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Mother-father informant discrepancies regarding diabetes management: Associations with diabetes-specific family conflict and glycemic control

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Abstract

Objective—To examine the relationship of mother-father informant discrepancies regarding diabetes management to diabetes-specific family conflict and glycemic control.

Methods—136 mothers and fathers of youth with type 1 diabetes reported on the youth's diabetes management, diabetes-specific family conflict, and amount of paternal involvement in diabetes care. Glycosylated hemoglobin A1c (HbA1c) was used to measure glycemic control.

Results—As hypothesized, mother-father discrepancies regarding diabetes management were positively associated with frequency of diabetes-specific family conflict. Contrary to hypotheses, mother-father discrepancies regarding diabetes management predicted poorer glycemic control for youth with less involved fathers only.

Conclusions—Results highlight the importance of caregivers being consistent about pediatric illness management and support the idea that informant discrepancies represent an important window into the functioning of the family system.

Keywords

type 1 diabetes; informant discrepancies; illness management; family conflict

Introduction

Fathers appear to play a unique role in the management of type 1 diabetes. Whereas mothers tend to manage the routine day-to-day care, fathers may contribute by providing support to mothers (Wysocki & Gavin, 2004) or by adjusting their level of involvement in response to

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the child's glycemic control (Hilliard et al., in press). Research also suggests that fathers' perceptions of diabetes regimen adherence, division of responsibility, and family functioning often differ from mothers' perceptions (Auslander, Bubb, Rogge, & Santiago, 1993; Dashiff, 2003; Dashiff et al., 2008; Leonard, Kratz, Skay, & Rheinberger, 1997; Wysocki & Gavin, 2004) and may demonstrate a unique relationship with glycemic control (Auslander et al., 1993).

Common strategies for analyzing mothers' and fathers' reports include combining data across informants to create a composite variable or utilizing a latent variable modeling approach (Holmbeck, Li, Schurman, Friedman, & Coakley, 2002). These approaches rest on the underlying assumption that mother-father discrepancies represent measurement error or deviations from a true score. Alternatively, divergent views can be treated as variables of interest. The latter approach posits that differing mother-father perspectives may represent an important window into the functioning of the family system (Achenbach, 2011; Holmbeck et al., 2002; De Los Reyes, 2011; De Los Reyes & Kazdin, 2005) and that these differences may impact how parents interact with each other and function over time (De Los Reyes, 2011). Research utilizing this approach seeks to answer the questions: (a) What does it mean when informants disagree? and (b) Can the meaning behind informant discrepancies be used to improve our understanding of child and family outcomes? (De Los Reyes, 2011).

Informant discrepancy has been an area of recent interest in the field of child clinical psychology, as evidenced by a 2011 special section in the Journal of Clinical Child and Adolescent Psychology (Volume 40, Issue 1) devoted to this topic. However, research has focused primarily on discrepancies between one parent (usually mother) and child, and fathers are often underrepresented or not included. Research with child clinical samples has linked parent-child informant discrepancies to a variety of child outcomes, including risk-taking behavior (Beck, Hartos, & Simons-Morton, 2006), internalizing/externalizing symptoms (Pelton & Forehand, 2001), and treatment response (Ferdinand, van der Ende, & Verhulst, 2006), and provides support for the idea that informant discrepancies predict poor outcomes in ways that cannot be accounted for by individual reports used to assess discrepancies (e.g., De Los Reyes, Goodman, Kliewer, & Reid-Quiñones, 2010; Ferdinand et al., 2006). A handful of studies in the pediatric psychology literature further suggest that informant discrepancies between youth with type 1 diabetes and their parents are associated with diabetes-specific family conflict (Miller & Drotar, 2003), poorer glycemic control (Anderson, Auslander, Jung, Miller & Santiago, 1990; Butner et al., 2009), and poorer parental psychosocial wellbeing (Butner et al., 2009).

When applied to *mother-father* discrepancies about diabetes management, this approach assumes that the degree to which parents hold differing views about how diabetes is managed in their family is an important variable in itself and may relate to family functioning and child outcomes. Differences between parents on childrearing views and values create the potential for conflict (Minuchin, 1985), and research has long demonstrated that parental agreement about child rearing predicts a positive family environment characterized by lower levels of conflict and favorable child outcomes (e.g., fewer behavioral problems) (Block, Block, & Morrison, 1981; Deal, Halverson, & Wampler, 1989; Stoneman, Brody, 1989), even two and a half years after the assessment of agreement

(Block et al., 1981). Mother-father agreement about child rearing issues has also been associated with family problem solving effectiveness, as defined by the quality of solutions proposed, extent of resolution, and perspective taking (Vuchinich, Vuchinich, & Wood, 1993). Within the context of diabetes, mother-father discrepancy about illness management may result in less effective and more conflict-ridden discussions about diabetes-specific problems. Mother-father discrepancy about illness management may also be associated with inconsistent parenting practices and limit setting around diabetes care, which could result in more frequent family conflict (e.g., Stoneman et al. 1989) and poorer glycemic control. Indeed, prior research has linked diabetes-specific coparenting conflict to poorer diabetes-management behaviors and diabetes-specific quality of life (Barzel & Reid, 2011). Parents who disagree on how diabetes is being managed may provide the child with differing instructions regarding diabetes management or may offer varying levels of supervision, depending on whether they perceive that the child has been successful in completing a given task. Inconsistencies in parental monitoring and instructions could engender frustration and distress in the child and/or reduce the child's level of treatment adherence, thus negatively impacting glycemic control.

The aims of this study were to examine the association of mother-father discrepancy about diabetes management to (1) frequency of diabetes-specific family conflict and (2) child glycemic control. We hypothesized that mother-father discrepancy would predict more frequent diabetes-specific family conflict, based upon the aforementioned research relating mother-father agreement to problem solving effectiveness (Vuchinich et al., 1993) and a positive family environment (Block et al., 1981; Deal et al., 1989; Stoneman et al., 1989), as well as preliminary findings in the diabetes literature linking *parent-child* discrepancies to diabetes-specific family conflict (Miller & Drotar, 2003). We chose to study diabetes-specific family conflict as the potential negative family outcome, given its demonstrated relationship to less effective illness management, poorer glycemic control, decreased quality of life, and greater parental perceived burden (Hood, Butler, Anderson & Laffel, 2007; Sander, Odell, & Hood, 2010). A modest increase in family conflict is common and even adaptive during the transition to adolescence as youth and their parents renegotiate roles and responsibilities to accommodate emerging autonomy (Collins & Laursen, 2004). Given that illness management is a salient responsibility for youth with diabetes and is typically transitioned from parents to youth throughout adolescence, it can be a target for conflict. Unfortunately, frequent family conflict about diabetes-specific topics is counterproductive to effective diabetes management and can have negative health outcomes.

We also hypothesized that mother-father discrepancy would predict poorer glycemic control, given prior research linking diabetes-specific coparenting conflict to poorer diabetes-management behaviors (Barzel & Reid, 2011) and preliminary findings linking *parent-child* discrepancies to poorer glycemic control (Anderson et al, 1990; Butner et al., 2009). We further hypothesized that mother-father discrepancy about diabetes management would exert a stronger effect on glycemic control when fathers are highly involved in diabetes management, as the child may receive inconsistent messages about diabetes management when two parents are involved but disagree on how the illness is being managed.

Method

Participants

Participants included a subset of families (N = 136) from an ongoing multisite prospective study of type 1 diabetes care and self-management trajectories during the transition to adolescence. Baseline data from those families with a participating male caregiver were used to conduct secondary analyses examining mother-father informant discrepancies regarding diabetes management. Of 361 families approached for the larger study, 240 (66.5%) completed baseline data. One hundred and forty-six included both a male and female caregiver.[1] Thirty-six male secondary caregivers were available but did not participate, and 10 families were excluded for not completing at least one of the primary measures. The resulting sample size was 136. Differences between families included in this study, those with male caregivers that did not participate (N = 36), and those without a male caregiver (N = 47) were that children in this study had lower HbA1c values [F (2, 218) = 11.08], had higher maternal-report of adherence [F (2, 216) = 5.08], were more likely to use a pump or pod versus a basal/bolus regimen (X^2 = 21.01, df = 6), and had higher family income (X^2 = 66.25, df = 10) (all p's < .05).

Fifty-four percent of youth in this subsample were female and 91% were Caucasian. Age at time of baseline evaluation ranged from 9.0 to 12.0 years (M = 10.5 years, SD = 0.9 years). The majority of youth received insulin via insulin pump or pod (66%), and mean illness duration was 4.1 years (SD = 2.4 years). The mean HbA1c closest to baseline was 7.9% (SD = 1.2%). Most parents completed high school (97%), and the modal income level was $73,000–126,500 (35%). The majority of self-identified primary caregivers were mothers (98.3%). Male caregivers consisted of biological fathers (N = 126, 92.6%), stepfathers (N = 5, 3.7%), adoptive fathers (N = 4, 2.9%), and other non-related male caregivers (N = 1, 0.7%) (all referred to as “fathers” for readability). Ninety-six percent (N = 131) of fathers lived in the same household as the child and mother, and 4% (N = 5) lived in a separate household but shared custody.

Procedure

The longitudinal study from which these data were drawn was conducted at three children's hospitals across the United States. Potential participant families were identified from the hospitals' diabetes clinic rosters. Information about the study was provided to eligible families by their diabetes physician or study coordinators in the diabetes clinic. Eligibility criteria included: (a) duration of type 1 diabetes ≥ 1 year, (b) 9 – 11 years old at the time of study enrollment, (c) absence of comorbid chronic physical condition, and (d) fluency in English. Parents and children provided written informed consent/assent. Child and parent interviews and questionnaires were completed in clinic or at the family's home, depending on the parents' preference. Families received a modest incentive for completion of baseline data ($40 gift coupons to parents, $10 gift coupons to children). The institutional review boards for the participating hospitals approved this study. Analysis of mother-father

[1]One additional participant with both a male and female caregiver was identified as ineligible after completing the baseline evaluation, as she was diagnosed with monogenic diabetes of the young (MODY) (Hattersley, Bruining, Shield, Niolstad, & Donaghue, 2006) and was no longer treated with insulin. This participant's data were removed from the study and all analyses.

informant discrepancy was not a primary aim of the larger longitudinal study and has not been reported in prior publications resulting from this data set (Hilliard et al., 2011; McNally, Rohan, Pendley, Delamater & Drotar, 2010; Rohan et al., 2011).

Measures

Perceptions of diabetes management—Mothers' and fathers' perceptions of diabetes management were individually assessed via the parent-report form of the Diabetes Self-Management Profile (DSMP; Harris et al., 2000). The DSMP is a semi-structured interview designed to assess diabetes management over the preceding three months. The DSMP includes 23 questions that assess diabetes self-management in 5 domains: exercise, management of hypoglycemia, diet, blood glucose testing, and insulin administration. Administration time is approximately 15–20 minutes. Responses to each item are assigned a numerical value (ranging from 0 to 4 for most items) corresponding to the reported frequency of a specific diabetes management task or the degree to which the behavior corresponds with the prescribed regimen. For example, responses to the question “If your child thinks [he/she] has a low blood sugar, how often does [he/she] test before treating?” would be scored as follows: Always (4); Usually or 75% of the time (3); Sometimes or 50% of the time (2); Infrequently or 25% of the time (1); Never (0). Scores for each item are then summed to obtain the total DSMP score, which has a possible range of 0 – 88. Higher scores indicate greater levels of diabetes adherence. In this sample, mean DSMP scores were 66.1 ± 8.3 for mother-report and 65.4 ± 8.5 for father-report (mother-father correlation: $r = .68$, $p < .01$). To ensure independent reports between family members, the DSMP was conducted in a separate room out of earshot from other family members when feasible, and the respondent was instructed to provide responses without consulting with other members of the family. The mother DSMP and father DSMP were conducted by the same interviewer in most cases (62/70 at Site 1, 61/62 at Site 2, 4/4 at Site 3). Procedures for computing discrepancy scores from DSMP data are described in the Data Analysis section.

The parent-report version of the DSMP has demonstrated acceptable internal consistency (α's = .69 to .70), test-retest reliability over 6 months (r's = .71 to .73), and a modest correlation with HbA1c in the expected direction ($r = -.20$) (DirecNet Study Group, 2005). In the present sample, internal consistency coefficients were $\alpha = .62$ for mother-report and $\alpha = .63$ for father-report. As previously noted by the DirecNet Study Group (2005), a high α coefficient would not be expected, as the DSMP measures several independent dimensions of diabetes self-management behavior.

Diabetes-specific family conflict—The frequency of family conflict over 19 diabetes tasks was assessed with the updated version of the Diabetes Family Conflict Scale (DFCS; Hood et al., 2007). As compared to the original 15-item DFCS (Rubin et al., 1989), the revised measure includes updated language about diabetes management and technology and several new or expanded items. Nine items refer to direct management tasks (“remembering to give shots or boluses;” “logging blood sugar results”) and 10 items refer to indirect management tasks (“what to eat when away from home;” “carrying sugar for reactions”). Each parent was presented with the following instructions: “For each of the following parts of diabetes care, fill in the bubble for the answer that best describes how much your family

argues about it." Response options ranged from 1 (never argue) to 3 (always argue). In this sample, mean DFCS scores were 24.0 ± 3.8 for mother-report and 23.6 ± 3.3 for father-report (mother-father correlation: $r = .48$, $p < .01$).

The updated version of the parent-report DFCS has acceptable internal reliability ($\alpha = .81$) and evidence of concurrent and predictive validity (Hood et al., 2007). Parent-report on the DFCS was positively correlated with parent-reported negative affect around blood glucose monitoring, perceived caregiver burden, and HbA1c, and negatively correlated with parent-reported quality of life in the child (Hood et al., 2007). In the present sample, internal consistency coefficients were adequate: $\alpha = .81$ for mother-report, $\alpha = .76$ for father-report. Mother and father reports were averaged to create a composite variable of diabetes-specific family conflict (Mean composite score: 23.8 ± 3.1). [2]

Paternal involvement in diabetes management—Fathers' involvement in diabetes care was assessed with the `amount' scale of the Dads' Active Disease Support measure (DADS; Wysocki & Gavin, 2004). Mothers and fathers indicated (yes/no) whether each of 24 diabetes care tasks was needed over the past 6 months. For those items that were needed, mothers and fathers then used a 5-point Likert scale to rate the amount (`never' to `always') of father's involvement with this task. A total score was calculated for each respondent by dividing the sum by the number of items endorsed as needed. The DADS `amount' scale has a possible range of 24 – 120, with higher scores indicating greater frequency of paternal involvement. In this sample, mean DADS `amount' scores were 68.8 ± 22.0 for mother-report and 69.2 ± 16.4 for father-report (mother-father correlation: $r = .56$, $p < .01$).

The DADS has demonstrated acceptable internal consistency (α's ≥ .92), test-restest reliability over 1 month (r's = .75 to .86), construct validity (using confirmatory factor analysis), and convergent validity (significant correlations with the Family Assessment Device General Functioning subscale) (Wysocki & Gavin, 2004). In the present sample, internal consistency coefficients for the `amount' scale were excellent: $\alpha = .96$ for mother-report and $\alpha = .90$ for father-report. Mother and father reports were then averaged to create a composite variable of amount of fathers' involvement in diabetes care (Mean composite score: 68.8 ± 17.2).

Medical and background information—Parents reported family demographic and medical information on a background information form. Glycosylated hemoglobin A1c (HbA1c) was used to measure glycemic control. Blood samples for HbA1c were obtained during the baseline study visit and shipped to a central laboratory for standardization purposes. Samples were analyzed using the TOSOH-G7 method (reference range 4.0–6.0%). Medical information (e.g., diagnosis date, insulin delivery method) was confirmed through medical chart review.

[2]The decision to use mother-father composite scores for the Diabetes Family Conflict Scale and the Dads' Active Disease Support measure was made to avoid the large number of regression analyses required to individually examine mother and father reports on every measure in the study (16 analyses) and the corresponding increased potential for Type 1 error. Results do not differ meaningfully when mother and father reports on these two measures are considered individually versus in combination, and conclusions remain the same.

Data Analysis

Mother-father informant discrepancy—There has been debate regarding the preferred methods for computing and statistically evaluating informant discrepancies. The most common strategies have been to calculate difference scores (Reporter 1 – Reporter 2) or absolute values of difference scores (Beck et al., 2006; Dekovic et al., 1997; Feinberg, Howe, Reiss, & Hetherington, 2000; Treutler & Epkins, 2003), which are then entered as predictors or outcomes in analyses. Unfortunately, these approaches can be difficult to interpret, as very different mother-father dyads (i.e., those that agree on high versus low levels of adherence; those in which fathers report higher versus lower levels of adherence than mothers) can be assigned similar discrepancy scores. Holmbeck et al. (2002) suggested that the significance of the interaction of the two perspectives in predicting outcomes be tested with regression analyses. While this strategy can accommodate differences in total discrepancy scores, it cannot reasonably accommodate differences on individual items. In the case of diabetes management, fathers may assign higher scores to some aspects of illness management and lower scores to others as compared to mothers, which could result in similar total scores despite high item discrepancy. For this study, an item-level discrepancy variable was created by calculating the absolute difference between the mother's and father's responses to each DSMP item and adding the absolute differences to create a continuous variable (ranging from 0 to 89), and a total DSMP discrepancy variable was created by calculating the absolute difference between the mother's and father's total DSMP score. Higher scores indicate more discrepancy between mother's and father's report. Benefits of this approach are that it allowed for the examination of informant discrepancy at the individual item level and at the total DSMP level, resulting in the greatest amount of information about informant discrepancies. We expected the item-level and total DSMP discrepancy variables to operate in a similar manner; however, when differences were observed, we expected the item-level variable to have a stronger relationship with outcomes.

To determine whether it is informant discrepancy per se, and not just level of diabetes management, that is driving the effect, all analyses controlled for level of diabetes management. To explore the impact of the direction of mother-father discrepancies, exploratory analyses examined whether the relationships between mother-father discrepancy and outcomes of interest differed when fathers reported worse illness management than mothers (i.e., fathers' total DSMP < mothers' total DSMP) as compared to when fathers reported better illness management than mothers (i.e., fathers' total DSMP > mothers' total DSMP).

Statistical analysis—Analyses were conducted utilizing SPSS software version 19 (SPSS, Inc., 2010). Preliminary analyses assessed for associations between mother-father discrepancy (item-level discrepancy, total DSMP discrepancy) and relevant demographic and medical variables. All continuous variables were centered prior to primary analyses, and interaction terms were computed using centered variables. Hypotheses were tested through a series of hierarchical regression analyses. Level of diabetes management (i.e., total DSMP score) and other potentially confounding variables (e.g., site, household composition) identified in preliminary analyses were entered on the first step. Because results could differ depending on whether level of diabetes management was based on mothers' versus fathers'

report, all analyses were first conducted controlling for mothers' report of diabetes management and then repeated controlling for fathers' report of diabetes management. For analyses testing the main effect of mother-father informant discrepancy on frequency of diabetes-specific family conflict (Hypothesis 1) and glycemic control (Hypothesis 2), mother-father informant discrepancy was entered on the second step and the composite DFCS variable or HbA1c was treated as the outcome variable. For analyses testing the interaction between mother-father informant discrepancy and amount of father involvement, mother-father informant discrepancy and the composite DADS variable were entered on the second step and the interaction term (Mother-Father Discrepancy × Father Involvement) was entered on the third step. Significant interactions were probed by deriving unstandardized betas (slopes) and a regression equation for families reporting high (1 *SD* above the mean) and low (1 *SD* below the mean) father involvement, as described by Aiken and West (1991) and Holmbeck (2002). Analyses were powered at 99% to detect a medium effect (f^2 = .14) (G*Power 3; Faul, Erdfelder, Lang & Buchner, 2007).

Results

Preliminary Analyses

Mother-father discrepancy scores were calculated for the sum of individual DSMP items (16.6 ± 8.0; range 0 – 37) and for the total DSMP score (5.2 ± 4.4; range 0 – 20). Item-level and total DSMP discrepancy scores were significantly correlated with one another (r = .37, p < .001). Preliminary analyses were conducted to examine relationships between mother-father discrepancy and relevant demographic/medical variables which could act as potential confounders. Mother-father item level discrepancy was negatively associated with mothers' report of diabetes management (r = −.34, p < .01) and fathers' report of diabetes management (r = −.39, p < .01). Mother-father item level discrepancy was also higher when the male and female caregivers lived in separate households (t(134) = −2.1, p = .04) and at Site 1 as compared to Site 2 (t(130) = 6.6, p < .01). Total DSMP mother-father discrepancy was higher at Site 1 as compared to Site 2 (t(126) = 2.0, p = .049). Level of diabetes management, site, and household composition were entered as covariates in analyses involving mother-father item-level discrepancy, and level of diabetes management and site were entered as covariates in analyses involving total DSMP discrepancy.

The discrepancy variables were not significantly related to child's age, gender, race, ethnicity, duration of diabetes at time of study participation, insulin delivery method, male caregiver's relationship to child (biological father vs. non-biological male caregiver), or total annual household income.

Primary Analyses

Hypothesis 1: Mother-father discrepancy will be positively associated with frequency of diabetes-specific family conflict—Total DSMP discrepancy significantly predicted frequency of diabetes-specific family conflict (controlling for mother DSMP: β = .21, p = .009, f^2 = .25; controlling for father DSMP: β = .20, p = .02, f^2 = .29). Item-level discrepancy was not a significant predictor of frequency of diabetes-specific family conflict (controlling for mother DSMP: β = .09, p = .34, f^2 = .03; controlling for

father DSMP: β = .12, p = .23, f^2 = .08). Table 1 displays the statistics associated with these regression analyses.

Hypothesis 2: Amount of father involvement will moderate the relationship between mother-father discrepancy and HbA1c—Neither item-level mother-father discrepancy (controlling for mother DSMP: β = −.08, p = .45, f^2 = .02; controlling for father DSMP: β = −.05, p = .66, f^2 = .01) nor total DSMP mother-father discrepancy (controlling for mother DSMP: β = .10, p = .22, f^2 = .05; controlling for father DSMP: β = .08, p = .35, f^2 = .05) exerted a main effect on HbA1c (Table 2). However, item-level discrepancy (statistically significant when controlling for mother DSMP: β = −.18, p = .03, f^2 = .13; marginally significant when controlling for father DSMP: β = −.16, p = .06, f^2 = .16) and total DSMP discrepancy (controlling for mother DSMP: β = −.16, p = .04, f^2 = .11; controlling for father DSMP: β = −.18, p = .02, f^2 = .21) interacted with amount of fathers' involvement to predict HbA1c (Table 2). Post-hoc investigation of these interactions revealed that the slopes were significantly different from zero only for the low father involvement group, where item-level discrepancy (B = .25, p = .04) and total DSMP discrepancy (B = .30, p = .01) predicted higher HbA1c (Figures 1 and 2).

Exploratory Analyses

Item-level discrepancy interacted with direction of discrepancy to predict HbA1c (statistically significant only when controlling for mother DSMP: β = .35, p = .01). For families in which the father reported worse diabetes management than the mother, item-level discrepancy was positively associated with HbA1c (β = .36, p = .01). For families in which the father reported better diabetes management than the mother, item-level discrepancy was negatively associated with HbA1c (β = −.45, p = .02). Total DSMP discrepancy did not significantly interact with direction of discrepancy to predict outcomes of interest.

Discussion

This study is the first to examine mother-father informant discrepancies about diabetes management in relation to family conflict and youth glycemic control. Whereas prior studies have documented differing perceptions of diabetes regimen adherence, division of diabetes responsibility, and family functioning in fathers versus mothers of youth with type 1 diabetes (Auslander et al., 1993; Dashiff, 2003; Leonard et al., 1997), previous research has not explored if and how these differing perceptions play a role in family and health outcomes. Given the seemingly complex relationship between amount of fathers' involvement and diabetes outcomes (Hilliard et al., in press; Wysocki & Gavin, 2004), research examining other parental factors potentially associated with diabetes outcomes is needed.

Fathers' perceptions of diabetes management in this sample tended to differ from perceptions of mothers, as reported in prior studies (Auslander et al., 1993; Dashiff, 2003; Dashiff et al., 2008; Wysocki & Gavin, 2004), and relationships emerged between mother-father discrepancy and child and family outcomes that could not be accounted for by the individual reports used to assess discrepancies. The observed relationship between mother-father discrepancy and frequency of diabetes-specific family conflict is consistent with prior

research documenting more frequent diabetes-specific family conflict in the context of parent-adolescent discrepancies about decision-making autonomy (Miller & Drotar, 2003). It may be that parents who disagree on how diabetes is being managed do not communicate consistent expectations or limits to the child, resulting in more frequent conflict about diabetes-specific topics within the family. Mother-father discrepancy about illness management may also be associated with less effective problem solving discussions (e.g., Vuchinich et al., 1993), resulting in more frequent family arguments. Unfortunately, this does not bode well for families high in mother-father discrepancy, given the documented relationship between frequent diabetes-specific family conflict and additional negative outcomes, including less effective illness management, poorer glycemic control, decreased quality of life, and higher levels of parental perceived burden (Hood, Butler, Anderson & Laffel, 2007; Sander, Odell, & Hood, 2010).

Consistent with findings related to parent-child discrepancy (e.g., Anderson, Auslander, Jung, Miller & Santiago, 1990; Butner et al., 2009), mother-father discrepancy predicted poorer glycemic control in certain cases. However, the finding that mother-father discrepancy predicted poorer glycemic control in the low father involvement group only was unexpected. The DADS measure focuses on the amount of fathers' direct involvement in diabetes management tasks (e.g., picking up prescriptions, administering medication, disciplining or rewarding child for cooperation with treatment) and does not assess caregiver communication about diabetes management. It may be that the low father involvement group encompasses both fathers who do not communicate with mothers about regimen adherence (“low direct involvement-high discrepancy”), as well as fathers who are not involved in direct illness management due to employment or other responsibilities but communicate frequently with family members about regimen adherence and therefore hold perceptions that are more similar to those of mothers (“low direct involvement-low discrepancy”). Fathers in the latter group may assist with diabetes problem solving and provide support to mothers, thereby impacting glycemic control indirectly. This interpretation should be examined with research assessing mother-father communication about diabetes management in addition to the amount of fathers' direct involvement in diabetes management tasks.

It is interesting that total DSMP discrepancy was more important than item-level discrepancy in relation to frequency of diabetes-specific family conflict. We had assumed that when significant relationships were observed, item-level discrepancy would be the stronger predictor, as the difference in total DSMP scores could mask the degree of actual discrepancy. It appears that disagreement about the family's overall level of illness self-management (i.e., the big picture) is more strongly associated with frequency of disease-specific conflict than disagreement about particular aspects of illness management. For example, a family in which the mother perceives that diabetes tasks are generally being accomplished successfully (and therefore changes to the family's approach to illness management are not needed) but the father perceives that diabetes management is not going well, or vice versa, may be at highest risk for frequent diabetes-specific conflict. In contrast, both item-level and total DSMP discrepancy predicted glycemic control in the low father involvement group, suggesting that parental agreement about particular aspects of illness management, as well as the overall level of management, may be important for child health

outcomes. Successful management of diabetes requires a high level of attention to detail, and in some families, parental discrepancies about these details may result in poorer glycemic control.

The results of this study have potential clinical implications for the routine management of diabetes and other pediatric health conditions. Informant discrepancies, when acknowledged, could present unique opportunities for discussion about differing perspectives. Given that disease-specific clinic visits and education sessions often include a review of logs and other recorded data, as well as a discussion about illness management since the last visit, these sessions may be a valuable forum for gaining a more accurate picture of disease management by integrating both mothers' and fathers' perceptions. Health care providers can emphasize the importance of both parents attending clinic visits and education sessions whenever possible and can invite non-attending parents to participate remotely through phone or web conferencing. While formal assessment of parental perceptions may not be feasible within the context of a routine clinic visit, health care providers can make efforts to inquire about and discuss the perceptions of both parents during the clinical interview Many health care providers are likely to rely on mothers to speak for the family in cases where fathers are less involved in illness management. However, results suggest that it may actually be more important to discuss and integrate mothers' and fathers' perceptions when fathers are less involved in illness management, as compared to when they are highly involved. Results also highlight the importance of discussing both the *big picture* (e.g., how has illness management been going overall?) as well as the specifics of illness care, as discrepancies in each appear to relate differentially to child and family outcomes. These strategies may not only lead to reductions in mother-father discrepancy and associated negative outcomes, but are also likely to communicate to families the value of fathers' input and involvement.

Several limitations should be noted. Participants were predominantly Caucasian and from well-educated, middle- to upper-middle class families. Both mother and father reports of illness management were favorable when compared with recent parent-reported DSMP data published for a similar age range (62 ± 8.7; Lewin, Storch, Williams, Duke, Silverstein, & Geffken, 2010), which may be a function of the relatively high socioeconomic status of families in this sample. The majority of male and female caregivers in this sample lived in the same home with the child, and these results may not generalize to children whose parents live in separate households. Results also may not generalize to families consisting of two same-sex caregivers. Statistical techniques did not account for non-independence of data collected from members of the same family. Multilevel modeling could be used in future research with larger samples as a means of addressing intrafamilial correlations. Because this paper reports on secondary analyses that were not planned at the time of study design, several constructs that may drive the observed relationships were not assessed. The measure of mother-father discrepancy used in this study does not allow differentiation of unresolvable discrepancy versus minor differences of opinion that could easily be resolved through discussion. Similarly, the measure of diabetes-specific family conflict does not yield separate scores for mother-father and parent-child conflict and does not rate intensity of diabetes-specific family conflict. Therefore, we cannot make conclusions about the exact

nature of the diabetes-specific conflict associated with mother-father informant discrepancies. Lastly, these cross-sectional data represent a single time-point and cannot be used to infer causality between the constructs assessed. Mother-father agreement was hypothesized to predict diabetes-specific family conflict and poorer glycemic control. Alternatively, families characterized by more frequent diabetes-specific conflict may engage in less communication about diabetes management given the negative interactions that it provokes, thereby resulting in more discrepant views. It is also possible that the constructs assessed in this study are all indicative of poor family functioning around diabetes care, but do not contribute directly to one another.

Future research with longitudinal data is needed to examine causality, as well as the impact of mother-father discrepancies on longer-term family conflict and changes in glycemic control over time. Research is also needed to identify underlying mechanisms of the relationships reported in this paper. For example, future studies directly assessing problem solving effectiveness can evaluate whether mother-father discrepancy is associated with less effective problem solving, which in turn leads to more frequent disease-specific family conflict. Similarly, studies directly assessing amount of caregiver communication about illness management can evaluate whether higher levels of mother-father communication are indeed associated with less informant discrepancy in families characterized by low father involvement, and in turn, better health outcomes. It will also be important for future research to evaluate the effectiveness of strategies aimed at decreasing mother-father discrepancy. For example, are mothers and fathers more likely to agree when both participate in clinic visits? Are regularly scheduled family meetings associated with less mother-father discrepancy? Future work could examine mother-father discrepancy about diabetes-related goals or strategy in addition to discrepancy about illness management behavior and could include alternate methods for measuring mother-father discrepancy (e.g., direct observation, informant perceptions of agreement). Importantly, future research with diverse samples and other illness groups is also needed to determine whether results generalize to ethnic minority or lower SES families and to the management of other chronic illnesses.

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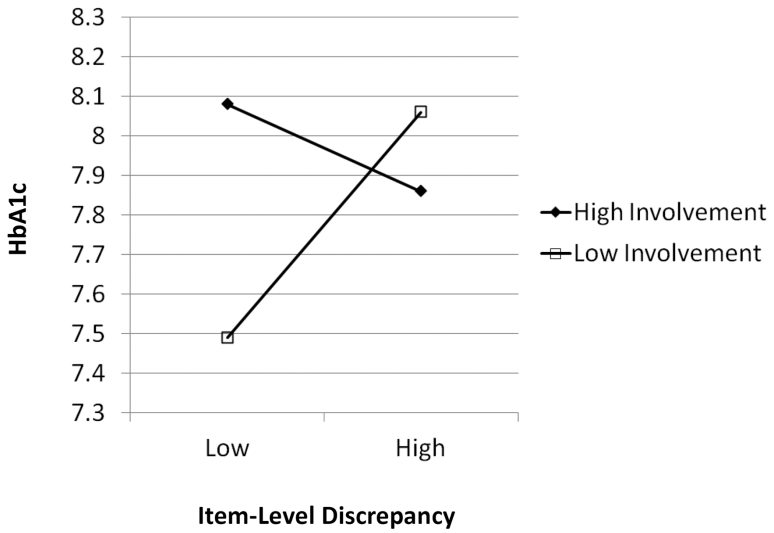

Figure 1.
Interaction between item-level discrepancy and amount of fathers' involvement in the prediction of HbA1c.

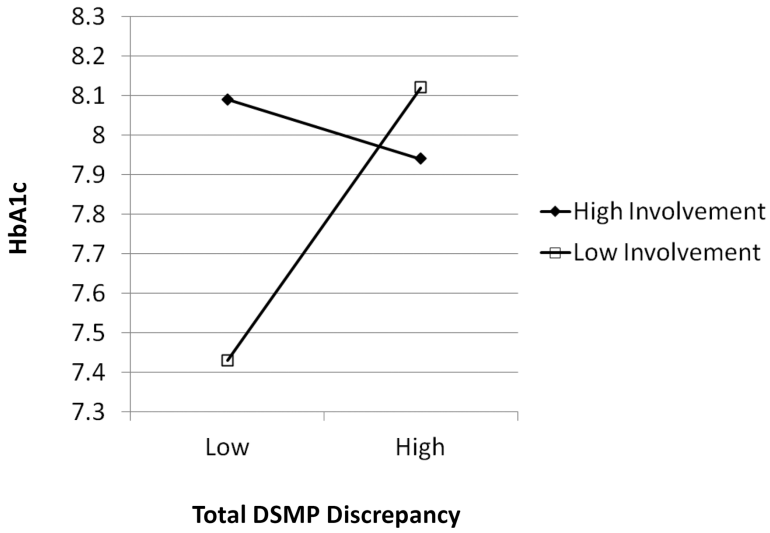

Figure 2.
Interaction between total DSMP discrepancy and amount of fathers' involvement in the prediction of HbA1c.

Table 1

Hierarchical Regression Models Predicting Diabetes-Specific Family Conflict: Main Effects

	B	SE(B)	β	$R^2\Delta$
Item-Level DSMP Discrepancy				
Block 1				.17(.13)
Level of Diabetes Management	−0.14(−0.11)	0.03(0.03)	$-.37^{**}(-.30^{**})$	
Site	−1.23(−1.42)	0.49(0.51)	$-.20^{*}(-.23^{**})$	
Household Composition	1.10(0.80)	1.30(1.33)	.07(.05)	
Block 2				.01(.01)
Mother-Father Discrepancy	0.04(0.05)	0.04(0.04)	.09(.12)	
Total DSMP Discrepancy				
Block 1				.17(.13)
Level of Diabetes Management	−0.13(−0.11)	0.03(0.03)	$-.36^{**}(-.30^{**})$	
Site	−1.27(−1.46)	0.49(0.50)	$-.21^{*}(-.24^{**})$	
Block 2				$.04^{**}(.04^{*})$
Mother-Father Discrepancy	0.15(0.14)	0.06(0.06)	$.21^{**}(.20^{*})$	

Note. Statistics not in parentheses refer to analyses with mother-reported level of diabetes management in Block 1 and statistics in parentheses refer to analyses with father-reported level of diabetes management in Block 1.

$^{**}P < .01$

$^{*}P < .05$

Table 2

Hierarchical Regression Models Predicting Glycemic Control: Main Effects and Interactions

	B	SE(B)	β	$R^2\Delta$
Item-Level DSMP Discrepancy				
Block 1				.19(.13)
Level of Diabetes Management	−0.06(−0.05)	0.01(0.01)	$-.43^{**}(-.36^{**})$	
Site	−0.18(−0.27)	0.18(0.19)	−.08 (−.12)	
Household Composition	0.11(−0.02)	0.48(0.50)	.02(−.004)	
Block 2 (Main Effect)				.004(.001)
Mother-Father Discrepancy	−0.01(−0.01)	0.01(0.02)	−.08(−.05)	
Block 2 (Interaction)				.03(.02)
Mother-Father Discrepancy	−0.004(−0.001)	0.01(0.02)	−.03(−.004)	
Father Involvement (Amount)	0.01(0.01)	0.01(0.01)	$.17^{*}(.14)$	
Block 3 (Interaction)				$.03^{*}(.02)^{+}$
Discrepancy × Involvement	−0.001(−0.001)	0.001(0.001)	$-.18^{*}(-.16^{+})$	
Total DSMP Discrepancy				
Block 1				.19(.13)
Level of Diabetes Management	−0.06(−0.05)	0.01(0.01)	$-.43^{**}(-.36^{**})$	
Site	−0.19(−0.26)	0.18(0.19)	−.08(−.11)	
Block 2 (Main Effect)				.01(.01)
Mother-Father Discrepancy	0.03(0.02)	0.02(0.02)	.10(.08)	
Block 2 (Interaction)				$.04^{*}(.03)$
Mother-Father Discrepancy	0.03(0.03)	0.02(0.02)	.12(.10)	
Father Involvement (Amount)	0.01(0.01)	0.01(0.01)	$.19^{*}(.16^{+})$	
Block 3 (Interaction)				$.03^{*}(.03^{*})$
Discrepancy × Involvement	−0.002(−0.003)	0.001(0.001)	$-.16^{*}(-.18^{*})$	

Note. Statistics not in parentheses refer to analyses with mother-reported level of diabetes management in Block 1 and statistics in parentheses refer to analyses with father-reported level of diabetes management in Block 1.

$^{**}P < .01$,

$^{*}P < .05$,

$^{+}P < .10$