

Evaluate the Association between Disclosure and Child Adjustment within Family
Communication Climate

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Muzi Chen

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Abstract

BACKGROUND: With the increasing use of Medically Assisted Reproduction (MAR) in conception, telling children how they were conceived becomes an important issue. Grounded in the Family Communication Patterns Theory (FCPT), this study examined the moderating effect of family communication climate on the association between disclosure and child adjustment problems. **METHODS:** Participants were 84 6- to 12-year-old children conceived using MAR with the intended parents' own gametes or gametes provided by a donor. Parents self-reported if children knew about their conception method and child adjustment problems through an online survey. Family communication climate was determined by observed family communication behavior of parents and children. **RESULTS:** Multiple regression models supported the hypothesized moderating effect of family communication climate on the association between disclosure and child adjustment problems. The statistically significant negative interaction suggested, in families with an open communication climate, disclosure tended to be associated with fewer child adjustment problems. In families with a closed communication climate, disclosure was associated with more child adjustment problems. **CONCLUSIONS:** While limited by a small sample size of disclosed children and a cross-sectional design, this study's findings provide preliminary but sound demonstration of the potentially important role of family communication climate. Rethinking the outcomes of disclosure through the lens of family communication climate is needed.

Keywords: disclosure, child adjustment, family communication climate, Medically Assisted Reproduction (MAR)

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Over the past several decades, Medically Assisted Reproduction (MAR) has been increasingly used by parents who might otherwise be unable to conceive children (CDC, 2014). The term MAR refers to a variety of infertility treatments, including “ovulation induction, controlled ovarian stimulation, ovulation triggering, Assisted Reproduction Technology (ART) procedures, and intrauterine, intracervical, and intravaginal insemination with semen of husband/partner or donor” (Zegers-Hochschild et al., 2009, p. 2686). Parents using MAR face the challenge of determining if they should tell their children how they were conceived; and if they favor disclosure, what information should be shared.

What disclosure involves varies given the diversity of MAR. For example, children conceived with the intended parents’ own egg and sperm (referred to as non-donor children) are genetically related to both parents (ASRM, 2011, 2012). For these families, disclosure is mainly about informing children of the use of medical assistance (e.g. ART). Disclosure can be more complex, however, if children were conceived with egg and/or sperm provided by a donor (referred to as donor children) such that they are not genetically related to one or both parents (ASRM, 2011, 2012). In this case, disclosure may involve telling children about the donor gamete use and donor information (Rosholm, Lund, Molbo, & Schmidt, 2010).

Informing children of their conception method is an important part of family communication. Nowadays, various facets of disclosure are under investigation in donor and non-donor children. Yet, no study has evaluated the connection between disclosure and child adjustment problems within family communication climate. This study proposed a conceptual model (Figure 1) to illustrate how the association between

disclosure and adjustment problems of donor and non-donor children would be affected by family communication climate.

Background: What We Know about Disclosure

Several disclosure topics have received substantial attention in the past and current research, including parental disclosure practices (Greenfeld, Ort, Greenfeld, Jones, & Olive, 1996; Brewaeys, Golombok, Naaktgeboren, Bruyn, & Van-Hall, 1997; Golombok, et al., 2002), when to disclose (Lalos, Gottlieb, & Lalos, 2007; Mac Dougall, Becker, Scheib, & Nachtigall, 2007), how to disclose (Kirkman, 2003; Peters, Kantaris, Barnes, & Sutcliffe, 2005), and outcomes of disclosure (Lycett, Daniels, Curson, Chir & Golombok, 2004; Colpin & Soenen, 2002). The extant disclosure literature emphasizes donor children over non-donor children (Nekkebroeck, Bonduelle, & Ponjaert-Kristoffersen, 2008; Brewaeys, 2001; Ilioi & Golombok, 2015). Although not the primary focus of this paper, knowledge about the above topics as to donor and non-donor children is critical for understanding the proposed study.

Parental disclosure practices. Rates of disclosure with children and with other people differ between parents of donor children and parents of non-donor children. Despite the variance due to national policies, cultural attitudes, and child developmental stages, parents of donor children (Brewaeys et al., 1997; Lycett et al, 2005; Golombok et al., 2011; Golombok et al., 2002; Freeman & Golombok, 2012) are generally less likely to disclose than parents of non-donor children (Nekkebroeck et al., 2008; Greenfeld et al., 1996; Colpin & Soenen, 2002; Colpin & Bossaert, 2008; Peters et al., 2005). Moreover, parents of donor children and parents of non-donor children are both more likely to disclose children's conception method to people outside their immediate family than to

their children (Gottlieb, Lalos, & Lindblad, 2000; Peters et al., 2005). However, the rates of disclosure with a third party tends to be lower in parents of donor children than in parents of non-donor children (Brewaeys et al., 1997; Rosholm et al., 2010).

When to disclose. Over 40% of parents intend to disclose to their children regardless of if donor gametes were used (Lalos et al., 2007; Soderstrom-Anttila, Salevaara, & Suikkari, 2010; Ludwig et al., 2008), yet they are unsure about the appropriate timing (Lalos et al., 2007; Mac Dougall et al., 2007; Peters et al., 2005). Research responding to this parental concern focuses mostly on donor children. Evidence suggests disclosure with donor and non-donor children at an early age (< 5 years old) is preferable to telling them later in life such as adolescence or adulthood (Rumball & Adair, 1999; Mac Dougall et al., 2007; Jadva, Freeman, Kramer, & Golombok, 2009; Siegel, Dittrich, & Vollmann, 2011).

How to disclose. How to inform children of their conception method appears to be another impediment to parental disclosure. This applies to both parents of donor children (Kirkman, 2003) and parents of non-donor children (Peters et al., 2005). Some disclosure resources are available to parents of donor children, such as disclosure books (Cooke, 1991; Schnitter, 1995), narratives (Scheib, Riordan, & Rubin, 2005), and strategies (Mac Dougall et al., 2007; Daniels & Thorn, 2001). Yet, they request more evidence-based and detailed professional guidance on disclosure (Mac Dougall et al., 2007; Hargreaves & Daniels, 2007). In contrast, parents of non-donor children receive much less guidance about how to approach disclosure, although some anecdotal evidence (Siegel et al., 2008) and picture books and stories are available (Wickham, 1992; Appleton, 2005).

Outcomes of disclosure. Studies on outcomes of disclosure focus on donor children and their reactions to disclosure. If donor children learn about their conception method at an early age, they commonly react with curiosity or disinterest (Lycett et al., 2005; Rumball & Adair, 1999; Scheib et al., 2005). However, donor children who were disclosed in adolescence or adulthood are inclined towards negative feelings, such as anger, mistrust, and frustration (Jadva et al., 2009; Turner & Coyle, 2000).

There is little evidence about non-donor children's responses to disclosure. One study suggests non-donor adults who knew their conception method at an early age tend to perceive their conception method as unproblematic for their identity or for their relationships with parents (Siegel et al., 2011).

Association between Disclosure and Child Adjustment

The small sample size of disclosed children has limited the extent to which consequences of disclosure and nondisclosure on child adjustment can be evaluated. Current evidence suggests disclosure seems to have little effect on child adjustment (Golombok et al., 2011; Golombok et al., 2002; Freeman & Golombok; 2012; Brewaeys et al., 1997; Lycett et al., 2004; Nekkebroeck et al., 2008; Colpin & Bossaert, 2008). Findings about donor and non-donor children are summarized in the upcoming sections.

Donor children. No significant difference in child adjustment was found between children who had been disclosed of their conception method and children who had not (Golombok et al., 2011; Golombok et al., 2002; Freeman & Golombok; 2012). This result had been replicated with children in middle childhood (Golombok et al., 2011) and adolescents (Golombok et al., 2002; Freeman & Golombok; 2012).

Due to the lack of disclosed children at a young age (e.g. 4 - 8 year old), two studies combined children of parents who had disclosed or intended to disclose to form a disclosing group (Brewaeys et al., 1997; Lycett et al., 2004). Children of parents inclined towards nondisclosure were categorized as the non-disclosing group. Disclosing children were found to have similar adjustment (Brewaeys et al., 1997) or fewer conduct problems (Lycett et al., 2004) relative to non-disclosing children, suggesting disclosure is not adverse for child adjustment.

Non-donor children. With one exception (Colpin & Soenen, 2002), disclosed children and non-disclosed children had similar adjustment (Nekkebroeck et al., 2008; Colpin & Bossaert, 2008). Colpin and Soenen (2002) found that parents reported more internalizing problems and total problems but not more externalizing problems in disclosed children than in non-disclosed children who were aged between 8 and 9 years. However, those problems fell within the normal range (Colpin & Soenen, 2002) and were found to disappear in mid-adolescence (Colpin & Bossaert, 2008), indicating little effect of disclosure on child adjustment.

It is important to note that all of the above studies focused on the direct effect of disclosure on child adjustment as if the family communication climate was identical across families. Drawing from the Family Communication Patterns Theory and empirical evidence, I suggested family communication climate would moderate the association between disclosure and child adjustment problems (see Figure 1).

The Moderating Effect of Family Communication Climate

Family Communication Patterns Theory (FCPT; Koerner & Fitzpatrick, 2002a, 2002b; Koerner, 2007; Koerner & Schrod, 2014) is useful in investigating the

moderating effect of family communication climate on the association between disclosure and child adjustment problems. The FCPT proposes that sharing a social reality among family members makes understanding of each other easier, supports family functioning, and benefits child adjustment (Koerner, 2007; Koerner & Schrod, 2014). Shared social reality exists when family members agree on their perceptions of a concept, believe others share their perceptions, and are accurate in their beliefs (Koerner, 2007; Koerner & Schrod, 2014).

Shared social reality can be created through two processes: conversation orientation and conformity orientation (Koerner & Fitzpatrick, 2002b). Conversation orientation refers to the extent to which families create a climate that encourages all family members to be engaged in unrestrained interactions about various topics. Conformity orientation is defined as the degree to which family communication emphasizes a climate of homogeneity of beliefs, values, and attitudes (Koerner & Fitzpatrick, 2002b).

This study focused on the conversation orientation because it emphasized family communication behavior and concept processing. Derived from the “concept-orientation” (McLeod & Chaffee, 1972), conversation orientation emphasizes processing and making sense of concepts through family interactions (Koerner, 2014).

In this study, families with a strong conversation orientation were conceptualized as having an open family communication climate. Members in these families embrace open, frequent, and spontaneous communication about a wide range of topics and share individual activities, thoughts, and feelings with one another (Koerner & Fitzpatrick, 2002b). Although an open family communication climate does not always result in

disclosure, it tends to encourage open and frequent parent-child interactions with regard to how children were conceived. Thus, children may be likely to share a social reality with their parents and, therefore, function well.

Conversely, families with a weak conversation orientation were conceptualized as having a closed family communication climate. Members in these families interact less frequently, avoid discussions on many topics, and share few private thoughts and feelings (Koerner & Fitzpatrick, 2002b). In a closed family communication climate, parents may not tell children how they were conceived. If conception information is shared, parents and children tend to have less frequent interactions on that topic. Hence, a closed family communication climate may pose challenges to the creation of a shared social reality, which may be adverse for child adjustment.

As depicted in Figure 1, this study aimed to investigate if family communication climate moderates the association between disclosure and child adjustment problems. Based on the FCPT and empirical evidence, I hypothesized that disclosure would be inversely associated with child adjustment problems in families with an open communication climate. However, disclosure was hypothesized to be positively associated with child adjustment problems when there was a closed family communication climate.

Method

Participants

Participants were 84 children from 57 families who were involved in an observational study. Participants were drawn from a larger online study ($N = 312$) aimed to examine family relationships and individual behavior in families formed via Medically

Assisted Reproduction (MAR). Participating families were initially recruited from the University of Minnesota Reproductive Medicine Clinic.

Children eligible for the observational study were conceived using MAR and born between 1998 and 2004. Their families lived within driving distance to the research lab to be able to participate in an observational study after completing the online survey.

Participating children were 6- to 12-years-old ($M = 1.47$ children per family, $SD = 0.66$; M child age = 8.57 years, $SD = 1.34$; 49% were male). The MAR used in this study included artificial insemination ($n = 5$; 6.0%) and ART ($n = 79$; 94.0%). A total of twenty-one children (25.3%) were aware of their conception method, of whom six were donor children (7.2%) and fifteen were non-donor children (18.1%). This study's disclosure rates of donor and non-donor children were comparable to the rates reported by previous studies with children of similar ages (Golombok et al., 2002; Colpin & Soenen, 2002; Peters et al., 2005). Eleven children (13.4%) were conceived with donor sperm and four children (4.8%) were conceived with donor egg.

Most participating parents (94.7%) and their partners (91.1%) were White. Most couples were heterosexual ($n = 50$; 87.7%); however, six (10.5%) were same-sex female couples and one (1.8%) was a single mother by choice. Of the heterosexual couples, 47 (94.0%) were married, two (4.0%) were separated, and one (2.0%) was divorced. Like most MAR families (Nachtigall, MacDougall, Davis, & Beyene, 2012), participating families had high annual household incomes and were well educated. Specifically, annual household incomes ranged from \$40,000 to \$200,000 or more ($median = \$90,000 - \$99,999$). Most parents (82.0%) and their partners (61.0%) held at least a bachelor's degree.

Procedure

This study's data were collected from both the larger online study and the subsequent small-scale observational study. Families in the larger study were identified through patient records and sent letters asking one parent to complete a survey using university Institutional Review Board approved procedures. The participating parent consented to provide information on demographics, disclosure, parental emotional state, parent-child relationship satisfaction, and child adjustment problems. Participants received a \$25 gift card for their time.

Upon survey completion, a random one hundred families were invited to partake in an observational study, and ultimately 57 families participated. Participating family members signed informed consent forms and then engaged in a 15-minute videotaped family communication task. The task asked family members to discuss what was least important and most important to their family using a list of statements (e.g. "In our family, it is important that we talk about what happened during the day"). A trained interviewer explained the task and then left the family alone for videotaping. While the camera was placed inconspicuously, family members were aware of being videotaped. The task elicited observable behavior indicating an open or a closed family communication climate. Each family received a \$100 gift card for their participation.

Measures

Disclosure. Parents reported if the child knew s/he was conceived with medical assistance (*no* = 0, *yes* = 1) in the survey.

Family communication climate. Family communication climate was determined by observing the extent to which the family used conversation orientation to create an

environment that fostered or impeded family communication. The observational coding system, family communication climate indicators, and scoring approach are described below.

Observational coding system. Videotapes were randomly assigned to observers who globally rated family communication climate based on an adapted version of the Iowa Family Interaction Rating Scales (Melby et al., 1998). Observers rated videotapes independently using a 9-point rating scale for each behavior (1 = *not at all characteristic*, 9 = *mainly characteristic*). Observers were blind to the purpose of the family communication task. Information about disclosure and donor gamete use was withheld to minimize rater biases.

Before viewing videotapes, observers received 6 weeks of training and passed both written and observation reliability tests. Rater drift, a phenomenon that an individual rater varies in his or her way of coding over time (Kimberlin & Winterstein, 2008), is not uncommon without appropriate supervision. Thus, observers attended weekly coding meetings to prevent rater drift and for continuous training.

To estimate interrater reliability, 49% of all videos were separately rated by a second observer (Floyd & Rogers, 2004). Interrater reliability was calculated by comparing the primary and the secondary ratings using intraclass correlations (ICC; Shrout & Fleiss, 1979; Suen & Ary, 1989). The mean intraclass correlations for the four family communication climate indicators (described below) were acceptable (Concept Focus ICC = .82; Communication ICC = .62; Listening ICC = .53; Warmth ICC = .80; Kenny, 1991; Mitchell, 1979).

Family communication climate indicators. The Family Communication Patterns Theory (FCPT) informed the selection of the four observational scales: *Concept Focus*, *Communication*, *Listening*, and *Warmth*. Each scale is described below.

Concept Focus is an individual characteristic scale that targets a family member's general behavior regardless of whom s/he is interacting with. *Concept Focus* assesses the extent to which a family member seeks information about a topic's characteristics through asking for clarifications, definitions, and examples when making decisions.

Each family member received his or her own *Concept Focus* score. For example, in a family with two parents (p1 and p2) and two children (c1 and c2), there will be a total of four *Concept Focus* scores; one for each family member. Family members who expressed greater interest in the topic's characteristics scored higher than those who did not.

In contrast, *Communication*, *Listening*, and *Warmth* are dyadic characteristic scales that capture a family member's interactive behavior towards another member (Melby et al., 1998). Specifically, *Communication* refers to a family member's ability to express his or her viewpoints, needs, and desires in a clear and appropriate manner and to facilitate the exchange of information with another member. *Listening* assesses the extent to which a family member both verbally and nonverbally indicate attentiveness to another member when that member is speaking. *Warmth* refers to a family member's verbal and nonverbal expressions of care, concern, and support towards another member (Melby et al., 1998).

In families with at least three people, each family member received multiple scores for his or her behavior toward each of the other members for scales of

Communication, Listening, and Warmth. Taking a family of two parents (p1 and p2) and two children (c1 and c2) for example, every family member would receive three dyadic scores for the *Communication* scale, the *Listening* scale, and the *Warmth* scale. This will result in twelve dyadic scores for each scale (4 members x 3 scores; p1-p2, p1-c1, p1-c2, p2-p1, p2-c1, p2-c2, c1-p1, c1-p2, c1-c2, c2-p1, c2-p2, and c2-c1).

Scoring approach. The family communication climate score was derived from the mean scores of *Concept Focus, Communication, Listening, and Warmth.* The mean *Concept Focus* score was the average of all family members' *Concept Focus* scores ($\alpha = .25$). The mean *Communication* score was the average of dyadic *Communication* scores indicating interactions only between parents and children ($\alpha = .68$; e.g. p1-c1, p1-c2; p2-c1, p2-c2; c1-p1, c1-p2; c2-p1, and c2-p2). Dyadic *Communication* scores addressing parent-parent interactions and child-child interactions were excluded (e.g. p1-p2, p2-p1, c1-c2, and c2-c1). This choice was made based on the FCPT, which essentially is a theory about communication between parents and children (Koerner, 2007). The mean *Listening* score ($\alpha = .62$) and the mean *Warmth* score ($\alpha = .77$) were computed in the same fashion as was the mean *Communication* score.

Confirmatory factor analysis based on the mean *Concept Focus, Communication, Listening, and Warmth* scores was employed. The four mean scores all loaded on one factor (*Concept Focus* $\lambda = .61$; *Communication* $\lambda = .92$; *Listening* $\lambda = .88$; *Warmth* $\lambda = .78$), thus they were added up to create the family communication climate score.

Child adjustment problems. Four dimension of child adjustment problems were tested in this study: externalizing problems, internalizing problems, thought problems, and attention problems. Parents reported child adjustment problems using the Child

Behavior Checklist in the survey (CBCL; Achenbach & Rescorla, 2001). Child externalizing problems measure ($\alpha = .81$) includes 17 rule-breaking behavior items ($\alpha = .74$) and 18 aggressive behavior items ($\alpha = .76$). Child internalizing problems measure ($\alpha = .74$) consists of 13 anxious/depressed problems items ($\alpha = .66$), 8 withdrawn/depressed problems items ($\alpha = .60$), and 11 somatic complaints items ($\alpha = .61$). The child thought problems measure has 16 items ($\alpha = .69$); and child attention problems measure has 9 items ($\alpha = .78$). Items were scored on a 3-point scale (0 = *not true*, 1 = *somewhat true or sometimes true*, 2 = *very true or often true*). Items were summed, with higher scores indicating greater problems. The CBCL has strong content and construct validity and high test-retest reliability (Achenbach & Rescorla, 2001).

Covariates. Covariates in this study were selected based on previous research. As described below, covariates included parent emotional state, child sex, child age, donor gamete use, and parent-child relationship satisfaction.

Parent emotional state. The transient mood state of the reporter for both the independent and dependent variables can artificially inflate correlations between these variables (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). For example, maternal depression may result in negative biases in self-reported child emotional problems, behavioral problems, and ADHD symptoms (Boyle & Pickles, 1997; Chi & Hinshaw, 2002). Hence, parent emotional state at the time of assessment, measured by the internalizing problems scale of the Adult Self Report, was controlled in all analyses ($\alpha = .86$; Achenbach & Rescorla, 2003).

Child sex and child age. Child sex (*male* = 0, *female* = 1) and child age are common predictors of child adjustment problems (Chaplin, Cole, & Zahn-Waxler, 2005; Bongers, Koot, van der Ende, & Verhulst, 2003).

Donor gamete use. Donor gamete use (*no* = 0, *yes* = 1) may have implications for family communication and child adjustment because donor and non-donor children differ in important aspects. For example, donor children do not share a full genetic link with their parents as non-donor children (ASRM, 2011), making family communication a more challenging task. This is because the cognitive processes involved in perceptions are at least partially inheritable (Alford, Funk, & Hibbing, 2005; Olson, Vernon, Harris, & Jang, 2001).

Parent-child relationship satisfaction. The connection between parent-child relationship and child adjustment has been established (Hakvoort, Bos, Balen & Hermanns, 2010). Parents reported relationship satisfaction with their children using the adapted Marital Opinion Questionnaire (MOQ; Huston & Vangelisti, 1991). The adapted MOQ includes 11 semantic differential items, all with the identical beginning statement “I would describe my relationship as...”. The first 10 items offers opposing adjectives for parent-child relationships on a 7-point scale (e.g. 1 = *hard*, 7 = *easy*; 1 = *free*, 7 = *tied down*). The last item indicates global relationship satisfaction (1 = *completely satisfied*, 7 = *completely dissatisfied*). Six items were reversely coded. The first 10 items were summed and averaged; then the mean value was averaged with the global relationship satisfaction item to achieve the final parent-child relationship satisfaction score. Higher scores indicated stronger parent-child relationship satisfaction. The reliability and validity

of the adapted MOQ have been demonstrated by previous research (Caughlin & Afifi, 2004).

Missing Data

Approximately 91.6% of children had complete data on all study variables. Missing values occurred on variables of disclosure (1.1%), family communication climate (3.6%), child adjustment problems (2.4%), parent-child relationship satisfaction (2.4%), and donor gamete use (3.6%). Children with and without complete data were compared on all study variables using t-tests and chi-squared tests (Acock, 2005) and no significant differences were found, thus data were deemed to be missing at random. Because list-wise deletion of missing data yields biased estimates and reduces statistical power, expectation-maximization (EM) was employed to recover missing values on continuous variables (Acock, 2005). Mplus 7.0 addressed missing data on binary variables with the full-information maximum-likelihood approach (Muthén & Shedden, 1999).

Data Analytic Plan

The proposed moderating effect of family communication climate on the association between disclosure and child adjustment problems was tested with nine multiple regression models using Mplus 7.0 (Muthén & Muthén, 2012). The sample size ($N = 84$) was sufficient for a statistical power of .8 with an alpha level of .05 and a large effect size (Cohen, 1992).

All nine models had identical independent variables, including disclosure, family communication climate, the interaction term between disclosure and family communication climate, and covariates. The interaction term was produced by first

centering both variables, and then taking their product. Each model had only one dependent variable (model 1: externalizing problems; model 2: rule-breaking behavior; model 3: aggressive behavior; model 4: internalizing problems; model 5: anxious/depressed problems; model 6: withdrawn/depressed problems; model 7: somatic complaints; model 8: thought problems; model 9: attention problems).

Mplus 7.0 tested the moderating effect of family communication climate in each model. The dependent variable was regressed on disclosure, family communication climate, the interaction term, and covariates.

The sample included multiple children from the same household (N = 84 children from 57 families), indicating the presence of shared family variance (Cook, 2012).

Analyses were performed using the COMPLEX specification in Mplus 7.0 to counteract the inflated t-values produced by shared variance (Múthen & Múthen, 2012).

Results

Model Testing: Externalizing Problems

The hypothesized moderating effect of family communication climate on the association between disclosure and child externalizing problems was tested by multiple regression. Table 1 contains descriptive statistics for study variables.

Associations with child externalizing problems were found for three covariates. Parent emotional state was positively associated with child externalizing problems ($b = .17$, 95% CI [.04, .30], $\beta = .24$, $t = 2.78$, $p = .005$), indicating that more depressed parents reported greater externalizing problems in children than less depressed parents. There was a positive association between donor gamete use and child externalizing problems ($b = 2.42$, 95% CI [.25, 4.58], $\beta = .24$, $t = 2.48$, $p = .013$). Thus, donor children had more

externalizing problems than non-donor children. Parent-child relationship satisfaction was negatively associated with child externalizing problems ($b = -2.47$, 95% CI [-3.56, -1.38], $\beta = -.42$, $t = -7.52$, $p < .001$). Hence, parents more satisfied with relationships with their children reported fewer child externalizing problems than less satisfied parents. No statistically significant associations with child externalizing problems were found for child sex or child age.

The expected moderating effect of family communication climate on the association between disclosure and child externalizing problems was supported after accounting for covariates ($b = -.52$, 95% CI [-.84, -.20], $\beta = -.23$, $t = -3.71$, $p < .001$). As illustrated below, this finding indicated that, in families with an open communication climate, disclosure tended to be associated with fewer child externalizing problems. Conversely, in families with a closed communication climate, disclosure was associated with more child externalizing problems. This model produced a large effect size, $R^2 = 0.44$, $p < .001$ (Cohen, 1988), meaning that 44% variance of child externalizing problems could be explained by disclosure, family communication climate, the interaction variable, and covariates.

To further understand which component(s) of child externalizing problems drove the statistically significant moderating effect of family communication climate, two additional models were tested. Results of the rule-breaking behavior model and the aggressive behavior model are described below.

Rule-breaking behavior. The rule-breaking behavior model did not support the proposed moderating effect, although associations with child rule-breaking behavior were found for two covariates. Among the covariates, parent emotional state was positively

associated with child rule-breaking behavior ($b = .10$, 95% CI [.03, .17], $\beta = .34$, $t = 4.06$, $p < .001$). In contrast, parent-child relationship satisfaction was negatively associated with child rule-breaking behavior ($b = -.43$, 95% CI [-.97, .11], $\beta = -.18$, $t = -2.19$, $p = .028$). This model produced a large effect size, $R^2 = 0.27$, $p = .037$ (Cohen, 1988).

Aggressive behavior. Associations with child aggressive behavior were found for some covariates. Child age was positively associated with child aggressive behavior ($b = .36$, 95% CI [.03, .69], $\beta = .18$, $t = 2.29$, $p = .022$), suggesting that older children had more aggressive behavior than younger children. Donor gamete use was also positively related to child aggressive behavior ($b = 1.89$, 95% CI [.58, 3.20], $\beta = .27$, $t = 2.94$, $p = .003$). The association between parent-child relationship satisfaction and child aggressive behavior was negative ($b = -2.04$, 95% CI [-2.70, -1.38], $\beta = -.50$, $t = -9.27$, $p < .001$). No statistically significant associations with child aggressive behavior were found for parent emotional state or child sex.

After controlling for covariates, the hypothesized moderating effect of family communication climate on the association between disclosure and child aggressive behavior was supported ($b = -.38$, 95% CI [-.58, -.19], $\beta = -.24$, $t = -3.74$, $p < .001$). This model produced a large effect size, $R^2 = 0.49$, $p < .001$ (Cohen, 1988).

Model Testing: Internalizing Problems

Unlike the externalizing problems model, the internalizing problems model did not support the proposed moderating effect of family communication climate, although associations with child internalizing problems were found for some covariates. Among the covariates, parent emotional state ($b = .09$, 95% CI [.01, .18], $\beta = .16$, $t = 2.00$, $p = .045$) and donor gamete use ($b = 1.85$, 95% CI [-.11, 3.82], $\beta = .23$, $t = 2.08$, $p = .038$)

were positively associated with child internalizing problems. There was a negative association between parent-child relationship satisfaction and child internalizing problems ($b = -2.09$, 95% CI [-2.79, -1.40], $\beta = -.43$, $t = -5.52$, $p < .001$). This model produced a large effect size, $R^2 = 0.42$, $p < .001$ (Cohen, 1988).

Multiple regression tests were also performed on subscales of the child internalizing problems measure. Results for models of anxious/depressed problems, withdrawn/depressed problems, and somatic complaints are described below.

Anxious/depressed problems. The anxious/depressed problems model produced similar results with the internalizing problems model. The moderating effect of family communication climate on the association between disclosure and child anxious/depressed problems was not supported. Only covariates of parent emotional state ($b = .09$, 95% CI [.02, .16], $\beta = .25$, $t = 2.70$, $p = .007$) and parent-child relationship satisfaction ($b = -1.20$, 95% CI [-1.77, -.63], $\beta = -.39$, $t = -6.09$, $p < .001$) were associated with child anxious/depressed problems. This model produced a large effect size, $R^2 = 0.50$, $p < .001$ (Cohen, 1988).

Withdrawn/depressed problems. Similarly, the moderating effect of family communication climate on the association between disclosure and child withdrawn/depressed problems was not supported. The association with child withdrawn/depressed problems was only found for parent-child relationship satisfaction ($b = -.66$, 95% CI [-1.05, -.27], $\beta = -.43$, $t = -4.73$, $p < .001$). This model generated a medium effect size, $R^2 = 0.22$, $p = .022$ (Cohen, 1988).

Somatic complaints. The moderating effect of family communication climate on the association between disclosure and child somatic complaints was not supported.

There were no statistically significant associations between covariates and child somatic complaints. Only family communication climate by itself was associated with child somatic complaints ($b = .06$, 95% CI [.01, .11], $\beta = .19$, $t = 2.79$, $p = .005$). This model produced a medium effect size, $R^2 = 0.13$, $p = .110$, (Cohen, 1988).

Model Testing: Thought Problems

After accounting for covariates, the thought problems model supported the expected moderating effect of family communication climate. Among the covariates, only parent-child relationship satisfaction was associated with child thought problems ($b = -1.30$, 95% CI [-2.17, -.43], $\beta = -.50$, $t = -3.79$, $p < .001$). With parent-child relationship satisfaction accounted for, the moderating effect of family communication climate on the association between disclosure and child thought problems was statistically significant ($b = -.23$, 95% CI [-.45, -.01], $\beta = -.23$, $t = -2.49$, $p = .013$). This model yielded a large effect size, $R^2 = 0.36$, $p = .019$ (Cohen, 1988).

Model Testing: Attention Problems

The attention problems model supported the expected moderating effect of family communication climate after accounting for covariates. Among the covariates, only parent-child relationship satisfaction was associated with child attention problems ($b = -1.54$, 95% CI [-2.00, -1.08], $\beta = -.38$, $t = -5.56$, $p < .001$). After controlling for parent-child relationship satisfaction, the moderating effect of family communication climate on the association between disclosure and child attention problems was statistically significant ($b = -.56$, 95% CI [-.77, -.34], $\beta = -.36$, $t = -4.47$, $p < .001$). This model produced a large effect size, $R^2 = 0.35$, $p = .001$ (Cohen, 1988).

Depiction of Moderating Effect

The moderating effect of family communication climate on the association between disclosure and child adjustment problems is depicted in Figure 2. This effect was similar across models of externalizing problems, aggressive behavior, thought problems, and attention problems. Thus, the externalizing problems model was used as an example.

To sufficiently differentiate “open” and “closed” family communication climate, the 20% cutoff was used (Ashcraft & Ridley, 2005; Hopko, McNeil, Gleason, & Rabalais, 2002), resulting in three groups (Table 2). Children with a family communication climate score in the top 20% of the distribution formed the “open” family communication climate group ($n = 17$; $M = 19.38$, $SD = 1.68$). Children with a family communication climate score in the bottom 20% of the distribution formed the “closed” family communication climate group ($n = 18$; $M = 9.40$, $SD = 1.62$). Children fell in the middle formed the medium family communication climate group ($n = 48$; $M = 14.14$, $SD = 1.81$). All groups were screened for potential outliers based on frequency distributions, and no influential outliers existed. Due to a particular interest in the open and the closed family communication climate, only these two groups are depicted in Figure 2.

Relationships between disclosure and child adjustment problems were calculated using Spearman’s rank correlation (Table 3). As depicted in Figure 2 (child externalizing problems model), in an open family communication climate, disclosure was negatively and weakly related to child externalizing problems ($r = -.14$, $p = .59$). In a closed family communication climate, there was a positive and strong correlation ($r = .64$, $p = .01$) between disclosure and child externalizing problems.

Discussion

Previous studies on the direct effect of disclosure on adjustment of school-aged donor and non-donor children suggest disclosure has little effect on child adjustment (Golombok et al., 2002; Freeman & Golombok; 2012; Golombok et al., 2011; Brewaeyns et al., 1997; Lycett et al., 2004; Nekkebroeck et al., 2008; Colpin & Bossaert, 2008). This study, however, indicates the association between disclosure and child adjustment problems varies across conditions of family communication climate. Adopting the lens of family communication climate allows scholars to rethink the outcomes of disclosure.

Open Family Communication Climate

This study's findings indicate that, in an open family communication climate, disclosure tends to be associated with fewer child adjustment problems. Although somewhat different from previous evidence (Golombok et al., 2002; Freeman & Golombok; 2012; Golombok et al., 2011; Brewaeyns et al., 1997; Lycett et al., 2004; Nekkebroeck et al., 2008; Colpin & Bossaert, 2008), family communication studies using samples from the general population or samples of adopted children provide insights into this finding. Of course, discretion should be exercised when applying results for other populations to MAR children.

Family communication studies in the general population support the benefit of an open family communication climate. For example, open and frequent family communication is associated with interpersonal skills development (Koesten & Anderson, 2004), less severe eating disorders (Botta & Dumlao, 2002), greater cognitive flexibility, and child well-being (Koesten, Schrodt, & Ford, 2009). Despite this, it is worth noting that results for the general population may not generalize to MAR children. For instance, parents using MAR are likely to be older and have higher socioeconomic

status than parents of naturally conceived children (Nachtigall et al., 2012), serving as protective factors for MAR children.

Research on adoptive families, whose parents often share similar demographic characteristics with MAR parents, may provide a better comparison. Adopted children who experience more open, frequent, and respectful communication about adoption with their parents (Brodzinsky, 2006; Von Korff & Grotevant, 2011; Stein & Hoopes, 1985) and whose expressions of feelings are supported by parents have more positive outcomes (Brodzinsky, 2006; Brodzinsky & Pinderhughes, 2002). Caution must be taken when generalizing these findings to MAR children because adopted children do not share a full genetic link with their parents as non-donor children do (ASRM, 2011).

Drawing from the above evidence, it may be possible that disclosure is another circumstance in which an open family communication climate tends to be favorable. Of course, findings for other populations may not be totally applicable to MAR children due to their unique characteristics. Thus, the open family communication climate should be investigated in MAR children specifically.

The Family Communication Patterns Theory (FCPT) adds explanatory power to the finding that an open family communication climate may be beneficial for disclosure (Koerner & Fitzpatrick, 2002b). When parents and children share a social reality, there are fewer familial misunderstandings and conflicts, better family functioning, and consequently, more positive child adjustment (Koerner & Fitzpatrick, 2002b). Shared social reality exists when parents and their children perceive children's conception method similarly, believe others share their perceptions, and they are all accurate in their beliefs. This can be obtained in an open family communication climate that facilitates

open, frequent, and spontaneous conversations about children's conception method after the initial disclosure. Grounded in the FCPT notwithstanding, this proposal must be fully examined through future research. For example, the direct assessment of a shared social reality with regard to children's conception method is an important task. It is also worth noting that it was the climate of family communication that was examined in the current study rather than communication openness about children's conception method.

This leads to the next point that an open family communication climate does not necessarily elicit disclosure. Actually, a majority of families with an open communication climate had not told children about their conception method. It is possible that parents in families with an open communication climate are open to numerous other topics, except the topic about how their children were conceived. Indeed, parents' unreconciled negative feelings pertaining to disclosure, such as a sense of shame and failure, (Hjelmstedt, Widström, Wramsby, & Collins, 2004) and fears about jeopardizing parent-child relationships (Cook, Golombok, Bish, & Murray, 1995) may impel them towards nondisclosure. Of course, this speculation should be carefully evaluated in future research.

Caution should be taken when generalizing the result that disclosure tended to be associated with fewer child adjustment problems in families with an open communication climate. The insignificant correlation between disclosure and child adjustment problems implies that this relationship may be absent in the population. If that is the case, the finding is in line with earlier direct-effect research that disclosure appears to have little effect on child adjustment (Golombok et al., 2002; Freeman & Golombok; 2012;

Golombok et al., 2011; Brewaeys et al., 1997; Lycett et al., 2004; Nekkebroeck et al., 2008; Colpin & Bossaert, 2008).

Closed Family Communication Climate

This study revealed the intriguing result that, in families with a closed family communication climate, telling children how they were conceived was associated with more child adjustment problems. This finding contradicts previous evidence (Freeman & Golombok; 2012; Golombok et al., 2011; Nekkebroeck et al., 2008; Colpin & Bossaert, 2008), yet may be explained by having gone beyond direct-effect research to specify when disclosure could be adverse for child adjustment.

According to the FCPT, families with a closed communication climate are unlikely to openly discuss topics (Koerner & Fitzpatrick, 2002b). Yet interestingly, some parents had informed children of their conception method, which might be relevant to their motivations for disclosure. Although unknown in this study, it is possible that preventing the potential familial or psychological turmoil posed by children's accidental discovery is the main disclosure motivation of those parents (Lycett et al., 2005; Lalos et al., 2007). Thus, in a closed communication climate, parents may avoid discussing children's conception method after the initial disclosure.

This leads to the concept of topic avoidance that may explain the potentially detrimental effect of a closed family communication climate on disclosed children. Topic avoidance refers to the purposeful evasion of a conversation topic within a relational context, such as parent-child relationship (Afifi & Burgoon, 1998; Afifi & Guerrero, 2000). It is a concept tied to a closed family communication climate (Segrin & Flora, 2005) and associated with parent-child relationship dissatisfaction (Golish, 2000;

Caughlin & Golish, 2002; Caughlin & Afifi, 2004). Particularly, parents' own topic avoidance may subject children to dissatisfaction in that children can accurately detect that avoidance (Caughlin & Golish, 2002). Thus, it may be possible that disclosed children sense their parents' topic avoidance about their conception method when parents change the subject, facial expression, or tone of voice (Caughlin & Golish, 2002; Lycett et al., 2005). This topic avoidance may compromise parent-child relationship satisfaction (Golish, 2000; Caughlin & Golish, 2002; Caughlin & Afifi, 2004) and family functioning (Paul & Berger, 2007), and thereby can be detrimental for child adjustment.

Additionally, the lack of a shared social reality informed by the FCPT (Koerner & Fitzpatrick, 2002b) may help explain why a closed family communication climate can be adverse for disclosed children. It may be that, in families with a closed communication climate, further discussions about children's conception method and exchanges of conception-related thoughts and feelings are inhibited. Thus, parents and children may disagree about how they perceive children's conception method, or erroneously believe they are in agreement when they are not. This absence of a shared social reality may compromise child adjustment (Koerner & Fitzpatrick, 2002b; Koerner, 2007). Of course, additional research is needed to evaluate this speculation.

In a closed family communication climate, child adjustment at middle childhood should be weighed against the elevated risk of accidental discovery by children later in life (Freeman & Golombok, 2012). While children desire to learn their conception information (Sigel et al., 2011), most parents keep it secret (Lalos et al., 2007; Greenfield et al., 1995). Rather, more than 50% of parents have confided in someone else, such as extended family members and friends, increasing the risk of unintended disclosure by a

third party (Lalos et al., 2007; Jadva et al., 2009; Greenfeld et al., 1995). Furthermore, medical and technological advances such as genetic testing and matching make the accidental discovery by donor children possible (Gottlieb et al., 2000; Lycett et al., 2005).

If the secret is discovered by children later in life, adjustment of children may be adversely affected. General family secret literature suggests keeping family secrets may lead to mistrust that generates self-doubt, psychological distance and suspicion in family members who do not know the secret (Imber-Black, 1998; Karpel, 1980). Consistently, adults who discovered their donor conception later in life express feelings of mistrust, negative distinctiveness, and frustration (Turner & Coyle, 2000). Hence, the undermined trust of parent-child relationships and psychological distress of children may take a toll on child adjustment (Turner & Coyle, 2000; Imber-Black, 1998).

It is noteworthy that the adverse effect of keeping children's conception method secret found in donor children may not generalize to non-donor children. Future research needs to place greater emphasis on non-donor children. Also, children who have not been told about their conception method at middle childhood should be monitored longitudinally to assess the risk of accidental discovery later in life. Longitudinal study is also needed to infer causality and direction of effects (Toh & Hern´an, 2008) between disclosure and child adjustment problems that this cross-sectional study is not able to do.

It is important to note that the sample sizes of disclosed children across conditions of family communication climate were small. Caution must be taken when interpreting the results. Although tentative because of the small sample sizes, two things ensured confidence in this study's findings. The disclosure rates of donor and non-donor children reported in this study were comparable with the rates reported by previous studies

(Golombok et al., 2011; Nekkebroeck et al., 2008). Also, outliers that may bias the results were not found. Future research with a larger sample size of disclosed children is needed.

Rethink Early Disclosure within Family Communication Climate

Anecdotal evidence suggests telling children how they were conceived at a young age (< 5 years old) is preferable to telling them later in life, regardless of if donor gametes were used (Rumball & Adair, 1999; Mac Dougall et al., 2007; Jadvá et al., 2009; Scheib et al., 2005; Siegel et al., 2011). Applying the lens of an open family communication climate to the examination of this preliminary result sparks two insights.

First, greater emphasis should be placed on conceptualizing disclosure as an ongoing process (Rumball & Adair, 1999; Siegel et al., 2011; Mac Dougall et al., 2007). An open family communication climate does not ensure disclosure. Yet, in families with an open communication climate, there tends to be unrestrained and frequent parent-child interactions about children's conception method after the initial disclosure. Conception information needs to be shared gradually, repeatedly, and reinforced such that it is normalized and incorporated into children's life stories (Scheib et al., 2005; Rumball & Adair, 1999; Siegel et al., 2011; Mac Dougall et al., 2007). To better understand the outcomes of disclosure as a continuous process rather than a single event, longitudinal research is needed.

Another insight is to examine if the early age of disclosure works in concert with an open family communication climate to have an effect on child outcomes. It seems that the seed of conception planted in children early in life is nourished by an open family communication climate such that children perceive it as "no big deal" (Rumball & Adair, 1999; Mac Dougall et al., 2007; Siegel et al., 2011). It is possible that the young age of

disclosure interacts with the open family communication climate in an important way to influence child outcomes, which should be investigated through future research.

Study Strengths and Limitations

This study has several advantages. A primary strength is that it is the first to go beyond prior direct-effect studies and contextualize the association between disclosure and child adjustment in family communication climate. This contextual approach suggests the conditions when disclosure may be favorable or adverse for child adjustment. This study also has methodological strengths increasing confidence in findings. A multi-method approach using both self-reports and observations reduces method biases (Podsakoff et al., 2003). The shared variance caused by multiple children in the same household was accounted for (Cook, 2012).

Despite the strengths, limits to generalizability deserve attention. The outcomes of disclosure may vary across child developmental stages (Colpin & Soenen, 2002; Colpin & Bossaert, 2008), limiting the application of this study's findings to 6- to 12-year-old children conceived using MAR. Also, due to the differential rates of disclosure across forms of households, this study's findings may be only generalized to households headed by heterosexual couples. For example, disclosure rates in families of single mother by choice or lesbian couples tend to be higher than those in families of heterosexual couples (Illioi & Golombok, 2015).

A weakness of this study was the low reliability of the *Concept Focus* scale. The unsatisfying reliability suggests the items in the *Concept Focus* scale were not internally consistent, which may be relevant to the small number of items in the scale (Gliem & Gliem, 2003). Future research should consider a stronger measure of *Concept Focus* in

the family communication climate measure.

Practical Implication

Findings of this study have important practical implications. Parents intending to disclose are unsure how to appropriately handle disclosure (Peters et al., 2005; Kirkman, 2003) and request pertinent guidance (Mac Dougall et al., 2007). Current efforts appear to focus on developing effective and proper language, narratives, and strategies (Rumball & Adair, 1999; Mac Dougall et al., 2007). Disclosure techniques (e.g. language and narratives) are important, yet this study's findings suggest they cannot be developed or applied in isolation of family communication climate. As Fitzpatrick and Koerner (1997) argued, family communication climate fosters the development of various functional communication skills. Moreover, family communication climate is relevant to parents' disclosure practices and intentions to disclose. Counseling professionals, therefore, should pay attention to the family communication climate when providing guidance on disclosure.

Conclusions

Through the lens of family communication climate, the association between disclosure and child adjustment was examined. Although preliminary, this study provides sound evidence that in families with an open communication climate, disclosure tends to be associated with fewer child adjustment problems. In families with a closed communication climate, disclosure is related to more child adjustment problems. Future research should further evaluate the potentially important role of family communication climate with a larger number of disclosed children and a longitudinal study design.

Table 1

Descriptive statistics among study variables: means, standard deviations, and correlations

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Disclosure	—															
2. Family communication climate	.07	—														
3. Parent emotional state	.03	-.01	—													
4. Child sex	-.09	-.03	-.01	—												
5. Child age	.16	.08	-.01	-.13	—											
6. Donor gamete use	.15	.13	.08	-.10	.01	—										
7. Parent-child Relationship	-.03	-.01	-.29*	-.03	-.02	.11	—									
8. Externalizing problems	.25*	.09	.40*	-.10	.19	.21	-.46*	—								
9. Rule-breaking behavior	.08	.08	.41*	-.11	.14	.11	-.27*	.86*	—							
10. Aggressive behavior	.25*	.09	.34*	-.06	.20	.21	-.52*	.96*	.68*	—						
11. Internalizing problems	.23*	.11	.33*	.05	.08	.14	-.47*	.62*	.41*	.67*	—					
12. Anxious/depressed	.31*	.08	.40*	.10	.17	.13	-.47*	.61*	.44*	.63*	.89*	—				
13. Withdrawn/depressed	.06	-.08	.14	.08	-.10	.05	-.41*	.40*	.30*	.41*	.62*	.40*	—			
14. Somatic complaints	.11	.22	.08	-.07	.01	.16	-.11	.28*	.08	.36*	.64*	.33*	.14	—		
15. Thought problems	.11	.08	.17	-.10	.01	-.01	-.50*	.52*	.38*	.53*	.44*	.39*	.38*	.20	—	
16. Attention problems	.19	-.08	.20	-.04	.02	-.02	-.41*	.62*	.47*	.62*	.44*	.40*	.33*	.21	.57*	—
17. Means	.25	14.25	6.61	.51	8.57	.19	6.36	3.02	.79	2.24	2.86	1.69	.52	.64	1.14	2.20
18. SD	.44	3.71	5.49	.50	1.34	.39	.66	3.94	1.55	2.73	3.19	2.02	1.01	1.22	1.74	2.66

Note. * $p < .05$

Table 2

Means and standard deviations of study variables for non-disclosed and disclosed children by family communication climate

	Closed		Medium		Open	
	Nondisclosure (n = 13)	Disclosure (n = 5)	Nondisclosure (n = 38)	Disclosure (n = 10)	Nondisclosure (n = 11)	Disclosure (n = 6)
Family communication climate	9.42 (1.63)	9.35 (1.79)	14.09 (1.77)	14.35 (2.06)	19.41 (1.96)	19.44 (1.35)
Parent emotional state	5.15 (4.52)	8.40 (8.17)	6.82 (5.51)	7.20 (5.61)	7.09 (6.06)	5.67 (5.47)
Child sex	.62 (.51)	.40 (.55)	.47 (.51)	.40 (.52)	.64 (.50)	.50 (.55)
Child age	8.62 (1.13)	8.49 (1.92)	8.30 (1.28)	9.13 (1.35)	8.82 (1.67)	8.84 (1.12)
Donor gamete use	0 (0)	.20 (.45)	.19 (.40)	.30 (.48)	.18 (.40)	.33 (.52)
Parent-child relationship satisfaction	6.30 (.65)	6.22 (.85)	6.41 (.58)	6.23 (.91)	6.39 (.69)	6.48 (.78)
Child adjustment problems						
Externalizing problems	1.71 (2.78)	7.80 (7.92)	2.42 (3.40)	3.40 (2.84)	4.09 (4.13)	2.67 (2.50)
Aggressive behavior	.92 (1.55)	5.20 (4.44)	1.84 (2.50)	3.00 (2.45)	3.00 (3.19)	1.67 (1.63)
Thought problems	.92 (.95)	3.20 (3.49)	.68 (.96)	1.60 (2.88)	1.55 (1.92)	.83 (.75)
Attention problems	1.46 (2.07)	7.40 (3.21)	1.66 (2.20)	2.30 (2.50)	2.64 (2.50)	1.17 (1.60)

Note. There was one missing value on child's disclosure status in the open family communication climate group.

Table 3

Spearman's rank correlations between disclosure and child adjustment problems by family communication climate

	Closed		Medium		Open	
	r_s	p	r_s	p	r_s	p
Externalizing problems	.64	.01*	.21	.15	-.14	.59
Aggressive behavior	.63	.01*	.25	.09	-.17	.52
Thought problems	.28	.27	.07	.63	-.08	.76
Attention problems	.70	.01*	.14	.35	-.27	.29

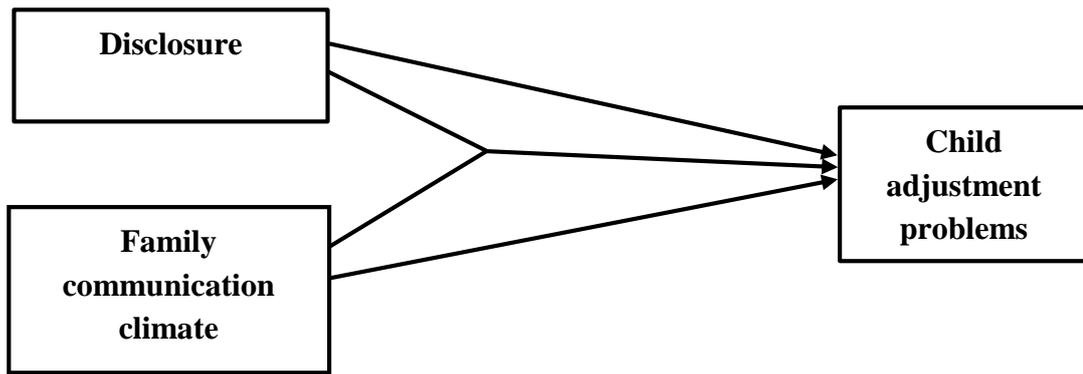


Figure 1. *Conceptual model depicting predicted associations among disclosure, family communication climate, and child adjustment problem.*

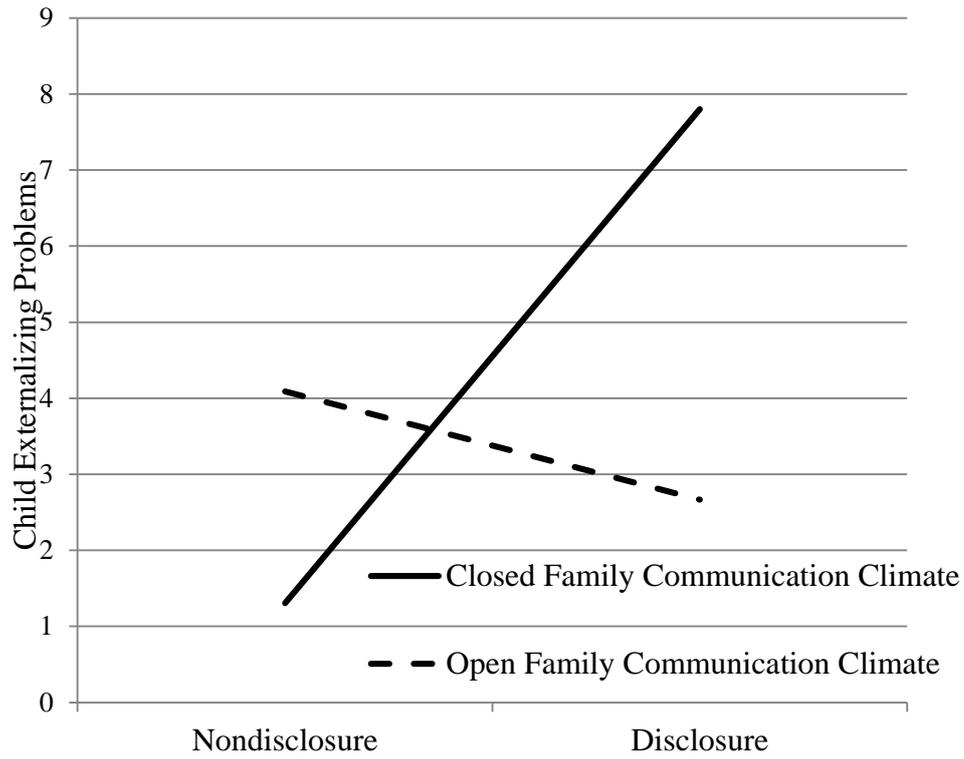


Figure 2. *Depiction of the moderating effect of family communication climate on the association between disclosure and child externalizing problems.*

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