THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE

DEPARTMENT OF HUMAN DEVELOPMENT AND FAMILY STUDIES

THE MODERATION OF AGE SPACING ON THE ASSOCIATION BETWEEN MATERNAL DIFFERENTIAL CONTROL AND INTERNALIZING BEHAVIORS

KRISTIN NICOLE FIELD
Spring 2010

A thesis
submitted in partial fulfillment
of the requirements
for a baccalaureate degree
in Human Development and Family Studies
with honors in Human Development and Family Studies

Reviewed and approved* by the following:

Jenae Neiderhiser
Liberal Arts Research Professor of Psychology
Thesis Supervisor

Hobart Cleveland
Associate Professor
Thesis Supervisor

Kathryn Hynes
Assistant Professor
Honors Adviser

* Signatures are on file in the Schreyer Honors College.

Abstract

Previous research on sibling comparison has largely examined the moderating effects of gender, sibling constellation, and age on the association between parental differential control (PDT) and externalizing behaviors. Although not extensively studied, research on internalizing behaviors and PDT have shown that there is an association between internalizing behaviors and maternal differential control. Sibling age spacing as a moderator has not been examined. Using a sample of 720 families from the Non-shared Environment on Adolescent Development (NEAD) project, this study examined sibling age spacing and the association between maternal differential control and internalizing behaviors of siblings. Sibling dyads included in this study were no more than 4 years apart and ranged from 9 to 18 years of age. Both mother and child reports of internalizing behaviors, which are not highly correlated, were examined separately via regression analyses. To examine family composition and twin effects on the association between maternal differential control and internalizing behaviors, step versus non-step and twin versus non-twin sibling dyads were also analyzed. Overall, results supported previous research showing an association between maternal differential control and internalizing behaviors. Sibling age difference did not moderate the association between maternal differential control and internalizing behaviors. This finding, however, could be due to the relatively small age differences seen in the sample.

Acknowledgements

This report is part of the Non-shared Environment in Adolescent Development project, supported by the National Institute of Mental Health (MH43373 David Reiss, MD, PI) and the William T. Grant Foundation.

Also, thank you to Dr. Jenae Neiderhiser, Dr. Hobart Cleveland, and Kristine Marceau for aiding in the completion of this thesis.

Table of Contents

Table of Contents Continued

Introduction

Children in the same family may be as different from one another as children from different families in reference to personality, psychopathology, and behavior problems (e.g., Daniels, Dunn, Furstenberg, & Plomin, 1985; Daniels & Plomin, 1985; Volling & Elins, 1998). Although most share fifty-percent of their genes, on average, have the same parents, and live in the same household, the treatment they receive from their parents is not necessarily equal. Parents treat their children differently in part because children's needs differ based on personality, interests, abilities, and maturity level (McHale, Updegraff, Crouter, & Killoren, 2005).

Parental differential treatment (PDT) demonstrates the existence of non-shared environments - or features of the environment experienced differently by siblings that make them more different (Volling & Elins, 1998)- in the same family. Previously, family factors were thought to be largely shared environmental (i.e. aspects of the environment that make siblings more similar) but the occurrence of PDT demonstrates the potential for non-shared environmental effects to exist within the family context. PDT, as a specific non-shared environment, has been shown to affect adolescent adjustment (Pike, McGuire, & Hetherington, 2007). According to social comparison theories (i.e., Festinger, 1954), children notice these differences in parental behavior as they evaluate their treatment against treatment received by their siblings (McHale, Crouter, McGuire, & Updegraff, 1995). In addition to discrepancies in actual treatment, siblings' *perceptions* of these discrepancies are potentially important to individual development and the development of differences between siblings (Daniels, Dunn, Furstenberg, & Plomin, 1985).

Most often, development, or adjustment, is measured by externalizing and internalizing behaviors. Specifically, the more a child exhibits these behaviors, the poorer the adjustment. Currently, much of the research done on parental differential treatment focuses on externalizing behaviors (e.g., Coldwell, Pike, & Dunn, 2008) because they are more easily observed by parents. Internalizing behaviors, however, are not overt, making internalizing behaviors more difficult to collect data on via parent reports (Richmond, Stocker & Rienks, 2005). To both demonstrate consistency between previous research and findings from the present study and to expand current literature, this study will examine the association between parental differential treatment and internalizing behaviors using child reports in addition to mother reports.

Additionally, many studies on parental differential treatment have examined gender, age, and birth order to see if they have moderating effects on the association between differential treatment and child outcome (Daniels et al., 1985). Though studies have largely collected data from families with siblings that are roughly 1-4 years apart, the effects of age difference between siblings have remained unexplored (e.g., Kowal & Kramer, 1997; Kowal, Kramer, Krull, & Crick, 2002; Tamrouti-Makkink, Dubas, Gerris, & van Aken, 2004; Volling & Elins, 1998). There is, however, reason to predict that age spacing will influence the effects of PDT. Studies not explicitly examining PDT have shown age spacing effects on sibling relationships and competition. It has been found that sibling dyads closer together in age have more conflict and aggression than siblings further apart in age (Minnett, Vandell, & Santrock, 1983). It was also found that siblings with a smaller age difference develop more differently from one another as compared to siblings with a greater age difference. It may be possible, then, that there is a connection between sibling age spacing and adjustment. This study will investigate the moderating effects of sibling age difference on the association between parental differential

treatment and internalizing behaviors. Specifically, it will determine if siblings closer in age or siblings further apart in age have fewer internalizing behaviors.

Social Comparison

Before examining parental differential treatment of siblings, it is essential to understand why differences in treatment by adults may have such an important impact on adjustment and development. Social comparison, according to Festinger (1954), is a means of gathering information about the self. Moreover, if objective information or standards are not available, individuals may compare themselves with the abilities and opinions of others in order to gain a better understanding of how well they are doing at a given task or in a given situation. Individuals are more likely to compare aspects of their lives to those that are both close in proximity and those that are similar to themselves.

Given that siblings generally live in the same household, siblings often make social comparisons with one another in the family context. Unlike for most evaluations of the self, for which no opportunities exist to negate a negative comparison by finding an alternative criterion to compare against (Festinger, 1954), children cannot obtain alternate sibling comparisons (Shanahan, McHale, Crouter, & Osgood, 2008). Therefore, unfavorable sibling comparisons may lead to a decrease in well-being, high depressive symptoms, and a negative sibling relationship. Parental treatment prompts sibling comparisons, and may result in unfavorable self-perceptions; as differential treatment is a factor that weighs heavily on child and adolescent development (Feinberg et al., 2000). Parental treatment is especially important because it is a within-family comparison. Of course, children may compare how they are treated by their parents to how a peer is treated by his or her parents. Comparing one's own treatment to peer treatment, however, is an imperfect comparison because different sets of parents are allocating

treatment. Therefore, comparing parental treatment within one's own family (i.e. with a sibling) allows children to gain more salient information on their status. Thus, as previously mentioned, sibling comparisons made about parental differential treatment are likely to effect sibling development and adjustment (Feinberg et al., 2000).

Parental Differential Treatment

Adler's Theory of Individual Psychology can be used to explain how development may be influenced by differential treatment. According to Adler's theory, as interpreted by Shanahan and colleagues (2008), ego development is spurred by children's comparisons of how their parents treat them versus their siblings. This interpretation complements the aforementioned notion that siblings glean information on their status within the family by making comparisons. From this, one may posit that if children perceive that they have a high status within the family based on parental treatment, then they will have a more positive ego development than siblings who perceive a low status within the family.

Furthermore, Adler's theory also suggests that children feel rivalry, hostility, and low self-esteem when their sibling is treated in a more favorable manner (McHale et al., 2005). Based on this assertion, PDT has an effect on the negative or positive adjustment of siblings (Brody, Stoneman, & McCoy, 1992; Feinberg et al., 2000). Adding to this, siblings' perceptions of differential treatment and whether such differences are justified moderate the effects of PDT (Kowal, Krull, & Kramer, 2006; Sheehan & Noller, 2002). That is, if a child perceives the PDT to be fair, they may develop positive relationships with family and an adaptive life trajectory. Treatment may be considered 'fair' if one's sibling is being given extra attention because of age-specific needs, as opposed to favoritism. For example, if the sibling is younger, they may need more assistance with daily tasks or if they are older, they may need help with skills, like learning

how to drive. Treatment may also be considered 'fair' if one's sibling has a developmental disability that requires extra time and care.

Adjustment and PDT

Whether child adjustment is positive or negative, it is most often examined by assessing children's behavior problems, specifically internalizing and externalizing symptoms. More internalizing and externalizing behaviors indicate less adaptive adjustment. A large amount of research has been conducted on the association between of PDT and both externalizing and internalizing behaviors (e.g. Tamrouti-Makkink et al., 2004) or just externalizing behaviors (e.g. Coldwell, Pike, & Dunn, 2008), though there is a small body of literature that looks exclusively at internalizing behaviors. Previous research on internalizing behaviors shows that females are more likely to develop internalizing behaviors than males (Richmond et al., 2005; Shanahan et al., 2008; Tamrouti-Makkink et al., 2004). Additionally, maternal differential control is positively linked to internalizing behaviors, while maternal differential warmth is not (Tamrouti-Makkink et al., 2004). Low self-esteem and high levels of anxiety, depression, and withdrawal, in particular, have been linked to more maternal differential control (Sheehan & Noller, 2002; Tamrouti-Makkink et al., 2004). One reason that current research has mainly focused on externalizing behaviors is because internalizing behaviors are more difficult to measure with parent reports alone (Richmond et al., 2005). Based on this information, I expect to find that differential maternal control is associated with internalizing behaviors. Such a finding will supplement the literature on the association between PDT and internalizing behaviors; and the inclusion of child reports in analyses will ensure consistency between previous research and findings of the present study.

Age Effects on Perceptions of PDT

When looking solely at maternal control, findings suggest that mothers use more control with older siblings than younger siblings (Kowal et al., 2002; Kowal & Kramer, 1997). Older siblings are given more responsibilities and are considered to be more mature. It is possible, then, that older siblings are discouraged from being hostile towards their younger siblings and may therefore internalize any feelings of anger they have about differential treatment (Shanahan et al., 2008). In contrast, it may be more acceptable for younger siblings to display more externalizing behaviors in their sibling relationship. Another possibility is that more control is elicited because many older siblings included in studies have just entered adolescence. This is significant because children have less autonomy during early adolescence, which gives increased opportunities for conflict with parents (Shanahan, McHale, Osgood, & Crouter, 2007). Increased conflict could then lead to increased discipline and control of the sibling.

As children reach early and mid-adolescence, it has been shown that children's reactions to PDT are strengthened due to increases in social and cognitive abilities and a decrease in the affective quality of parent-child relationships (Shanahan et al., 2008). For instance, one study showed that 12 year-olds reported their treatment to be less fair than did 8 year-olds (McHale et al., 2000). Again, this may be due to increased conflict when children are entering adolescence.

Additionally, McHale, Updegraff, Tucker, and Crouter (2000) posit that adolescents, as opposed to children, use their reasoning abilities to more closely monitor PDT, rather than rationalizing it; making them more vulnerable to its negative effects. Studies have shown that older siblings are more sensitive to PDT than their younger siblings (e.g., Feinberg & Hetherington, 2001; McHale et al., 2005) and are likely to spend more time and effort in trying to understand why PDT is occurring (Kowal & Kramer, 1997). By understanding the reasons

behind PDT, for example, acknowledging that parents may be meeting the needs of their sibling based on age, older siblings may be less impacted by the differential behaviors. If, however, the older sibling cannot acknowledge PDT as being 'fair,' they are more likely than their younger siblings to display internalizing behaviors (Kowal et al., 2002). Increased vulnerability to the perception of PDT during early adolescence may also be due to lower levels of self-esteem, as compared to childhood (McHale et al., 2000).

Not only is conflict more frequent after childhood, but early adolescents have fewer positive feelings towards family members (Larson, Richards, Moneta, Holmbeck, & Duckett, 1996). Fewer positive feelings may lead to increased conflict within the parent-child relationship. One study found that higher parental conflict levels for 15 year-olds were associated with greater parental control (De Goede, Branje, & Meeus, 2008). If one sibling in a family is in adolescence and is experiencing increased parental control they may perceive their differential treatment as unfair, increasing the likelihood that they develop internalizing behaviors. During the high school years, however, adolescents begin to have more positive feelings toward family members (Larson et al., 1996). More favorable feelings towards parents may be due to the fact that as children reach middle to late adolescence, they gain more power in the parent-child relationship (De Goede et al., 2008; Steinberg, 1981). As children in late adolescence gain greater autonomy, they may no longer perceive themselves as receiving greater parental control than their sibling, decreasing the likelihood that sibling comparisons will lead to the development of internalizing behaviors.

Although the effects of PDT on internalizing behaviors appear to weaken as children age, older siblings included in this study were entering adolescence; thus, this study should not only find an association between differential maternal control and internalizing behaviors, but it

should also find that older siblings are more likely to develop internalizing behaviors than younger siblings. As mentioned, such a finding is expected because the older siblings that were included in this study were entering adolescence, where conflict and the effects of PDT on internalizing behaviors are increased. This finding would also supported by previous research showing older siblings' increased vulnerability to PDT.

Sibling Age Difference Effects

In addition to age, sibling age difference, or spacing, may also have a moderating affect on the association between PDT and child adjustment. Researchers have yet to examine the moderation of age spacing on the association between PDT and child outcomes. Nevertheless, other studies have looked at age spacing and the effects on siblings. Cornoldi and Fattori (1976) examined sibling age difference effects on firstborns and symbiotic dependence with their mothers. Findings suggested that when a sibling is born less than three years after the firstborn, the symbiotic relationship between the firstborn and the mother is disrupted and the firstborn's need for affiliation will transcend into adulthood. Since many studies reporting on PDT use sibling pairs that are less than three years apart, there may be a link between the increased vulnerability to and monitoring of PDT displayed by older siblings and the disrupted symbiotic relationship posited by Cornoldi and Fattori (1976). Specifically, this link would show that the smaller the difference in age between siblings, the less favorable the older child's adjustment.

Past research has also examined the association between sibling age difference and sibling relationship quality. Siblings who are less than 2 years apart are more likely to have similar abilities and interests, as well as share the same peers, than siblings spaced further apart (Minnett et al., 1983). With so many similarities between closely spaced siblings, it seems likely that these dyads would be more likely to make social comparisons with one another in regard to

PDT. In addition, it is more likely for siblings closer in age to display higher levels of aggression (Minnett et al., 1983). Increased competition may result in the aggression and conflict seen between siblings. Sibling competition can be based in Darwinian theory, enabling the child who attains the most parental investment to gain advantages of resources (Lalumière, Quinsey & Craig, 1996). An innate drive to maximize resources and parental investment may encourage siblings to compare the treatment they receive from their parents to the treatment their sibling receives.

Increased awareness of differences in treatment may give rise to changes and differences in siblings' adjustment. Adjustment may differ because siblings develop diverse strengths and abilities to gain more parental investment (Lalumière et al., 1996) if differences in treatment are perceived. As previously mentioned, siblings closer in age tend to be more similar than siblings further apart in age. It is possible, then, that siblings with a smaller age difference would need similar forms of investment from their parents (e.g., both siblings are learning motor skills), whereas siblings further apart would need different forms of investment (e.g., one siblings is learning motor skills and the other is learning mathematics). Requiring similar attention, or investment, from parents may lead siblings closer in age to adapt different strategies for getting attention, while siblings with a greater age difference would not have to compete for attention by developing different abilities. This hypothesis is supported by Feinberg and Hetherington (2000), who found that siblings closer in age had less similarity in their adjustment than did siblings who were further apart in age (as cited by Feinberg, McHale, Crouter, & Cumsille, 2003). Given that age spacing has an impact on adjustment in sibling dyads, this study will examine if age spacing has a similar moderating affect on the association between PDT and internalizing behaviors. Because siblings spaced further apart appear to have less competition

and need for comparison, I expect to find that the greater the age difference between siblings, the weaker the association between PDT and internalizing behaviors will be.

Present Study

As reviewed above, there is evidence for an association between parental differential treatment and behavior problems. Comparatively little research has been done on internalizing behaviors because they are more difficult to observe; however, differences in maternal control have been linked to internalizing behaviors. Additionally, in research on differential treatment, child reports of internalizing behaviors are seldom utilized and are often different form parent reports. Studies have also examined the role of gender, gender constellations of siblings, age, and birth order on the association between PDT and internalizing behaviors, while the potential moderation of age spacing between siblings has not been explored on this association. Such age differences between siblings may be important for understanding the association between PDT and internalizing behaviors because age spacing effects are seen in sibling relationships. Therefore, the present study aims to (a) examine the association between differential maternal control and internalizing behaviors in siblings, and (b) estimate whether the association between maternal control and level of internalizing behaviors is moderated by the age difference of sibling pairs (see Figure 1).

Hypotheses

I hypothesize that differential maternal control will be associated with more internalizing behaviors in children (Tamrouti-Makkink et al., 2004; Volling & Elins, 1998). Although such a relationship has been found in previous research, internalizing behaviors and differential maternal control have not been studied extensively. It is therefore necessary to determine whether this association is consistent across samples. I also expect that older siblings will have

increased levels of internalizing behaviors as compared to younger siblings when both are exposed to the same level of maternal control. Some studies (e.g. Kowal & Kramer, 1997; McHale et al., 1995) suggest that because older siblings have increased cognitive ability they are better able to justify PDT and develop fewer negative effects. Conversely, it has been found that because older siblings included in many studies are entering adolescence their self-esteem will be lower (McHale et al., 2000), increasing the likelihood that internalizing behaviors will develop. Adolescents may be likely to use their increased cognitive ability to more intensely analyze PDT and become more vulnerable to its effects because of their low self-esteem; as opposed to rationalizing and justifying PDT.

Finally, the association between maternal differential control and internalizing behaviors is expected to be modified by the age difference between siblings. According to Minnett et al. (1983), siblings further apart in age experience less aggression with one another than siblings closer in age. Decreased aggression, and thus decreased competition, may lead to fewer comparisons of parental treatment. If siblings are making fewer comparisons of PDT, then fewer negative behavioral outcomes may be seen. Based on this assertion, I expect that the greater the age difference between siblings, the weaker the association between maternal differential control and internalizing behaviors for both siblings.

Methods

Participants

Data are from the Nonshared Environment on Adolescent Development (NEAD) project. NEAD is a longitudinal study designed to explore the impact of genetic and environmental factors on adolescent development (Neiderhiser et al., 2007; Reiss, Neiderhiser, Hetherington, & Plomin, 2000). Random-digit dialing and commercial market panels were used to recruit

families. There were six sibling types: monozygotic twins, dizygotic twins, and full siblings in nondivorced families, as well as full siblings, half siblings, and step siblings in stepfamilies. Siblings in these families were required to be between the ages of 9 and 18 and could be no more than 4 years apart in age. Siblings were also required to reside in the targeted household for at least half of each week. All stepfamilies were beyond the early stages of family formation, and had been together for at least 5 years before the onset of the study. Older siblings, labeled Child 1, younger siblings, labeled Child 2, and both of their parents were measured at three times: Wave 1, Wave 2, and Wave 3 in 1988, 1991, and 1999, respectively.

The present study examined Wave 1 of NEAD, which included 720 middle-class families of varying education and income from 47 states. The mean level of education for mothers was 13.6 years and 14.0 years for fathers. Within the sample, 7% of mothers and 10% of fathers received less than a high school education, 42% of mothers and 35% of fathers graduated high school, and the remainder of the parents received some post high school education (Neiderhiser et al., 2007). The family income for the sample ranged from $25,000 to $35,000 with 12% of families earning less than $20,000 per year and 32% earning more than $50,000 per year. While there was some representation of various ethnic groups, 94% of women and 93% of men were European American. The sibling sample was comprised of 52% boys and 48% girls. The mean age for older siblings was 14.5 (SD = 2.2 years), and the mean age for younger siblings was 12.9 (SD = 2.2 years). The age range for both siblings included in Wave 1 was 9 to 18 years. See Reiss et al. (2000) and Neiderhiser et al. (2007) for more details about sample design, recruitment, and sample characteristics.

Measures

Parental differential treatment. PDT was measured by the Sibling Inventory of Differential Experiences (SIDE), where both siblings reported on their experiences with sibling interaction, parental treatment, and peer-group characteristics in comparison with those of their sibling (Daniels & Plomin, 1985). Parents tend to underestimate the amount of differential treatment present in their relationships with their children (Pike, Reiss, Hetherington, & Plomin, 1996). Thus, child reports will be utilized in the analysis of PDT. The subscale measuring maternal control was utilized for analyses. Children were asked to rate the extent to which they perceived differential maternal control on a scale of 1 to 5 (1 = with me much more, 2 = with me a bit more, 3 = with both of us the same, 4 = with [sibling] a bit more, and 5 = with [sibling] much more) on items including, "[mother] has punished us for our misbehavior." Four items are included in this scale, with scores ranging from 4-20. Low scores indicate more perceived maternal control directed at the sibling, while high scores indicate more perceived maternal control directed toward the target child.

Internalizing behaviors. Internalizing behaviors were measured using the Behavioral Problems Index (BPI), created by Zill and Peterson (Zill, Peterson, & Snyder, 1987). The original BPI measured a range of behavioral problems that a child may exhibit based on parent reports. NEAD created a child version of the BPI in order to capture the child's perception of their behaviors. Items for the BPI-child version were reworded to be in the first person. Six subscales are used to determine possible behavior patterns: peer conflict/social withdrawal, immature/dependent, hyperactive, headstrong, anxious/depressed, and antisocial. To examine the potential differences between reports and their effects, the present study used both mother and youth reports on the anxious/depressed subscale. Respondents rated three items such as,

"I/[my child] was too dependent on others" on a scale of 1 (often true) to 3 (not true). Previous research has found low correlations between parent and child reports of internalizing behaviors (Achenbach, McConaughy, & Howell, 1987). Thus, by looking at both mother and youth reported internalizing behavior, I will determine if such discrepancies exist and whether differing effects due to such discrepancies are found in the analyses.

Analytic Strategy

Given that NEAD uses a twin/sibling design, all analyses will first be run using Child 1 data and then run again using Child 2 data to determine whether or not the perspective of older- versus younger sibling affects results. By analyzing siblings separately, I will be controlling for within-family confounds.

After running descriptive statistics, I will use correlations to look at broader associations between sibling age, age difference, maternal differential control, and internalizing behaviors, in order to determine which variables will be controlled for. Next, a series of hierarchical linear regressions will be performed to test hypotheses. In model 1 I will examine the effects of covariates, sibling age, age difference, sibling type, and gender, with internalizing behaviors as the dependent variable. Maternal differential control, as experienced by Child 1 or Child 2 individually, will be introduced in model 2. The interaction between age difference and maternal control will be introduced in model 3 with internalizing behaviors as the dependent variable. Since mother reports will be used in addition to child reports, parallel hierarchical linear regressions will also be used with sibling age, age difference, sibling type, and gender to assess the effects of PDT. The change in R^2 in step two will either support or not support the hypothesis that differential maternal control will elicit more internalizing behaviors in older siblings, and the change in R^2 in step three will either support or not support the hypothesis that

greater age differences will weaken the effects of maternal differential control on internalizing behaviors. Follow-up t-tests will be used to determine the nature of significant interactions.

Exploratory analyses will examine whether sibling type influences these associations since the sample includes siblings of varying genetic relatedness (i.e. twin vs. non-twin and step vs. non-step). These analyses will be run for Child 1 and Child 2 separately to test for sibling differences. It is possible that sibling type may affect the level of internalizing behaviors and/or the level of maternal differential control. It is more likely, however, that there will not be systematic differences due to sibling type. If differences do exist by sibling type, further analyses will be done for each sibling type separately to see where there are discrepancies.

Results

For both child and mother reports, I first ran correlations between key demographic constructs and the constructs of interest in order to determine which variables would need to be controlled for in subsequent analyses. The correlations between age, age difference, gender, differential maternal control, and both mother and sibling reports of internalizing behaviors for both Child 1 and Child 2 showed that all of these variables contributed to some of the variance in both differential maternal control and internalizing behaviors, and all except for age difference (the proposed moderator) were entered as controls in following analyses. Mean level differences for Child 1 and Child 2 on the constructs of interest can be found in Table 1. Generally, siblings were entering early adolescence and were a little over a year apart in age. Both Child 1 and Child 2 scored in the mid to low ranges for the Differential Maternal Control and Internalizing Behavior scales on both mother and child reports. Correlations for mother and child reports of internalizing behaviors were small and non-significant (see Table 2). The next step in analysis was to examine hierarchical linear regressions with age, gender, differential maternal control,

age difference, and the interaction between age difference and differential maternal control predicting internalizing behavior for Child 1 and Child 2 separately. These analyses examined child reports and mother reports separately. For the interpretation of findings regarding gender, it should be noted that males were coded as "1" and females as "2".

Child Reports on Internalizing Behaviors

All sibling types. For all regression analyses covariates were added in model 1, differential control was added in model 2, age difference was added in model 3, and the interaction of differential maternal control and age difference was added in model 4. See Table 3 for a summary of the regression results for all sibling types. Differential maternal control in model 2 was significant ($\beta = -.13$, $t = -3.56$, $p < .05$; $\beta = .15$, $t = 3.96$, $p < .05$), showing that it predicted internalizing behaviors for both Child 1 and Child 2 above and beyond the covariates. The addition of age difference in model 3 predicted internalizing behaviors only for Child 1 ($\beta = .10$, $t = 2.64$, $p < .05$). Differential maternal control remained significant for both siblings after also controlling for age difference (Child 1: $\beta = -.13$, $t = -3.50$, $p < .05$; Child 2: $\beta = .14$, $t = 3.82$, $p < .05$). The interaction between age difference and differential maternal control did not significantly predict internalizing behaviors ($\beta = -.07$, $t = -.32$, $\Delta R^2 = .01$, $p < .05$). Due to rounding, the ΔR^2 remained non-significant even though it increased by one percent from model 3 to model 4.

Mother Reports on Internalizing Behaviors

All sibling types. See Table 4 for regression results when mother reports on children's internalizing behaviors were used as the outcome. It was found that only gender significantly predicted Child 1's internalizing behavior in all four of the models (model 4: $\beta = .09$, $t = 2.39$, $p < .05$). None of the variables, including age difference and the interaction between age

difference and differential maternal control, significantly improved the model of fit for Child 2's internalizing behaviors.

Twin vs. Non-twin Siblings

In an exploratory analysis, a hierarchical regression was run to investigate if being a twin versus a non-twin sibling affected the impact of maternal differential control on internalizing behaviors. Because twin siblings are the same age, age difference and the interaction between age difference and differential maternal control were not included in the model. Before the regression was run, descriptive statistics were found for both twin and non-twin siblings, see Table 5. See Table 6 for regression results on twins, and Table 7 for non-twin siblings. As with the whole sample, both siblings were entering early adolescence and scored in the mid to low range of both the differential maternal control and internalizing behavior scales (mother and child reports).

Twin siblings. Age and gender significantly predicted the internalizing behaviors of Child 1 ($\beta = .18$, $t = 2.57$, $p < .05$; $\beta = .16$, $t = 2.22$, $p < .05$), see Table 6. Child 2 internalizing behaviors, however, were not significantly predicted by differential maternal control, age difference, or the interaction between age difference and differential maternal control.

Non-twin siblings. Age did not significantly predict internalizing behaviors for Child 1, as displayed in Table 7. Conversely, age significantly predicted Child 2's internalizing behaviors in all models. Gender and differential maternal control remained significant predictors in all of the models for Child 2. Although gender remained significant in all models for Child 1, differential maternal control was no longer significant when the interaction between age difference and differential maternal control was added in model 4. Further, when age difference was added into model 3, it did not significantly predict internalizing behaviors for either sibling,

even though it was a significant predictor of internalizing behaviors for Child 2 ($\beta = .10$, $t = 2.64$, $p < .05$). The interaction between age difference and differential maternal control was not significant for either sibling and washed out the effects of age difference for Child 2, making it no longer significant.

Step vs. Non-step Siblings

I then conducted similar analyses examining the potential differences in internalizing behaviors between step siblings and non-step siblings. It is possible that genetic relatedness may affect PDT, thus impacting child behavior outcomes. Although some these effects may be seen in the twin versus non-twin analyses (because of the use of MZ and DZ twins), examining the data with step versus non-step siblings demonstrates the potential effects of non-related (step) siblings and genetically related siblings. It should be noted that for step and non-step sibling analyses, twin sibling dyads were not included as results may have been confounded because there is no age difference between those siblings. As with the twin versus non-twin analyses, descriptive statistics were run, as shown in Table 8. It can be seen that Child 1, in step and non-step dyads, is nearing middle adolescence and Child 2 is entering early adolescence. Again it is seen that both siblings have scored in the mid to low range for both the differential maternal control and internalizing behavior scales. A hierarchical linear regression was then performed when data was split by step versus non-step siblings to see the impact of sibling relatedness on differential maternal control and internalizing behaviors. Table 9 displays regression results for step siblings and Table 10 displays regression results for non-step siblings.

Step siblings. Age did not significantly predict internalizing behaviors for either Child 1 or Child 2 in any of the models. Gender, however, did significantly predict internalizing behaviors in all of the models for both siblings. When differential maternal control was added

into the regression in model 2, it significantly predicted internalizing behaviors for Child 1 (β = -.21, t = -3.45, $p < .05$, ΔR^2 = .08), but not for Child 2. Age difference did not significantly predict internalizing behaviors for either sibling when the variable was added in model 3. Differential maternal control was no longer significant for Child 1 when the interaction between age difference and differential maternal control was added in model 4.

Non-step siblings. Results show age significantly predicted internalizing behaviors for Child 2 (β = .13, t = 2.60, $p < .05$), but not Child 1 (see Table 10). Age was only a significant predictor for Child 2 in model 1, as it became non-significant in model 2. Gender significantly predicted internalizing behaviors for both Child 1 and Child 2 in all models. It was also found that differential maternal control significantly predicted internalizing behaviors for Child 2 when added in model 2 (β = .18, t = 3.58, $p < .05$, ΔR^2 = .03). As age difference was added in model 3, it did not significantly predict internalizing behaviors for either sibling. Similarly, the interaction between age difference and differential maternal control did not significantly predict the internalizing behaviors of either Child 1 or Child 2, while gender (for both siblings) and differential maternal control (for Child 2) retained a significant relationship in model 4.

In summary, I found that gender was generally predictive of internalizing behaviors for both Child 1 and Child 2 when using child reports; showing that females are more likely to report internalizing behaviors than males. Age was predictive for Child 1 and Child 2 when the whole sample was analyzed, for Child 1 in twin dyads, and Child 2 in non-twin dyads. Differential maternal control was found to predict internalizing behaviors for both Child 1 and Child 2 when the whole sample was used until the interaction variable was added to the regression, then the relationship was no longer predictive. This pattern was also seen for Child 1 non-twin siblings, and Child 1 step-siblings. Differential maternal control was consistently

predictive of internalizing behaviors for Child 2 non-twin siblings and for Child 2 non-step siblings.

I also found that age difference predicts of internalizing behaviors for Child 1 when the data was not split and Child 2 in non-twin dyads when child reports of PDT were utilized. The interaction between age difference and differential maternal control was not significant in any of the analyses.

There were few significant predictors of mother reports of child internalizing behaviors. Only gender predicted mother reports of Child 1's internalizing behaviors. As discussed above, child reports yield more significant predictors of child internalizing behaviors than mother reports. This comparison is consistent with previous research that has shown mother reports of internalizing behaviors to be incompatible with child reports of the same behaviors.

Discussion

In addition to examining the impact of sibling age, gender, and differential maternal control on child internalizing behaviors, this study also examined the potential impact of sibling age difference on internalizing behaviors. It was expected that sibling age difference would have an impact on the association between differential maternal control and child internalizing behaviors; specifically that the greater the age difference, the weaker the effects of differential maternal control on internalizing behaviors. While this hypothesis was not supported, results regarding gender, age, and differential maternal control supported previous research. This study was therefore able to strengthen the limited research done on internalizing behaviors and PDT by showing that results hold across samples. It should also be noted that this study examined older siblings and younger siblings separately. Although I did not explicitly test for differences

between older and younger siblings, the pattern of findings suggests that there may be differences. Subsequent studies can explicitly test for and examine these differences.

Despite the fact that hypotheses were not made in reference to gender and age, results for these variables coincide with current research on PDT (Richmond et al., 2005; Kowal et al., 2002; Kowal & Kramer, 1997). Gender effects showed that females are more likely than males to report internalizing behaviors. This finding is supported by several studies (e.g. McHale et al., 2000; Shanahan et al., 2008; Tamrouti-Makkink et al., 2004). It may also be speculated that societal norms discourage females from displaying overtly aggressive and hostile behaviors, causing them to instead become withdrawn and develop internalizing behaviors to cope with their negative emotions. In contrast, it may be more acceptable for males to develop externalizing behaviors to display their masculinity, making it less likely that they will develop anxious and depressive behaviors.

Although age did not consistently predict internalizing behaviors, when it did, findings suggest that older children were more likely to display internalizing behaviors than younger siblings. Older siblings may be more likely to develop internalizing behaviors because they are discouraged from being hostile towards their younger siblings, while it may be more acceptable for younger siblings to display externalizing behaviors in the sibling relationship (Shanahan et al., 2008). Older siblings have also been found to spend more time and effort monitoring PDT, as opposed to rationalizing it, making them more sensitive to PDT and more likely to develop internalizing behaviors (McHale et al., 2000). Furthermore, this result could be due to increased conflict during adolescence. As Shanahan et al. (2007) found, increased conflict during adolescence may lead to increased maternal control, which in turn, would lead to increased internalizing behaviors.

Mean differential maternal control scores show that older siblings do not perceive more control than younger siblings, as both children scored in the mid range of the scale, implying that there is equal control between siblings; which does not support my hypothesis. An association was found between differential maternal control and internalizing behaviors in regression results, however, even though the hypothesis that older siblings would receive more differential control was not supported. When differential maternal control was a significant predictor for the older sibling's internalizing behaviors, the association was consistently negative. This finding tells us that as older siblings perceive less control than their younger sibling, the older sibling's internalizing behaviors decrease. A negative association for differential maternal control was also found for younger siblings in non-twin dyads. Siblings may be content with less maternal control because it denotes greater autonomy in the parent-child relationship. It is possible, then, that siblings who perceive less maternal control also perceive that treatment as being fair. This being said, perceiving the treatment as fair, in addition to receiving preferable treatment, the sibling would not experience the negative effects of differential maternal control and would not develop internalizing behaviors, as was seen in Kowal et al. (2002).

There were, however, some inconsistencies in the findings. The association between differential maternal control and internalizing behaviors was positive for younger siblings in both the whole sample and in non-step dyads. This relationship suggests that as the younger sibling is subject to less control than their older sibling, the younger sibling's internalizing behaviors actually increase. This finding could possibly mean that younger siblings believe that if they act out, or engage in externalizing behaviors, they will be subject to more control. Therefore, they develop internalizing behaviors as an avoidance tactic against greater maternal control.

It was hypothesized that a greater age difference between siblings would weaken the effects of differential maternal control on internalizing behaviors. This hypothesis, however, was not supported. In fact, the opposite moderating effect was found: a greater age difference between siblings appears to strengthen the effects of differential maternal control on internalizing behaviors. It should be noted, however, that age difference was only significant for older siblings in the whole sample analysis and younger siblings in non-twin dyads. It is possible that the lack of significant effects in favor of my hypothesis is the result of the restricted range of sibling age differences in NEAD, which had a maximum sibling age spacing of four years.

The limitations set by a restricted range of sibling age differences can be seen by considering a study conducted by Cornoldi and Fattori (1976), who posited that the first few years of life are essential for mother-child relationships. If this relationship is interrupted by the birth of a sibling within the first three years of life, the older child will have a need for attachment throughout the rest of his/her life. Based on this assertion, I posited that if the symbiotic relationship is disrupted by the birth of a sibling, the older child may be more vulnerable to PDT and its effects. The association between a disrupted symbiotic relationship and increased vulnerability is plausible because the older child's continuous need for attachment may lead them to make more sibling comparisons on PDT to determine whether they or their sibling is receiving the greatest amount of positive attention. Considering the fact that NEAD included sibling dyads that were a maximum of four years apart, most of the older siblings had experienced a disrupted symbiotic relationship. Therefore, if older siblings who had a disrupted symbiotic relationship are indeed more vulnerable to PDT, then one would expect a positive association between differential maternal control and internalizing behaviors, as was found in some regression analyses in this study. Future research could increase the range of age spacing,

which would contribute to the understanding of the effects of the symbiotic relationship by examining the differences between disrupted and completed symbiotic relationships. Designing a study as such, a more accurate summary of the effects of age spacing may be found.

Mother reports on children's internalizing behaviors were found to yield few significant results, which may be the effect of several factors. It may simply be that children are better than their parents at interpreting and reporting their internal states (Compas, Oppedisano, Conner, Gerhardt, Hinden, Achenbach, & Hammen, 1997). A child feeling anxious or depressed may not outwardly show those feelings and would thus not be observable or reportable by parents. It may also be posited that parent reports may be biased. A parent, in this case mothers, may not want to admit that their child is experiencing internalizing behaviors, especially if they believe those behaviors are socially unacceptable or are in some way their fault.

Mother reports of internalizing behaviors may have also yielded few results because they were analyzed using child reports of differential maternal control. Because mother reports were not significantly predictive in these analyses, it may suggest that children who report high levels of internalizing behaviors also report high levels of differential treatment, due to perceptions associated with internalizing behaviors. For instance, if a child is depressed, they may be apt to make more sibling comparisons and to view those comparisons as negative because of their low self-esteem. To avoid biases based on the perceptions of the participants, future studies may benefit from using observer reports to gather data on both differential treatment and internalizing behaviors.

Limitations

As mentioned above, the full effect of sibling age difference may not have been seen in the results because the sibling dyads used in NEAD are only one to four years apart. This does

not provide a substantial difference between large and small age spacing. It would therefore be beneficial for subsequent studies to include a sibling sample with a larger range of age differences. At a minimum, an appropriate age spacing range would be from zero to six years apart because one would see the effects of both a disrupted symbiotic relationship and the effects of a completed symbiotic relationship more equally. That is to say, in the present study, only one year of a completed symbiotic relationship was included (when siblings were four years apart); however, with an age spacing range of zero to six, there would be three years of a disrupted symbiotic relationship (one to three years apart, as described by Cornoldi & Fattori, 1976) and three years of a completed symbiotic relationship (four to six years apart) included in the study. A balanced range such as this could give a more accurate view of the moderation of age spacing on the association between differential maternal control and internalizing behaviors.

In addition to the small range of sibling age difference, there are other limitations to this study. The NEAD sample includes only same sex sibling dyads. Other studies have found that sibling constellation may affect the results concerning PDT (Daniels et al., 1985; McHale et al., 1995; McHale et al., 2000). Future studies would be able to get a more complete picture of the interaction between differential maternal control and internalizing behaviors if both mixed and same sex sibling dyads were included in the sample.

Another limitation to this study is that the anxious/depressed subscale of the Behavior Problems Index is comprised of three items. Using a scale with only three items may give an inaccurate picture of the participant's internalizing behaviors because of generalization. For instance, one of the items asks if the participant has been dependent on others. It does not ask what the situation was or how they were dependent on others. Therefore, if a participant had recently been through a traumatic event or frequently asked for help (which is likely since

subjects were children and adolescents), it may appear as though they have a many internalizing behaviors. Thus, a scale with more items, that are also more specific, may provide a fuller understanding and a more accurate account of internalizing behaviors.

Future Directions

Previous research on the association between PDT and internalizing behaviors has largely examined mother reports as the sole source of information for child internalizing behaviors. Coldwell et al. (2008) noted, however, that mother and child reports of internalizing behaviors were not highly correlated. To test this assertion, this study used both mother and child reports of child internalizing behaviors in its analyses and a correlation was run between both reports. In support of Coldwell et al. (2008), mother and child reports were not highly correlated. Furthermore, analyses run using mother reports yielded few results. Such a discrepancy may be due to mother bias or increased reporting of differential treatment of children who also report increased levels of internalizing behaviors. Knowing this, future research on this topic may be aided by using observer reports, in addition to mother and child reports, to gain more accurate findings. Additionally, it would be constructive for future research to include a wider range of sibling age differences to account for potential symbiotic relationship effects. Future studies would also benefit from using both same and mixed sex sibling dyads to gain a fuller understanding of the moderating effects of age spacing on the association between maternal differential control and internalizing behaviors.

References

Achenbach, T. M., McConaughy, S.H., & Howell, C. T. (1987). Child/adolescent behavioral and emotional problems: Implications of cross-informant correlations for situational specificity. *Psychological Bulletin, 101*, 213-232.

Brody, G. H., Stoneman, Z., & McCoy, J. K. (1992). Parental differential treatment of siblings and sibling differences in negative emotionality. *Journal of Marriage and the Family*, 54, 643-651.

Coldwell, J., Pike, A., & Dunn, J. (2008). Maternal differential treatment and child adjustment: A multi-informant approach. *Social Development*, 17(3), 597-612.

Compas, B. E., Oppedisano, G., Conner, J. K., Gerhardt, C. A., Hinden, B. R., Achenbach, T. M., & Hammen, C. (1997). Gender differences in depressive symptoms in adolescence: Comparison of nation samples of clinically referred and nonreferred youths. *Journal of Consulting and Clinical Psychology,* 65, 617-626.

Cornoldi, C., & Fattori, L. C. (1976). Age spacing in firstborns and symbiotic dependence. *Journal of Personality and Social Psychology,* 33(4), 431-434.

Daniels, D. & Plomin, R. (1985). Differential experience of siblings in the same family. *Developmental Psychology,* 21(5), 747-760.

Daniels, D., Dunn, J., Furstenberg, F. F., & Plomin, R. (1985). Environmental differences within the family and adjustment differences within pairs of adolescent siblings. *Child Development*, 56, 764-774.

De Goede, I. H. A., Branje, S. J. T., & Meeus, W. H. J. (2007). Developmental changes in adolescents' perceptions of relationships with their parents. *Journal of Youth Adolescence*, 38(1), 75-88.

Feinberg, M. & Hetherington, E. M. (2001). Differential parenting as a within-family variable. *Journal of Family Psychology*, 15(1), 22-37.

Feinberg, M. E., McHale, S. M., Crouter, A. C., & Cumsille, P. (2003). Sibling differentiation: Sibling and parent relationship trajectories in adolescence. *Child Development,* 74(5), 1261-1274.

Feinberg, M. E., Neiderhiser, J. M., Simmens, S., Reiss, D., & Hetherington, E. M. (2000). Sibling comparison of differential parental treatment in adolescence: Gender, self-esteem, and emotionality as mediators of the parenting-adjustment association. *Child Development*, 71(6), 1611-1628.

Festinger, L. (1954). A theory of social comparison processes. *Human Relations, 7,* 117-140.

Kowal, A., Kramer, L., Krull, J. L., & Crick, N. R. (2002). Children's perceptions of the fairness of parental preferential treatment and their socioemotional well-being. *Journal of Family Psychology*, 16(3), 297-306.

Kowal, A. & Kramer, L. (1997). Children's understanding of parental differential treatment. *Child Development*, 68(1), 113-126.

Kowal, A. K., Krull, J. L., & Kramer, L. (2006). Shared understanding of parental differential treatment in families. *Social Development*, 15(2), 277-294.

Lalumière, M. L., Quinsey, V. L., & Craig, W. M. (1996). Why children from the same family are so different from one another: A Darwinian note. *Human Nature*, 7(3), 281-290.

Larson, R. W., Richards, M. H., Moneta, G., Holmbeck, G., & Duckett, E. (1996). Changes in adolescents' daily interactions with their families from ages 10 to 18: Disengagement and transformation. *Developmental Psychology*, 32(4), 744-754.

McHale, S. M., Crouter, A. C., McGuire, S. A., & Updegraff, K. A. (1995). Congruence between mothers' and fathers' differential treatment of siblings: Links with family relations and children's well-being. *Child Development*, 66, 116-128.

McHale, S. M., Updegraff, K. A., Shanahan, L., Crouter, A. C., & Killoren, S. E. (2005). Siblings' differential treatment in Mexican American families. *Journal of Marriage and Family*, 67, 1259-1274.

McHale, S. M., Updegraff, K. A., Jackson-Newsorn, J., Tucker, C. J., & Crouter, A. C. (2000). When does parents' differential treatment have negative implications for siblings? *Social Development*, 9(2), 150-171.

Minnett, A. M., Vandell, D. L., & Santrock, J. W. (1983). The effects of sibling status on sibling interaction: Influence of birth order, age spacing, sex of child, and sex of sibling. *Child Development*, 54, 1064-1072.

Neiderhiser, J. M., Reiss, D., & Hetherington, E. M. (2007). The Nonshared Environment in Adolescent Development (NEAD) Project: A longitudinal family study of twins and siblings from adolescence to young adulthood. *Twin Research and Human Genetics*, 10(1), 74-83.

Pike, A., McGuire, S., Hetherington, E. M., Reiss, D., & Plomin, R. (1996). Family environment and adolescent depressive symptoms and antisocial behavior: A multivariate genetic analysis. *Developmental Psychology*, 32(4), 590-603.

Richmond, M. K., Stocker, C. M., & Rienks, S. L. (2005). Longitudinal associations between sibling relationship quality, parental differential treatment, and children's adjustment. *Journal of Family Psychology*, 19(4), 550-559.

Reiss, D., Neiderhiser, J. M., Hetherington, E., & Plomin, R. (2000). *The relationship code: Deciphering genetic and social influences on adolescent development*. Cambridge, MA: Harvard University Press.

Shanahan, L., McHale, S. M., Osgood, D. W., & Crouter, A. C. (2007). Conflict frequency with mothers and fathers from middle childhood to late adolescence: Within- and between-families comparisons. *Developmental Psychology*, 43(3), 539-550.

Shanahan, L., McHale, S. M., Crouter, A. C., & Osgood, D. W. (2008). Linkages between parents' differential treatment, youth depressive symptoms, and sibling relationships. *Journal of Marriage and Family*, 70, 480-494.

Shebloski, B., Conger, K. J., & Widaman, K. F. (2005). Reciprocal links among differential parenting, perceived partiality, and self-worth: A three-wave longitudinal study. *Journal of Family Psychology*, 19(4), 633-642.

Sheehan, G. & Noller, P. (2002). Adolescents' perceptions of differential parenting: Links with attachment style and adolescent adjustment. *Personal Relationships*, 9, 173-190.

Steinberg, L. D. (1981). Transformations in family relations at puberty. *Developmental Psychology.* 17(6), 833-840.

Tamrouti-Makkink, I. D., Dubas, J. S., Gerris, J. R. M., & van Aken, M. A. G. (2004). The relation between the absolute level of parenting and differential parental treatment with adolescent siblings' adjustment. *Journal of Child Psychology and Psychiatry*, 45(8), 1397-1406.

Volling, B. L. & Elins, J. L. (1998). Family relationships and children's emotional adjustment as correlates of maternal and paternal differential treatment: A replication with toddler and preschool siblings. *Child Development*, 69(6), 1640-1656.

Zill, N., Peterson, J. L., & Snyder, N. O. (1987). *Analysis of public use data from 1981 Child Health Supplement to the National Health Interview Survey*. Washington, D.C.: Child Trends.

Figures

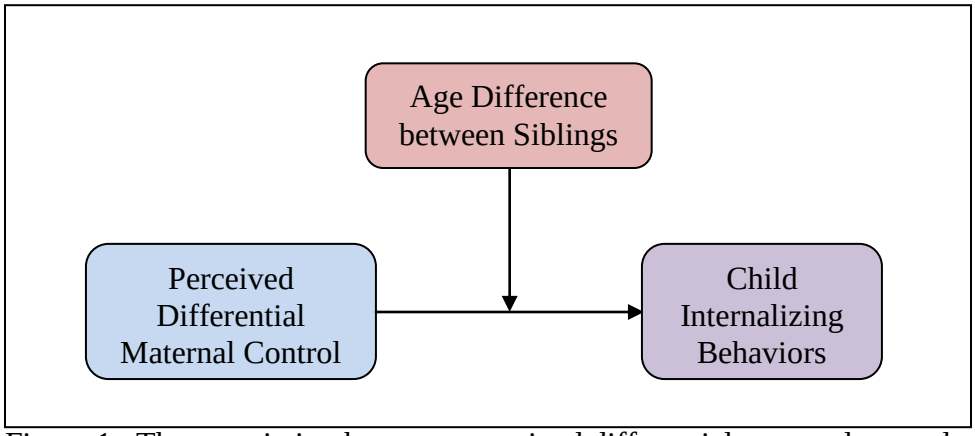

Figure 1. The association between perceived differential maternal control and child internalizing behaviors as moderated by age difference between siblings.

Tables

Table 1
Whole Sample Descriptive Statistics for Child 1 and Child 2 Variables

	Child 1			**Child 2**		
	Mean	S.D.	Range	Mean	S.D.	Range
Age	14.52	2.20	10-18	12.91	2.21	9-18
Age Difference	1.61	1.29	0-5	--	--	--
Differential Maternal Control	11.71	1.99	4-20	12.43	2.11	4-20
Internalizing Behaviors	3.01	1.79	0-6	2.89	1.75	0-6
Internalizing Behaviors (Mother Report)	2.36	1.86	0-6	2.28	1.94	0-6

Table 2
Correlations between Mother and Child Reports of Internalizing Behaviors

	Mother Report for C1	Mother Report for C2
C1 Report		
Correlation	-.01	--
Sig.	.88	
C2 Report		
Correlation	--	.01
Sig.		.72

Table 3

Whole Sample Hierarchical Linear Regression for Child 1 and Child 2 with Child Reports of Internalizing Behaviors (Child 1 N = 705; Child 2 N = 708)

	Child 1					**Child 2**				
	B	Std. Error	β	T	R^2	B	Std. Error	β	T	R^2
Model 1:										
Age	**.09**	**.03**	**.11**	**3.07***	**.06***	**.10**	**.03**	**.12**	**3.23***	**.04***
Gender	**.76**	**.13**	**.21**	**5.81***		**.51**	**.13**	**.15**	**3.92***	
Model 2:										
Age	**.09**	**.03**	**.11**	**3.12***	**.08***	**.08**	**.03**	**.10**	**2.76***	**.06***
Gender	**.73**	**.13**	**.21**	**5.64***		**.49**	**.13**	**.14**	**3.78***	
Differential Maternal Control	**-.12**	**.03**	**-.13**	**-3.56***		**.12**	**.03**	**.15**	**3.96***	
Model 3:										
Age	**.07**	**.03**	**.09**	**2.25***		**.09**	**.03**	**.12**	**2.96***	
Gender	**.74**	**.13**	**.21**	**5.73***	**.08***	**.49**	**.13**	**.14**	**3.80***	.06
Differential Maternal Control	**-.11**	**.03**	**-.13**	**-3.50***		**.12**	**.03**	**.14**	**3.82***	
Age Difference	**.14**	**.05**	**.10**	**2.64***		.06	.05	.04	1.07	
Model 4:										
Age	**.07**	**.03**	**.09**	**2.27***		**.09**	**.03**	**.11**	**2.95***	
Gender	**.74**	**.13**	**.21**	**5.68***		**.49**	**.13**	**.14**	**3.83***	
Differential Maternal Control	-.10	.06	-.11	-1.66	.09	.09	.05	.11	1.67	.06
Age Difference	.24	.31	.17	.77		-.14	.31	-.11	-.46	
Age Difference x Differential Maternal Control	-.01	.03	-.07	-.32		.02	.03	.16	.65	

Notes: * $p < .05$; significant items are highlighted in **bold**

Table 4

Whole Sample Hierarchical Linear Regression for Child 1 and Child 2 with Mother Reports of Internalizing Behaviors (Child 1 N = 706; Child 2 N = 707)

	Mother Report of Child 1					**Mother Report of Child 2**				
	B	Std. Error	β	T	R^2	B	Std. Error	β	T	R^2
Model 1:										
Age	.00	.03	.01	.13	**.01***	-.02	.03	-.03	-.66	.00
Gender	**.33**	**.14**	**.09**	**2.35***		-.03	.15	-.01	-.19	
Model 2:										
Age	.00	.03	.01	.13	.01	-.03	.03	-.03	-.82	.00
Gender	**.33**	**.14**	**.09**	**2.34***		-.04	.15	-.01	-.25	
Differential Maternal Control	-.00	.04	-.00	-.08		.05	.04	.05	1.33	
Model 3:										
Age	.02	.03	.02	.53		-.03	.04	-.03	-.75	
Gender	**.32**	**.14**	**.09**	**2.30***	.01	-.04	.15	-.01	-.25	.00
Differential Maternal Control	-.00	.04	-.00	-.12		.05	.04	.05	1.32	
Age Difference	-.08	.06	-.06	-1.42		.00	.06	.00	.08	
Model 4:										
Age	.01	.03	.02	.37		-.03	.04	-.03	-.73	
Gender	**.34**	**.14**	**.09**	**2.39***		-.05	.15	-.01	-.36	
Differential Maternal Control	-.07	.06	-.07	-1.02	.01	.11	.06	.12	1.87	.01
Age Difference	-.46	.34	-.32	-1.37		.48	.35	.32	1.36	
Age Difference x Differential Maternal Control	.03	.03	.27	1.15		-.04	.03	-.33	-1.36	

Notes: * $p < .05$; significant items are highlighted in **bold**

Table 5

Descriptive Statistics for Child 1 and Child 2 Variables in Twin and Non-twin Sibling Dyads

	Twin						**Non-twin**					
	Child 1			**Child 2**			**Child 1**			**Child 2**		
	Mean	S.D.	Range	Mean	S.D.	Range	Mean	S.D.	Range	Mean	S.D.	Range
Age	13.62	2.53	10-18	--	--	--	14.85	1.96	10-18	12.65	2.01	9-18
Age Difference	0.00	0.00	0.00	--	--	--	2.20	.98	0-5	--	--	--
Differential Maternal Control	11.77	1.68	6-20	12.08	1.73	5-20	11.65	2.10	4-20	12.56	2.23	4-20
Internalizing Behaviors	2.68	1.75	0-6	2.73	1.69	0-6	3.14	1.78	0-6	2.96	1.77	0-6
Internalizing Behaviors (Mother Report)	2.61	1.85	0-6	2.22	1.89	0-6	2.26	1.86	0-6	2.28	1.96	0-6

Table 6

Hierarchical Linear Regression for Child 1 and Child 2 in Twin Sibling Dyads (N = 192; DZ = 99; MZ = 93)

	Child 1					**Child 2**				
	B	Std. Error	β	T	R^2	B	Std. Error	β	T	R^2
Model 1:										
Age	**.13**	**.05**	**.18**	**2.57***	**.06***	.09	.05	.14	1.93	.03
Gender	**.55**	**.25**	**.16**	**2.22***		.28	.24	.08	1.16	
Model 2:										
Age	**.12**	**.05**	**.17**	**2.39***	.06	.10	.05	.14	1.91	.03
Gender	**.56**	**.25**	**.16**	**2.25***		.27	.25	.08	1.09	
Differential Maternal Control	-.06	.08	-.06	-.78		.03	.07	.03	.40	

Notes: * $p < .05$; significant items are highlighted in **bold**

Table 7
Hierarchical Linear Regression for Child 1 and Child 2 in Non-twin Sibling Dyads (Child 1 N = 513; Child 2 N = 516)

	Child 1					**Child 2**				
	B	Std. Error	β	T	R^2	B	Std. Error	β	T	R^2
Model 1:										
Age	.04	.04	.05	.98	**.06***	**.09**	**.03**	**.11**	**3.07***	**.05***
Gender	**.85**	**.15**	**.24**	**5.55***		**.76**	**.13**	**.21**	**5.81***	
Model 2:										
Age	.05	.04	.06	1.28	**.08***	**.09**	**.03**	**.11**	**3.12***	**.08***
Gender	**.80**	**.15**	**.23**	**5.26***		**.73**	**.13**	**.21**	**5.64***	
Differential Maternal Control	**-.12**	**.04**	**-.14**	**-3.29***		**-.12**	**.03**	**-.13**	**-3.56***	
Model 3:										
Age	.04	.04	.04	.99		**.07**	**.03**	**.09**	**2.25***	
Gender	**.80**	**.15**	**.23**	**5.30***	.08	**.74**	**.13**	**.21**	**5.73***	.08
Differential Maternal Control	**-.12**	**.04**	**-.14**	**-3.26***		**-.11**	**.03**	**-.13**	**-3.50***	
Age Difference	.11	.08	.06	1.34		**.14**	**.05**	**.10**	**2.64***	
Model 4:										
Age	.04	.04	.04	.97		**.07**	**.03**	**.09**	**2.27***	
Gender	**.81**	**.15**	**.23**	**5.30***		**.74**	**.13**	**.21**	**5.68***	
Differential Maternal Control	-.14	.10	-.17	-1.45	.08	**-.10**	**.06**	**-.11**	**-1.66***	.08
Age Difference	.00	.45	.00	-.00		.24	.31	.17	.77	
Age Difference x Differential Maternal Control	.01	.04	.06	.24		-.01	.03	-.07	-.32	

Notes: * $p < .05$; significant items are highlighted in **bold**

Table 8

Descriptive Statistics for Child 1 and Child 2 Variables in Step and Non-step Sibling Dyads (Twin Dyads Excluded)

	Step						**Non-Step**					
	Child 1			**Child 2**			**Child 1**			**Child 2**		
	Mean	S.D.	Range	Mean	S.D.	Range	Mean	S.D.	Range	Mean	S.D.	Range
Age	15.06	2.06	10-18	13.30	2.12	10-18	14.78	1.92	11-18	12.42	1.93	9-17
Age Difference	1.76	1.14	0-5	--	--	--	2.35	.87	1-4	--	--	--
Differential Maternal Control	11.69	2.43	4-18	12.61	2.65	4-20	11.64	1.98	4-20	12.54	2.07	7-20
Internalizing Behaviors	3.03	1.80	0-6	2.98	1.79	0-6	3.18	1.77	0-6	2.96	1.76	0-6
Internalizing Behaviors (Mother Report)	1.69	1.68	0-6	1.61	1.74	0-6	2.45	1.88	0-6	2.51	1.98	0-6

Table 9

Hierarchical Linear Regression for Child 1 and Child 2 in Step Sibling Dyads (Twin Dyads Excluded) (N = 130)

	Child 1					**Child 2**				
	B	Std. Error	β	T	R^2	B	Std. Error	β	T	R^2
Model 1:										
Age	.07	.08	.09	.99	**.07***	.13	.07	.15	1.78	**.10***
Gender	**.90**	**.31**	**.25**	**2.89***		**.99**	**.31**	**.27**	**3.24***	
Model 2:										
Age	.07	.07	.09	1.03	**.15***	.10	.07	.12	1.42	.11
Gender	**.84**	**.30**	**.23**	**2.79***		**1.00**	**.30**	**.27**	**3.29***	
Differential Maternal Control	**-.21**	**.06**	**-.28**	**-3.45***		.10	.06	.15	1.78	
Model 3:										
Age	.06	.07	.06	.76		.07	.08	.09	1.96	
Gender	**.84**	**.30**	**.23**	**2.81***	.16	**.98**	**.30**	**.27**	**3.26***	.12
Differential Maternal Control	**-.21**	**.06**	**-.28**	**-3.44***		.11	.06	.16	1.90	
Age Difference	.14	.13	.09	1.06		-.17	.14	-.11	-1.18	
Model 4:										
Age	.06	.08	.07	.80		.07	.08	.09	.96	
Gender	**.84**	**.30**	**.23**	**2.78***		**1.01**	**.30**	**.28**	**3.34***	
Differential Maternal Control	-.16	.15	-.22	-1.04	.16	-.01	.11	-.02	-.12	.14
Age Difference	.41	.76	.26	.538		-1.07	.72	-.68	-1.49	
Age Difference x Differential Maternal Control	-.02	.07	-.18	-.36		.07	.06	.62	1.29	

Notes: * $p < .05$; significant items are highlighted in **bold**

Table 10

Hierarchical Linear Regression for Child 1 and Child 2 in Non-step Sibling Dyads (Twin Dyads Excluded) (Child 1 N = 383; Child 2 N = 386)

	Child 1					**Child 2**				
	B	Std. Error	β	T	R^2	B	Std. Error	β	T	R^2
Model 1:										
Age	.03	.05	.03	.58	**.06***	**.12**	**.05**	**.13**	**2.60***	**.04***
Gender	**.83**	**.18**	**.23**	**4.69***		**.46**	**.18**	**.13**	**2.62***	
Model 2:										
Age	.04	.05	.04	.78	.06	.09	.05	.10	1.91	**.07***
Gender	**.80**	**.18**	**.23**	**4.49***		**.44**	**.17**	**.13**	**2.54***	
Differential Maternal Control	-.07	.04	-.08	-1.57		**.15**	**.04**	**.18**	**3.58***	
Model 3:										
Age	.03	.05	.03	.60		.09	.05	.10	1.91	
Gender	**.80**	**.18**	**.23**	**4.53***	.06	**.44**	**.18**	**.13**	**2.54***	.07
Differential Maternal Control	-.07	.05	-.08	-1.54		**.15**	**.04**	**.18**	**3.58***	
Age Difference	.08	.10	.04	.74		.03	.10	.02	.25	
Model 4:										
Age	.03	.05	.03	.59		.09	.05	.10	1.85	
Gender	**.81**	**.18**	**.23**	**4.53***		**.42**	**.18**	**.12**	**2.40***	
Differential Maternal Control	-.10	.13	-.11	-.81	.06	**.33**	**.12**	**.39**	**2.76***	.07
Age Difference	-.08	.58	-.04	-.13		.94	.59	.47	1.60	
Age Difference x Differential Maternal Control	.01	.05	.08	.27		-.07	.05	-.47	-1.58	

Notes: * $p < .05$; significant items are highlighted in **bold**

Academic Vita of Kristin N. Field

Name: Kristin N. Field

Address: 1604 Trumbulls Ct.
Crofton, MD 21114

Email ID: knf5012

Education
Major and Minor: Human Development and Family Studies (HDFS); Psychology
Honors: Human Development and Family Studies

Thesis Title: The Moderation of Age Spacing on the Association between Maternal Differential Control and Internalizing Behaviors
Thesis Supervisors: Jenae Neiderhiser and Hobart Cleveland

Work Experience

January 2010 – May 2010
Children's Mental Health Counselor
Assist in group therapy, behavior modification, design therapy lessons, administrative duties as needed
Helping Elementary At-Risk To Succeed (HEARTS) – State College, PA
Becky Swentosky

May 2009 – Present
Teaching Assistant
Basic child care, encourage learning and appropriate social skills, parental interaction, administrative duties
KinderCare Learning Center – Gambrills, MD
Ellen Jones

June 2007 – January 2009
Event Coordinator/Sales Associate
Taught children's art classes, coordinated a two week summer art camp, scheduled and directed birthday parties, provided customer service, completed customer sales, replenished inventory
Michaels Arts & Crafts – Bowie, MD
Deb Johnson

Academic Activities
Teaching Assistant for an honors HDFS methods course (HDFS 310M)
Research Assistant in a psychology lab

Community Service
The Penn State IFC/Pan-Hellenic Dance Marathon (THON)