).

Some differences in predictors of spontaneous adolescent disclosure as a function of the type of issue being disclosed were also found in this study. Consistent with the results presented for disclosure across all domains, parenting and teens' self-perceived communication competence did not contribute to adolescent disclosure over time when all variables were considered in domain-specific analyses. However, higher ratings of openness in communication with mothers were associated with more disclosure from adolescents about prudential, personal and moral/conventional issues. While domain-specific disclosure self-efficacy beliefs also yielded positive relationships with teens' willingness to divulge prudential and moral/conventional violations, this was not the case for the disclosure of

comparatively innocuous personal information. Consistent with the hypothesis, these results suggest an individual's self-beliefs about their capacity for disclosure may facilitate their actual disclosure in situations where the content is embarrassing or difficult to reveal (Bussey, 2010).

The current study makes a significant contribution to the field as it provides a uniquely comprehensive view of how parent, adolescent and parent-adolescent interaction factors may collectively influence spontaneous disclosure. A high proportion of the variance in disclosure ratings provided by teens was accounted for by the factors that were included, highlighting their shared contribution to the disclosure process. Future research would benefit from investigating whether the results obtained here differ at different stages of the developmental process. A strength of the study was the analysis of longitudinal data that accounted for the stability of disclosure over time and thus enabled the consideration of causal processes. Furthermore, a new measure for assessing spontaneous adolescent disclosure across social domains, the TOLDS, was developed emphasizing the spontaneity that renders such sharing of information by teens unique. The present study was also the first to verify the multi-dimensional structure of the disclosure measure used with respect to social domain theory (Turiel, 1983, 2006), as well as take into account the degree to which adolescents engaged in behaviors targeted for disclosure in domain-specific analyses.

The reliance on self-report data from adolescents should, however, be noted. This approach to assessing parental and adolescent behavior has been criticized, given discrepancies between parents and adolescents are often reported (De Los Reyes, Goodman, Kliewer, & Reid-Quinones, 2010; De Los Reyes & Kazdin, 2005; Dishion & McMahon, 1998; Racz & McMahon, 2011; Reidler & Swenson, 2012). The consideration of both adolescent and parent reports has therefore been advocated in the interests of obtaining a more accurate picture of family and adolescent functioning (Racz & McMahon, 2011). While multi-informant data is no doubt useful, adolescent disclosure research is concerned with

information parents may not be privy to. Whether the multi-informant approach would have yielded more reliable findings is thus unclear. Past research further indicates that adolescents' perceptions of their family environment may be more important than parents' perspectives for predicting adolescent outcomes (Jaccard, Dittus, & Gordon, 1998). Nonetheless, parent-adolescent reporting discrepancies may provide invaluable information about the parent-child relational context in which disclosure occurs, as well as the relationship between disclosure and teens' socio-emotional adjustment (De Los Reyes, 2011; De Los Reyes et al., 2010; De Los Reyes & Kazdin, 2005; Reidler & Swenson, 2012). Accordingly, future studies would benefit from continuing to explore whether reporting discrepancies for youths' willingness to engage in disclosure predict adolescent and parent-child relational outcomes.

In essence, the results of this study suggest the relative emphasis that has been placed on parental attributes for eliciting adolescent spontaneous disclosure could be misguided. Individual adolescent and parent-teen interaction factors may offer more insight regarding how disclosure from teenagers may be facilitated. However, just as Kerr and Stattin (2000) argue, this does not preclude the notion that parenting plays a crucial role in creating the open and receptive family climate that ultimately increases the likelihood an adolescent will freely reveal information about their activities to that parent. Instead, the current findings highlight that *merely* exhibiting sincerity and warmth may not be sufficient for parents to encourage adolescent disclosure, particularly if this is in the absence of the adolescent believing there is openness in the relationship. Nor can parents simply rely on the assumption that teens believed to be competent communicators will divulge information about their behavior. Rather, it may be advisable for parents to take a proactive role in fostering their child's confidence to disclose difficult information and cultivating an environment that is conducive to openness in the parent-adolescent relationship.

Chapter 3

The Impact of Pressured Information Management on Boys' and Girls' Psychological Functioning

Abstract

This study involving 463 adolescents compared the impact of pressured information management with mothers on boys' and girls' subsequent psychological functioning. This novel concept of pressured information management involved both pressured secrecy and disclosure and was defined as the degree to which adolescents feel they have no choice but to engage in these strategies. While pressured secrecy was especially aversive for girls, yielding associations with both depression and anxiety, it was related to stress only in boys. Pressured disclosure was less detrimental, and in fact, had a positive influence on girls' anxiety over time. Alternate casual models for these effects were considered but not supported by the data. Together, these findings highlight the importance of considering teens' reasons for engaging in different information management strategies and suggest adolescents who feel they have no choice but to keep secrets or disclose information to mothers may experience psychological consequences that are gender-specific.⁸

⁸ Manuscript submitted for publication.

Introduction

The role of adolescents as active agents who make strategic decisions about the information they do and do not provide parents about their daily activities has become increasingly recognized (Marshall, Tilton-Weaver, & Bosdet, 2005; Tilton-Weaver et al., 2010; Tilton-Weaver & Marshall, 2008). This process, referred to as adolescent information management (Marshall et al., 2005; Tilton-Weaver & Marshall, 2008), includes deliberate choices that are made on the part of the adolescent to spontaneously disclose information about their behavior to parents, as well as conscious decisions to keep aspects of their lives secret from caregivers. Although the psychosocial outcomes associated with these different information management choices have recently received considerable research interest (e.g., Finkenauer, Engels, & Meeus, 2002; Frijns & Finkenauer, 2009; Frijns, Finkenauer, & Keijsers, 2013; Frijns, Keijsers, Branje, & Meeus, 2010; Laird & Marrero, 2010; Smetana, Villalobos, Tasopoulos-Chan, Gettman, & Campione-Barr, 2009), the psychological impact of choosing information management strategies for particular reasons is not well understood. The aim of the present study was therefore to conduct a focused inquiry into the emotional consequences associated with the perception that one's decision to engage in disclosure and secrecy is driven by a specific relational reason, namely the extent to which teens feel pressured by mothers to engage in these strategies. This novel approach of examining pressured information management was conducted using a longitudinal study that compared the impact of other-focused pressure to engage in disclosure and secrecy with mothers on boys' and girls' subsequent psychological functioning.

Research concerning adolescent disclosure has undergone significant transformation over the past decade since publication of Stattin and Kerr's (2000; Kerr & Stattin, 2000) influential papers highlighting the different pathways to parental knowledge. Importantly, Stattin and Kerr's research, as well as the studies which followed (e.g., Keijsers, Branje, VanderValk, & Meeus, 2010; Kerr, Stattin, & Burk, 2010), demonstrated that the implications

of parental knowledge for adolescent adjustment vary as a function of the source of parental knowledge. These sources include the spontaneous disclosure of information from teenagers, parental solicitation and the use of parental control. Distinguishing between these diverse ways caregivers acquire information about their teens' behavior has highlighted the important role of how parental knowledge is obtained in fostering positive adolescent development. This study aimed to refine current understanding about spontaneous disclosure by considering a new pathway through which this information management strategy, as well as secret-keeping, may occur. This process is termed pressured information management and occurs when adolescents feel compelled to spontaneously disclose or conceal information because they perceive implicit pressure from the potential target of their disclosure or non-disclosure to employ such an information management strategy. While this target could be anyone in the adolescents' life from whom they perceive such pressure, teens' endorsement of pressured information management with mothers was the focus of this study.⁹

To date much of the research examining the implications of teens' willingness to divulge information to parents has tacitly assumed that spontaneous youth disclosure is synonymous with teens' willingness to voluntarily reveal information about their behavior. In this study, we argue that although it may sometimes appear that adolescents choose to spontaneously reveal information about their behavior to mothers, in the sense that their mothers have not explicitly asked for these details first, it is possible that some teens may be

⁹ Although pressured information management with parents was of chief interest to this study, it was not possible to assess pressured disclosure and secrecy for mothers and fathers separately due to practical and time constraints. Nor was it considered appropriate to ask teens to rate their pressured information management beliefs for parents collectively, given previous research has demonstrated when parents from the same family are compared, their knowledge of their children's behavior differs (Crouter & Head, 2002; Smetana, Metzger, Gettman, & Campione-Barr, 2006). Therefore, this study focused on teens' use of pressured secrecy and disclosure with mothers only. However, in doing so, the intention is not to suggest that this concept of other-focused pressured information management applies to mothers exclusively. On the contrary, it is acknowledged that pressure to disclose information or keep secrets may occur in relation to any person the adolescent shares a meaningful relationship with, including fathers, siblings, or even peers. Indeed, pressured information management deriving from these different relational targets warrants future investigation as it is possible the effects on adolescents' socio-emotional well-being may vary as a function of the source of this perceived pressure.

driven to do so because of an underlying belief they have no choice but to provide these details. This may derive in part from the attitudes they perceive and reactions to non-disclosure they anticipate from the potential target of secrecy (in this case, mothers), which can create other-focused pressure to instead reveal that information. That is, while adolescents may offer information about their lives in the absence of direct maternal solicitation and seemingly spontaneously, the degree to which such disclosures can be regarded as truly voluntary warrants consideration. Likewise, whether the results obtained by Stattin and Kerr (2000) and others which attest to the positive influence of spontaneous adolescent disclosure on youth adjustment can be generalized to disclosures which appear to have occurred spontaneously but from the perspective of the teen arise from implicit pressure to divulge those details requires further examination. Similarly, situations where teens feel other-focused pressure to tell mothers about their behavior should be considered independently from those where the decision to reveal this information occurs on the basis of self-focused preferences that often reflect some instrumental need the teenager hopes to fulfill through disclosure (e.g., telling to receive social support and validation, meet impression management goals, express pent up emotions or increase intimacy with the target of disclosure; Buhrmester & Prager, 1995; Bussey & Grimbeek, 1995; Finkenauer, Engels, & Kubacka, 2008; Marshall et al., 2005).

Similarly, teenagers' choices to keep secrets from mothers about their activities may be underscored by a belief they have no option but to conceal that information, given the nature of their relationship with their mother and the reactions to disclosure they foresee (Finkenauer et al., 2008; Finkenauer et al., 2002). These conditions may invoke feelings of other-focused pressure to withhold that information, which can be distinguished from instances where adolescents' choices to engage in secrecy are predicated on self-focused processes, including concerns about privacy and parental jurisdiction (Darling, Cumsille, Caldwell, & Dowdy, 2006; Marshall et al., 2005; Smetana et al., 2009), the desire for

emotional and physical autonomy from parents (Darling et al., 2006; Finkenauer et al., 2008; Finkenauer et al., 2002; Marshall et al., 2005; Trost, Biesecker, Stattin, & Kerr, 2007) or believing that disclosure in a particular circumstance is unnecessary owing to the negligible risk of harm (Smetana et al., 2009).

Given the disparate reasoning that underscores self- and other-focused pressure to manage information with mothers, it is reasonable to expect the psychological consequences of adopting information management strategies for such divergent reasons will also differ. Nevertheless, to date, little research has differentiated between when adolescents choose to reveal or conceal information from parents on the basis of other-focused pressure, and when these decisions are governed by self-focused interests. Nonetheless, this distinction is important as the line of reasoning that guides these choices may affect adolescents' psychological functioning, over and above the impact of the information management strategy that is employed. Consistent with this view is the stance taken by Laird and Marerro (2010), who argue the implications of adolescents' use of different information management tactics may vary as a function of the relational context and motivations which underscore these decisions. Thus, to enhance understanding about the consequences of different information management tactics for adolescent adjustment, the way in which the parent-child relationship contextualizes teens' choices to engage in these strategies needs to be considered (Keijsers & Laird, 2010). Yet, there exists a paucity of research investigating this issue. The current study aims to bridge this gap by examining the impact of other-focused pressure to engage in these information strategies on boys' and girls' psychological functioning.

Exploring the psychological outcomes associated with *pressured* information management is especially crucial, given past studies which suggest the primary reason teens withhold information from parents is to avoid negative parental reactions, a key factor underscoring other-focused information management (Marshall et al., 2005; Tilton-Weaver & Marshall, 2008). Although related concepts have been referred to in the literature (e.g., teens'

beliefs about their obligations to disclose and parental authority; Smetana et al., 2006; Darling et al., 2006; Marshall et al., 2005; feeling they have to ‘tell or else’; Marshall et al., 2005; or cannot get away with non-disclosure; Darling et al., 2006; and fearing the consequences of telling, including adverse parental reactions; Darling et al., 2006; Marshall et al., 2005; Smetana et al., 2009), no study to date has synthesized these ideas to offer a single construct that reflects the degree to which adolescents feel compelled to engage in spontaneous disclosure with parents (‘pressured disclosure’), or forced to keep secrets from caregivers (‘pressured secrecy’). To measure these novel constructs, the Pressured Information Management Scale (PIMS) was developed. This new scale was used to assess the impact of engaging in pressured disclosure and secrecy with mothers on teens’ psychological functioning and was considered separately for boys and girls so that gender comparisons could be made.

Although no studies have explicitly examined the impact of pressured information management on teens’ psychological functioning, the wealth of research concerning the consequences of secrecy and disclosure in general for adolescents is suggestive. For example, a multitude of studies have found that keeping secrets from parents during adolescence is associated with a range of negative emotional, physiological, psychological and relational outcomes. These include concurrent associations between the use of secrecy with parents and increased physical complaints and depression (Finkenauer et al., 2002), as well as more negative coping strategies in children (Almas, Grusec, & Tackett, 2011). Teens’ secrecy from parents has additionally been found to longitudinally predict depressive symptoms (Frijns, Finkenauer, Vermulst, & Engels, 2005; Frijns et al., 2010), higher instances of externalizing problems (Frijns et al., 2005; Frijns et al., 2010) and poorer quality parent-child relationships (Keijsers, Branje, Frijns, Finkenauer, & Meeus, 2010). Longitudinal linkages have also been reported between withholding information from parents and increased stress, lower self-esteem and less self-control (Frijns et al., 2005). Although the impact of secrecy on

adolescent anxiety has not been explored directly, measures used in previous studies to assess depressive mood have contained items that may be considered synonymous with anxiety symptoms (e.g., feeling nervous; Finkenauer et al., 2002; Frijns et al., 2005). It is thus possible that adolescents who withhold information from mothers about their behavior may also experience more anxiety, perhaps due to the fear of being ‘found out’.

These findings have led to the proposal of a secrecy-maladjustment link (Frijns et al., 2010) and are congruent with the view that concealing information is hard work, exacting a psychological and physiological toll on the secret-keeper (Larson & Chastain, 1990; Pennebaker, 1989). It requires constant active monitoring and inhibition of one’s thoughts, feelings and behaviors to avoid inadvertently revealing the concealed information, leading to higher physiological arousal and could thus be expected to be associated with increased stress (Frijns et al., 2010). At the same time, secrecy may entail rumination on distorted perceptions, given adolescents who withhold information are denied the opportunity to challenge these thoughts in response to mothers’ own perspectives and upon receiving their support and validation (Frijns et al., 2010). Nor is the teen who keeps secrets from mothers afforded the chance to obtain advice from female caregivers as to how they might best navigate high-risk situations, which may cause the adolescent undue anxiety as they negotiate these situations. Furthermore, consciously withholding information from others is commonly associated with having something that is shameful to hide and tends to be appraised by individuals, including the secret-keeper, as a negative behavior (Bok, 1989; Frijns et al., 2010). This can lead to maladaptive thinking patterns that adversely impact adolescents’ mood, already at risk due to the negative relational consequences associated with keeping secrets. These include undermining intimacy, communicating separateness and creating distance with the person from whom the secret is kept (Buhrmester & Prager, 1995; Finkenauer et al., 2008; Finkenauer et al., 2002).

Although these negative outcomes of secrecy may also be apparent when adolescents withhold information for self-focused reasons, it is anticipated they will especially be evident when teens feel other-focused pressure to engage in secret-keeping, given the particularly unfavorable relational context that is implied by pressured information management. Indeed, the adverse impact of parental pressure for teens' psychological functioning has been demonstrated in other domains including emotion research, where studies have found that pressure from caregivers to inhibit emotional expression can lead to depression in girls and poor emotion regulation in young adults (e.g., Keenan, Hipwell, Hinze, & Babinski, 2009; Roth & Assor, 2012). Accordingly, it was hypothesized that boys and girls in this longitudinal study who reported more pressure to engage in secrecy with mothers, would experience more emotional difficulties over time, including higher symptoms of depression, anxiety and stress. Although some advantages of keeping secrets from parents have been reported (e.g., the development of emotional autonomy and individuation; Buhrmester & Prager, 1995; Finkenauer et al., 2008; Finkenauer et al., 2002), the secrecy measure used in these studies did not distinguish between concealment that occurs on the basis of self-focused principles, versus secret-keeping that is driven by other-focused pressure. Reports of concealment in these studies may therefore have confounded instances of secrecy based on these two different motivational processes, thus leading to both positive and negative adolescent outcomes. Given pressured secrecy is considered to derive from an adverse relational context with parents, it was expected that the stronger endorsement of this construct would be exclusively associated with negative outcomes for adolescents.

Like secrecy, motivations for disclosure may not always be positive as adolescents may feel subtly coerced to reveal personal information to their parents (Almas et al., 2011; Smetana et al., 2006). It seems intuitive that pressured information management, regardless of whether it is in relation to secrecy or disclosure, would be associated with poorer adolescent outcomes since an adverse relational context is implied where pressure to engage in these

strategies is felt. This is congruent with Smetana and Metzger's (2008) view that disclosure which feels coerced may negatively affect adolescent adjustment, and is supported by research that indicates feelings of being controlled are associated with poorer socio-emotional outcomes (Kerr & Stattin, 2000). Findings from Roth and Assor (2012) are also consistent with this view, suggesting that parental pressure to express, as well as suppress, emotions predicts maladaptive emotion regulation and intimacy patterns. It was thus expected that both boys and girls in this study who reported more pressured disclosure with mothers, would also report worse depression, anxiety and stress over time.

Whether pressured secrecy and disclosure would be equally aversive was also of interest in this study, given the increasing body of evidence that secrecy and disclosure comprise two distinct, albeit related, constructs (Almas et al., 2011; Finkenauer et al., 2002; Frijns et al., 2010; Laird & Marrero, 2010; Marshall et al., 2005). Once considered opposite ends of the same continuum, it is now commonly accepted that non-disclosure is not the same as secrecy, since the former can occur without effort and the intention to conceal information. For example, an adolescent may simply forget to reveal certain details to parents (Marshall et al., 2005). In contrast, secrecy is conceptualized as a conscious process that entails the active and considered inhibition of disclosure (Frijns et al., 2010). It thus follows that pressured disclosure and secrecy may have differential effects on teens' psychological functioning. On the basis of research which indicates sharing information with parents tends to be associated with less internalizing symptoms (e.g., Laird & Marrero, 2010; Smetana et al., 2009) and the use of more positive coping strategies (e.g., Almas et al., 2011), it was hypothesized that pressured disclosure, although not ideal and therefore not expected to have a positive impact, would be less aversive than pressured secrecy for both boys and girls. This is because the mere sharing of information with mothers affords adolescents the opportunity to receive advice and support about managing high-risk situations, considered the key advantage of disclosure to parents in adolescence (Crouter & Head, 2002; Darling et al., 2006; Dishion &

McMahon, 1998). Furthermore, pressured disclosure may impart benefits that are not available with pressured secrecy, including the prospect of sharing information with mothers, which builds connectedness, closeness and intimacy in the parent-child relationship, thereby fulfilling an important interpersonal function (Buhrmester & Prager, 1995; Frijns et al., 2013).

Disparities in the way boys and girls engage interpersonally and the degree to which they use information management strategies with mothers have been found in numerous studies (Buhrmester & Prager, 1995; Darling et al., 2006; Finkenauer et al., 2002; Frijns & Finkenauer, 2009; Frijns et al., 2013; Frijns et al., 2005; Keijsers, Branje, Frijns et al., 2010; Keijsers, Branje, VanderValk et al., 2010; Laird & Marrero, 2010; Smetana et al., 2006; Smetana et al., 2009; Soenens, Vansteenkiste, Luyckx, & Goosens, 2006; Stattin & Kerr, 2000; Youniss & Smollar, 1985). It is therefore likely that the relationship between teens' perceptions of pressured information management and their subsequent adjustment will also vary as a function of gender.

For example, previous studies indicate girls require more emotional support from parents and experience more reciprocity, connectedness and intimacy with mothers than do boys (Field, Lang, Yando, & Bendell, 1995; Youniss & Ketterlinus, 1987; Youniss & Smollar, 1985). This, however, appears to be at odds with the use of secrecy as an interpersonal strategy, which creates distance in the relationship between the secret-keeper and the person from whom the secret is kept (Buhrmester & Prager, 1995; Finkenauer et al., 2008; Finkenauer et al., 2002), and suggests the costs of secrecy in adolescence may be more pronounced for females than it is for males. Consistent with this, Keijsers, Branje, Frijns et al. (2010) found stronger concurrent and longitudinal linkages between girls' use of secrecy with parents and poorer quality parent-child relationships than they did for boys. Further supporting these findings is research which has found keeping a private secret is more strongly associated with somatic complaints and depressive mood for girls than it is for boys (Frijns et al., 2013). It was expected these gender differences would be accentuated in the

context of pressured secrecy owing to the particularly negative relational circumstances implicated by this form of information management. Accordingly, it was hypothesized that girls in this study who engaged in more pressured secrecy would experience worse subsequent psychological outcomes than boys who also reported engaging in more pressured secrecy.

In addition, Frijns et al. (2013) posited that girls might reap more benefits from sharing previously withheld information than their male counterparts. This may be because girls tend to desire closer relationships with their mothers, often choosing to confide personal information to female caregivers and to a greater degree than male adolescents (Cauce et al., 1996; Smetana et al., 2006; Youniss & Smollar, 1985). Given disclosure serves particular interpersonal functions, such as enhancing relationship development (Buhrmester & Prager, 1995; Derlega & Grzelak, 1979), sharing of information with mothers, even when such disclosure feels pressured, may yield relational benefits for girls that are not as germane to boys. Thus, while girls in this study were expected to be more vulnerable than boys to the negative psychological consequences associated with pressured secrecy, it was anticipated they would be somewhat buffered against the adverse implications of pressured disclosure experienced by their male counterparts.

While a direct effects model positing that pressured information management has an impact on boys and girls subsequent psychological functioning was of primary interest in this study, the plausibility of two other causal models were also explored to clarify the direction of the expected relationships. This approach is consistent with the position that alternate and reciprocal models of causation should be considered if understanding about the relationship that exists between parent-teen processes and adolescent outcomes is to be enriched (Keijsers, Branje, VanderValk et al., 2010; Kerr & Stattin, 2000; Kerr et al., 2010; Racz & McMahon, 2011; Stattin & Kerr, 2000). A reverse effects model was thus tested, asserting that poorer adolescent psychological adjustment influences teens' beliefs that their information

management decisions are pressured. In addition, a full bidirectional model which incorporated paths from both the direct and reverse effects models was examined, taking into account the possibility that adolescents' feelings of pressured information management may lead to poorer psychological adjustment, which in turn may increase teens' perceptions that their information management choices are pressured. These three models (representing direct, reverse and full bidirectional effects) were compared to determine which one provided the best explanation of the data. Although it has been suggested that teens with psychological adjustment difficulties may make different information management decisions to those who are well adjusted (e.g., Frijns & Finkenauer, 2009; Frijns et al., 2005; Frijns et al., 2010; Pachankis, 2007), strong support for the contribution of adolescents' internalizing problems to their subsequent information management choices has not been obtained (e.g., Frijns & Finkenauer, 2009; Frijns et al., 2010). It was thus anticipated that the direct effects model postulating that pressured secrecy and disclosure are determinants, as opposed to outcomes, of adolescent adjustment, would provide a superior fit for the data.

In sum, the primary aim of the current study was to compare boys' and girls' psychological responses to two forms of information management strategies used with mothers, but yet unexplored: pressured disclosure and pressured secrecy. Accordingly, a new scale, called the PIMS, was created to assess the degree to which youths report engaging in these strategies. It was anticipated that a direct effects model proposing a longitudinal linkage from pressured information management to teens' psychological adjustment would provide a better explanation for the data than a reverse or full bidirectional effects model. Specifically, pressured secrecy was hypothesized to have an adverse impact on adolescents' depression, anxiety and stress over time, and that this relationship would be stronger for girls than it would be for boys. In contrast, while pressured disclosure was also expected to negatively influence adolescents' subsequent psychological functioning, it was anticipated that the emotional responses of girls would be more favorable than those of their male counterparts.

Method

Participants

The sample consisted of 463 (268 male, $M_{\text{age}} = 13.97$, $SD = 1.43$, range: 12-17 years) Australian students from middle-class backgrounds in grades 8 and 11. Students were tested first at Time 1 (T1) and again seven months later at Time 2 (T2). While data were collected from a total of 567 adolescents at T1, only 463 of these students completed the T2 questionnaire due to absenteeism and the migration of the sample. This resulted in an attrition rate of 18.34%, which is less than or comparable to that reported in other studies on adolescents' information management with parents (e.g., Frijns et al., 2005; Kerr et al., 2010; Tilton-Weaver et al., 2010). Similar to other research (e.g., Frijns et al., 2005; Marshall et al., 2005), only data from the 463 students who participated in both waves of data collection were included in this study. A series of mixed multi-level analyses were conducted comparing the responses of participants with complete data for both waves and those who were only present for a single time point on the key variables of interest. The linear mixed model procedure was adopted due to the specific advantage associated with this statistical method for handling 'unbalanced' analyses (Affleck, Zautra, Tennen, & Armeli, 1999; SPSS, 2005). The results of these analyses indicated that no significant differences between students who participated in both or one wave of data collection were present for any of the study variables.

Approximately 82% of the sample was White, 10% Asian, 3% Middle-Eastern, and the remaining 5% were from other ethnic groups. Parental consent for students to participate in the study was obtained using active consent. Written assent was also obtained from each adolescent prior to participation.

Measures

The Pressured Information Management Scale (PIMS). The PIMS is a 12-item instrument that was created for the current study. It consists of two subscales which are measured by six items each: pressured disclosure and pressured secrecy. Items assess the

extent to which teenagers' decisions to engage in these two information management strategies are motivated by an underlying belief that the adolescent has no other choice, given the negative maternal attitudes they perceive and adverse reactions to disclosure or secrecy they anticipate. For pressured disclosure, participants were asked to consider the times they have told their mother what was going on in their life (without her having to ask) and rate how much they agreed with each item (e.g., *'she makes me feel like I have to tell "or else"'*) on a 6-point Likert scale, ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). For pressured secrecy, they were asked to consider the times they have not told their mother about what was going on in their life and to rate how much they agreed with each item (e.g., *'she would react badly if I did tell her'*) on the same 6-point Likert scale.

A series of steps were taken in developing this measure. First, an initial pool of 17 items was collated with nine items representing adolescent pressured secrecy and eight items representing adolescent pressured disclosure. These items were developed following an examination and synthesis of the key themes from the extant body of literature concerning adolescents' reasons for disclosure, non-disclosure and secrecy (e.g., Darling et al., 2006; DePaulo & Kashy, 1998; Marshall et al., 2005; Smetana et al., 2006; Smetana et al., 2009). Motivations for engaging in these information management strategies that implicated other-focused pressures (e.g., telling because adolescents fear the consequences of not telling; Marshall et al., 2005) were targeted. These were considered different from self-focused processes that reflected the adolescents' own choice to engage in that information management strategy (e.g., telling because they want to create intimacy in the relationship; Buhrmester & Prager, 1995).

This larger initial pool was then reduced to 16 items, with one pressured secrecy item deleted on the basis of feedback provided by a panel that consisted of fifteen experts in the field of child psychology. These experts rated each item with respect to how well it reflected the intended pressure subscale, considering both face validity for the item and its

appropriateness for adolescents aged 13 to 17 years. The experts further indicated the one item they would exclude and the one item they considered best assessed adolescent pressure to engage in that specific information management strategy with mothers. The wording of items was also modified on the basis of feedback provided by these experts. After revisions were made, a focus group of four teenagers drawn from the same age group and background as adolescents who participated in this study was held in order to pilot the final questionnaire with respect to item relevance and comprehension. Two additional items from each of the pressured secrecy and pressured disclosure subscales were deleted owing to concerns they reflected a concept different from that captured by the remaining items and therefore impacted the interpretability of the overall subscale. The resulting instrument, named the PIMS, consisted of 12 items with six items reflecting adolescent pressured disclosure and six items reflecting adolescent pressured secrecy (see Appendix A for final scale). The reliability alphas for the PIMS were .87 at T1 and .89 at T2. For the pressured disclosure and pressured secrecy subscales, reliability alphas were .80 and .88 at T1 and .83 and .89 at T2, respectively.

The Depression Anxiety Stress Scales. The 21-item short form of the Depression Anxiety Stress Scales (DASS-21; Lovibond & Lovibond, 1995) was used to measure adolescents' psychological adjustment. This self-report inventory assesses the presence and severity of symptoms of three negative emotional states: depression (7 items; e.g., *'I felt I had nothing to look forward to'*), anxiety (7 items; e.g., *'I was worried about situations in which I might panic and make a fool of myself'*) and stress (7 items; e.g., *'I found it difficult to relax'*). Items are rated on a 4-point Likert scale, ranging from 0 (*did not apply to me at all*) to 3 (*applied to me very much, or most of the time*), with higher scores indicative of higher levels of negative emotionality. The DASS-21 has been used extensively in adult populations where it has been well-validated, demonstrating a stable factor structure, good convergent and discriminant validity and high internal consistency in both clinical and non-clinical samples (e.g., Antony, Bieling, Cox, Enns, & Swinson, 1998; Henry & Crawford, 2005; Lovibond &

Lovibond, 1995). More recently, the DASS-21 has also been used as a measure of negative affect in adolescent populations and demonstrated good internal consistency (e.g., Einstein, Lovibond, & Gaston, 2000; Jovanovic & Brdaric, 2012; Ricciardelli & McCabe, 2001; Tan & Martin, in press; You, Leung, & Fu, 2012). In this study, the reliability alphas for the DASS-21 were .93 at T1 and .94 at T2. The reliability alphas for the depression, anxiety and stress subscales of the DASS-21 at T1 were .89, .81 and .85, respectively. At T2, these subscale reliability alphas were .90, .81 and .87.

The original three-factor structure of the DASS-21 proposed by Lovibond and Lovibond (1995) has consistently yielded fit indices suggestive of reasonable fit in adolescent samples (e.g., Osman et al., 2012; Szabó, 2009; Tully, Zajac, & Venning, 2009; Willemsen, Markey, Declercq, & Vanheule, 2011). Despite this, reservations about its application to teenagers exist as the validity of the stress factor for this age group has been questioned in some studies (Szabó, 2010; Tully et al., 2009; Willemsen et al., 2011). Szabó (2010), however, argued that simplified versions of the DASS-21 may increase the reliability and validity of the scale for younger populations, given it was originally designed for adults and thus contains expressions that could be unfamiliar to adolescents. In the current study, additional clarifying information was provided in parentheses for items identified by the teen focus group as difficult to understand in order to facilitate understanding and increase the validity of the DASS-21 in this adolescent population [e.g., *I felt that I was rather touchy (or “easily upset/irritated”)*].

A confirmatory factor analysis (CFA) was conducted using Mplus 6 (Muthén & Muthén, 2010) to determine whether the original three-factor structure fit the data.¹⁰ Given there was some skewness in the data (skewness ranged from .47 to 2.15; kurtosis ranged from .08 to 4.07), robust chi-square test statistics were calculated using the Mean-adjusted Maximum Likelihood (MLM) estimator (Satorra & Bentler, 1994), which is considered a more optimal method for estimating standard errors when normality assumptions are violated. The MLM chi-square test is based on the Satorra-Bentler scaled chi-square statistic ($S-B\chi^2$; Satorra & Bentler, 1988), which serves as a correction for the Maximum Likelihood chi-square statistic when distributional assumptions are violated. The fit indices that were yielded suggested the original three-factor structure of the DASS-21 provided an adequate fit for the data [$S-B\chi^2(186, N = 463) = 442.48, p < .001, RMSEA = .06, CFI = .92, TLI = .91$].

Missing Data

Missing data at the individual item level ranged from 1.5 to 17.9%. Multiple imputation with 20 completed datasets produced using the EM (expectation-maximization) algorithm in IBM SPSS Statistics 19 was used to handle missing data for individual items and the results of analyses were pooled in line with Rubin's (1987) recommendations. This procedure imputes values for missing data without introducing bias and has been repeatedly shown to be superior to other common methods of handling item nonresponse, including list-wise deletion, pair-wise deletion and mean substitution (Allison, 2001; Enders, 2001; Schafer & Graham, 2002).

¹⁰ Model fit in this study was assessed using three goodness-of-fit indices: Root Mean Square Error of Approximation (RMSEA; Steiger & Lind, 1980), Comparative Fit Index (CFI; Bentler, 1990) and Tucker-Lewis Index (TLI; Tucker & Lewis, 1973). According to Hu and Bentler (1999), a cut-off value close to or below .06 for the RMSEA is indicative of good model fit. Others have further argued that values between .06 and .08 represent reasonable fit and those between .08 and .10 suggest mediocre fit, given the sensitivity of the RMSEA to sampling error and model complexity (Browne & Cudeck, 1993; MacCallum, Browne, & Sugawara, 1996). An RMSEA above .10 is widely considered to be indicative of poor fit between the hypothesized model and the data (Browne & Cudeck, 1993; MacCallum et al., 1996). Likewise, while Hu and Bentler (1999) argue that values close to or above .95 for the CFI and TLI represent good model fit, others have argued this cut-off is too restrictive, especially for multifactor rating scales where analyses are conducted at the item level (Marsh, Hau, & Wen, 2004). Values above .90 for these comparative fit indices have therefore been advocated as indicative of adequate model fit (Bentler & Bonnett, 1980).

Procedure

Schools agreeing to take part in the current study were asked to forward consent forms to the parents of all students eligible for participation. As it was not possible to obtain data regarding how many families were actually forwarded these forms, an accurate response rate cannot be calculated. However, of those forms returned, the proportion of parents/guardians who provided their consent was approximately 76.0%.

Participants completed a pen-and-paper questionnaire during the first part of the school year, and again seven months later. Two forms of the questionnaire were prepared that counterbalanced the sequence in which scales were presented. These different questionnaire versions were randomly administered at each testing session by trained research assistants on school premises during group testing sessions lasting approximately 40-50 minutes. Moreover, the chief investigator was present during all testing sessions in order to answer questions as required and provide a verbal explanation of instructions that were presented in written form. Respondents were asked to answer the survey questions in relation to their mother, or the person that has assumed the role of their mother.¹¹ Participants were assured that their individual responses were confidential and would not be seen by parents, teachers, or peers. It was also explained that there were no right or wrong answers to questions in the survey and that they should simply answer honestly.

Results

Analytic strategy

Where appropriate, analyses were conducted using Mplus 6 (Muthén & Muthén, 2010) with MLM estimation to account for skewness in the data,¹² or otherwise, using IBM

¹¹ Four students identified someone other than their biological mother as the woman who raised them (e.g., adopted mother). Linear mixed model analyses were conducted comparing the responses of participants identifying their biological mother as the target of their responses and those who selected a different individual. For the major variables of interest, these analyses yielded no statistically significant differences between these two groups.

¹² As well as the DASS-21, some skewness was also present for items in the PIMS (skewness ranged from .16 to 1.65; kurtosis ranged from -.02 to 2.03). Classic rules of thumb for interpreting skewness suggest values greater than ± 1 indicate the distribution is highly skewed (Bulmer, 1979).

SPSS Statistics 19. As the data presented are hierarchical with students nested within schools, preliminary analyses were conducted to examine the potential effect of clustering on analyses using the linear mixed modeling procedure. A random intercept model predicting adolescents' psychological functioning from pressured disclosure and pressured secrecy with school as a random factor was performed at each time point. Teens' psychological adjustment was operationalized in terms of each of the three negative emotional states assessed by the DASS-21 (depression, anxiety and stress). The random factor was not significant for all analyses. The intraclass correlation (ICC) was also calculated for each analysis to determine the amount of variance in the outcome variables that was attributable to differences between schools, with values less than .25 suggesting that modeling of the nested data structure is unnecessary (Kreft, 1996). The ICCs obtained in this study ranged from .0 to .05, indicating there was no significant clustering effect of school. Therefore, the hierarchical effect of schools was not accounted for in subsequent analyses.

Results are presented in four parts: 1) Analyses outlining the factor structure and measurement invariance of the PIMS; 2) Correlations between all major variables at T1 and T2, separately for boys and girls; 3) Multivariate multiple regression analyses examining gender differences for all major variables at both time points; and 4) Multi-group longitudinal analyses comparing the relationship between types of pressured information management and psychological adjustment variables for boys and girls. Three models were tested. A direct effects model examined the impact of T1 pressured disclosure and pressured secrecy on T2 depression, anxiety and stress. Then, a reverse effects and full bidirectional model were considered to determine which of the three models provided the best fit for the data.

Factor structure and measurement invariance of the PIMS

To examine the factor structure of the 12-item PIMS measure, an exploratory factor analysis (EFA) was conducted on T1 data. Kaiser's rule for extracting factors was used to retain factors with eigenvalues greater than 1.00. Oblimin rotation was then utilized as the

pressured secrecy and pressured disclosure subscales were expected to correlate. Indeed, the final factor correlation matrix revealed a factor correlation of .49. The results of the EFA suggested a conceptually meaningful two-factor solution that included pressured disclosure and pressured secrecy and accounted for 58.14% of the variance in PIMS items.¹³

Metric invariance is an important prerequisite to enable meaningful comparisons across groups (Bollen, 1989). A multigroup structural equation modeling approach within the framework of a CFA was used to test the cross-group factorial invariance of the PIMS for boys and girls (see Byrne, 2008). A well-fitting baseline model was established for each group separately by examining the modification indices yielded for the two-factor solution of the PIMS. Items with large residual covariances that shared similar wording were allowed to correlate, in line with the recommendations of Cole, Ciesla, and Steiger (2007). This resulted in one pair of correlated items for each subscale (pressured disclosure: items 3 and 6, both containing “I have to tell”; pressured secrecy: items 5 and 6, where synonyms of “no choice” were used). The resulting baseline models for boys [$S-B\chi^2(62, N = 268) = 145.99, p < .001$, RMSEA = .07, CFI = .95, TLI = .93] and girls [$S-B\chi^2(62, N = 195) = 129.80, p < .001$, RMSEA = .08, CFI = .94, TLI = .92] fit the data reasonably well. A multigroup CFA model with all parameters freely estimated for the two groups [$S-B\chi^2(102, N = 463) = 215.94, p < .001$, RMSEA = .07, CFI = .95, TLI = .94] was compared to a metric invariance model with all factor loadings constrained to be equal across gender [$S-B\chi^2(112, N = 463) = 229.98, p < .001$, RMSEA = .07, CFI = .95, TLI = .94]. The Satorra-Bentler scaled difference chi-square test statistic (Satorra & Bentler, 2001), obtained using computer software developed by Crawford and Henry (2003), was not significant [$S-B\chi^2(10, N = 463) \text{ difference} = 13.18, p = .214$]. This indicated the equality constraints specified in the more restrictive model were tenable, and accordingly, that items on the PIMS were interpreted in the same way by boys

¹³ The results of this exploratory factor analysis are shown in Appendix B. A confirmatory factor analysis that was conducted on the overall sample and replicated this factor structure was not included in the manuscript submitted for publication but is discussed in Appendix B.

and girls in this study. Full scalar invariance was tested by additionally constraining the intercepts of all indicators to be equal for boys and girls [$S-B\chi^2(122, N = 463) = 256.13, p < .001$, RMSEA = .07, CFI = .94, TLI = .94] but was not supported by the data [$S-B\chi^2(20, N = 463)$ difference = 39.96, $p = .005$].

Several authors have argued that full scalar invariance is not necessary for substantive analysis to continue (Byrne, Shavelson, & Muthén, 1989; Steenkamp & Baumgartner, 1998). Rather, partial scalar invariance is considered sufficient and is demonstrated when at least two indicators are shown to have equal factor loadings and intercepts across groups. Partial scalar invariance was thus tested by sequentially releasing the equality constraints on the intercepts of items that most severely violated scalar invariance, relative to the other indicator intercepts in the model. After the equality restraints for the intercepts of pressured secrecy items 3 and 4 were released, partial scalar invariance was supported by the data [$S-B\chi^2(120, N = 463) = 244.08, p < .001$, RMSEA = .07, CFI = .95, TLI = .94; $S-B\chi^2(18, N = 463)$ difference = 27.03, $p = .078$]. This suggested the PIMS possessed partial strong factorial invariance across gender, thereby allowing differences between boys and girls to be compared in subsequent analyses.

The extent to which the PIMS exhibited measurement invariance across T1 and T2 was also examined. The configural model in which the factor structure of the PIMS for both waves of data collection were modeled simultaneously and with all parameters freely estimated [$S-B\chi^2(230, N = 463) = 612.95, p < .001$, RMSEA = .06, CFI = .93, TLI = .92] was compared to a metric invariance model where factor loadings across time were constrained to be equal [$S-B\chi^2(240, N = 463) = 625.33, p < .001$, RMSEA = .06, CFI = .93, TLI = .92]. The Satorra-Bentler scaled difference chi-square test statistic (Satorra & Bentler, 2001) was not significant [$S-B\chi^2(10, N = 463)$ difference = 10.29, $p = .416$], indicating that metric invariance of the PIMS across time was supported by the data. Full scalar invariance at T1 and T2 was also tested and similarly supported [$S-B\chi^2(20, N = 463)$ difference = 19.44, $p =$

.493]. A full uniqueness model of invariance that additionally constrained residual variances across time was examined and supported by the data [$S-B\chi^2(32, N = 463)$ difference = 40.48, $p = .144$]. This suggested the PIMS possessed strict factorial invariance across time.

Correlations between variables

Intercorrelations between all major variables involved in this study at T1 and T2 are presented separately for boys and girls in Table 1. All intercorrelations were significant and positive, except for the relationship between T2 pressured disclosure and anxiety for girls, which was not significant.

Table 1

Intercorrelations for boys and girls between all major variables at T1 and T2

Variable	1	2	3	4	5
1. Pressured disclosure		.40*** (.52***)	.22*** (.31***)	.29*** (.27***)	.20** (.24***)
2. Pressured secrecy	.55*** (.56***)		.44*** (.35***)	.33*** (.30***)	.43*** (.30***)
3. Depression	.28*** (.30**)	.29*** (.29***)		.59*** (.78***)	.71*** (.83***)
4. Anxiety	.28*** (.13)	.31*** (.19**)	.72*** (.69***)		.70*** (.80***)
5. Stress	.35*** (.24**)	.32*** (.28***)	.76*** (.73***)	.75*** (.73***)	

Note. Intercorrelations are presented above the diagonal for boys ($n = 268$), below the diagonal for girls ($n = 195$), and in parentheses for T2.

** $p < .01$ *** $p < .001$.

Table 2 displays cross-time correlations for all variables separately for boys and girls. The moderate to strong correlations between initial and subsequent levels of each variable indicates pressured information management and psychological adjustment were stable over time. With the exception of some associations for girls, including T1 pressured disclosure and T2 anxiety, as well as T1 depression and T2 pressured disclosure, all cross-time correlations were significant and positive. Of note, for both boys and girls, cross-time correlations

between PIMS subscales and adjustment were stronger for pressured secrecy than pressured disclosure. Moreover, for girls the relationship between pressured secrecy and subsequent adjustment was strongest for depressive symptoms. In contrast, the strongest correlation between pressured secrecy and subsequent adjustment for boys was for stress.

Table 2

Cross-time correlations for boys and girls between all major variables

Variable	T2 Pressured disclosure	T2 Pressured secrecy	T2 Depression	T2 Anxiety	T2 Stress
Boys^a					
T1 Pressured Disclosure	.41***	.32***	.16*	.14*	.12*
T1 Pressured Secrecy	.24***	.50***	.28***	.23***	.30*
T1 Depression	.20**	.34***	.55***	.39***	.46***
T1 Anxiety	.21***	.26***	.39***	.45***	.35***
T1 Stress	.16*	.32***	.46***	.41***	.50***
Girls^b					
T1 Pressured Disclosure	.64***	.36***	.24**	.08	.20**
T1 Pressured Secrecy	.43***	.61***	.35***	.22**	.28***
T1 Depression	.13	.17*	.59**	.50***	.47***
T1 Anxiety	.18*	.20**	.51***	.56***	.45***
T1 Stress	.23**	.25***	.54***	.51***	.61***

^a $n = 268$. ^b $n = 195$.

* $p < .05$ ** $p < .01$ *** $p < .001$.

Gender differences for all major variables

Gender differences for the major variables of interest at T1 and T2 were examined using the multivariate multiple regression procedure to control for the inflated Type-I error rate that results from performing multiple analyses. The dependent variables were all relevant predictors and outcome measures at both time points. The independent variable was gender. This model was saturated. The fit of a model in which all regression coefficients were jointly constrained to zero was significantly worse [$S-B\chi^2(10, N = 463) = 42.77, p < .001$]. This indicated the overall multivariate effect of gender was significant. The Wald test of parameter

constraints was also conducted and provided further evidence that the overall effect of gender was significant [Wald S-B χ^2 (10, $N = 463$) = 44.04, $p < .001$].

An examination of individual path coefficients from the unconstrained model revealed that significant gender differences were evident for depression (T1: $\beta = .10$, $z = 2.21$, $p = .027$; T2: $\beta = .12$, $z = 2.53$, $p = .012$) and stress (T1: $\beta = .20$, $z = 4.25$, $p < .001$; T2: $\beta = .17$, $z = 3.68$, $p < .001$) at both T1 and T2. A significant gender effect was also obtained for anxiety ($\beta = .12$, $z = 2.63$, $p = .009$) and pressured disclosure ($\beta = -.11$, $z = -2.43$, $p = .015$) at T1. As can be seen in Table 3, girls reported higher scores than boys across all measures, except pressured disclosure, for which boys provided higher scores at T1, relative to their female counterparts.

Table 3

Relevant means and standard deviations for the overall sample and separately for each gender

Variable	Pressured disclosure	Pressured secrecy	Depression	Anxiety	Stress
T1 Means (SD)					
Overall Sample	2.61 (1.03)	2.88 (1.26)	.70 (.69)	.56 (.57)	.87 (.66)
Boys ^a	2.71 (1.05)	2.93 (1.25)	.64 (.63)	.50 (.50)	.76 (.58)
Girls ^b	2.48 (1.00)	2.82 (1.27)	.78 (.75)	.64 (.64)	1.02 (.73)
T2 Means (SD)					
Overall sample	2.62 (1.08)	2.91 (1.27)	.65 (.70)	.48 (.54)	.84 (.69)
Boys ^a	2.70 (1.10)	2.96 (1.26)	.58 (.65)	.45 (.53)	.74 (.68)
Girls ^b	2.51 (1.04)	2.85 (1.29)	.74 (.75)	.53 (.55)	.97 (.70)

^a $n = 268$. ^b $n = 195$.

The invariance of these gender differences at T1 and T2 was examined by testing whether the effects of gender observed on predictors and outcome measures at T1 were equivalent to the impact of gender on these variables at T2. The Wald test of parameter constraints confirmed that the effect of gender at T1 did not differ significantly from its effect at T2 [Wald S-B χ^2 (5, $N = 463$) = 3.14, $p = .678$].

Relationship between pressured information management and adolescent psychological functioning

Three separate models specifying different directionality for the relationship between pressured information management and teens' psychological adjustment were examined (see Figure 1). Model 1, the direct effects model, tested the notion that pressured information management has a direct impact on adolescents' subsequent emotional functioning by including paths from pressured disclosure and secrecy at T1 to each psychological adjustment variable at T2. To clarify the directionality of the relationships observed for Model 1, the reverse effects model was tested, which is depicted as Model 2 in the figure. This examined the impact of adolescents' psychological adjustment on subsequent feelings of pressured information management by including paths from each T1 adjustment variable to pressured disclosure and secrecy at T2. A full bidirectional model, represented by Model 3, was also investigated. This tested whether pressured information management affected subsequent emotional functioning, and whether this in turn invoked further pressured disclosure and secrecy. Paths from T1 pressured information management to T2 adjustment variables, as well as T1 adjustment variables to T2 pressured information management were thus examined in Model 3.

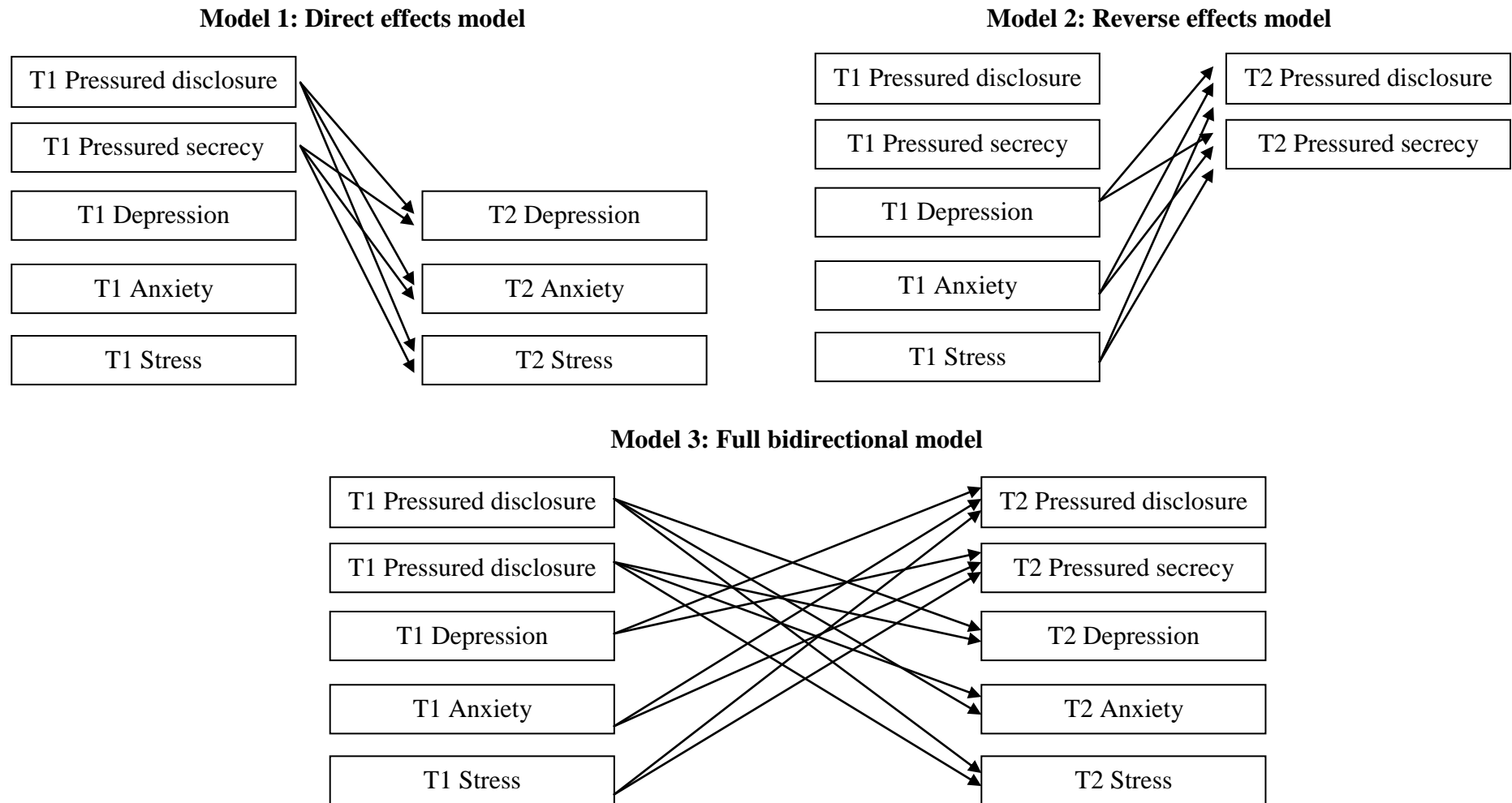


Figure 1. Models depicting possible relationships between adolescent pressured information management and adjustment. For clarity, the autoregressive paths for endogenous variables are not represented, but were included for all analyses. The relevant T1 variables are thus included above.

Each model was tested using a multigroup analysis for gender. The autoregressive paths for all endogenous variables in the model were included to control for the degree of temporal stability associated with these variables. The Akaike Information Criterion (AIC) was then used to compare the three competing models, as these models were not nested (Burnham & Anderson, 2002). In the context of regression, the AIC is considered asymptotically optimal and preferable to other measures of relative model fit, including the Bayesian Information Criterion (BIC). This is because the AIC penalizes free parameters less strongly than the BIC and is regarded as more robust when sample sizes are large (Burnham & Anderson, 2002, 2004; Shibata 1980, 1981; Yang, 2005). AIC differences between competing models therefore provide a reliable indication of which model yields the best fit: the lower the AIC, the better the model fit. Burnham and Anderson (2002) provide recommended cut-offs for substantive AIC differences and suggest differences between four and seven across models provides considerable support for the model with the lower AIC.

Model fit indices and relative goodness of fit measures (here, the AIC) are presented in Table 4. Model 1, the direct effects model, demonstrated reasonable model fit, with a CFI of .98 and TLI of .94. Although the RMSEA was larger than the recommended cut-off for well-fitting models, it did not exceed the $<.10$ guideline that is offered by MacCallum et al. (1996), which takes into account the sensitivity of the RMSEA to both sampling error and model complexity. Moreover, Brown (2006) argues that with limited degrees of freedom, the magnitude of the RMSEA is of less concern, provided all other indices (e.g., the CFI and TLI) are robust and suggestive of good model fit, which is the case with Model 1.

Table 4
Comparison of model fit indices and AIC for all three models

Model	S-B χ^2	df	RMSEA	CFI	TLI	AIC
Model 1 Direct effects	36.23***	12	.09	.98	.94	1496.68
Model 2 Reverse effects	10.61***	4	.08	.98	.92	2520.94
Model 3 Full bidirectional model	48.47***	16	.09	.98	.91	4013.49

*** $p < .001$.

As can be seen in Table 5, the results of the direct effects model indicated that boys who reported greater pressured secrecy at T1, also had higher stress scores at T2 ($\beta = .18$, $z = 2.62$, $p = .009$). For girls, higher pressured secrecy scores at T1 were associated with more depression ($\beta = .23$, $z = 3.04$, $p = .002$) and anxiety ($\beta = .15$, $z = 2.17$, $p = .030$) at T2. Furthermore, girls who reported more pressured disclosure at T1, reported less anxiety at T2 ($\beta = -.15$, $z = -2.13$, $p = .033$).

Table 5
Longitudinal direct effects model results (standardized)

Variable	Estimate	Std. Error	Z-score
Boys			
T1 Depression → T2 Depression	.38***	.05	7.91
T1 Pressured disclosure → T2 Depression	.04	.06	.56
T1 Pressured secrecy → T2 Depression	.11	.08	1.45
T2 Depression → unexplained variance	.79***	.05	16.39
T1 Anxiety → T2 Anxiety	.33***	.04	7.43
T1 Pressured disclosure → T2 Anxiety	< -.01	.07	-.05
T1 Pressured secrecy → T2 Anxiety	.13	.08	1.72
T2 Anxiety → unexplained variance	.85***	.04	19.82
T1 Stress → T2 Stress	.31***	.04	7.81
T1 Pressured disclosure → T2 Stress	-.01	.06	-.08
T1 Pressured secrecy → T2 Stress	.18**	.07	2.62
T2 Stress → unexplained variance	.83***	.04	19.23
Girls			
T1 Depression → T2 Depression	.46***	.05	9.03
T1 Pressured disclosure → T2 Depression	-.01	.08	-.08
T1 Pressured secrecy → T2 Depression	.23**	.08	3.04
T2 Depression → unexplained variance	.67***	.06	12.16
T1 Anxiety → T2 Anxiety	.51***	.06	9.21
T1 Pressured disclosure → T2 Anxiety	-.15*	.07	-2.13
T1 Pressured secrecy → T2 Anxiety	.15*	.07	2.17
T2 Anxiety → unexplained variance	.72***	.05	13.29
T1 Stress → T2 Stress	.49***	.05	10.05
T1 Pressured disclosure → T2 Stress	-.01	.07	-.08
T1 Pressured secrecy → T2 Stress	.09	.07	1.19
T2 Stress → unexplained variance	.73***	.05	13.82

* $p < .05$ ** $p < .01$ *** $p < .001$.

Although Model 2, the reverse direct effects model, provided a reasonable fit for the data, none of the paths from T1 adjustment variables to T2 pressured information management were significant. An examination of AIC differences between Model 1 and 2 provided further confirmation that the direct effects model was considerably superior to reverse effects model. Likewise, Model 3, the full bidirectional model yielded an AIC that was considerably larger than the AIC reported for Model 1. Therefore, these results indicated the direct effects model was preferable to both the reverse effects and full bidirectional model in providing a parsimonious explanation of the data. That is, a longitudinal relationship from pressured information management to adolescent adjustment provided a better fit for the data

than a model specifying a longitudinal relationship from adjustment to pressured information management, or a full bidirectional model that incorporated both direct and reverse effects.

Discussion

This study compared the impact of teens' pressured information management beliefs on boys' and girls' subsequent emotional functioning. While pressured secrecy exacted a negative influence on both boys' and girls' adjustment over time, the specific psychological consequences were different for each gender and seemingly more pernicious for girls. In contrast, pressured disclosure did not lead to negative outcomes for adolescents. In fact, it was linked to reduced anxiety symptoms for girls. These findings support the view that considering the parent-child relational context is crucial for understanding teens' information management decisions and how these choices impact their adjustment (Keijsers & Laird, 2010; Laird & Marerro, 2010; Tilton-Weaver et al., 2010). Furthermore, these results highlight the important contribution of other-focused pressured information management to adolescents' psychosocial well-being, the impact of which has until now been relatively ignored. More specifically, these findings suggest that for adolescents who feel their decision to engage in secrecy with mothers is driven by the belief they have limited recourse to do otherwise, a negative price on their psychological functioning may be incurred. Although not tested directly in this study, it is possible the adverse emotional responses observed occurred over and above the well-established consequences that arise from using secrecy as an information management strategy.

Consistent with expectations, associations were found between adolescents' perceptions of pressured secrecy and their later endorsement of negative emotional states. For boys, higher ratings of pressured secrecy were associated with more stress over time. In contrast, girls who endorsed more pressured secrecy initially, reported more subsequent symptoms of depression and anxiety. In line with predictions, pressured secrecy therefore yielded a broader and more adverse impact on psychological outcomes for girls than it did for

boys. This is consistent with past research demonstrating the cost of secrecy for female adolescents is greater than it is for male adolescents (e.g., Frijns et al., 2013; Frijns et al., 2010; Keijsers, Branje, Frijns et al., 2010). It also accords with the position taken in this study that these gender differences would be evident when other-focused pressures drive the use of this information management strategy and implicates the role of the negative relational context that underscores pressured secrecy, yet seems at odds with the importance of the mother-child relationship for daughters.

The finding that girls who reported more pressure to engage in secrecy with mothers also experienced more depression over time not only aligns with past research indicating that secrecy has a negative impact on adolescents' mood and the quality of the parent-child relationship, but also with studies which suggest these effects are more profound for girls than boys (Finkenauer et al., 2008; Finkenauer et al., 2002; Frijns et al., 2005; Frijns et al., 2013; Frijns et al., 2010; Keijsers, Branje, Frijns et al., 2010). The other-focused nature of the reasoning underlying this pressured information management tactic further implies that girls who endorse this strategy may ultimately want to share aspects of their lives with mothers, but owing to the maternal attitudes they perceive and consequences to disclosure they anticipate, determine them inappropriate or unsuitable confidants. These findings suggest that for female adolescents, pressured secrecy may lead to a loss of intimacy and connectedness with their mothers, resulting in feelings of sadness and a decline in positive affect that manifests as depressive symptoms.

In contrast, for boys, pressured secrecy and subsequent depression were not related. Although an unexpected finding and contrary to studies which suggest secrecy has a negative impact on adolescents' mood, even after controlling for gender (e.g., Frijns et al., 2005; Frijns et al., 2010), these results are consistent with other research which demonstrates male, compared with female adolescents, experience greater separateness from families, are less concerned about connectedness with parents and tend to be more impervious to the impact of

poorer family relationships on teens' psychological well-being (Avison & McAlpine, 1992; Keijsers, Branje, Frijns et al., 2010; Leadbeater, Kuperminc, Blatt, & Hertzog, 1999; Marshall, 2001; Rayle, 2005). It thus follows that boys would not experience the same decline in mood after pressured secrecy that girls do.

Girls in this study who reported more pressured secrecy also endorsed more anxiety symptoms over time. This is congruent with the view that adolescents who withhold information from parents experience increases in physiological arousal, owing to the constant active monitoring and suppression of thoughts that is associated with secret-keeping (Frijns et al., 2010). Anxiety may also derive from the fear of being 'found out' and the perceived consequences of failing to conceal these details. As negative beliefs about these expected costs of disclosure are considered key to pressured secrecy, it is perhaps unsurprising that anxiety would be triggered in the context of this information management tactic. However, other explanations are possible that consider the nature of anxiety itself, which is characterized by enduring feelings of stress, autonomic arousal and uneasiness (Lovibond & Lovibond, 1995; Norton, 2007), as well as the role of mothers as important relational targets for girls (Cauce et al., 1996; Youniss & Ketterlinus, 1987; Youniss & Smollar, 1985). Specifically, the use of pressured secrecy is likely to interfere with the desire of daughters for emotional reciprocity and intimacy with mothers. This may result in an internal conflict that gives rise to feelings of anxiety, as was observed in this study. This would also explain why the expected relationship between pressured secrecy and increased anxiety was not found for boys, who do not strive for intimacy and closeness with mothers to the same extent that girls do (Field et al., 1995; Youniss & Smollar, 1985). Alternatively, adolescent females who consider their mothers unlikely confidants and thus engage in pressured secrecy, may in turn disclose little about their behavior to mothers, thereby denying themselves access to a potentially important source of support and advice (Crouter & Head, 2002; Darling et al., 2006; Dishion & McMahon, 1998). This may give rise to anxious ruminations about the

challenges they face. Almas et al. (2011) support this view, suggesting that children who keep secrets from parents may fail to learn positive strategies for coping with distress. Indeed, teenagers who actively conceal information from parents are afforded fewer opportunities to receive this maternal guidance and are thus left to their own devices, or more likely, rely on the input of their equally inexperienced peers to manage difficult situations. Given the multitude of possibilities for why this novel finding occurred, determining its exact mechanism, or indeed, mechanisms, warrants further investigation and is a goal for future research.

For boys, higher ratings of pressured secrecy were associated with increased stress reactions over time. This supports past studies that have similarly found secrecy to be a precursor of stress (Frijns et al., 2005). However, as with the heightened anxiety response observed for girls, the precise mechanism of this effect remains unknown. Since stress has been conceptualized as a response to situations under which an individual feels pressured (Baum, Singer, & Baum, 1981; Norton, 2007), it is possible this pressure derives simply from believing one has no choice but to keep secrets from their mother. Thus, in response to this stressor, an increased stress reaction is observed. However, since only boys in this study reported elevated stress levels following pressured secrecy, this may implicate the role of other more gender-specific processes in accounting for this effect. For example, extensive research suggests boys tend to engage in more problem and delinquent behaviors than their female counterparts (Farrington & Painter, 2004; Lahey et al., 2006; Moffitt, Caspi, Rutter, & Silva, 2001). In the context of pressured secrecy, the impact of this may be two-fold. First, these boys may be more inclined to conceal information from mothers, thereby denying them the opportunity for advice and support to handle these high-risk situations and thus may feel more vulnerable to peer pressure. Secondly, since boys are especially prone to engaging in these high-risk behaviors, the perceived costs of failing to hide this information may be higher for male than female adolescents, given such activities typically elicit greater parental

disapproval and more severe punishment. Despite the strong body of evidence supporting the view that boys engage in comparatively more delinquent behaviors than girls, this explanation for the results remains only speculative as delinquency levels were not accounted for in this study. Future studies exploring the impact of pressured information management on teens' emotional functioning would therefore benefit from examining the potential role of engaging in delinquent and problem behaviors for the effects observed.

Consistent with expectations, the psychological impact of pressured disclosure was less aversive than the effects of pressured secrecy and more favorable for female than male adolescents. However, pressured disclosure did not result in the negative psychological outcomes that were anticipated. In fact, pressured disclosure imparted some benefits for female adolescents, with higher ratings associated with less anxiety over time. One possible explanation for this somewhat curious finding is that female adolescents who perceive more other-focused pressure to disclose information to mothers may in turn reveal more about their behavior and daily activities, thus allowing for maternal guidance. However, given no concomitant reduction in anxiety or stress was observed for boys also endorsing more pressured disclosure, this explanation seems unlikely. More plausible is the idea that pressured disclosure with female caregivers may impart relational benefits which are not as important to boys as girls, who strive for greater closeness and intimacy in their relationship with mothers. These may include offering an avenue for opening up dialogue between mothers and daughters, or at the very least, giving female adolescents the impression that their mothers have some interest in their lives. Irrespective of the exact mechanism driving this effect, the current findings suggest that for female adolescents, feeling pressured to engage in disclosure with mothers may have a more positive influence on their psychological functioning than was first anticipated. Moreover, for both boys and girls, the results suggest that the effects of pressured disclosure are less pernicious than the adverse impact of pressured secrecy on teens' psychological functioning.

An additional aim of this study was to compare the plausibility of three causal models in order to clarify the direction of the relationship between adolescents' pressured information management decisions and their psychological adjustment. Consistent with past research (e.g., Frijns & Finkenauer, 2009; Frijns et al., 2010), the direct effects model positing that pressured secrecy and disclosure impact boys' and girls' subsequent emotional functioning provided a better fit for the data than the alternative reverse effects and full bidirectional model. These findings provide additional support for the view that teens' information management choices are causes, not outcomes, of adolescent adjustment (Frijns & Finkenauer, 2009).

The current study is not without limitations and the reliance on adolescent self-report data should be acknowledged as multi-informant data may have provided a more reliable indication of adolescents' information management choices and psychological well-being. Nonetheless, there is increasing awareness that teens' perceptions may be more important than parents' perspectives for predicting adolescent outcomes (Jaccard, Dittus, & Gordon, 1998), and were thus the focus of this study. The emphasis on information management with mothers only should, however, also be noted. It is foreseeable that results obtained for boys in particular may be different when the paternal-child relationship is considered, as well as for pressured information management with other individuals, such as peers. Moreover, it is possible the impact of pressured information management on teens' psychological functioning that was observed occurred because such pressure impacts adolescents' actual disclosure and secrecy, which in turn affects adjustment. Although the impact of actual information management on teens' psychological functioning was not the focus of this study, but rather the consequences of choosing these strategies for a certain relational reason, future studies would benefit from considering the potential role played by actual disclosure and secrecy. Likewise, the possible contribution of other variables not included in this study but which may have influenced the results should be investigated. These include adolescent age, ethnicity and socio-economic background, as well as relevant parenting attributes.

Furthermore, whether the effects of other-focused pressured information management obtained would be different when these choices are driven by self-focused reasons cannot be ascertained from this study, given self-focused secrecy and disclosure were not examined. Future studies ought to directly compare the impact of both pressured and truly voluntary information management on adolescents' subsequent emotional functioning. In doing so, additional efforts to validate the PIMS as a meaningful measure of pressured information management with parents should be undertaken. Future research would also benefit from investigating whether the impact of pressured disclosure and secrecy varies as a function of issue type owing to studies that suggest the use and impact of information management strategies is dependent on the topic adolescents reveal or conceal (e.g., Smetana et al., 2006; Smetana, Villalobos, Rogge, & Tasopoulos-Chan, 2010; Smetana et al., 2009).

Despite these limitations, the current study contributes to the field by introducing the new concept of pressured information management, thereby enhancing understanding about the nature and impact of teens' information management choices. Also, the analysis of data at two time points enabled the consideration of both causal processes and alternative models of causation that took into account the stability of adolescent adjustment and pressured information management over time. Collectively, the results suggest that while adolescents may be active agents who make decisions about what information to share and not share with parents, these choices occur within the context of a parent-child relationship that cannot be overlooked. Considering how these relational circumstances influence teenagers' reasons for making the information management decisions they do is especially important if insight regarding the psychological consequences of these strategies is to be enhanced. When the family environment is characterized by a climate in which the adolescent perceives negative maternal attitudes and reactions to disclosure, teens may feel they have no choice but to withhold information from mothers and engage in a process we have coined 'pressured

secrecy'. Ultimately, these findings indicate the cost of secrecy under these conditions, particularly for girls, may be pricey.

Chapter 4

Polynomial Regressions with Response Surface Analyses: The Longitudinal Contribution of Agreement and Discrepancy Between Mother-Adolescent Disclosure Reports to Delinquency

Abstract

The contribution of congruence and discrepancy between mother-adolescent reports of teen disclosure to the development of delinquency has been increasingly recognized and was the focus of this longitudinal study. Data were collected from 193 mother-adolescent dyads (113 boys; $M_{\text{age}} = 13.82$ years at T1) and analyzed using polynomial regressions with response surface analyses, a sophisticated statistical procedure that has distinct advantages for capturing the intricacies of the relationship between multi-informant data and outcomes. Adolescent disclosure across different domains of social behavior was explored. The magnitude of discrepancy between mother-adolescent perceptions of prudential disclosure was positively associated with the number of delinquent activities teens endorsed at follow-up. For moral/conventional violations, there was a significant linear effect of agreement, such that higher subsequent levels of delinquency were reported when both mothers and teens initially rated the disclosure of these issues as low. This was different from the disclosure of personal activities, for which there was a curvilinear effect of agreement that indicated delinquency was less likely at the extremes of disclosure. Collectively, these findings suggest that mother-adolescent perceptions of youths' willingness for disclosure may play an important conjoint role in determining delinquent trajectories.¹⁴

¹⁴ Manuscript submitted for publication.

Introduction

Extensive research has shown that of the different pathways to parental knowledge, spontaneous disclosure from teens constitutes the most important source and is more highly correlated with adolescent adjustment than any other mechanism (Keijsers, Branje, VanderValk, & Meeus, 2010; Kerr & Stattin, 2000; Kerr, Stattin, & Burk, 2010; Stattin & Kerr, 2000). Often cited explanations for this finding posit that such disclosures provide parents with information about their child's engagement in problem behavior, which in turn affords parents the opportunity to impart teens with the guidance and support they need to navigate these high-risk situations (Crouter & Head, 2002; Darling, Cumsille, Caldwell, & Dowdy, 2006; Dishion & McMahon, 1998; Keijsers et al., 2010; Smetana, 2008). Implicit in this is the assumption that from these disclosures, parents acquire accurate awareness of their child's involvement in delinquent activities, a premise that may not hold when teens' disclosure reports diverge from those provided by their parents. It is therefore crucial when investigating this issue to adopt an approach that takes into account the mutual contribution of actual adolescent disclosure, as well as the accuracy of parental perceptions of this disclosure, in establishing the nature of the link between teenagers' willingness to divulge information to parents and psychosocial outcomes for teens.

Despite this imperative, there is a paucity of research examining this issue. Rather, to date, most studies investigating the association between adolescent disclosure and adjustment have opted for more simplistic conceptualizations based primarily on reports of disclosure from teenagers *or* their parents, but not both. Although a minority of studies (e.g., De Los Reyes, Goodman, Kliewer, & Reid-Quñones, 2010; Reidler & Swenson, 2012) have begun considering the additional role played by multi-informant disclosure discrepancies in adolescent outcomes, the methodologies currently used within developmental psychology may not fully capture the complexity of the interplay that exists between adolescent-reported disclosure, parent-reported disclosure and teenage delinquency. The current study aims to

bridge this gap by examining the potential conjoint influence of disclosure reports provided by adolescents and their mothers¹⁵ on teens' subsequent involvement in delinquent behaviors using polynomial regressions with response surface analyses, a sophisticated statistical technique with distinct advantages for exploring the intricacies of these relationships.

Previous studies focusing primarily on reports of disclosure provided either by teens or their parents offer valuable insight about the expected nature of these relationships. For example, Kerr et al. (2010) reported longitudinal linkages between teens' willingness to engage in spontaneous disclosure and their subsequent involvement in delinquency, regardless of whether this information came exclusively from adolescents, parents or was represented by cross-rater models where accounts of disclosure and delinquency came from either informant. Similar results have been obtained in other studies using both cross-sectional (e.g., Cumsille, Darling, & Martínez, 2010; Kerr & Stattin, 2000; Soenens, Vansteenkiste, Luyckx, & Goossens, 2006; Stattin & Kerr, 2000; Vieno, Nation, Pastore, & Santinello, 2009) and longitudinal data (e.g., Keijsers et al., 2010; Stavriniades, 2011; Willoughby & Hamza, 2011). Collectively, these findings support the notion that spontaneous disclosure from teens about their behavior serves as a protective factor against the development of delinquency.

Given the wealth of research consistent with the association between teens' willingness to disclose information to parents and reduced problem behavior, a youth-driven perspective of parental knowledge during adolescence has been advanced (e.g., Keijsers et al., 2010; Kerr & Stattin, 2000; Kerr et al., 2010; Stattin & Kerr, 2000). However, there is increasing recognition that such a view may undervalue the complex and reciprocal nature of parent-adolescent interactions, prompting others to suggest these mechanisms are perhaps best considered as part of a more dynamic 'family-oriented process' that involves a multitude

¹⁵ Due to practical and time constraints it was not possible to also assess adolescent disclosure to fathers and paternal perceptions of this disclosure. Therefore, this study focussed on the conjoint relationship between adolescent- and mother-reported disclosure only. This is consistent with the approach taken in previous research that has similarly examined the impact of discrepancies in disclosure reports on adolescent outcomes exclusively with regard to the mother-adolescent relationship (e.g., De Los Reyes, Goodman, Kliewer, & Reid-Quinones, 2010; Reidler & Swenson, 2012).

of parent-child factors of conjoint influence (Low, Snyder, & Shortt, 2012; Racz & McMahon, 2011; Willoughby & Hamza, 2011). In line with this perspective are studies which attest to the contribution of various parenting factors in helping steer adolescents away from deviant behavior, whether over and above the impact of spontaneous disclosure or as part of a transactional process that occurs alongside teens' willingness to share information with parents (e.g., Dishion, Nelson, & Bullock, 2004; Fletcher, Steinberg, & Williams-Wheeler, 2004; Laird, Marrero, & Sentse, 2010; Soenens et al., 2006; Vieno et al., 2009; Willoughby & Hamza, 2011). Such research lends further support to the claim that when disentangling the nature of the relationship between disclosure and delinquency, the consideration of mutual parent-adolescent processes is warranted.

One such parent-teen factor to have recently received some research attention is agreement and discrepancy between mother-adolescent reports of disclosure. Historically, such discrepancies were widely treated as methodological 'nuisances' that needed to be remedied so the true nature of the relationship between the variables could be verified (De Los Reyes, 2011; De Los Reyes, Henry, Tolan, & Wakschlag, 2009; Reidler & Swenson, 2012). This view was underscored by commonly held beliefs that discrepancies in multi-informant data reflect nothing more than the perceptual biases of the respective informants or measurement error (De Los Reyes et al., 2010). Such views gave rise to futile efforts to identify 'optimal' informants of child experiences, as well as strategies that aim to reconcile these discrepancies but paradoxically do little more than provide an obscured evaluation of the attributes at hand (Bird, Gould, & Staghezza, 1992; De Los Reyes & Kazdin, 2005; Piacentini, Cohen, & Cohen, 1992).

More recently, however, attitudes towards the perceived utility of multi-informant discrepancies have undergone a significant shift, acknowledging the inherent inevitability of this phenomenon, as well as its value for shedding light on a number of important family and developmental processes that directly influence youth adjustment (Bell, Rychener, Munsch,

2001; De Los Reyes, 2011; De Los Reyes & Kazdin, 2005). For instance, discrepancies between mother-child reports of juvenile behavioral and emotional problems (e.g., Ferdinand, van der Ende, & Verhulst, 2004), various parenting behaviors (e.g., Feinberg, Howe, Reiss, & Hetherington, 2000; Gaylord, Kitzmann, & Coleman, 2003; Guion, Mrug, & Windle, 2009), the quality of the mother-adolescent relationship (e.g., Pelton & Forehand, 2001) and parent-imposed restrictions on risky behaviors such as teen driving (e.g., Beck, Hartos, & Simons-Morton, 2005) have been found predictive of adverse psychosocial outcomes in a multitude of studies.

Although minimal agreement between disclosure ratings provided by mothers and their adolescents has been consistently reported (De Los Reyes, Goodman, Kliwer, & Reid-Quñones, 2008), there are only two studies that we know of addressing this issue in the context of adolescent disclosure. Most recently, Reidler and Swenson (2012) reported evidence of a relationship between the magnitude of discrepancy observed for mother-child ratings of youth self-disclosure and instances of externalizing behavior. It should, however, be noted that self-disclosure, which refers to the sharing of personal information in part to build intimacy with others, is not synonymous with the act of disclosing information about one's whereabouts and activities (Marshall, Tilton-Weaver, & Bosdet, 2005). Therefore, the implications of parent-child discrepancies for positive teen adjustment may be different when teens' disclosure to mothers about their behavior is considered.

In contrast to Reidler and Swenson (2012), De Los Reyes et al. (2010) examined the relationship between teen delinquency and discrepancies in mother-child reports of parental monitoring behaviors, a construct that comprised disclosure from adolescents about their whereabouts and activities, as well as parental solicitation of this information and more generally, parental knowledge. In this study, three discrete discrepancy groups were identified through exploratory latent profile analysis using standardized difference scores for the three parental monitoring behaviors. These groups represented cases involving mothers who over-

reported monitoring relative to their child, who under-reported monitoring relative to their child and whose ratings were in alignment with their child. Subsequent analyses comparing these groups found that relative to the group with ratings in alignment, the children of mothers who at baseline reported more parental monitoring than their teens also reported more delinquency two years later. In contrast, the individual reports of parental monitoring behaviors provided by mothers and teens did not contribute to the longitudinal prediction of adolescents' involvement in delinquent activities. These findings add to the growing body of evidence indicating that mother-child reporting discrepancies may yield important insight about the psychosocial functioning of teens, over and above the information garnered from individual reports alone (De Los Reyes et al., 2010, Gaylord et al., 2003).

In the De Los Reyes et al. (2010) study, however, rates of delinquency for teens whose mothers over-reported parental monitoring relative to their child, versus adolescents who provided higher ratings of these behaviors than mothers, were not compared. Therefore, the role of discrepancy direction in relation to parental monitoring behaviors and teen delinquency remains unclear. Moreover, since mother-child reporting discrepancies for adolescent disclosure were considered in concert with those observed for parental knowledge and solicitation, conclusions regarding the unique contribution of discrepancies for disclosure specifically to the development of delinquency are problematic. This is important since past research has highlighted the crucial role played by spontaneous disclosure from adolescents in determining negative outcomes for teens (e.g., Kerr & Stattin, 2000; Kerr et al., 2010; Stattin & Kerr, 2000). Additional exploration of this issue is therefore of paramount concern.

Further supporting this imperative that the relationship between mother-adolescent reporting discrepancies for disclosure and problem behavior in teens be further explored are a number of methodological issues with the statistical procedures presently utilized to examine their impact on developmental processes. For example, while the interaction approach has been lauded by some as preferable to the use of other statistical procedures (Holmbeck &

O'Donnell, 1991; Zuckerman, Gangé, Nafshi, Knee, & Kieffer, 2002), it has also been met with compelling criticism for its limitations capturing the complexity of the relationship between multi-informant data and an outcome (e.g., Edwards, 2001; Shanock, Baran, Gentry, Pattison, & Heggstad, 2010). Specifically, its critics argue that the nature of this relationship is reduced to a two-dimensional view when the interaction method is used where congruence between multi-informant reports is represented by a single point only, prohibiting the examination of complex agreement effects. In addition, the data provided by mothers and adolescents are not directly compared, and hence, the degree of discrepancy between these reports is not directly measured either (Reidler & Swenson, 2012). Therefore, conclusions about the relationship between the magnitude of discrepancy observed for mother-adolescent reports of disclosure and delinquency are limited when product terms are used to signify the degree of congruence between these reports.

The difference scores approach is a popular alternative. However, its use has similarly been criticized (see Edwards, 2002, for a review). For example, it has been argued that while difference scores combine measures of conceptually distinct constructs into a single score believed to represent equal but opposite contributions of its component measures, in reality, this assumption does not hold since greater weight is assigned to the component measure with the larger variance. Therefore, any significant results obtained may be due to the influence of this component measure alone. Likewise, it is thought that difference scores capture little more than the combined effects of the separate measures used to create them, which are confounded when these are reduced to a single coefficient. In addition, similar to the interaction method, it has been asserted that difference scores reduce what is essentially a three-dimensional relationship between multi-informant data and an outcome to a two-dimensional plane that oversimplifies these connections. Although De Los Reyes et al. (2010) present an interesting application of standardized difference scores to latent profile analysis, enabling groups based on discrepancy types to be identified and compared, Edwards (2001)

cautions against the use of such procedures as simply heightening this loss of information. Indeed, it is reasonable to expect that understanding of the relationship between multi-informant discrepancies and adolescent outcomes will be enhanced using dimensional solutions that take into account the degree of discrepancy and congruence in the data provided by two individuals.

A viable alternative circumventing many of these methodological issues is offered by organizational psychology, which favors the use of polynomial regressions with response surface analyses to investigate the impact of multi-informant discrepancies (e.g., Gentry, Ekelund, Hannum, & de Jong, 2007; Harris, Anseel, & Lievens, 2008; Ostroff, Atwater, & Feinberg, 2004). This sophisticated statistical technique pioneered by Edwards and Parry (1993) uses the coefficients from polynomial regressions that comprise the individual reports supplemented by higher order terms to generate three-dimensional surface graphs that represent the relationship between two paired variables (i.e., mother- and adolescent-reported disclosure) and an outcome (i.e., teen delinquency). In this way, the conceptual integrity of the individual reports is retained, while permitting hypotheses regarding the implications of congruence and discrepancy between multi-informant reports to be tested directly (Edwards, 2001). These tests correspond to potential linear and curvilinear relationships between multi-informant agreement and a specified dependent variable, as well as the role played by the direction and magnitude of multi-informant discrepancies in determining this outcome.

In this study, whether congruence and discrepancy between reports of adolescent disclosure across different domains of behavior provided by mothers and their teens contributed to the development of delinquency was of interest. Although the utility of polynomial regressions over difference scores for examining the relationship between multi-informant discrepancies and outcomes has recently been acknowledged within developmental psychology (e.g., Laird & De Los Reyes, 2013), as far as we know this is the first study to apply the approach to disclosure and make use of response surface plotting to interpret the

results. Moreover, to our knowledge no study to date has investigated whether the impact of discrepancies in multi-informant disclosure reports on outcomes differs according to the type of behavior being disclosed. This is despite the importance that context has been accorded in previous research for determining the relationship between parent-child reporting discrepancies and socio-emotional consequences for children (De Los Reyes & Kazdin, 2005). Therefore, the impact of congruence and discrepancy between reports of disclosure provided by mothers and teens was considered separately for teens' willingness to divulge information about different types of behavior, categorized according to social domain theory (Turiel, 1983, 2006). These included *prudential* activities (relating to health, safety, comfort and teens' potential to come to harm), *personal* issues (regarding teens' control over their body, privacy and personal preferences), and *moral/conventional* behaviors (pertaining to justice, welfare, rights and behavioral norms; Smetana, Metzger, Gettman, & Campione-Barr, 2006; Smetana, Villalobos, Tasopoulos-Chan, Gettman, & Campione-Barr, 2009; Turiel, 2006).

It was hypothesized that when mother-adolescent reports of prudential and moral/conventional disclosure are in agreement and high, this would be associated with less delinquency over time, given the inverse relationship between teens' willingness to divulge information about their daily activities and their engagement in problem behavior that has been reported in past studies (e.g., Keijsers et al., 2010; Kerr et al., 2010; Stavrinides, 2011; Willoughby & Hamza, 2011). That is, the conjoint influence of increased disclosure from teens about their involvement in risky or negative behaviors that may have a direct bearing on their involvement in delinquency, together with mothers' accurate awareness of this disclosure, was expected to serve as a protective factor against the development of delinquency as these circumstances place mothers in the best position possible to guide their children towards more adaptive choices, considered the key benefit of disclosure from teens

to parents during adolescence (Crouter & Head, 2002; Darling et al., 2006; Dishion & McMahon, 1998; Keijsers et al., 2010; Smetana, 2008).

In contrast to the disclosure of prudential and moral/conventional activities, a curvilinear relationship was anticipated between delinquency and mother-adolescent agreement for disclosures within the personal domain, such that teens were expected to endorse less problem behavior at the extremes of disclosure. This was based on research and theory which indicates adolescents feel least obligated to disclose personal issues to parents, given these are considered by parents and teens alike to fall under teens' jurisdiction and authority (Buhrmester & Prager, 1995; Nucci, 1996; Smetana & Metzger, 2008; Smetana et al., 2006). It thus follows when teenagers *choose* to engage in personal disclosure with mothers, and mothers accurately perceive this disclosure, this may reflect certain positive qualities of the mother-teen relationship that independently buffer teens against the development of delinquency. These include maternal support, trust, warmth, positive affect and stronger attachment (e.g., Goldstein, Davis-Kean, & Eccles, 2005; Hoeve et al., 2009; Hoeve et al., 2012; Smetana & Metzger, 2008). On the other hand, there is growing recognition that teens' decisions to withhold information from mothers about their personal activities may arise from a developmentally appropriate need to establish autonomy and individuation from parents, rather than the desire to reject parental authority (Nucci, 1996; Nucci, Hasebe, Lins-Dyer, 2005; Steinberg, 1990). This is consistent with the view that individuation during adolescence entails a process of emotional disengagement rather than detachment from parents whereby well-adjusted teens learn to balance autonomous self-guided action with the need for connectedness and positive relationships (Zimmer-Gembeck & Collins, 2003). When mothers possess accurate insight into their child's lack of personal disclosure, this may especially convey a degree of mutual understanding between parent and child. Therefore, consistent with a curvilinear relationship, it was anticipated that high, as

well as low, reports of personal disclosure from both mothers and adolescents would be associated with less delinquency over time.

Conversely, no discrepancy effects were expected for the impact of mother-adolescent reports of personal disclosure on delinquency. This is because, unlike prudential and moral/conventional activities, issues comprising the personal domain tend not to imply right or wrong courses of behavior, but rather the personal preferences and choices of teens (Goldstein et al., 2005). Mother-adolescent discrepancies for the disclosure of personal issues are therefore less likely to influence teens' engagement in problem behavior, given parental involvement in this domain is not expected to be as important for averting delinquent trajectories as in the case of prudential and moral/conventional behaviors. Therefore, the discussion of anticipated multi-informant discrepancy effects is restricted to teens' willingness to share their involvement in prudential and moral/conventional activities with mothers.

Previous research (e.g., De Los Reyes et al., 2010) suggests when it comes to the direction of mother-adolescent reporting discrepancies for disclosure, teens whose mothers over-report disclosure relative to their child, also report more subsequent involvement in delinquency. This is because these mothers may possess insufficient or inaccurate information about their child's daily activities, rendering them ill-equipped to effectively steer their teen away from problem behavior (De Los Reyes et al., 2010). However, also tenable is the hypothesis that delinquency may be more likely when mothers under-estimate their child's disclosure. In line with research that suggests parental perceptions of concealment are related to the use of poorer parenting strategies (Finkenauer, Frijns, Engels, & Kerkhof, 2005), this may occur because mothers who under-estimate teen disclosure possibly respond in ways that independently contribute to the development of delinquency over time. Therefore, no effects for the direction of multi-informant reporting discrepancies were anticipated in this study. Rather, the magnitude of mother-adolescent reporting discrepancies for the disclosure of

prudential and moral/conventional behaviors was expected to be more consequential, such that with larger discrepancies, more instances of delinquency were predicted at follow-up. This is consistent with research showing that discrepancies between multi-informant reports provided by parents and their children at their core reflect disrupted communication patterns that have a deleterious impact on adolescent adjustment (Guion et al., 2009).

Method

Participants

One-hundred and ninety-three adolescents (113 male, $M_{\text{age}} = 13.82$, $SD = 1.34$, range: 12-17 years) and their mothers¹⁶ participated in this study at Time 1 (T1) and again seven months later at Time 2 (T2). The sample was drawn from Australian middle-class students in grades 8 and 11. Approximately 87.5% of these adolescents self-identified as White, 6.8% Asian, and 2.9% Middle-Eastern. The remaining 2.8% were from other ethnic groups. At baseline assessment, 9.8% of mothers had completed high school up to grade 10, 11.4% continued to grade 12 but had no post-high school qualifications, 62.7% had completed a diploma, associate diploma, Bachelor's or vocational degree, and 16.1% possessed their Masters or Doctorate. The majority of mothers at T1 also reported living with a spouse, partner or de-facto (93.3%). Active consent was used to obtain permission from parents for their children to participate in the study, as well as consent for mothers' own participation. Written assent was also obtained from each adolescent prior to taking part in the study.

Data were collected from 339 mother-adolescent dyads at T1, resulting in an attrition rate of 43.1%. Similar to other research (e.g., De Los Reyes et al., 2010), only data from the 193 mother-adolescent pairs who provided responses at both waves of data collection were included in this study.¹⁷

¹⁶ 'Mother' in this study referred to the female adolescents' perceived as having raised them. Only one student in the current sample identified this as someone other than their biological mother, in this case, their grandmother.

¹⁷ A series of mixed multi-level analyses were conducted comparing responses on key study variables for mother-adolescent dyads providing complete data at both T1 and T2, versus where the parent or child participated at one time point only. The linear mixed model procedure was chosen due to its advantages for handling 'unbalanced' statistical analyses (Affleck, Zautra, Tennen, & Armeli, 1999; SPSS, 2005). The results of

Measures

The Teen Overall Level of Disclosure Scale (TOLDS). Adolescents' spontaneous disclosure to mothers about their daily activities and behaviors, as well as mothers' perceptions of this disclosure, were measured using the TOLDS (Kearney & Bussey, 2013). This 9-item instrument assesses teens' disclosure to mothers across three domains from social domain theory (Turiel, 1983, 2006): prudential (3 items; e.g., *'If you go to parties where other teens are drinking alcohol'*), personal (3 items; e.g., *'How you spend your allowance or money you've earned from a part-time job'*) and moral/conventional issues (3 items; *'If you break a promise or lie to someone'*). Adolescents were asked to rate how often they usually tell their mother, without her having to ask, about their engagement in each of the activities or behaviors listed using a 6-point Likert scale, ranging from 1 (*never tell*) to 6 (*always tell*). Using the same 6-point scale, mothers were also asked to consider how often they think their child tells them about their involvement in each activity or behavior without having to ask the adolescent about it first. A response was requested from all participants, regardless of whether the adolescent did not endorse having engaged in that behavior, as well as where mothers did not believe their child had ever been involved in that activity. In these instances, participants were further instructed that even if they/their child had never performed the activity or behavior listed, not even once, they should consider how often they believed spontaneous disclosure would occur in the event they did and provide a response on the same 6-point Likert scale. Kearney and Bussey (2013) provided evidence for the 3-factor structure of the TOLDS, as well as good internal consistency ($T1\alpha = .85$; $T2\alpha = .87$). For the 9-item adolescent-report scale, reliability in this study was .84 at T1 and .85 at T2. For mother-

these analyses indicated that no significant differences between these groups were present for any study variables except one. This was adolescents' ratings of delinquency at T1, a control variable in this study ($b = -5.58$, $t(553) = -2.34$, $p = .019$), for which adolescents included in the final sample reported less delinquency at baseline than those who were excluded because they or their mother did not complete the questionnaire at both waves of data collection. However, no differences between groups were present for T2 delinquency, the dependent variable of interest.

reported items, these were .88 and .89 at T1 and T2, respectively. The reliability alphas for the TOLDS subscales based on adolescent and mother report at both time points are presented in Table 1.

The Delinquency Scale. Sixteen items from the 21-item Delinquency Scale (Barnes, Welte, Hoffman, & Dintcheff, 1999) were used to assess adolescents' frequency of involvement in minor (8 items; e.g., *'Used dirty language or swear words'*) and major (8 items; e.g., *'Beaten up someone on purpose'*) delinquent activities over the past year. Items on this self-report measure are scored using a 6-point scale that includes as anchors 0 (*never*), 1 (*once*), 2 (*2–3 times*), 3 (*4–5 times*), 4 (*6–9 times*), and 5 (*10 or more times*). Ratings provided by adolescents were recoded to the midpoint value of each frequency interval. These were then summed to derive a measure of the total number of delinquent acts committed in the past year. Consistent with previous research (Miller, Melnick, Barnes, Sabo, & Farrell, 2007; Stavrinides, 2011), four items were omitted from the original scale. An additional item assessing teens' involvement in sexual relations was also excluded, in part because not all schools consented to the administration of this item. Furthermore, a growing body of literature has questioned the nature of the relationship between adolescent sexual activity and subsequent delinquency, stressing the importance of the context in which the sexual behavior occurs in accounting for this previously well-established association (e.g., Grello, Welsh, Harper, & Dickson, 2003; Harden & Mendle, 2011; McCarthy & Casey, 2008). The item from the Delinquency Scale asking adolescents to quantify their instances of sexual behavior was therefore excluded. For the remaining 16-item measure, the reliability alpha at T1 was .76 and .74 at T2 (see Table 1).

Table 1
Means, standard deviations and reliability for all adolescent- and mother-reported variables

Variable	Adolescent report		Mother report	
	M (SD)	α	M (SD)	α
T1 disclosure				
TOLDS-Prudential	3.62 (1.54)	.79	4.51 (1.13)	.80
TOLDS-Personal	4.49 (.97)	.64	4.76 (.80)	.67
TOLDS-Moral/conventional	3.15 (1.25)	.77	3.80 (1.17)	.81
Delinquency ^a	30.98 (22.37)	.76		
T2 disclosure				
TOLDS-Prudential	3.50 (1.51)	.77	4.54 (1.11)	.79
TOLDS-Personal	4.31 (1.04)	.73	4.73 (.78)	.64
TOLDS-Moral/conventional	3.08 (1.25)	.79	3.84 (1.18)	.84
Delinquency ^a	32.83 (23.14)	.74		

^aMother-reported adolescent delinquency was not used in this study.

Missing Data

Participants who did not complete at least 80% of their administered items were automatically excluded from this study, resulting in the deletion of data obtained from four mother-adolescent dyads. For the remaining sample of 193 mother-adolescent pairs, there were small amounts of missing data at the individual item level (range 0.0-1.0%). Single imputation using the EM (expectation-maximization) algorithm in IBM SPSS Statistics 19 was used to handle missing data for individual items prior to scale computation. This procedure has been shown to be superior to other common methods of handling item nonresponse, including list-wise deletion, pair-wise deletion and mean substitution (Allison, 2001; Enders, 2001; Schafer & Graham, 2002).

Procedure

Schools agreeing to take part in this study were asked to forward the consent form for student participation to the parents of all adolescents eligible to participate. As it was not possible to obtain data regarding how many families were actually forwarded these forms, an accurate response rate cannot be calculated. However, of the consent forms that were

returned, the proportion of parents/guardians who consented to their child's participation was approximately 76%.

Adolescents completed the same pen-and-paper questionnaire during the first part of the school year and again seven months later, which is similar to the test-retest interval reported in other studies also examining adolescent disclosure and delinquency (e.g., Stavrinides, 2011). Two forms of the questionnaire were prepared that counterbalanced the sequence in which scales were presented to minimize potential order effects. These were administered by trained research assistants on school premises during group testing sessions lasting approximately 40-50 minutes. Moreover, the chief investigator was present during all testing sessions in order to answer questions as required and provide a verbal explanation of instructions that were presented in written form. Respondents were asked to answer the survey questions in relation to their mother, or the person who had assumed this role in their lives. Adolescents were assured that their individual responses were confidential and would not be seen by parents, teachers or peers. It was also explained that there were no right or wrong answers to questions in the survey and that they should simply answer honestly.

Mother consent forms and questionnaires were sent home with participating students on the day the student survey was administered at their school in sealed envelopes that also contained a reply-paid self-addressed envelope for mothers to return these documents directly to the chief investigator. Written instructions for completing the survey were provided and mothers were explicitly asked not to discuss the questions with their child beforehand. Again, it is not possible to determine an accurate response rate for mothers as it is uncertain how many participating adolescents passed on the mother consent form and questionnaire pack that was provided. However, 59.8% of the mothers of adolescents who took part in the first wave of data collection returned a consent form and questionnaire.

Results

Analytic strategy

As the data presented are hierarchical with students nested within schools, preliminary analyses were conducted to examine the potential effect of clustering on analyses using the linear mixed modeling procedure. A random intercept model predicting adolescent delinquency at T2 from T1 adolescent- and mother-reported disclosure was performed for each disclosure domain. School was included as a random factor but not significant for any analyses. The intraclass correlation (ICC) was also calculated for each analysis to determine the amount of variance in T2 delinquency that was attributable to differences between schools, with values less than .25 suggesting that modeling of the nested data structure is unnecessary (Kreft, 1996). The ICCs obtained in this study ranged from 0 to .04, indicating there was no significant clustering effect of school. Therefore, the hierarchical effect of schools was not accounted for in subsequent analyses.

Results are outlined in two sections. First, partial correlations between all major variables at T1 and T2 controlling for the gender of the adolescent are presented. Second, polynomial regressions with response surface analyses were conducted in accordance with the procedure outlined by Shanock et al. (2010) to examine the impact of mother-adolescent discrepancy and agreement in disclosure ratings on teens' subsequent reports of delinquency.¹⁸ These polynomial regressions were conducted via path analysis in Mplus 6 using maximum likelihood-robust (MLR) estimation (Muthén & Muthén, 2010) to account for skewness and kurtosis in the data (skewness ranged from -.74 to 1.25; kurtosis ranged from -1.26 to 2.88). This estimation method provides robust estimates and less biased standard errors even in the presence of substantial deviations from normality. The results obtained were then used to conduct response surface analyses with three-dimensional

¹⁸ Prior to conducting these analyses, Shanock et al. (2010) recommend that the base rates of discrepancies in the data be probed first to verify these exist and thus justify subsequent exploration. These are presented in Appendix D.

representations of the surface area yielded using the Microsoft Excel spreadsheet supplied by Shanock et al. (2010).

Partial correlations between study variables

Partial correlations between all study variables controlling for the gender of the adolescent are presented in Table 2.¹⁹ The cross-time stability between T1 and T2 delinquency was strong. The intercorrelations between adolescent-reported disclosure for each domain were all significant and ranged in magnitude from moderate to strong. Similarly, all intercorrelations between mother-reported disclosure domains were significant and strong. Of note, only adolescent reports of disclosure were related to teens' delinquency ratings at T1 and T2, such that higher disclosure was associated with less delinquent activities. Mother-reported disclosure, however, was not related to delinquency at either T1 or T2. Moreover, domain-domain associations between mother and adolescent disclosure reports were minimal, ranging from no relationship for personal and moral/conventional behaviors to only a small correlation for prudential activities.

¹⁹ Past research regarding the role played by adolescent gender and age in patterns of multi-informant discrepancies has yielded inconclusive findings. For example, studies investigating this issue in the context of parental monitoring and adolescent self-disclosure have found no evidence that the age of a child relates to the discrepancy effects observed (e.g., De Los Reyes et al., 2008; De Los Reyes et al., 2010; Reidler & Swenson, 2012) and similar findings have been reported more broadly in other research examining informant discrepancies (e.g., Choudhury, Pimentel, & Kendall, 2003; Feinberg et al., 2000; Lanz, Scabini, Vermulst, & Gerris, 2001). Findings regarding the influence of gender differences on parent-child discrepancies have been similarly inconsistent, with some studies reporting no effect (e.g., Reidler & Swenson, 2012) and others demonstrating stronger results for either boys or girls (e.g., Kolko & Kazdin, 1993; McCauley Ohannessian, Lerner, Lerner, & von Eye, 2000). To determine whether it was necessary to take gender and grade differences into account in this study, multigroup analyses comparing the pattern of correlations between adolescent-reported disclosure, mother-reported disclosure and delinquency at both time points across boys and girls, as well as adolescents in grade 8 and 11, were conducted separately for each disclosure domain. Consistent with past research, the results for each model indicated that while structural covariances did not differ as a function of grade for any disclosure domain [prudential: $\chi^2(14, N = 193) = 19.12, p = .160$, RMSEA = .04, CFI = .99, TLI = .98; personal: $\chi^2(14, N = 193) = 20.10, p = .102$, RMSEA = .05, CFI = .97, TLI = .97; moral/conventional: $\chi^2(14, N = 193) = 16.84, p = .265$, RMSEA = .03, CFI = .99, TLI = .99]; some gender differences were apparent [prudential: $\chi^2(14, N = 193) = 31.76, p = .004$, RMSEA = .08, CFI = .92, TLI = .93; personal: $\chi^2(14, N = 193) = 52.74, p < .001$, RMSEA = .12, CFI = .82, TLI = .85; moral/conventional: $\chi^2(14, N = 193) = 31.95, p = .004$, RMSEA = .08, CFI = .91, TLI = .92]. Therefore, gender was included as a covariate in subsequent analyses.

Table 2
Partial correlations between all study variables, controlling for gender

Variable	1	2	3	4	5	6	7	8
1. T1 Prudential disclosure (AR)	-	.55***	.66***	.23*	.17	.07	-.27**	-.27**
2. T1 Personal disclosure (AR)	-	-	.55***	.08	.17	.11	-.28**	-.28**
3. T1 Moral/conventional disclosure (AR)	-	-	-	.21*	.20*	.11	-.24*	-.21*
4. T1 Prudential disclosure (MR)	-	-	-	-	.66***	.70***	-.05	-.09
5. T1 Personal disclosure (MR)	-	-	-	-	-	.64***	-.01	-.05
6. T1 Moral/conventional disclosure (MR)	-	-	-	-	-	-	-.16	-.14
7. T1 Delinquency (AR)	-	-	-	-	-	-	-	.83***
8. T2 Delinquency (AR)	-	-	-	-	-	-	-	-

Note. MR = mother-report; AR = adolescent-report.

* $p < .05$ ** $p < .01$ *** $p < .001$.

The effects of adolescent- and mother-reported disclosure discrepancy and agreement for subsequent delinquency

To examine the hypothesized impact of discrepancy and agreement in adolescent- and mother-reported disclosure on teens' subsequent engagement in delinquent activities, a polynomial regression analysis was conducted for each disclosure domain, each with the regression equation:

$$D = b_0 + b_1X + b_2Y + b_3X^2 + b_4XY + b_5Y^2 + b_6W + b_7Z + e$$

In this equation, D represents adolescents' self-reported involvement in delinquency at T2, b_0 is the constant and e is the error term. X signifies mothers' perceptions of their teens' disclosure and Y is indicative of adolescents' actual reported disclosure. A necessary condition for the interpretability of polynomial regression analyses is that the measurement of these X and Y components are commensurate; that is, both predictors are expressed on the same numeric scale (Edwards, 2002). In this study, this prerequisite was met since mothers and adolescents provided their ratings of disclosure using the same 6-point Likert scale. In line with Aiken and West (1991), these variables were centered prior to analysis to aid with interpretation and reduce the potential for multicollinearity. Centering was conducted in relation to the midpoint of the disclosure scale, as opposed to the respective means of each variable. This is consistent with Edwards' (1994) recommendations for preventing nonessential ill-conditioning for this type of analysis. The remaining key terms in the regression equation, W and Z , represent the two covariates that were also included for each analysis: the adolescents' gender, controlled for reasons that have been previously explained, and adolescents' baseline delinquency score, to account for the stability of teen delinquency across time.

Unlike traditional regression, when interpreting polynomial regressions with response surface analyses less emphasis is placed on the significance of the relative coefficient weights that are obtained. Rather, of key interest is whether the set of predictor variables explain a significant amount of the variance in the dependent variable and the nature of the ‘response surface pattern’ yielded using these regression coefficients (Harris, Anseel, & Lievens, 2008; Shanock et al., 2010). Once the first of these conditions has been established via an examination of the R^2 obtained for the polynomial regression, substantive analysis can continue and involves using the relevant coefficients (represented by b_1 to b_5 in the above equation) to calculate surface tests that estimate the slope and curvature along two planes that together comprise the response surface pattern. This is then graphed to provide a three-dimensional visual representation of the data to aid interpretation. The first of these planes, ‘the line of agreement’, represents where $X = Y$ and runs from the point where both adolescent- and mother-reported disclosure are 4 to where these values are both -4 (see Figure 1).

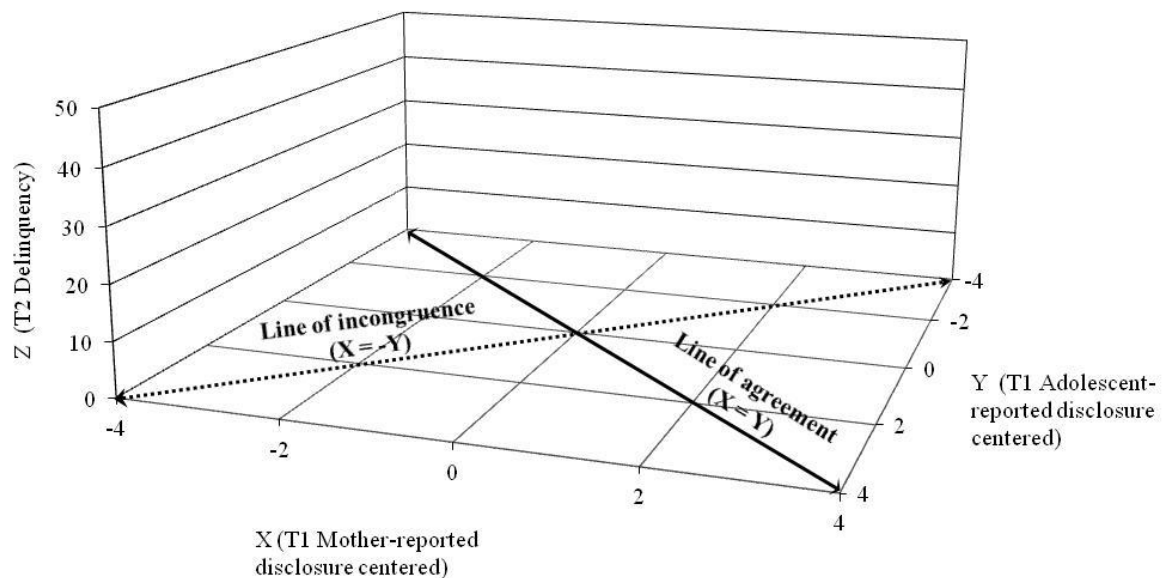


Figure 1. Three-dimensional representation of relationship between mother-reported disclosure, adolescent-reported disclosure and delinquency, showing line of agreement and incongruence.

Slope and curvature along this plane are determined by two surface tests, called a_1 ($b_1 + b_2$) and a_2 ($b_3 + b_4 + b_5$), respectively. If a_1 is significant, the slope of the line of agreement represents how agreement between mother- and adolescent-reported disclosure relates to delinquency at T2 from the point where both mother and child consistently report that disclosure is very high (4, 4) to the point where both mother and child consistently report that disclosure is very low (-4, -4). Curvature along the line of agreement (as demonstrated by a significant a_2) would indicate the relationship between agreement in mother- and adolescent-reported disclosure and T2 delinquency is non-linear. The second of these planes, 'the line of incongruence', represents where $X = -Y$ and runs from the point where mother-reported disclosure is 4 and adolescent-reported disclosure is -4 to where these values are reversed (shown in Figure 1). Slope and curvature along this plane are established by the significance of surface tests a_3 ($b_1 - b_2$) and a_4 ($b_3 - b_4 + b_5$), respectively. When a_3 is significant, the slope of the line of incongruence provides evidence as to how the direction of the discrepancy between mother- and adolescent-reported disclosure relates to T2 delinquency (for example, if delinquency is more likely when the discrepancy derives from mothers believing more disclosure has occurred than their adolescent reports, versus where the adolescent endorses more disclosure than their mother recognizes). When a_4 is significant, this curvature along the line of incongruence indicates the degree of discrepancy present also has an influence on the outcome (see Edwards, 1994 and Shanock et al., 2010 for a more detailed overview of the polynomial regression with response surface analysis approach and relevant formulae. These are also provided in Appendix F).

The results of the polynomial regression analyses and surface tests conducted for this study are shown in Tables 3 and 4, respectively. Three-dimensional visual representations of the results for each domain holding gender and delinquency at T1 constant are also provided to aid interpretation (see Figure 2). For all disclosure domains, the R^2 yielded by the polynomial regression suggested that a significant proportion of the variance in adolescents'

T2 delinquency scores was explained by the set of predictor variables, a necessary condition to justify the exploration and interpretation of surface tests (Edwards, 2002).

The subsequent response surface analysis for prudential disclosure indicated there was significant positive curvature along the line of incongruence ($a_4 = 2.03, p = .049$), resulting in a convex-shaped surface (see Figure 2a). This indicated the relationship between discrepant mother and adolescent reports of prudential behavior and teens' subsequent involvement in delinquent activities was non-linear, with delinquency increasing more sharply as the degree of discrepancy also increased. In contrast, for personal disclosure, curvature was present along the line of agreement only and was negative ($a_2 = -2.24, p = .038$). As shown in Figure 2b, the concave-shape of this curve indicated that adolescents' self-reported engagement in delinquency at T2 decreased more sharply along the line of agreement when both the mothers' and adolescents' baseline disclosure ratings increased or decreased from a certain point. That is, for the personal domain, when T1 mother and adolescent reports were in agreement, T2 delinquency was lowest at the extremes of disclosure. For moral/conventional violations, the surface test corresponding to the slope of the line of agreement was significant and negative ($a_1 = -2.03, p = .049$). An examination of the response surface (see Figure 2c) yielded further insight, illustrating that when mother and adolescent ratings of moral/conventional disclosures at baseline were similarly high, adolescents reported less delinquency at T2 than when mothers' and their teens' both rated adolescent disclosure of these activities as low.

Table 3

Polynomial regressions examining domain-specific discrepancies in mother- and adolescent-reported disclosure at T1 as predictors of delinquency at T2

Disclosure domain	Variable	<i>b</i> (<i>SE</i>)	<i>R</i> ²
Prudential	Constant	9.06 (2.34)***	.63***
	T1 delinquency	.78 (.047)***	
	Gender ^a	-2.96 (1.92)	
	<i>b</i> ₁ : MR disclosure	-1.48 (.95)	
	<i>b</i> ₂ : AR disclosure	-.48 (.85)	
	<i>b</i> ₃ : MR disclosure squared	.51 (.61)	
	<i>b</i> ₄ : MR disclosure x AR disclosure	-.76 (.55)	
	<i>b</i> ₅ : AR disclosure squared	.76 (.44)	
Personal	Constant	11.25 (2.75)***	.63***
	T1 delinquency	.79 (.05)***	
	Gender ^a	-2.75 (1.96)	
	<i>b</i> ₁ : MR disclosure	1.67 (3.10)	
	<i>b</i> ₂ : AR disclosure	.11 (1.52)	
	<i>b</i> ₃ : MR disclosure squared	-.70 (1.71)	
	<i>b</i> ₄ : MR disclosure x AR disclosure	-.32 (1.94)	
	<i>b</i> ₅ : AR disclosure squared	-.22 (1.23)	
Moral/ Conventional	Constant	8.76 (2.33)***	.62***
	T1 delinquency	.79 (.05)***	
	Gender ^a	-2.72 (1.92)	
	<i>b</i> ₁ : MR disclosure	-.71 (.80)	
	<i>b</i> ₂ : AR disclosure	-1.32 (.89)	
	<i>b</i> ₃ : MR disclosure squared	.35 (.47)	
	<i>b</i> ₄ : MR disclosure x AR disclosure	.49 (.73)	
	<i>b</i> ₅ : AR disclosure squared	-.05 (.55)	

Note. MR = mother-report; AR = adolescent-report

^aDummy coded 0 = male, 1 = female.

****p* < .001.

Table 4
Domain-specific surface tests

Disclosure domain	Surface tests
Prudential	
Slope of the line of agreement: $a_1 (b_1 + b_2)$	-1.96
Curvature along the line of agreement: $a_2 (b_3 + b_4 + b_5)$.50
Slope of the line of incongruence: $a_3 (b_1 - b_2)$	-1.01
Curvature along the line of incongruence: $a_4 (b_3 - b_4 + b_5)$	2.03*
Personal	
Slope of the line of agreement: $a_1 (b_1 + b_2)$	1.78
Curvature along the line of agreement: $a_2 (b_3 + b_4 + b_5)$	-2.24*
Slope of the line of incongruence: $a_3 (b_1 - b_2)$	1.56
Curvature along the line of incongruence: $a_4 (b_3 - b_4 + b_5)$.041
Moral/conventional	
Slope of the line of agreement: $a_1 (b_1 + b_2)$	-2.03*
Curvature along the line of agreement: $a_2 (b_3 + b_4 + b_5)$.80
Slope of the line of incongruence: $a_3 (b_1 - b_2)$.61
Curvature along the line of incongruence: $a_4 (b_3 - b_4 + b_5)$	-.19

Note. Slope of line of agreement represents slope along MR = AR line; Curvature along line of agreement represents curvature along MR = AR line; Slope of line of incongruence represents slope along MR = - AR line; Curvature along line of incongruence represents curvature along MR = - AR line; MR = mother-report; AR = adolescent-report.

* $p < .05$.

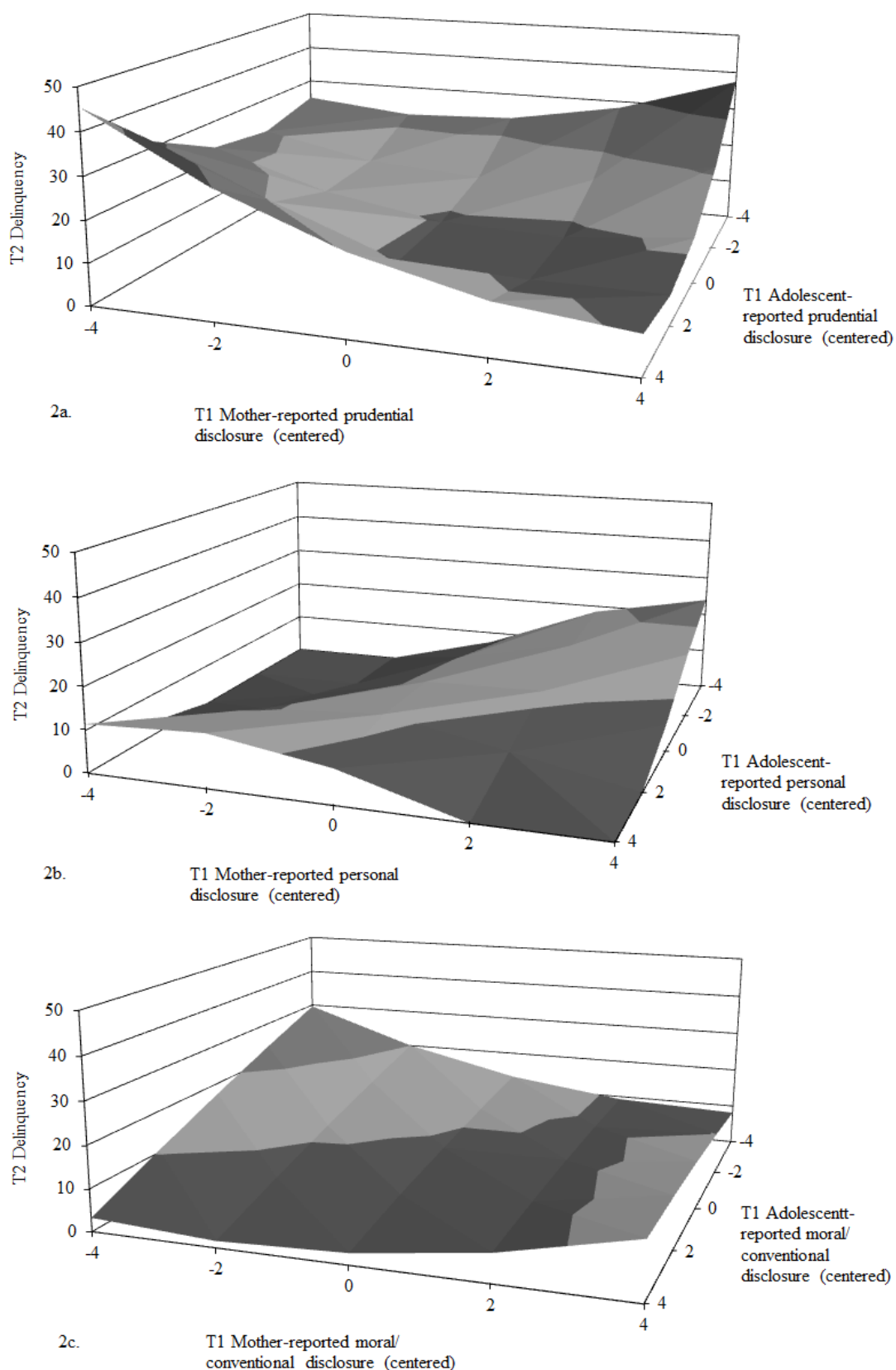


Figure 2. Adolescent delinquency at T2 as a function of mother-adolescent reports of domain-specific disclosure, controlling for gender.

Discussion

The first of its kind, this study investigated the contribution of agreement and discrepancy between mother-adolescent reports of youth disclosure to delinquency using polynomial regressions with response surface analyses. Compared to other methods used within developmental psychology to analyze multi-informant data, this sophisticated statistical technique possesses distinct advantages for capturing the complexity of the interplay that exists between adolescent-reported disclosure, mother-reported disclosure and delinquency in teens. Previous studies have posited that the context in which parent-child reporting discrepancies occur is an important determinant of the relationship between these disparities and psychosocial consequences for children (De Los Reyes & Kazdin, 2005). Mother-adolescent perceptions of teens' willingness to divulge information about their behavior were therefore analyzed separately for three domains of social conduct: prudential, moral/conventional and personal activities (Turiel, 1986; 2006). Accordingly, associations between problem behavior and congruent or discrepant mother-adolescent reports of disclosure are also discussed systematically in relation to each social domain. Although a number of domain-specific differences were apparent in the findings, together they provide additional support for the growing body of evidence which suggests mother-adolescent reporting discrepancies and agreement have the potential to shed light on the relationship between disclosure and adjustment that cannot be garnered from individual reports alone. Indeed, similar to other research (e.g., De Los Reyes et al., 2010), reports of disclosure provided by the mothers and adolescents in this study were not related to subsequent ratings of problem behavior for any domain. Rather, it was the conjoint influence of adolescents' willingness to share information with mothers about their activities and maternal perceptions of this disclosure that mattered.

For prudential disclosures specifically, the findings indicate that disparities in mother-adolescent perceptions of teens' willingness to divulge their involvement in risky behaviors

may serve as a risk factor for delinquency. As expected, the magnitude of discrepancy observed between mother-adolescent reports of prudential disclosure was associated with problem behavior in teens; the more these perspectives diverged, the greater the number of delinquent activities teens endorsed at follow-up. This is consistent with previous studies which have similarly demonstrated that the extent of the discrepancy which exists between multi-informant reports of behavior is an important determinant of outcomes for teens (e.g., Barker, Bornstein, Putnick, Hendricks, & Suwalsky, 2007; Feinberg et al., 2000; Reidler & Swenson, 2011).

What this study contributes, however, is the additional finding that while the magnitude of discrepancy matters, the source of this discrepancy does not. No relationship between discrepancy direction for mother- and adolescent-reported prudential disclosure and teens' subsequent involvement in problem behavior was found. This not only aligns with the hypothesis, but also the view that mother-child reporting discrepancies reflect disrupted communication patterns that may have an adverse influence on adolescent adjustment (Guion et al., 2009; Reidler & Swenson, 2011). For example, mothers who over-report adolescents' willingness to disclose information about their involvement in risky activities may lack adequate insight about their teens' behavior, thereby compromising their ability to effectively steer them towards more adaptive choices. While this premise is one that is well-established in the literature, the current study further augments our understanding of these processes by indicating that teens' whose mothers' *under*-estimate their willingness to engage in prudential disclosure may also be vulnerable to delinquency. Although the exact mechanism of this effect warrants further investigation, it is possible these under-reporting mothers respond to their perception that teens are withholding information about their risky behavior with negative parenting strategies which independently contribute to delinquency (e.g., parental intrusiveness; Goldstein et al., 2005). This is consistent with the results of previous research showing that parental perceptions of concealment from teens tend to be associated with the

use of poorer parenting techniques (Finkenauer et al., 2005). Alternatively, it may simply be the case that mothers who under-report their teens' disclosure of prudential activities are not paying sufficient attention to these disclosures, and thus fail to provide corrective feedback.

Mother-adolescent reporting discrepancies for prudential disclosure may have further specific practical and clinical implications. Mothers who over-estimate the extent of their child's disclosure for risky activities, as well as teens who believe they do in fact communicate openly with mothers about these matters, may be less inclined to work on the communication and parenting issues that have given rise to such divergent perspectives. According to De Los Reyes and Kazdin (2005), this is especially important if reporting discrepancies are related to negative outcomes for teens, as appears to be the case for adolescents' disclosure of prudential activities. Future research would therefore benefit from investigating ways the degree of discrepancy present between mother-adolescent perceptions of prudential disclosure can be reduced.

The finding of no agreement effects between mother-adolescent reports of prudential disclosure and delinquency offers important insight about the prevention of problem behavior in teens, even when willingness to divulge these details is low but accurately perceived by parents. More specifically, while it was expected that teens belonging to mother-adolescent dyads who endorsed low levels of prudential disclosure would engage in more delinquency at follow-up, the results did not support this. One plausible explanation for this curious finding is that mothers who accurately perceive teens' non-disclosure about their involvement in prudential behavior may engage other mechanisms of parental knowledge to obtain this information. Thus, while Stattin and Kerr (2000; Kerr & Stattin, 2000) contend that teens' willingness to divulge information about their behavior is the chief way parents become knowledgeable about their children's activities, mothers who possess accurate understanding that this is unlikely in their particular circumstances may invoke other methods to acquire

these details. If true, this would suggest that even in cases where adolescent disclosure is low, this need not be the case for maternal knowledge.

Since alternative pathways to parental knowledge were not the focus of this study, this explanation for the current findings remains speculative. Nonetheless, it is reinforced by the results of a recent study which indicates when the more general construct of maternal knowledge is measured there is a significant effect of agreement, with lower mother-adolescent reports of knowledge demonstrating a relationship with more problem behavior in teens (Laird & De Los Reyes, 2013). Also supportive is research that has re-examined the role played by sources of parental knowledge other than disclosure in deterring youths from delinquency and found that the use of parental control (e.g., Willoughby & Hamza, 2011) and parental solicitation may be effective, especially in situations where teens are less likely to be forthcoming about their behavior (e.g., Laird et al., 2010). These issues highlight the continuing need to examine the role of different sources of parental knowledge in preventing teen problem behaviors. They also lend considerable support to the view that conceptualizing these issues as predominately a youth-driven process may be too simplistic as it undervalues the complex and reciprocal nature of parent-child interactions.

The pattern of results yielded for adolescents' disclosure of moral/conventional violations was different from those observed for teens' willingness to divulge information about their prudential activities. As anticipated, agreement between mother-adolescent reports of moral/conventional disclosure was associated with problem behavior at follow-up. Specifically, when these baseline disclosure ratings were in alignment and low, teens endorsed higher levels of delinquency over time. However, the magnitude of discrepancy between mother-adolescent reports of moral/conventional disclosure and number of delinquent activities endorsed at follow-up were not related.

Exactly why the findings for moral/conventional violations varied from those attained for prudential disclosure is unknown. Perhaps it is best understood in the context of research

which suggests that while prudential issues become a source of conflict and negotiation between parents and teens (Daddis, 2011; Smetana, 2000), by adolescence matters of morality and convention entail well-established expectations for behavior (Smetana, 1995; Smetana et al., 2006; Turiel, 1983). Compared to prudential violations, moral/conventional breaches are also considered by children and adolescents themselves as more generalizably wrong independent of parental authority and beliefs (Smetana, 1995; Smetana & Asquith, 1994; Yau & Smetana, 2003). Thus, in contrast to adolescents' non-disclosure of their prudential activities, mothers who discern teens are withholding information about their moral/conventional conduct may feel less impetus to acquire this information via alternative means and provide corrective feedback, believing their child should have already internalized the desirable course of behavior. Or perhaps it is that they have already tried to do this and failed. Similarly, mother-adolescent reporting discrepancies are less likely to carry import for moral/conventional activities than they are risky behaviors. This is because issues of morality and convention tend to be prescriptive. In contrast, the most adaptive choice in prudential situations may be more ambiguous to teens and hence, parental guidance more beneficial.

With regard to personal disclosure, a curvilinear relationship between mother-adolescent agreement and problem behavior was observed, such that delinquency at follow-up was lowest at the extremes of disclosure. That is, teens from mother-adolescent dyads reporting relatively high, as well as relatively low, levels of personal disclosure endorsed less subsequent delinquency than teens from dyads who reported average levels of personal disclosure. These findings are in line with the hypothesis and highlight the importance of strong mother-adolescent relationships characterized by mutual trust and understanding as a protective factor against delinquency. That positive outcomes for teens are possible at the low end of the disclosure continuum is consistent with the view that individuation from parents supports adaptive psychosocial functioning in teens and research demonstrating that parental intrusiveness and over-control of the personal domain is associated with a number of adverse

adolescent outcomes (e.g., Goldstein, et al., 2005; Hasebe, Nucci, & Nucci, 2004; Smetana, Crean, & Campione-Barr, 2005; Zimmer-Gembeck & Collins, 2003). The notion that teens' expansion of an arena of privacy over personal information may be crucial to their positive adjustment as it promotes healthy autonomy and individuation from parents is not new (e.g., Buhrmester & Prager, 1995; Nucci et al., 2005). However, these findings contribute to current understanding as they further suggest that accurate maternal awareness of these autonomy issues, in this case as manifested by fewer personal disclosures, may also play an important role. This is perhaps owing to the mutual understanding that is conveyed when there is such congruence in perspective between mother and child.

Although this study contributes to current understanding of the relationship between mother-adolescent reported disclosure and delinquency, there are limitations worth mentioning. The reliance on self-report data from adolescents, particularly to ascertain their involvement in delinquency, should for example be noted. In addition, whether similar outcomes to those reported here with respect to mother-adolescent relationships would be yielded when father-adolescent reports of disclosure are considered warrants further exploration.

The inclusion of delinquency at baseline as a control variable enabled the longitudinal contribution of multi-informant reporting discrepancies and congruence to delinquency to be examined, and therefore reflects one of the main strengths of this study. It may also account for why the results of the surface tests reported here were, admittedly, modest. The consideration of multi-informant data using a sophisticated statistical procedure that allowed for a more in-depth examination of the relationship between adolescent-reported disclosure, mother-reported disclosure and problem behavior in teens is also noteworthy. As far as we are aware, it is the first study to have investigated these issues using this methodology.

Collectively, these findings are consistent with the interpretation that congruence and discrepancy between mother-adolescent reports of teens' willingness to share information

with parents may contribute to the longitudinal prediction of delinquency in ways ratings provided by individual informants do not. This may explain why seemingly contradictory findings for the relationship between spontaneous adolescent disclosure and deviance are often reported in previous research (e.g., Keijsers et al., 2010; Kerr & Stattin, 2000; Kerr et al., 2010; Stattin & Kerr, 2000; versus Frijns, Keijsers, Branje, & Meeus, 2010; Smetana & Metzger, 2008). Ultimately, the results of this study suggest that to understand whether a teenager is more or less likely to drift towards problem behavior, the sheer presence or absence of disclosure may be relatively unimportant. Rather, the degree of congruence between adolescents' willingness to share information about their activities, coupled with the relational and practical implications associated with mothers' perceptions of this disclosure, may be more crucial for determining psychosocial outcomes for teens.

Chapter 5

General Discussion

Overview of Findings

The findings from this research highlight the important conjoint role played by mother, adolescent and mother-adolescent interaction factors in facilitating spontaneous disclosure from youths and maximizing its benefits. In study one, presented in Chapter 2, the longitudinal contribution of adolescents' perceptions of openness in communication with mothers to teens' willingness to disclose information about their prudential, personal and moral/conventional behavior was demonstrated. Moreover, teenagers with higher self-efficacy beliefs regarding their ability to reveal their involvement in contentious or potentially embarrassing activities were shown to be more willing to engage in such disclosure to mothers over time. These findings are consistent with previous research which has also demonstrated the importance of open communication and self-efficacy beliefs to the disclosure process (e.g., Bandura, Caprara, Barbaranelli, Regalia, & Scabini, 2011; Bussey, 2010; Caprara, Regalia, Scabini, Barbaranelli, & Bandura, 2004; Caprara et al., 1998; Hunter, Barber, Olsen, McNeely, & Bose, 2011; Smetana, Villalobos, Tasopoulos-Chan, Gettman, & Campione-Barr, 2009).

Although adolescents' perceptions of openness with mothers influenced their subsequent disclosure, the second communication factor included in this study, teens' self-perceived interpersonal communication competencies, did not. Similarly, adolescents' perceptions of maternal psychological and behavioral control were not influential over teens' willingness to disclose these details over time, nor were ratings of maternal warmth once communication and efficacy processes were also taken into account. These findings extend those that have been previously obtained (e.g., Blodgett Salafia, Gondoli, & Grundy, 2009; Smetana, Metzger, Gettman, & Campione-Barr, 2006; Soenens, Vansteenkiste, Luyckx, & Goossens, 2006) by showing that while parenting may relate to teens' willingness to divulge information, its role as a catalyst of spontaneous youth disclosure should not be overstated or considered independently from other important adolescent and parent-adolescent interaction

factors. Nor can mothers simply rely on the assumption that adolescents considered to be competent communicators will reveal information about their behavior to them. However, just as Kerr and Stattin (2000) argue, the results from this first study do not preclude the possibility that parenting plays a crucial role in creating the open and receptive family climate that ultimately increases the likelihood adolescents will freely divulge information about their behavior. Rather, the results suggest that when it comes to eliciting disclosure from teens, parents are perhaps best served by cultivating an environment in families that is conducive to disclosure and which fosters youths' confidence to reveal their daily activities. This may be especially important in relation to teens' willingness to disclose the most difficult, but perhaps also the most important, details about their behavior.

Consistent with the ideas presented above were the results of study two, presented in Chapter 3, which highlighted the crucial role played by parenting in contextualizing the information management decisions teens make and the impact these have on the psychological functioning of youths. The notion of pressured information management was thus proposed. This concept extended consideration of the disclosure process to those instances where teens believe they have little choice but to reveal or conceal details about their behavior in view of the negative maternal reactions and attitudes they perceive. The emotional consequences associated with this pressure to engage in secrecy or disclosure was examined for both male and female adolescents. While pressured secrecy exacted a negative influence on boys' and girls' adjustment over time, its impact on female adolescents was seemingly more pernicious as girls who endorsed more pressured secrecy reported both a decline in mood and elevated anxiety scores. For boys, higher pressured secrecy scores were related to increased stress only. These findings are consistent with the extant literature demonstrating a relationship between secrecy and maladjustment for teenagers (e.g., Almas, Grusec, & Tackett, 2011; Finkenauer, Engels, & Meeus, 2002; Frijns & Finkenauer, 2009; Frijns, Finkenauer, Vermulst, & Engels, 2005; Frijns, Keijsers, Branje, & Meeus, 2010;

Keijsers, Branje, Frijns, Finkenauer, & Meeus, 2010; Smetana, Villalobos, Rogge, & Tasopoulos-Chan, 2010), as well as the increasing number of studies showing that its consequences may be particularly aversive for girls (e.g., Frijns, Finkenauer, & Keijsers, 2013; Keijsers, Branje, Frijns et al., 2010). The results further indicated pressured disclosure was less detrimental than pressured secrecy. In fact, the use of pressured disclosure was linked to reduced anxiety symptoms in girls and implicated the important role closeness and intimacy with maternal caregivers plays in fostering healthy female development. These findings provide increasing support for the view that the parent-child relational context is crucial for understanding teens' information management choices and how these impact adolescents' emotional functioning (Keijsers & Laird, 2010; Laird & Marerro, 2010; Tilton-Weaver et al., 2010).

This view that mothers and teens may conjointly influence the outcomes of adolescent information management were further investigated in study three, presented in Chapter 4, but this time with respect to the behavioral consequences of disclosure for youths. Using polynomial regressions with response surface analyses, the impact of congruence and discrepancy between mother-adolescent reports of spontaneous youth disclosure across different social domains on the development of delinquency was investigated. For risky or prudential activities, the magnitude of discrepancy between mother-adolescent reports of teens' willingness to disclose their involvement in these behaviors was an important determinant of delinquency at follow-up. This is in line with the findings from an impressive body of literature which have similarly demonstrated that mother-child reporting discrepancies across multiple domains are predictive of adverse adolescent psychosocial outcomes (e.g., Beck, Hartos, & Simons-Morton, 2005; Feinberg, Howe, Reiss, & Hetherington, 2000; Ferdinand, van der Ende, & Verhulst, 2004; Gaylord, Kitzmann, & Coleman, 2003; Guion, Mrug, & Windle, 2009; Laird & De Los Reyes, 2013; Lippold, Greenberg, & Feinberg, 2011; Pelton & Forehand, 2001). Moreover, for mother-adolescent

reports of teens' willingness to divulge moral/conventional violations there was a significant linear effect of agreement, such that more problem behavior was endorsed by youths when both mothers and teens rated the disclosure of these activities as low at baseline. This differed from the impact of agreement between mother-adolescent reports for the personal domain, for which the relationship was curvilinear and showed that delinquency was less likely at the extremes of disclosure.

The findings presented in study three are thus consistent with those that were obtained in studies one and two as they further highlight the importance of the dynamic interplay that occurs between mother-adolescent factors in facilitating positive youth outcomes. Specifically, the results from Chapter 4 showed that teens' actual willingness to disclose information about their behavior, coupled with maternal perceptions of this disclosure, play a crucial conjoint role in determining delinquent trajectories among teens. Importantly, the findings suggested that reports of youth disclosure alone, whether provided by adolescents or their mothers, are relatively unimportant for understanding whether a teenager is more or less likely to drift towards problem behavior. Rather, it is the degree of congruence between mother-adolescent ratings of teens' willingness to share this information about their activities that appears to be most critical for determining adverse behavioral outcomes. These findings add to the growing body of evidence showing that multi-informant reporting discrepancies have the potential to shed light on a number of important family and developmental processes that directly influence youth adjustment and cannot be garnered from individual reports alone (Bell, Rychener, Munsch, 2001; De Los Reyes, 2011; De Los Reyes, Goodman, Kliever, & Reid-Quñones, 2010; De Los Reyes & Kazdin, 2005; Gaylord et al., 2003).

Theoretical Implications

This research adds to the theoretical fabric of the disclosure literature in a number of diverse and equally valuable ways. For example, recent conceptions of adolescent information management have highlighted the importance of acknowledging the active role

teens play in their own development by making strategic decisions about the details they do and do not share with parents about their behavior (Marshall, Tilton-Weaver, & Bosdet, 2005; Tilton-Weaver et al., 2010; Tilton-Weaver & Marshall, 2008). The first two studies of this thesis provide evidence that strongly supports this research direction.

In study one (Chapter 2), adolescents' perceptions of openness in communication in their relationship with mothers was shown to be instrumental to their willingness to reveal their involvement in a broad range of behaviors, organized according to social domain theory (Turiel, 1983, 2006). Moreover, the importance of teens' self-beliefs in their capacity to disclose contentious or embarrassing behaviors to mothers in order for that disclosure to occur was also demonstrated and hence, illustrated the value of distinguishing between youths' involvement in different activities on the basis of social domain theory (Turiel, 1983, 2006). Although the contribution of teens' self-efficacy for assertiveness to disclosure processes has been investigated previously (e.g., Hunter et al., 2011), this research was the first to examine whether youths' beliefs in their ability to engage in spontaneous disclosure with mothers specifically enabled it. This was an important theoretical development, given Bandura's (1986, 2001) original conceptualization of self-efficacy implicates the role of domain-linked knowledge structures in determining outcomes. Considered the foundation of human agency within social cognitive theory (SCT; Bandura, 1986, 2001), the finding that disclosure self-efficacy beliefs can facilitate spontaneous youth disclosure is consistent with the active role that has been ascribed to adolescents as information managers with parents.

This view that teens make strategic decisions about the information they do and do not reveal to mothers was further investigated in study two via the introduction of pressured information management. Comprising both pressured disclosure and pressured secrecy, this theoretical innovation was offered to provide a more nuanced understanding of the reasoning which governs youths' information management decisions based on their relational history with their mothers and thus makes a significant contribution to the field. It was argued that

instances where teens choose to share or withhold information from maternal caregivers on the basis of self-focused preferences should be considered separately from situations where adolescents feel compelled to engage in these strategies because they perceive implicit pressure from the target of their information management to do so. This so-called other-focused pressure was considered to derive from the reactions or attitudes to disclosure and non-disclosure that the adolescent attributes to this target, in this case mothers.

Prior to this research, no theories had been presented differentiating between adolescents' information management decisions that were made on the basis of other-focused pressure, versus where these choices appeared to be governed by self-focused interests. Nonetheless, this distinction is important as the line of reasoning that guides these choices may affect adolescents' psychological functioning, over and above the impact of the information management strategy that is employed (Keijsers & Laird, 2010; Laird & Marerro, 2010). Distinguishing between pressured and self-focused information management may thus offer an explanation for why relations between disclosure, secrecy and youth outcomes in the literature have at times been inconsistent. This account goes beyond Frijns et al.'s (2010) reformulation of the disclosure-adjustment link as a secrecy-maladjustment link by highlighting the possibility that the reasoning teens use to justify their information management decisions may also play a role apart from the use of that strategy itself in determining their psychosocial corollaries.

Although the reasons presented in study two as underscoring pressured adolescent information management bear a resemblance to some that have been offered previously for why teens' may decide to disclose or not disclose their activities to parents (e.g., Darling, Cumsille, Caldwell & Dowdy, 2006; Marshall et al., 2005; Smetana et al., 2006; Smetana et al., 2009; Tilton-Weaver et al., 2010), this research was the first to synthesize these disparate ideas and advance a single construct that reflects the degree to which youths' feel compelled to engage in these strategies with caregivers. As shown in study two, when teens' choices to

engage in spontaneous disclosure or keep secrets from mothers are guided by the belief they have limited recourse to do otherwise, this can have an impact on their psychological functioning that is not only gender-specific, but also specific to that pressured information management strategy. The results thus provide further support for the growing body of evidence that indicates secrecy and disclosure comprise two distinct constructs, as opposed to opposite ends of the same continuum (Almas et al., 2011; Finkenauer et al., 2002; Frijns et al., 2010; Laird & Marrero, 2010; Marshall et al., 2005).

Finally, previous research investigating the sources and implications of parental knowledge has often advocated either parent- or adolescent-driven models of influence. Offering a bridge between these two divergent perspectives, the studies comprising this thesis investigated how mothers and youths may *both* contribute, whether individually or conjointly, to teen disclosure, as well as the psychosocial outcomes they experience following their information management choices. The collective contribution of a diverse array of maternal, adolescent and mother-adolescent interaction factors to youths' willingness to divulge information about their behavior was examined in study one. In study two, how the mother-adolescent relational milieu contextualizes teens' information management decisions and their emotional consequences was explored. Lastly, the conjoint influence of actual youth disclosure about their behavior and maternal perceptions of these disclosures to the deterrence of problem behavior in teens was examined in study three. The results of all three studies showed that while adolescents play an active role in making judicious decisions about the information they do or do not share with mothers, these choices occur within the context of a parent-child relationship that cannot be overlooked. These studies further demonstrate that some positive adolescent outcomes are more achievable when mothers and teens pool their knowledge and resources and work together, which is consistent with the notion of collective agency within social cognitive theory (SCT; Bandura, 1986, 2001, 2006a). This research therefore extended the conceptualization of youths' as active agents within the framework of

adolescent information management to the consideration of collective agency from SCT by first drawing a link between the agentic role that is ascribed to teens as contributors to their own development by both theories. The theoretical bridging between adolescent information management and processes rooted in SCT (e.g., collective efficacy, self-efficacy beliefs) offered by this research thus represents an exciting avenue for future studies to enhance current understanding of how parents and teens mutually influence spontaneous disclosure, and in turn, positive adolescent development. The potential role played by other important elements of SCT should thus be considered. This includes how outcome expectancies for disclosure, goal-setting and parental self-efficacy beliefs (Bandura, 1986, 2001) additionally influence these processes.

Clinical Implications

The findings from this research also have important implications for the prevention of negative psychosocial outcomes during adolescence. Firstly, broad parenting programs tend to have as their objective the provision of strategies and skills that parents use to enhance the general functioning of the family. This often includes emphasizing the role effective parental monitoring plays in deterring youths from problem behavior (Racz & McMahon, 2011). These programs are guided by considerable research which indicates dysfunctional parenting practices such as poor parental monitoring place children at risk of developing conduct problems (e.g., Barnes, Hoffman, Welte, Farrell, & Dintcheff, 2006; Dishion & McMahon, 1998; Loeber & Dishion, 1983; Loeber & Stouthamer-Loeber, 1986). However, the results of this research suggest parenting factors alone may be relatively unimportant when it comes to eliciting spontaneous youth disclosure about their behavior, as well as maximizing its benefits. This is consistent with the influential findings of Stattin and Kerr (2000; Kerr & Stattin, 2000), which were the first to cast doubt over the primary role usually attributed to parents within these programs for determining adolescent outcomes and instead highlighted the crucial contribution of adolescents themselves to their adjustment.

This was shown in study one of this research, which demonstrated that maternal attributes such as warmth, behavioral control and psychological control did not contribute to the longitudinal prediction of spontaneous adolescent disclosure once the impact of teens' self-efficacy and communication processes were also taken into account. Similarly, in study three, maternal perceptions of youths' willingness to freely divulge their involvement across a range of activities were not associated with levels of delinquency at follow-up. These findings highlight that intervention programs and their individual components which focus exclusively on the importance of parenting behaviors in attenuating youth problem behavior may be less effective than the research and social rhetoric guiding their development might suggest. In contrast, all three studies from this research indicate that interventions which take into account the role of teens, as well as conjoint parent-teen influences, may be more successful in facilitating youth disclosure and augmenting the benefits of adolescent information management. Of particular importance appears to be the degree of openness in the relationship shared between mother and teenager. This is evidenced by the results of study one that demonstrated teens who perceive more openness in communication with mothers are also more likely to divulge to them their involvement in a range of behaviors, including risky activities. In studies two and three, pressured secrecy and mother-adolescent disclosure reporting discrepancies, diametric opposites of openness, both led to adverse emotional and behavioral outcomes for teens at follow-up. These findings thus suggest that interventions which at their core aim to build positive relationships between parents and adolescents based on open communication may be of more benefit to youth adjustment than those which focus on the role of parental behavior alone in facilitating these processes.

The results of study one further indicate that prevention programs may benefit from the inclusion of components that aim to boost youths' self-efficacy to engage in spontaneous disclosure with mothers, particularly in the context of risky or potentially embarrassing behavior. According to SCT (Bandura, 1986, 2001) mastery experiences acquired through

modeling and the rehearsal of skills in a non-threatening environment may build an individual's self-efficacy to engage in that behavior (Bandura, 1997; Ozer & Bandura, 1990). This implicates the potentially favorable contribution that role-plays between parents and adolescents as part of intervention programs may offer for bolstering communication within families about youths' daily activities and in particular, their prudential behavior. This is especially important because it is these risky activities that are likely to be of most concern to parents who wish to deter their teens from deviant trajectories (Smetana, 2008).

Enhanced disclosure from teens about their engagement in prudential behavior may in turn serve to attenuate the degree of discrepancy that often exists between parent-adolescent perceptions of youths' involvement in these activities (De Los Reyes, Goodman, Kliewer, & Reid-Quñones, 2008). Indeed, study three provides evidence that directly supports the importance of reducing mother-adolescent reporting discrepancies in relation to youth disclosure about their involvement in risky behavior to avert delinquent trajectories. Incorporating strategies in prevention programs that aim to ameliorate these divergent perspectives and encourage open communication within the family is thus of paramount importance. The finding from study three of no agreement effect for mother-adolescent perceptions of teens' disclosure about their risky activities also carries import as it suggests even where teens are less than forthcoming about their involvement in risky behavior, delinquent involvement is not guaranteed so long as mothers have accurate awareness about their non-disclosure. This provides some support for the growing view that other mechanisms of maternal knowledge do play some role in preventing youth problem behavior, especially among teens who may be least likely to spontaneously offer information to parents about their activities (e.g., Laird, Marrero, & Sentse, 2010; Willoughby & Hamza, 2011). The results pertaining to mother-adolescent perceptions of personal disclosure from youths also conveyed crucial information, indicating that positive behavioral outcomes were possible even at the low end of these disclosures. This implicated the crucial function that autonomy-seeking

processes serve during adolescence in supporting adaptive psychosocial functioning (e.g., Buhrmester & Prager, 1995; Nucci, Hasebe, & Lins-Dyer, 2005; Zimmer-Gembeck & Collins, 2003).

Mother-adolescent reporting discrepancies for youth disclosure may have additional implications. For example, mothers who over-estimate teens' willingness to engage in disclosure may lack sufficient information about their child's behavior, rendering them ill-equipped to effectively steer their adolescent away from delinquent activities (De Los Reyes et al., 2010). On the other hand, mothers who under-estimate teen disclosure may respond to their perception that youths are not being forthcoming about their behavior in negative ways that independently contribute to delinquency (Finkenauer, Frijns, Engels, & Kerkhof, 2005; Goldstein, Davis-Kean, & Eccles, 2005). This suggests both maternal over- *and* under-reports of youth disclosing behaviors may have an adverse influence on problem behavior among teens, which is consistent with the results of study three indicating that the direction of disclosure reporting discrepancies for prudential activities was less crucial to the development of delinquency. This has further important clinical implications as mothers who over-estimate child disclosure, as well as teens whose mothers under-estimate their willingness to communicate about these issues, may approach intervention through the lens that no problem exists. They may thus be less inclined to work on the parenting or communication issues that have given rise to such divergent perspectives. Disclosure reporting discrepancies should thus be explored openly as part of interventions addressing youth problem behaviors to strengthen the rationale for treatment, as well as alleviate these disparities which at their core reflect disrupted communication patterns that adversely impact adolescent adjustment (Guion et al., 2009; Reidler & Swenson, 2012).

Strengths of the Present Research

The key strength of this research lies in its many innovations. Study one was the first of its kind to investigate the collective contribution of a diverse array of parent, adolescent

and parent-adolescent interaction processes to youth disclosure over time. In study two, the theoretical innovation of pressured information management was advanced and its gender-specific consequences explored, thus filling an important void in the literature. Lastly, study three offered a more nuanced examination than has been conducted previously of the impact of congruence and discrepancy between mother-adolescent reports of disclosure on the development of delinquency. This was achieved using polynomial regressions with response surface analyses—a sophisticated statistical technique with distinct advantages for capturing the complexity of these relationships that hitherto had not been applied to disclosure research. A further strength which supported these objectives was the longitudinal research design, enabling the analysis of data acquired across two time points. This allowed for the longitudinal contribution of various factors to youth disclosure and adjustment to be stringently tested by accounting for stability in the outcome variable over time.

Moreover, while some studies purport to measure *spontaneous* adolescent disclosure, the scales used do not always include items emphasizing the spontaneity that characterizes this type of sharing of information from teens to parents. When this occurs, it is possible that true cases of spontaneous disclosure are confounded with other sources of parental knowledge, like parental solicitation. The development and use of the Teen Overall Level of Disclosure Scale (TOLDS) as part of this research ameliorated these issues by including in its instructions an explicit focus on teens' willingness to spontaneously divulge information to parents about their behavior and thus reflects a key strength. Moreover, no consensus measure for assessing spontaneous disclosure across social domains of behavior existed prior to this research, with the items included across studies often subject to variation (e.g., Rote, Smetana, Campione-Barr, Villalobos, & Tasopoulos-Chan, 2012; Smetana et al., 2006; Smetana et al., 2009, Yau, Tasopoulos-Chan, & Smetana, 2009). Nor does it seem the validity of measures used in the disclosure literature is routinely verified (Racz & McMahon, 2011). In this research, the multidimensional structure of the TOLDS with respect to social domain

theory (Turiel, 1983, 2006) was validated using factor-analytic techniques for the first time in research examining spontaneous disclosure from youths across social domains of behavior. Indeed, continuing these efforts to verify the validity of the TOLDS as a meaningful measure of youths' willingness to engage in disclosure with parents about their daily activities is an important goal for future research.

In addition, Smetana et al. (2009) acknowledged the merit of assessing youths' willingness to discuss behaviors they have not performed, while still discriminating between behaviors in which teens were currently engaged and those they were not. Building upon these ideas, the possibility that the *degree* to which adolescents are involved in certain activities may impact their willingness to reveal these behaviors was considered in study one by accounting for this factor statistically in domain-specific analyses. However, it should be noted that this was not possible for domain-specific disclosure in study three as there was some overlap between items on this measure of behavioral assessment and the delinquency scale that was used. Consistent with the approach taken in previous research (e.g., Barnes, Welte, Hoffman, & Dintcheff, 1999), these overlapping items, and hence the assessment of behavioral engagement, was excluded from analysis. Finding ways to incorporate the extent to which teens endorse engaging in the activities targeted in disclosure studies thus remains a task for future research in this area.

Finally, the consideration of multi-informant data using a sophisticated statistical procedure that permitted an in-depth examination of the relationship between adolescent-reported disclosure, mother-reported disclosure and delinquency during the teenage years is also noteworthy. Indeed, the importance of considering both parent and adolescent reports to enhance the credibility of findings is well-established (Brown & Bakken, 2011; Racz & McMahon, 2011). While the potential for polynomial regressions to shed light on how multi-informant data influences youth outcomes has been recently recognized within the developmental literature (e.g., Laird & De Los Reyes, 2013), study three is the first to date to

apply this methodology to mother-adolescent reports of disclosure from teens and adopt surface plots to facilitate understanding of these complex relationships.

Limitations and Future Directions

Although this research makes a significant contribution to the understanding of adolescent information management and its implications for youth adjustment, there are a number of limitations worth mentioning. Firstly, the reliance on self-report adolescent data to assess parental and youth behaviors in this thesis should be noted. This approach has been criticized owing to research which suggests discrepancies between data provided by parents and adolescents tend to be the rule rather than the exception (De Los Reyes et al., 2008; De Los Reyes et al., 2010; De Los Reyes & Kazdin, 2005; Dishion & McMahon, 1998; Racz & McMahon, 2011; Reidler & Swenson, 2012). It has thus been argued that multi-informant data, used only in study three of this research, may provide a more complete picture of family and adolescent functioning (Racz & McMahon, 2011).

In direct opposition to this view is research that has demonstrated the perspectives provided by teens may offer a more reliable indicator of what goes on in families and the lives of adolescents than can be discerned from reports provided by parents (e.g., Jaccard, Dittus, & Gordon, 1998; Sessa, Avenoli, Steinberg, Morris, 2001; Xiao, Li, & Stanton, 2011). These findings have led other researchers to assert that teens' subjective beliefs about youth and parental behavior may be the most important to obtain (e.g., Barber & Harmon, 2002; Morris et al., 2002; Tilton-Weaver et al., 2010), particularly in the context of adolescent information management which, by definition, is concerned with details that parents may not be privy to. Nonetheless, consistent with the results of study three, multi-informant data may yield invaluable information about the parent-child relational context in which disclosure occurs, as well as reduce the artificial inflation of results that arises when single reports are used owing to shared-method variance. Future studies would thus benefit from continuing to explore how mother-adolescent reports conjointly influence youth outcomes. Multi-method designs (e.g.,

observational paradigms, qualitative research, the use of more objective indices of adjustment like police and school records) may also prove useful for supplementing self-report measures. Moreover, whether the issues explored in this thesis vary across the developmental period and among at-risk populations of youths should be considered.

Longitudinal linkages in this research were assessed over two time points seven months apart. While this interval is consistent with that reported in other studies also examining adolescents' management of information across two time points (e.g., Frijns & Finkenauer, 2009; Frijns et al., 2005; Stavrinides, 2011), it is possible that the relationships observed here may be different across longer time periods. Future research would thus benefit from investigating these issues over greater time frames. The collection of data across two time points only should also be noted. Longitudinal designs that incorporate several waves of data collection are necessary to allow mediation processes to be probed. This is important as these mediation analyses may yield crucial insight about the subtleties of the interplay between factors that contribute to the disclosure and psychosocial functioning of youths (Racz & McMahon, 2011). For example, it is possible that adolescent perceptions of openness in communication with mothers contribute to the relationship between maternal warmth/responsiveness and youth disclosure that has been found in previous studies (e.g., Blodgett Salafia et al., 2009). This would explain why in study one maternal warmth was found predictive of youth disclosure when considered with other parenting attributes, but ceased to influence teens' willingness to divulge information to mothers once communication and efficacy processes were also taken into account. Examining whether adolescents' perceptions of openness in communication with mothers mediates the relationship between maternal warmth and youth disclosure thus constitutes an important objective for future research employing cross-lagged panel designs across multiple time points. These would also enable bidirectional influences and alternate models of causation to be further investigated, as was done in study two of this research. Whether parental, adolescent and joint parent-

adolescent influences on youth disclosure and adjustment unfold in an interactive fashion over time therefore represents both a much needed and burgeoning area of research that warrants further attention (Brown & Bakken, 2011; Racz & McMahon, 2011).

This research was further limited by its specific focus on mother-adolescent relationships. Although questions addressing teens' information management with fathers could not be included due to time and practical constraints, it is conceivable that the results yielded may differ when the paternal-adolescent relationship is considered. This is supported by previous studies which clearly demonstrate that when mothers and fathers from the same family are compared, differences exist in their knowledge of teen behavior (e.g., Bumpus, Crouter, & McHale, 2001; Crouter & Head, 2002; Smetana et al., 2006; Waizenhofer, Buchanan, & Jackson-Newsom, 2004). A multitude of studies have further advocated that the role of peers and siblings in the disclosure process should also be considered (e.g., Buhrmester & Prager, 1995; Howe, Aquan-Assee, & Bukowski, 1995; Howe, Aquan-Assee, Bukowski, Lehoux, & Rinaldi, 2001; Low, Snyder, & Shortt, 2012; Rose et al., 2012; Waller & Rose, 2013). This is consistent with Brown and Bakken (2011) who argue that a more contextually sensitive and integrative understanding of how teens' families and friends might contribute to information management processes in interactive ways that support or undermine positive adolescent development is required.

Finally, whether the predictors and outcomes of adolescents' management of information differ when teens convey details about their behavior to parents electronically or via face-to-face interactions with caregivers should be explored, given the growing popularity of instant messaging, e-mail and social media interfaces among youths for keeping parents apprised of their lives (Thurlow & McKay, 2003). This issue indeed represents both an important and interesting line of inquiry owing to recent studies which indicate the psychological outcomes of disclosure and young adults' communication with parents over

electronic technologies may be different from when other modalities are used (e.g., Gentzler, Oberhauser, Westerman, & Nadorff, 2011; Iacovelli & Johnson, 2012).

Summary and Conclusions

Stattin and Kerr's (2000; Kerr & Stattin, 2000) influential findings brought to attention the flaw in conceptualizing the prevention of youth problem behavior as a static and purely parental task that underestimates the contribution of adolescents to their own development. Since then, a plethora of research has seen the pendulum swing both ways, with some studies arguing that parental knowledge is mainly a youth-driven process (e.g., Keijsers, Branje, VanderValk, & Meeus, 2010; Kerr, Stattin, & Burk, 2010), whereas others continue to advocate for the chief role of parents in curbing teen problem behavior (e.g., Brody, 2003; Capaldi, 2003; Fletcher, Steinberg, & Williams-Wheeler, 2004). This research examined the collective contribution of mothers and adolescents to teens' willingness to engage in spontaneous disclosure with maternal caregivers and how both parties influence youth psychosocial outcomes. The findings indicate that strict adherence to either a parent- or youth-driven model of teen disclosure may undervalue the complex and mutually influential nature of interactions between parents and adolescents. Rather, these issues are best understood within the context of a dynamic 'family-oriented process' that is inclusive of parent-teen factors.

In all three studies, the importance of cultivating an open environment within families was demonstrated. Teens' perceptions of openness in communication with mothers were the broadest predictor of youth disclosure across multiple domains of social behavior. Meanwhile, pressured secrecy and mother-adolescent reporting discrepancies, the direct antitheses of open communication, negatively impacted teens' socio-emotional functioning over time. Kerr and Stattin (2000) were thus perhaps right after all when they said over a decade ago that an open and communicative environment in families is most important for encouraging spontaneous disclosure from youths. What the results from this research add are

findings which suggest when it comes to teens' management of information with mothers, both parties may play a crucial conjoint role in creating an atmosphere that is conducive to positive communication, and in turn, supports optimal adolescent adjustment.

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Appendices

Appendix A
Items Used in Chapters 2-4 and Changes
from Original Scales

Items Developed for this Research

The Teen Overall Level of Disclosure Scale (TOLDS—Adolescent Report)

How often you **usually** tell your mother **without her having to ask** about the activity or behavior listed?

Even if you have never done the activity or behavior listed, not even once, try to imagine how often you **would** tell your mother **without her having to ask** if you did do that activity or behavior. Circle the number that best reflects this.

	Never tell	Almost never tell	Rarely tell	Some- times tell	Often tell	Always tell
1. If you spread rumors about or say something cruel to friends	1	2	3	4	5	6
2. If you drink alcohol (<u>Note:</u> Not including sips given to you by your parents)	1	2	3	4	5	6
3. How you spend your free time after school or on the weekend	1	2	3	4	5	6
4. What you talk about with friends (this could be over the phone, the internet, or in text messages)	1	2	3	4	5	6
5. If you get pulled up by an adult other than your parents (e.g., teachers, grandparents, etc.) for being rude or disrespectful	1	2	3	4	5	6
6. How you spend your allowance or money you've earned from a part-time job	1	2	3	4	5	6
7. If you watch a movie that has explicit sex or violence in it	1	2	3	4	5	6
8. If you go to parties where other teens are drinking alcohol	1	2	3	4	5	6
9. If you break a promise or lie to someone	1	2	3	4	5	6

Note:

Items 2, 7, 8—prudential domain (TOLDS-PR)

Items 3, 4, 6—personal domain (TOLDS-PE)

Items 1, 5, 9—moral/conventional domain (TOLDS-MC)

The Teen Overall Level of Disclosure Scale (TOLDS—Mother Report)

How often you think your child tells you about their involvement in the activities or behaviors listed below (**without you having to ask them**)?

Even if you think your child has never done the activity or behavior listed, try to imagine how often you think your child **would** tell you about it (**without you having to ask them**), if they did engage in that activity or behavior. Circle the number that best reflects this.

	Never tell	Almost never tell	Rarely tell	Some- times tell	Often tell	Always tell
1. If they spread rumors about or say something cruel to friends	1	2	3	4	5	6
2. If they drink alcohol (<u>Note:</u> Not including sips given to them by you or your spouse)	1	2	3	4	5	6
3. How they spend their free time after school or on the weekend	1	2	3	4	5	6
4. What they talk about with friends (this could be over the phone, the internet, or in text messages)	1	2	3	4	5	6
5. If they get pulled up by other adults (e.g., teachers, grandparents, etc.) for being rude or disrespectful	1	2	3	4	5	6
6. How they spend their allowance or money they've earned from a part-time job	1	2	3	4	5	6
7. If they watch a movie that has explicit sex or violence in it	1	2	3	4	5	6
8. If they go to parties where other teens are drinking alcohol	1	2	3	4	5	6
9. If they break a promise or lie to someone	1	2	3	4	5	6

Note:

Items 2, 7, 8—prudential domain (TOLDS-PR)

Items 3, 4, 6—personal domain (TOLDS-PE)

Items 1, 5, 9—moral/conventional domain (TOLDS-MC)

Assessment of behavioral engagement

Listed below are activities or behaviors that some teenagers your age do. Please circle the option that matches how many times you have done that activity or behavior.

	Never	Once	A few times	Lots of times (4 or more)	Never	Once
1. Spread rumors about or said something cruel to friends	1	2	3	4	5	6
2. Drank alcohol (<u>Note:</u> Not including sips given to you by your parents)	1	2	3	4	5	6
3. Had free time after school or on the weekend	1	2	3	4	5	6
4. Talked to friends over the phone, the internet, or in text messages	1	2	3	4	5	6
5. Got pulled up by an adult other than your parents (e.g., teachers, grandparents, etc.) for being rude or disrespectful	1	2	3	4	5	6
6. Got an allowance or earned money from a part-time job	1	2	3	4	5	6
7. Watched a movie that had explicit sex or violence in it	1	2	3	4	5	6
8. Went to a party where other teens were drinking alcohol	1	2	3	4	5	6
9. Broke a promise or lied to someone	1	2	3	4	5	6

Note:

Items 2, 7, 8—prudential domain (TOLDS-PR)

Items 3, 4, 6—personal domain (TOLDS-PE)

Items 1, 5, 9—moral/conventional domain (TOLDS-MC)

Assessment of disclosure self-efficacy

The following questions are designed to help us get a better understanding of the kinds of things that are easy for teenagers to tell their mother about and those that are more difficult.

Imagine that you **did** do each of the activities or behaviors listed below and decided to tell your mother about them (**without her having to ask**). Please rate **how well** you think you can tell your mother about the thing listed.

For example, if the question said, “How well can you tell your mother... who called while she was out?”, and you think you can tell her pretty well, you would circle the pretty well option like this...

Not well At all	Kind of well	Pretty well	Well	Very Well	Extremely well
1	2	3	4	5	6

Remember, we are **NOT** asking whether you do or don't tell your mother about the thing listed. We are asking **how well** you **could** tell her about that activity, if you **did** tell her.

	Not well at all	Kind of well	Pretty well	Well	Very well	Extremely well
1. Spread rumors about or said something cruel to friends	1	2	3	4	5	6
2. Drank alcohol (<u>Note:</u> Not including sips given to you by your parents)	1	2	3	4	5	6
3. Had free time after school or on the weekend	1	2	3	4	5	6
4. Talked to friends over the phone, the internet, or in text messages	1	2	3	4	5	6
5. Got pulled up by an adult other than your parents (e.g., teachers, grandparents, etc.) for being rude or disrespectful	1	2	3	4	5	6
6. Got an allowance or earned money from a part-time job	1	2	3	4	5	6

	Not well at all	Kind of well	Pretty well	Well	Very well	Extremely well
7. Watched a movie that had explicit sex or violence in it	1	2	3	4	5	6
8. Went to a party where other teens were drinking alcohol	1	2	3	4	5	6
9. Broke a promise or lied to someone	1	2	3	4	5	6

Note:

Items 2, 7, 8—prudential domain (TOLDS-PR)

Items 3, 4, 6—personal domain (TOLDS-PE)

Items 1, 5, 9—moral/conventional domain (TOLDS-MC)

The Pressured Information Management Scale (PIMS)

Pressured Disclosure Scale (PIMS-PD)

Most teenagers tell their mothers about some of the things that go on in their lives. However, their reasons for doing so may be very different. Think about the times you **HAVE** told your mother (without her having to ask) about what's going on in your life and circle the number that matches how much you agree with each statement.

	Strongly disagree	Mostly disagree	Disagree a little bit	Agree a little bit	Mostly agree	Strongly agree
1. When I <u>tell</u> my mother what's going on in my life, it's because... she makes me tell her	1	2	3	4	5	6
2. When I <u>tell</u> my mother what's going on in my life, it's because... her rules are that I <i>have</i> to tell her	1	2	3	4	5	6
3. When I <u>tell</u> my mother what's going on in my life, it's because... she makes me feel like I have to tell 'or else'	1	2	3	4	5	6
4. When I <u>tell</u> my mother what's going on in my life, it's because... she would never understand if I kept something from her	1	2	3	4	5	6
5. When I <u>tell</u> my mother what's going on in my life, it's because... she expects me to tell her	1	2	3	4	5	6
6. When I <u>tell</u> my mother what's going on in my life, it's because... I have to tell her, that's just the way it is	1	2	3	4	5	6

Pressured Secrecy Scale (PIMS-PS)

In the same way that most teenagers tell their mothers about some of the things that go on in their lives, most teenagers will have, at one time or another, kept something from their mother. Again, their reasons for doing so can be very different. Think about the times you **HAVEN'T** told your mother about what's going on in your life and circle the number that matches how much you agree with each statement.

	Strongly disagree	Mostly disagree	Disagree a little bit	Agree a little bit	Mostly agree	Strongly agree
1. When I <u>don't tell</u> my mother what's going on in my life, it's because... she would make me feel bad about myself if I told her	1	2	3	4	5	6
2. When I <u>don't tell</u> my mother what's going on in my life, it's because... I worry about what she'd say or do if I did tell her	1	2	3	4	5	6
3. When I <u>don't tell</u> my mother what's going on in my life, it's because... she would make things bad for me if I told her	1	2	3	4	5	6
4. When I <u>don't tell</u> my mother what's going on in my life, it's because... she would react badly if I did tell her	1	2	3	4	5	6
5. When I <u>don't tell</u> my mother what's going on in my life, it's because... the way she is, I feel like I have no choice but to keep things from her	1	2	3	4	5	6
6. When I <u>don't tell</u> my mother what's going on in my life, it's because... I feel when it comes to her, my only option is not to tell	1	2	3	4	5	6

**Pre-existing Measures Used in this Research with Changes from Original Scales
Indicated in Italics**

As children grow up to be teenagers and young adults, they learn more and more about their mother and how their mother is raising them. These questions are designed to help us get a better understanding of this in relation to **your** mother.

Please read each statement and circle the number that most closely **describes the way your mother acts towards you**.

Acceptance subscale of the shortened Child's Report of Parent Behavior Inventory (CRPBI-30; Schludermann & Schludermann, 1988)

<u>My mother is a person who...</u>	Not like her	Somewhat like her	A lot like her
1. Makes me feel better after talking over my worries with her	1	2	3
2. Smiles at me very often	1	2	3
3. Is able to make me feel better when I am upset	1	2	3
4. Enjoys doing things with me	1	2	3
5. Cheers me up when I am sad	1	2	3
6. Gives me a lot of care and attention	1	2	3
7. Makes me feel like the most important person in her life	1	2	3
8. Believes in showing her love for me	1	2	3
9. Often praises me	1	2	3
10. Is easy to talk to	1	2	3

Psychological Control Scale Youth Self-Report (PCS-YSR; Barber, 1996)

<u>My mother is a person who...</u>	Not like her	Somewhat like her	A lot like her
1. Is always trying to change how I feel or think about things	1	2	3
2. Changes the subject whenever I have something to say	1	2	3
3. Often interrupts me	1	2	3
4. Blames me for other family members' problems	1	2	3
5. Brings up past mistakes when she criticizes me	1	2	3
6. Is less friendly with me if I do not see things her way	1	2	3
7. Will avoid looking at me when I have disappointed her	1	2	3
8. If I have hurt her feelings, stops talking to me until I please her again	1	2	3

Parental Monitoring of Behavior subscale of the Parental Regulation Scale (PRS; Barber, 2002)

<u>My mother is a person who...</u>	Not like her	Somewhat like her	A lot like her
1. Asks me questions about how I am behaving outside the home	1	2	3
2. Reminds me of the rules she has set for me	1	2	3
3. Watches to make sure I behave appropriately	1	2	3
4. Talks to neighbors, parents of my friends, or my teachers about my behavior	1	2	3
5. Makes efforts to know who my friends are, where I spend my time, etc.	1	2	3
6. Doesn't seem to care whether or not I behave like she wants me to	1	2	3
7. Is unaware of how I am behaving in or outside the home	1	2	3
8. Checks on me in reasonable ways to see if I am behaving like she wants me to	1	2	3

Note: Two items were omitted from the original subscale provided by Barber (2002), based on the recommendation of B. Soenens (personal communication, December 14, 2011). All 10 original items are presented at the end of this appendix.

Short form of the Interpersonal Communication Competence Scale (ICCS-SF; Rubin & Martin, 1994)

Here are some statements about how people interact with other people. For each statement, circle the number that best reflects the way **YOU** communicate with others (**in general, not just with your mother**). Please be honest in your responses and reflect carefully on the way you communicate.

	Almost never	Rarely	Some- times	Often	Almost always
1. I allow friends to see who I really am	1	2	3	4	5
2. I can put myself in others' shoes	1	2	3	4	5
3. I am comfortable in social situations	1	2	3	4	5
4. When I've been wronged, I confront the person who wronged me	1	2	3	4	5
5. My conversations <i>with people usually move smoothly from one topic to the next</i>	1	2	3	4	5
6. My friends can tell when I'm happy or sad	1	2	3	4	5
7. <i>When I talk to people, I usually come across as open, not judgmental</i>	1	2	3	4	5
8. My friends truly believe that I care about them	1	2	3	4	5
9. <i>When I talk to someone, I am able to get what I need from the conversation</i>	1	2	3	4	5

Note: Italics are used to indicate changes in wording from the original items provided by Rubin and Martin (1984). These re-worded items can be compared to those used in the original scale offered by Rubin and Martin (1984), which is listed at the end of this appendix. This also includes an additional item that was found to load poorly on the suggested unidimensional factor structure of the ICCS-SF and was thus deleted from this research.

**Open family communication subscale of the Parent-Adolescent Communication Scale
(Barnes & Olson, 1982)**

These questions are designed to help us get a better understanding of the kinds of ways children communicate with their mother. Please circle the number that matches how much you agree with each statement.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1. I can discuss my beliefs with my mother without feeling restrained or embarrassed	1	2	3	4	5
2. My mother is always a good listener	1	2	3	4	5
3. My mother can tell how I'm feeling without asking	1	2	3	4	5
4. I am very satisfied with how my mother and I talk together	1	2	3	4	5
5. If I were in trouble, I could tell my mother	1	2	3	4	5
6. I openly show affection to my mother	1	2	3	4	5
7. When I ask questions, I get honest answers from my mother	1	2	3	4	5
8. My mother tries to understand my point of view	1	2	3	4	5
9. I find it easy to discuss problems with my mother	1	2	3	4	5
10. It is very easy for me to express all my true feelings to my mother	1	2	3	4	5

Short form of the Depression Anxiety Stress Scales (DASS-21; Lovibond & Lovibond, 1995)

These questions are designed to give us a better understanding about how you think and feel. Please fill in the circle that matches how much each statement has applied (or “happened”) to you **over the past week**. There are no right or wrong answers. Do not spend too much time on any statement.

	Did not apply to me at all	Applied to me to a bit, or some of the time	Applied to me to a lot, or a good part of time	Applied to me very much, or most of the time
1. I found it hard to wind down (<i>or “unwind”</i>)	1	2	3	4
2. I was aware of dryness of my mouth	1	2	3	4
3. I couldn't seem to experience any positive feeling at all	1	2	3	4
4. I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)	1	2	3	4
5. I found it difficult to work up the initiative (<i>or “start”</i>) to do things	1	2	3	4
6. I tended to over-react to situations	1	2	3	4
7. I experienced trembling (e.g. in the hands)	1	2	3	4
8. I felt that I was using a lot of nervous energy	1	2	3	4
9. I was worried about situations in which I might panic and make a fool of myself	1	2	3	4
10. I felt that I had nothing to look forward to	1	2	3	4
11. I found myself getting agitated	1	2	3	4
12. I found it difficult to relax	1	2	3	4
13. I felt down-hearted and blue	1	2	3	4
14. I was intolerant of anything that kept me from getting on with what I was doing	1	2	3	4
15. I felt I was close to panic	1	2	3	4

	Did not apply to me at all	Applied to me to a bit, or some of the time	Applied to me to a lot, or a good part of time	Applied to me very much, or most of the time
16. I was unable to become enthusiastic about anything	1	2	3	4
17. I felt I wasn't worth much as a person	1	2	3	4
18. I felt that I was rather touchy (<i>or</i> “ <i>easily upset/irritated</i> ”)	1	2	3	4
19. I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)	1	2	3	4
20. I felt scared without any good reason	1	2	3	4
21. I felt that life was meaningless	1	2	3	4

Note:

Items 3, 5, 10, 13, 16, 17, 21—Depression
 Items 2, 4, 7, 9, 15, 19, 20—Anxiety
 Items 1, 6, 8, 11, 12, 14, 18—Stress

Changes in the items used from the original scale offered by Lovibond and Lovibond (1995) are provided in italics. These changes represent additions intended to clarify the meaning of the original item, presented alongside these clarifying statements. Thus, to reduce redundancy the original scale is not provided again at the end of the appendix.

The Delinquency Scale (Barnes, Welte, Hoffman, & Dintcheff, 1999)

Listed below are some things that teenagers your age do. Please circle the option that matches how many times you have done that thing during the past year.

	Never	Once	2-3 times	4-5 times	6-9 times	10 or more times
1. Stayed out later than your parents said you should	1	2	3	4	5	6
2. Argued or fought with your mother	1	2	3	4	5	6
3. Skipped a day of school without a real excuse	1	2	3	4	5	6
4. Argued or fought with your father	1	2	3	4	5	6
5. Purposely damaged or messed up something not belonging to you	1	2	3	4	5	6
6. Tried to get something by lying to a person about what you would do for them or who you were	1	2	3	4	5	6
7. <i>Used drugs to get high or for the thrill of it</i>	1	2	3	4	5	6
8. Taken something of value which didn't belong to you	1	2	3	4	5	6
9. Beaten up someone on purpose	1	2	3	4	5	6
10. Copied answers from someone else's exam or test paper in school	1	2	3	4	5	6
11. Had 5 or more <i>glasses (or the equivalent) of beer/wine, or 5 or more shots of liquor</i>	1	2	3	4	5	6
12. Been involved in a physical fight with a gang or group of friends	1	2	3	4	5	6
13. Used a credit card or check without the owner's permission	1	2	3	4	5	6

	Never	Once	2-3 times	4-5 times	6-9 times	10 or more times
14. Broken into a house, business or car to take something or look around	1	2	3	4	5	6
15. Taken money from someone in your family without the person knowing about it	1	2	3	4	5	6
16. Used dirty language or swear words	1	2	3	4	5	6

Note:

Items 1, 2, 3, 4, 6, 10, 11, 16—Minor delinquency

Items 5, 7, 8, 9, 12, 13, 14, 15—Major delinquency

Adapted items are in italics. Five items were also omitted from the original scale developed by Barnes, Welte, Hoffman, and Dintcheff (1999). A copy of the full scale is provided at the end of this appendix.

Original Scales that were Adapted for Use in the Present Research

Note: Specific items adapted or deleted for this research are presented in italics.

Original Parental Monitoring of Behavior subscale of the Parental Regulation Scale (PRS; Barber, 2002)

My mother is a person who...

1. Asks me questions about how I am behaving outside the home
2. Reminds me of the rules she has set for me
3. Watches to make sure I behave appropriately
4. Talks to neighbors, parents of my friends, or my teachers about my behavior
5. *Is aware of whether or not I'm behaving like she wants me to*
6. Makes efforts to know who my friends are, where I spend my time, etc.
7. Doesn't seem to care whether or not I behave like she wants me to
8. Is unaware of how I am behaving in or outside the home
9. Checks on me in reasonable ways to see if I am behaving like she wants me to
10. *Goes overboard in checking on my behavior*

Original short form of the Interpersonal Communication Competence Scale (ICCS-SF; Rubin & Martin, 1994)

1. I allow friends to see who I really am
2. I can put myself in others' shoes
3. I am comfortable in social situations
4. When I've been wronged, I confront the person who wronged me
5. *My conversations are pretty one-sided*
6. *My conversations are characterized by smooth shifts from one topic to the next*
7. My friends can tell when I'm happy or sad
8. *My communication is usually descriptive, not evaluative*
9. My friends truly believe that I care about them
10. *I accomplish my communication goals*

Original Delinquency Scale (Barnes, Welte, Hoffman, & Dintcheff, 1999)

1. Stayed out later than your parents said you should
2. Argued or fought with your mother
3. Skipped a day of school without a real excuse
4. *Ran away from home*
5. Argued or fought with your father
6. Purposely damaged or messed up something not belonging to you
7. Tried to get something by lying to a person about what you would do for them or who you were
8. *Used marijuana or hashish*
9. *Used drugs (other than marijuana) to get high or for kicks*
10. Taken something of value which didn't belong to you
11. Beaten up someone on purpose
12. *Had sexual relations with someone*
13. Copied answers from someone else's exam or test paper in school
14. *Had 5 or more cans of beer/wine, or drinks of liquor*
15. Been involved in a physical fight with a gang or group of friends
16. Used a credit card or check without the owner's permission
17. Broken into a house, business or car to take something or look around
18. Taken money from someone in your family without the person knowing about it
19. *Pushed, shoved or hit a parent or another adult in your family.*
20. *Threw something at someone in your family when you were angry*
21. Used dirty language or swear words

Appendix B
Factor Analyses for the TOLDS (Chapter 2) and
PIMS (Chapter 3)

Table 1

Factor structure and loadings of the TOLDS, deduced from exploratory factor analysis forcing three factors and with principal axis factoring and oblimin rotation

Disclosure domain and items	Factor loadings		
	1	2	3
Prudential disclosure			
2. If you drink alcohol (<u>Note:</u> Not including sips given to you by your parents)	-.71		
7. If you watch a movie that has explicit sex or violence in it	-.39		
8. If you go to parties where other teens are drinking Alcohol	-.90		
Personal disclosure			
3. How you spend your free time after school or on the Weekend		.67	
4. What you talk about with friends (this could be over the phone, the internet, or in text messages)		.43	
6. How you spend your allowance or money you've earned from a part-time job		.69	
Moral/conventional disclosure			
1. If you spread rumors about or say something cruel to Friends			.80
5. If you get pulled up by an adult other than your parents (e.g., teachers, grandparents, etc.) for being rude or Disrespectful			.46
9. If you break a promise or lie to someone			.72

A confirmatory factor analysis was also conducted to determine the replicability of this three-factor solution. In line with the Cole, Ciesla, and Steiger (2007), two design-driven correlated residuals were permitted. These were items 3 and 6 (both beginning with “How you spend your” and thus addressing the concept of allocation by teens) and items 2 and 8 (both referencing alcohol-related activities). The proposed three-factor solution deduced from the exploratory factor analysis fit the data reasonably well [χ^2 (22, $N = 463$) = 65.40, $p < .001$, CFI = .97, TLI = .95, RMSEA = .07, 95% CI [.05, .08]].

To provide further validation of the factor structure of the TOLDS, the sample was randomly divided into two. An exploratory factor analysis was conducted on the first half ($N=234$) and yielded similar results to those obtained for the whole sample, while a confirmatory factor analysis was conducted on the second sample and indicated adequate

model fit [$\chi^2 (22, N = 229) = 57.22, p < .001, CFI = .96, TLI = .93, RMSEA = .08, 95\% CI [.06, .11]$]. These results offer additional support for the proposed three-factor solution of the TOLDS, comprising prudential, personal and moral/conventional disclosures.

Table 2

Factor structure and loadings of the PIMS, deduced from exploratory factor analysis with principal axis factoring and oblimin rotation

PIMS subscale and items	Factor loadings	
	1	2
1. Pressured disclosure		
She makes me tell her	.62	
Her rules are that I <i>have</i> to tell her	.81	
She makes me feel like I have to tell ‘or else’	.63	
She would never understand if I kept something from her	.40	
She expects me to tell her	.58	
I have to tell her, that’s just the way it is	.65	
2. Pressured secrecy		
She would make me feel bad about myself if I told her		.70
I worry about what she’d say or do if I did tell her		.61
She would make things bad for me if I told her		.87
She would react badly if I did tell her		.83
I feel like I have no choice but to keep things from her		.75
I feel when it comes to her, my only option is not to tell		.72

A confirmatory factor analysis on the overall sample was conducted in addition to the multi-group analyses reported in Chapter 3 to further assess the replicability of this two-factor solution. Consistent with these multigroup analyses, two design-driven correlated residuals were permitted (Cole et al., 2007). These were pressured disclosure items 3 and 6 (both containing “I have to tell”) and pressured secrecy items 5 and 6 (where synonyms of “no choice” were used). The proposed two-factor solution from the exploratory factor analysis fit

the data reasonably well [χ^2 (51, $N = 463$) = 166.91, $p < .001$, CFI = .95, TLI = .94, RMSEA = .07, 95% CI [.05, .08]] and was thus further validated.

Appendix C

Partial Correlations Between Domain-specific/Cross-domain Disclosure and Disclosure Self-efficacy at Time 1 and Time 2 from Chapter 2

Table 1

Partial correlations at T1 and T2 between domain-specific/cross-domain disclosure self-efficacy, controlling for grade and gender

Variable	1	2	3	4	5	6
1. Disclosure (prudential)		.48***	.62***	.56*** ^a	.36***	.33***
2. Disclosure (personal)	.47***		.56***	.22***	.56*** ^a	.29***
3. Disclosure (moral/conventional)	.63***	.50***		.31***	.35***	.46*** ^a
4. Disclosure self-efficacy (prudential)	.58*** ^a	.26***	.28***		.40***	.59***
5. Disclosure self-efficacy (personal)	.24***	.56*** ^a	.29***	.45***		.49***
6. Disclosure self-efficacy (moral/conventional)	.30***	.24***	.45*** ^a	.57***	.38***	

Note. Partial correlations between T1 variables are presented above the diagonal and partial correlations between T2 variables are presented below the diagonal.

^aRelevant domain-specific measure of behavioral engagement at T1 or T2 also controlled in analysis.

*** $p < .001$.

Appendix D

Base Rate of Reporting Discrepancies in Chapter 4

Consistent with previous research (e.g., Fleenor, McCauley, & Brutus, 1997; Shanock et al., 2010), base rates for the degree of discrepancy and agreement present between adolescent and mother reports of disclosure were calculated for each domain to verify the existence and type of discrepancies in the sample. Mother- and adolescent reported disclosure scores were first standardized to allow for the exploration of these potential discrepancies. Dyads for whom one informant's standardized score was determined to be half a standard deviation above or below the standardized score provided by the other informant were considered to have discrepant disclosure reports. Depending on the direction of the difference observed, these cases represented mothers who either over- or under-estimated their teens' willingness to engage in disclosure for that domain. As can be seen from Table 1, the distribution of mothers reporting higher disclosure than their teenager, lower disclosure than their teenager, or similar levels of disclosure to their teenager were approximately even for each domain. This supported the assumption that discrepancies would be present in the data, and accordingly, that further examination of the relationship between these discrepancies and teens' subsequent involvement in delinquency was warranted.

Table 1

Percentage of mother-reported disclosure over, under and in-agreement with adolescent-reported disclosure, shown separately for each domain

Agreement group	Percentage	Mean standardized score		Mean unstandardized score	
		Disclosure (MR)	Disclosure (AR)	Disclosure (MR)	Disclosure (AR)
T1 Prudential domain					
Mother-report lower than adolescent-report	33.7	-.65	.65	3.78	4.62
Mother- and adolescent-report in agreement	34.2	.12	.09	4.65	3.75
Mother-report higher than adolescent-report	32.1	.55	-.77	5.14	2.42
T1 Personal domain					
Mother-report lower than adolescent-report	35.8	-.74	.55	4.17	5.02
Mother- and adolescent-report in agreement	32.1	.25	.24	4.95	4.73
Mother-report higher than adolescent-report	32.1	.58	-.85	5.22	3.67
T1 Moral/conventional domain					
Mother-report lower than adolescent-report	32.6	-.66	.84	3.02	4.20
Mother- and adolescent-report in agreement	30.6	-.13	-.16	3.65	2.95
Mother-report higher than adolescent-report	36.8	.70	-.61	4.62	2.38

Note. MR = mother-report; AR = adolescent-report.

Appendix E

Hypothesized Models of Disclosure from Chapter 2

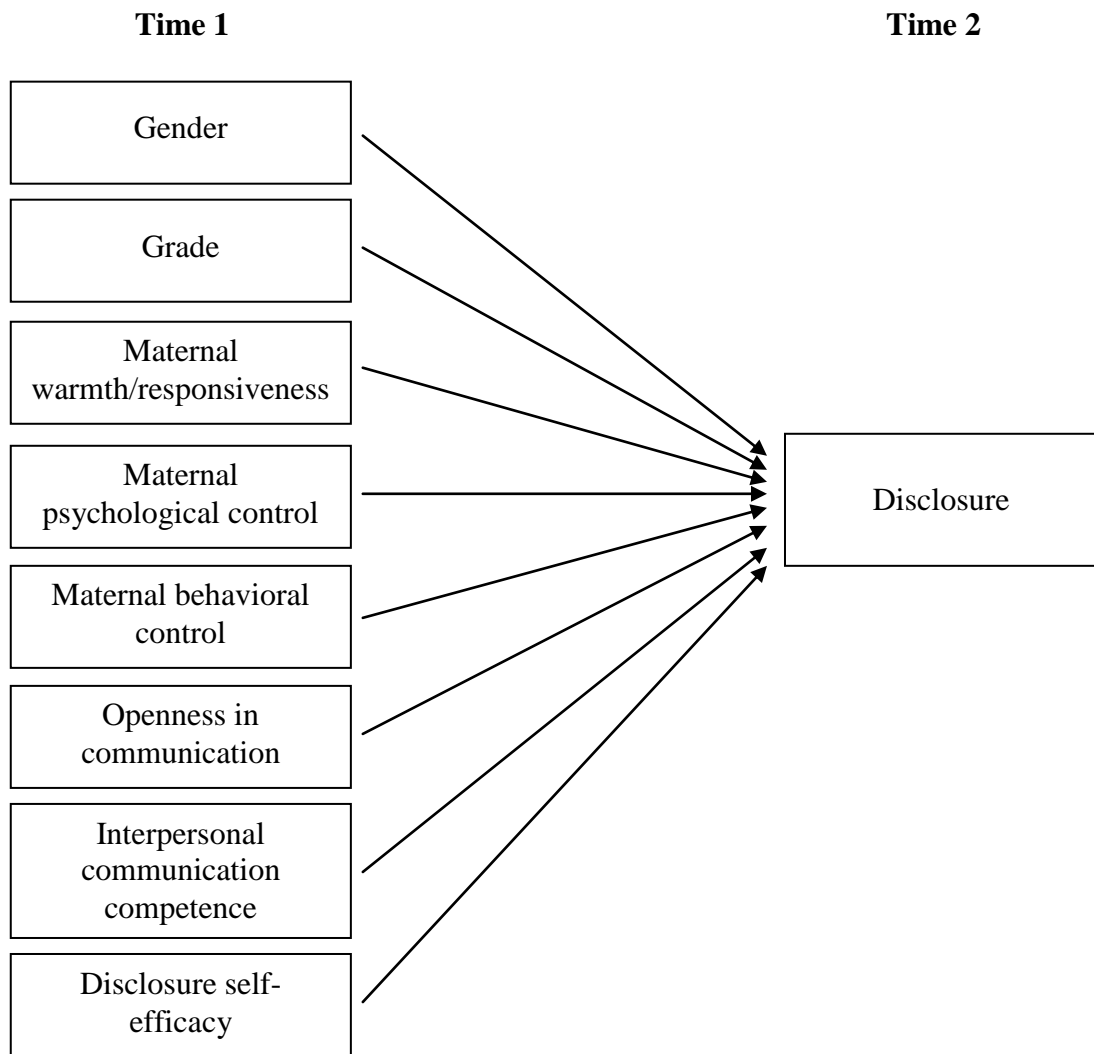


Figure 1. Hypothesized model of overall disclosure, including covariates. For clarity, autoregressive path from disclosure at T1 to disclosure at T2 is not shown but was included for analysis.

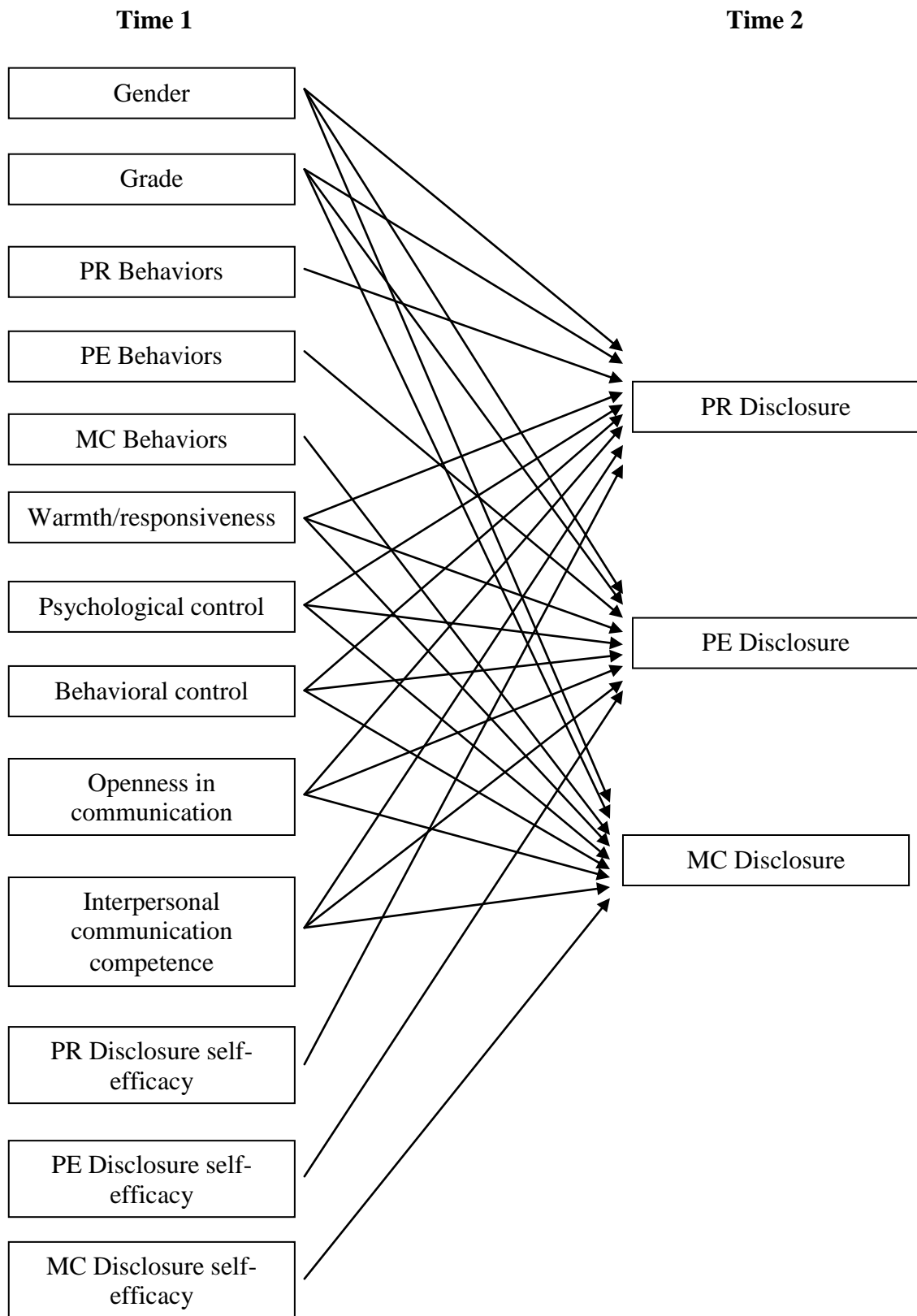


Figure 2. Hypothesized model of domain-specific disclosure, including covariates. For clarity, autoregressive paths from domain-specific disclosure at T1 to domain-specific disclosure at T2 are not represented, but were included for analysis. PR=Prudential; PE=Personal; MC=Moral/conventional.

Appendix F
Formulae for Calculating the Significance of Surface Tests
from Chapter 4

The formulae for calculating the significance of the surface tests indicated in Chapter 4 (a_1 through to a_4) are provided below and have been taken from Shanock et al. (2010).

Surface Test: a_1

$$t = \frac{a_1}{\sqrt{(SE^2_{b_1} + SE^2_{b_2}) + 2COV_{b_1b_2}}}$$

Surface Test: a_2

$$t = \frac{a_2}{\sqrt{(SE^2_{b_3} + SE^2_{b_4} + SE^2_{b_5}) + 2COV_{b_3b_4} + 2COV_{b_4b_5} + 2COV_{b_3b_5}}}$$

Surface Test: a_3

$$t = \frac{a_3}{\sqrt{(SE^2_{b_1} + SE^2_{b_2}) - 2COV_{b_1b_2}}}$$

Surface Test: a_4

$$t = \frac{a_4}{\sqrt{(SE^2_{b_3} + SE^2_{b_4} + SE^2_{b_5}) - 2COV_{b_3b_4} + 2COV_{b_4b_5} - 2COV_{b_3b_5}}}$$

Appendix G

Final Macquarie University Human Ethics Committee

Approval Letter

MACQUARIE
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4 February 2010

Ms Josephine Paparo
Department of Psychology
Faculty of Human Sciences

Reference: HE25SEP2009-D00140

Dear Ms Paparo,

FINAL APPROVAL

Title of project: Disclosure to mothers during adolescence about normative behaviours

Thank you for your recent correspondence. Your response has addressed the issues raised by the Ethics Review Committee (Human Research) and you may now commence study 1 of your research only. This approval is subject to the following conditions:

1. The Committee will not approve passive consent for this study even if a Principal indicates that this is their preferred form of consent. In the event that one of more of the Principals requests passive consent and will not consider active consent, you will not be able to collect data from these schools.
2. The Committee has approved the following age groups to be included in the study: Years 8-11 (ages 13-17).
3. Please provide quarterly progress reports for this project.

Please note the following standard requirements of approval:

1. The approval of this project is **conditional** upon your continuing compliance with the *National Statement on Ethical Conduct in Human Research (2007)*.
2. Approval will be for a period of five (5 years) subject to the provision of annual reports. **Your first progress report is due on 27 April 2010.**

If you complete the work earlier than you had planned you must submit a Final Report as soon as the work is completed. If the project has been discontinued or not commenced for any reason, you are also required to submit a Final Report on the project.

Progress Reports and Final Reports are available at the following website:
http://www.research.mq.edu.au/researchers/ethics/human_ethics/forms

3. If the project has run for more than five (5) years you cannot renew approval for the project. You will need to complete and submit a Final Report and submit a new application for the project. (The five year limit on renewal of approvals allows the Committee to fully re-review research in an environment where legislation, guidelines and requirements are continually changing, for example, new child protection and privacy laws).
4. Please notify the Committee of any amendment to the project.

ETHICS REVIEW COMMITTEE (HUMAN RESEARCH)
MACQUARIE UNIVERSITY

http://www.research.mq.edu.au/researchers/ethics/human_ethics

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5. Please notify the Committee immediately in the event of any adverse effects on participants or of any unforeseen events that might affect continued ethical acceptability of the project.
6. At all times you are responsible for the ethical conduct of your research in accordance with the guidelines established by the University. This information is available at: <http://www.research.mq.edu.au/policy>

If you will be applying for or have applied for internal or external funding for the above project it is your responsibility to provide Macquarie University's Research Grants Officer with a copy of this letter as soon as possible. The Research Grants Officer will not inform external funding agencies that you have final approval for your project and funds will not be released until the Research Grants Officer has received a copy of this final approval letter.

Yours sincerely

Dr Karolyn White
Director of Research Ethics
Chair, Ethics Review Committee (Human Research)

Cc: Associate Professor Kay Bussey, Department of Psychology