This study demonstrates the use of multilevel modeling to examine influences on ratings of whole family functioning collected from multiple family members \((N = 26,614)\) living in 11,023 families with 1 or more dependent children aged 0 to 24 years. Results indicate that 45.7% of the variance in ratings of whole family functioning was shared among family members, whereas 54.3% was nonshared. Family-level characteristics, such as socio-economic status (SES), family structure and composition, and family well-being, accounted for 30.6% of between-family variation (i.e., shared perceptions). Individual-level characteristics, such as sex, age, dependent child status, education, and well-being, accounted for 5.6% of within-family variance (i.e., unique perceptions). There was significant between-family variation in the relationship between dependent child status and ratings of family functioning, and increased rating discrepancies among members of the same family were linked with higher levels of family SES. The findings attest to the validity of measuring whole family functioning directly from self-report ratings provided from multiple family members. However, caution is warranted when assessments are available only from single respondents.

Keywords: whole family functioning, multilevel modeling, multiple informants, informant discrepancies

Family systems theories have influenced the development of whole family functioning instruments, particularly through the concept that the family represents an integral whole that is more than the sum of its lower order features (Minuchin, 1974). One approach to measuring whole family functioning involves multiple family members providing assessments of characteristics of the family through questionnaire items that target the family as a whole. Using this approach, whole family functioning represents a contextual phenomenon inferred from the ratings of family members. These ratings are presumed to arise from the object of measurement (i.e., aspects of family functioning), from the idiosyncratic perceptions of individual family members, and from random measurement error. When multiple informants provide information, researchers and clinicians must identify analytic approaches that properly account for shared and nonshared variability in family members’ assessments. Previous researchers have used structural equation models (SEMs; Cook & Goldstein, 1993; Jacob & Windle, 1999) to distinguish common variance, which is shared among multiple respondents, from unique variance, which is associated with individual respondents’ perspectives, and random measurement error. The common variance represents the underlying latent construct of interest and is often used to predict important outcomes (Little, Lindenberger, & Nesselroade, 1999). Cronbach (1995) suggested that the reliable variation associated with the unique perspective of raters may be as interesting as the reliable variation associated with the measurement of latent variables, yet very little is known about the systematic influences on ratings of whole family functioning measured as a contextual effect at the family level (i.e., shared perceptions) and as an individual-level effect at the respondent level (i.e., unique perspectives). A greater understanding of these influences will increase our knowledge of (a) whole family functioning as a meaningful construct and (b) individual family member characteristics that may lead to nonrandom differences in family ratings.

The objective of the present study is to demonstrate the use of multilevel models (MLMs) to examine influences on family functioning associated with shared versus unique perceptions held by individual family members. In the
present study, an ecological framework (Bronfenbrenner, 1979) is used to distinguish family- and individual-level influences on ratings directed at whole family functioning. Family context influences are divided into two areas: status and capacity (Boyle, Georgiades, Racine, & Mustard, 2007). Status refers to the socioeconomic and demographic characteristics of families (e.g., income, family structure and composition). Capacity refers to assets and resources available to families. Levels of health and functioning (e.g., physical and mental) shared among all family members serve as indicators of family capacity. Similar to family-level characteristics, individual-level characteristics can be divided into status and capacity: The former refers to demographic characteristics of each member in the family, and the latter refers to individual health and functioning, as well as educational achievement.

The background review begins with a description of multilevel modeling as an analytic method used to disaggregate between-versus within-family variability in ratings obtained from multiple family members. Next, the social relations model (SRM; Kenny & La Voie, 1984) is briefly reviewed with the objective of drawing distinctions between family effects derived from measures directed at the whole family versus dyadic subsystems. Finally, there is a presentation of the variables selected for analysis and reasons for modeling their associations with assessments of family functioning.

Multilevel Models (MLMs)

MLMs partition the variability of assessments obtained from multiple respondents nested within groups into between-group differences (Level 2) and within-group differences (Level 1). When family functioning is studied as a dependent variable in a multilevel framework, group differences (Level 2) are represented by averaging the assessments of individual family members. These mean scores are used to estimate between-family variability. At Level 1, family functioning is represented by individual-level assessments after removing the family mean. These individual scores are used to estimate within-family variability in responses. With this application, Level 2 represents shared perceptions of family members and is conceptualized as whole family functioning, whereas Level 1 represents the unique perceptions of individual family members and measurement error. MLMs have been used by family researchers to model family- and individual-level variance of family relationships assessed at a variety of levels: sibling, marital, and parent–child (Jenkins, Dunn, O’Connor, Rasbash, & Behnke, 2005; Laurenceau & Bolger, 2005; Shanahan, McHale, Osgood, & Crouter, 2007; Snijders & Kenny, 1999).

Ratings of whole family functioning provided by multiple family members form a nested hierarchy of correlated assessments that vary in number depending on family size. MLMs are well suited for such data structures (Kreft & De Leeuw, 1998): They make it possible to study the effect of family-level variables (e.g., structure, composition, and size) on the shared perceptions of family members inclusively, without limiting respondents to a fixed number. Paired with this advantage is the opportunity to study influences on the unique perceptions of family members also without restriction. MLMs can accommodate numerous covariates assessed at different levels (e.g., family and individual), test for statistical interactions within and across levels, and estimate a variety of special parameters associated with residual variation (i.e., random slopes, intercept-slope covariances).

Social Relations Model (SRM)

An alternative approach to derive family-level effects is to estimate between-family variability in subsystem characteristics. In this approach, the unit of assessment is the individual and/or dyad, and family effects are “net” of these lower order features. The purpose of the SRM (Kenny & La Voie, 1984) is to identify sources of variability in dyadic relationships using a “round robin” design (Cook, 2001, 2005; Cook & Kenny, 2004). Family effects derived from SRM represent the extent to which dyadic relationships are similar within families after controlling for other sources of variation; typically, these family effects account for less than 15% of the variance (Branje, van Aken, & van Liestout, 2002; Cook, 1993, 1994, 2000, 2001; Cook & Kenny, 2004).

Proponents of SRM have argued that statistical estimates of between-family differences in these lower order features are indicative of whole family functioning and that ratings directed at whole family functioning have limited measurement prospects (Cook, 2005; Cook & Kenny, 2004, 2006). An alternative view holds that the extent to which these family effects constitute a measure of whole family functioning is an empirical question that depends on the extent to which dyadic- and family-level processes are exchangeable. If family-level patterns operate differently than dyadic-level processes, they will be missed by dyadic assessments. Put simply, the presence of all family members may alter the behavior of individual members in ways that are not predictable from a study of their interactions taken two at a time. For example, the presence of the whole family may dampen behavioral expression or induce aggressiveness that is not evident or observed in dyadic situations. It is noteworthy that family-level processes, such as adaptive organization and family cohesion, have been reported to have unique explanatory power over and above dyadic family interaction in predicting developmental outcomes in children—providing support for the importance of whole family functioning (Johnson, Cowan, & Cowan, 1999; Richmond & Stocker, 2006).

Family- and Individual-Level Influences on Family Functioning

This study capitalizes on the nested data structure to disaggregate family- and individual-level influences on ratings of whole family functioning measured as a contextual effect at the family level and an individual-level effect at the respondent level. At the family level, the influence of so-
cioeconomic status (SES), family structure (lone-parent status and family size) and composition (age and sex composition of dependents), and family well-being on whole family functioning is examined. The family stress model (Conger & Elder, 1994) suggests that low SES is associated with economic pressure and psychological distress, which in turn are associated with negative consequences for families. Previous studies have consistently reported a relationship between low SES and a wide spectrum of deficits in family processes, including lower levels of family functioning, parenting problems, and marital conflict (Conger & Donnellan, 2007; Hayden et al., 1998; Repetti, Taylor, & Seeman, 2002). In our framework, SES is a general-level measure that captures elements of parental capability, family opportunity, and stress that are expected to be associated strongly with ratings of family functioning.

Lone-parent status and family size represent status variables that may increase stress among family members by diluting family resources and increasing the challenges of behavioral regulation and control (Boyle & Lipman, 2002; Hetherington & Clingempeel, 1992). Given that levels of problem behavior are higher among boys than girls (Macoby, 1998) and that siblings are similar to each other on levels of externalizing problems (Richmond & Stocker, 2006), it is hypothesized that contagion effects among all male siblings will depress ratings of family functioning overall. A similar argument prompts the hypothesis that family-level ratings will be influenced by the age composition of siblings. Mothers with young children exhibit higher levels of depressed mood, and early stages of family formation are characterized by greater economic stress and uncertainty (Goodman & Gotlib, 2001).

We examine the influence of psychological well-being as a contextual effect at the family level and an individual-level effect at the respondent level by creating an explanatory variable at the family level, estimated as the mean level of psychological well-being within each family. Well-being should be linked to family functioning through its connection with physical and mental health. Past studies have identified associations between poor family functioning and psychiatric illness (Friedmann et al., 1997; Keitner et al., 1995; Weinstock, Keitner, Ryan, Solomon, & Miller, 2006). Family well-being, as an ecological phenomenon, may have different implications for ratings of family functioning than well-being as an individual-level characteristic.

In addition to psychological well-being, this study focuses on the dependent status of family members at the individual level. Having data from all household members provides an opportunity to examine the relationship between individual family ratings and the status of members within the family. Some evidence suggests that dependents will report lower levels of family functioning than their parents (Noller, Seth-Smith, Bouma, & Schweitzer, 1992; Shek, 1998). In addition, ratings of dependents have shown less convergence with parent ratings of family functioning and more correlated errors, providing empirical evidence for greater variability in their ratings (Jacob & Windle, 1999). Multilevel modeling enables us to examine the extent to which the family context modifies the relationship between individual ratings of family functioning and dependent status by modeling a random slope for dependent status. This random slope represents between-family differences in the regression of family ratings on dependent status.

Finally, the nested data structure is used to demonstrate how a family-level variable—SES—might be associated with variability among family members in their individual ratings of family functioning within the same family. Evidence of a negative association between SES and within-family discrepancies is drawn from studies examining informant discrepancies in ratings of childhood psychopathology (De Los Reyes & Kazdin, 2005; Duhig, Renk, Epstein, & Phares, 2000), father involvement in families (Coley & Morris, 2002), and parental behaviors (Tein, Roosa, & Michaels, 1994).

The objectives of the study are to (a) partition ratings of whole family functioning into between-family (shared perceptions) versus within-family (unique perceptions of family members) differences, (b) model influences on ratings of whole family functioning measured as a contextual effect at the family level and an individual-level effect at the respondent level, (c) examine whether the family context modifies the relationship between dependent child status and family assessments, and (d) examine the extent to which family SES influences variability in assessments among family members (i.e., levels of disagreement).

**Method**

Information for this research comes from the Ontario Health Survey, a cross-sectional study conducted in 1990 to provide data on population health (Ontario Ministry of Health, 1990). The target population consisted of all residents of private dwellings in Ontario during the survey period, January through December 1990. Exclusions (e.g., foreign service personnel, the homeless, people in hospitals and correction facilities, First Nations people living on reserves, and residents of extremely remote areas) constituted less than 5% of the total population. Verbal consent was obtained prior to the start of the interview and before the administration of questionnaires.

The sample was obtained using a stratified, multistage design that included clusters at the public health unit ($n = 42$) and census enumeration area levels ($n = 1,925$). There were 35,479 dwellings selected, and in 87.5% of these dwellings, the person most knowledgeable (PMK) in the household was interviewed in person about the sociodemographic characteristics of the family and the health care utilization of all residents. Separate questionnaires on personal well-being and ratings of family functioning were left for self-completion for all residents (including the PMK) aged 12 years and older. These questionnaires were either mailed back to the study office or picked up from the family on a separate occasion. To be eligible for analysis in the present study, the household must have included one or more dependent children, defined as a son or daughter aged 0 to 24 years (including foster and adopted children; $n = 13,126$ households). Among residents aged 12 years and older, 26,614 of 36,951 (72.0%) from 11,023 of 13,126
(84.0%) households had complete assessments of family functioning and were included in the analysis. The ethnic backgrounds identified by respondents were 58.1% Canadian, 16.5% English/Scottish/Irish, 6.4% French, 10.4% other European, and 8.5% other. Approximately 73.2% of the sample was born in Ontario, 9.3% in the rest of Canada, 9.6% in Europe, and 7.9% elsewhere. Among respondents with missing data on individual items (one item missing, \( n = 1,578 \); two items missing, \( n = 104 \); three items missing, \( n = 5 \)), responses were imputed using the EM algorithm (Schafer, 1999).

**Variables and Measures**

*Family functioning.* Family functioning was measured by the General Functioning subscale of the McMaster Family Assessment Device (FAD), which was completed by all household members aged 12 years and older (Byles, Byrne, Boyle, & Offord, 1988; Epstein, Baldwin, Bishop, & Keitner, 1983). The FAD is a self-report questionnaire, designed to assess whole family functioning according to multiple family members’ perceptions. The test–retest reliability and internal reliability of the FAD have been good in community samples in North America (Byles et al., 1988), in China (Shek, 2001), and in referred samples (McDermott, Batik, Roberts, & Gibbon, 2002), but not in children less than 12 years old (Binhum, Wamboldt, Gavin, & Wamboldt, 2002). Its internal consistency reliability in the present study was .89. The scale was derived by summing items that sampled the six domains included in the McMaster Model of Family Functioning (MMFF): problem solving, communication, roles, affective responsiveness, affective involvement, and behavioral control (Epstein, Bishop, Ryan, Miller, & Keitner, 1993). The scale consisted of an instruction to respondents: “Next are statements about families and family relationships. For each one, mark the circle beside the category which best describes your family.” This was followed by 12 statements that described family behavior and relationships in each of the dimensions. The response option for each statement was 1 = strongly agree, 2 = agree, 3 = disagree, and 4 = strongly disagree. After recoding positively oriented items, item scores were summed to obtain a total score, which could range from 12 to 48, with higher scores representing better functioning.

*Individual-level variables.* Information to measure individual respondent characteristics was taken from the structured interview with the PMK: a count of the number of individuals in the household; family status (0 = two parent, 1 = lone parent); the age structure of dependents, classified as all < 12 years old (0 = no, 1 = yes) or all 12+ years old (0 = no, 1 = yes), with mixed ages serving as the reference category; and the sex structure of dependents, classified as all boys (0 = no, 1 = yes) or all girls (0 = no, 1 = yes), with mixed boys and girls serving as the reference category. A measure of family SES was constructed from five indicators: the level of education of the PMK and that of his or her spouse/partner, the prestige associated with the occupation of the PMK and that of his or her spouse/partner, and the natural log of family income. Each of the five indicators was standardized to have a mean of 0 and a standard deviation of 1. The unweighted standardized variables were added together and restandardized to have a mean of 0 and standard deviation of 1. The internal consistency reliability of this composite measure was .71. The average level of well-being was derived from the scores of each family member to represent well-being as a family-level variable. These average levels of well-being were rescaled to have a mean of 0 across all families in the analysis.

**Analysis**

In this study we used MLwiN (Rasbash et al., 2000) to conduct multilevel regression analyses of family functioning assessments obtained from \( i \) respondents, nested in \( j \) families. In multilevel regression, response variability is partitioned across levels of a nested data structure. The proportion of between-family variance to total variance quantifies the extent to which ratings of family functioning by individual family members are similar; here it represents a contextual measure of whole family functioning. In contrast, within-family variance is an index of the extent to which individuals in the same family differ from the overall family mean, with higher values indicating more dissimilarity between them; here it represents the unique perceptions of family members, those not shared by others in the same family. Between-cluster variability at the public health unit and census enumeration area levels was less than 1% in total—too small to merit incorporating into the analysis (Boyle & Willms, 1999).

The equation depicting the final model is shown below,
where $i$ represents a respondent and $j$ represents a family. Variables with $ij$ subscripts are respondent-specific predictors (Level 1), and variables with a single $j$ subscript are family-level predictors (Level 2). The betas are regression coefficients and called fixed effects in MLM; they are interpretable in the same way as beta coefficients in ordinary least squares (OLS) regression.

$$famfunctioning_{ij} = \beta_{0j} + \beta_{1j}hhldsize_{ij} + \beta_{2j}loneparent_{ij} + \beta_{3j}all-sibs<12_{ij} + \beta_{4j}all-sibs\geq12_{ij} + \beta_{5j}all-boysibs_{ij} + \beta_{6j}all-girlsibs_{ij} + \beta_{7j}SES_{ij} + \beta_{8j}wellbe-ave_{ij} + \beta_{9j}dep-res_{ij} + \beta_{10j}oth-res_{ij} + \beta_{11j}male_{ij} + \beta_{12j}age_{ij} + \beta_{13j}sec-educ_{ij} + \beta_{14j}postsec-educ_{ij} + \beta_{15j}lone-parent_{ij} + \beta_{16j}few-ind_{ij} + \beta_{17j}sec-educ_{ij} + \beta_{18j}lone-parent_{ij} + [u_{0j} + (u_{1j} \times dep-res_{ij}) + e_{ij}].$$

Level 1 fixed-effect variables are able to explain both within- and between-family variation because individuals within the same family are more likely to share individual-level characteristics than individuals from different families. Level 2 fixed-effect variables are able to explain between-family differences because family-level characteristics are shared across all family members. Note that well-being is measured as both a Level 2 variable (family averages) and a Level 1 variable (individual-level well-being). Introducing the family mean for well-being makes it possible to estimate the average incremental effect of family well-being on individual well-being.

Called a Level 1 random effect, $e_{ij}$ represents within-family differences in ratings of family functioning after taking into account the explanatory variables; it is assumed to be distributed normally with a mean of 0 and variance $\sigma^2_e$: This variance is a measure of unique (nonshared) perceptions of family members. In the final model, Level 1 error variance is modeled as a complex function in which family-to-family heterogeneity in Level 1 differences ($\sigma^2_e$) is a function of SES (not shown). The expectation is that lower SES will be associated with higher levels of variability in assessments among members of the same family.

The family-level intercepts ($\beta_{0j}$) and the slopes for dependents ($\beta_{i}$) are expected to vary across families. They are each represented by fixed effects that capture the overall averages ($\beta_0$ and $\beta_5$) and by family-specific deviations ($u_{0j}$ and $u_{0j} \times dep-res_{ij}$) called Level 2 random effects. $U_{ij}$ is a random intercept and represents the difference between the average rating for each family and the overall average in ratings of family functioning after taking into account the explanatory variables; $u_{0j} \times dep-res_{ij}$ is a random slope and represents between-family differences in regression coefficients (slopes) for dependent residents. When these random effects are expressed as variances ($\sigma^2_{u0}$ and $\sigma^2_{u5}$), they form a $2 \times 2$ variance–covariance matrix. Random effects parameters provide additional opportunities to explore differences in within- versus between-group regressions that are a function of the explanatory variables.

In the absence of any explanatory variables, the variances derived from the Level 1 and Level 2 error terms ($e_{ij}$ and $u_{ij}$) can be used to estimate the intraclass correlation coefficient [ICC = $\sigma^2_{u0}/(\sigma^2_{u0} + \sigma^2_{e})$]. The ICC quantifies the extent to which members of the same family agree on their assessments of family functioning. The addition of predictor variables is expected to explain variability in family ratings. We use the approach recommended by Snijders and Bosker (1999) for estimating proportional reductions in error in the prediction of ratings. In comparing two models, Model A versus Model B, the proportional reduction in error for predicting individual ratings (total explained variance) is a function of 1 - $(\sigma^2_{u0B} + \sigma^2_{eB})/((\sigma^2_{u0A} + \sigma^2_{eA}))$, whereas the proportional reduction in error for predicting the family average is a function of 1 - $(\sigma^2_{u0B} + \sigma^2_{eB})/((\sigma^2_{u0A} + \sigma^2_{eA}))$, where $n$ represents the average number of family ratings ($n = 2.83$).

To achieve our research objectives, we developed four models. Model 1 was the null model used to estimate the ICC. Models 2 and 3 introduced the family- and then individual-level explanatory variables, respectively. These models estimated the regression coefficients and explained the variance associated with the two types of variables. Model 4 specified dependent status as a random effect at Level 2 and SES as a predictor of Level 1 variation. The former estimated family variability in the regression of family ratings on dependent status, and the latter estimated the association between family SES and within-family differences in family ratings.

**Results**

Table 1 describes the family and individual characteristics of those in the original survey and compares nonrespondents and respondents in the sample for analysis. The sample for analysis includes 11,023 families and 26,614 individuals. There were many statistically significant differences between nonrespondents and respondents. The general pattern was consistent with greater loss of data among more disadvantaged families and individuals (e.g., lone-parent families and fewer individuals with postsecondary education completed). Data on well-being and family functioning were unavailable for nonrespondents because they did not return self-completed questionnaires.

**Between- Versus Within-Family Variation and the Influence of Family and Individual Characteristics**

The multilevel null model is Model 1 in Table 2. The average level of family functioning in the sample was 38.11. Between- versus within-family variation was estimated as 16.27 versus 19.34. The ICC (the ratio of between vs. total variation) was 45.69% (16.27/35.61) and represents shared variance in the ratings of family functioning by individual members. The reciprocal estimate (54.31%) represents the extent to which ratings differed within families.

Model 2 in Table 2 shows the fixed effects regression coefficients of family functioning on family characteristics. Household size was negatively associated with family functioning. There was a positive association between lone-parent status and family functioning ($\beta = 0.41$). Age struc-
tured of dependents exhibited a strong association with family functioning. Compared to families with dependents of mixed ages, those families that had dependents who were all 12 years of age or older scored 1.61 scale points higher on levels of family functioning, whereas families whose children were all less than 12 years old scored 0.61 scale points lower. In families with all-male dependents, average ratings were lower, whereas the opposite characterized families in which all dependents were female. Family SES (in standard units) and average levels of well-being in the family exhibited particularly strong positive associations with family functioning. Among the individual-level characteristics (Model 3), there was a strong positive association between family functioning and individual well-being ($\beta = 0.22$). With individual well-being in the model, the new value associated with the effect of average family well-being ($\beta = 0.20$) represents the average incremental effect of family well-being on individual well-being. In contrast, there were strong negative associations between assessments of family functioning and being male, age in years, and the classification of family members as dependents and other residents versus parents. Compared to individuals with a secondary education, those with less than secondary education reported lower ratings of family functioning, whereas those with postsecondary education completed reported higher ratings.

The proportional reduction in error at Level 1 (total explained variance) associated with Model 2 versus Model 1 was 19.94% (1 - 28.51/35.61); and at Level 2, it was 30.65% (1 - 16.02/23.10). Comparing Model 3 and Model 2, the analogous estimates were 5.61% (1 - 26.91/28.51) for Level 1 and close to 0 (1 - 15.97/16.02) for Level 2.

**Influence of Family Context and Individual Characteristics on Family Assessment Ratings**

Model 4 in Table 2 specifies dependent status as a random effect at Level 2 and also includes SES as a predictor of Level 1 variation. The random regression coefficient for dependent status ($\sigma_{u0}^2$) was statistically significant and large in magnitude (8.18), indicating significant variation between families in the strength of the relationship between dependent status and ratings of family functioning. The family-level intercept/slope covariance for dependent status ($\sigma_{u0}$) was significant and negative, indicating that families with lower mean levels of family functioning had steeper
slopes. At Level 1, SES (β₁) predicted within-family variability in ratings of family functioning. At higher levels of SES, there was more within-family variability in responses.

Within family (Level 1)
- Age in years (β₁₁)
- Male (β₁₂)
- Education
- Less than secondary (β₁₃)
- Postsecondary complete (β₁₄)
- Well-being family average (β₁₅)

Between family (Level 2)
- Intercept/intercept (σ_u²)
- Dep/Dep (σ_e²)
- Intercept/dep (σ_e²)
- Within family (Level 1)
- Intercept/intercept (σ_u²)
- Intercept/SES (σ_u²)
- –2 × log likelihood

### Discussion

The present study demonstrates how MLMs can be used to (a) distinguish shared from unique perceptions in ratings of whole family functioning and (b) examine factors that influence ratings at both the family and individual levels. About 46% of the variance in ratings of family functioning was shared among family members, whereas 54% was unique. To place these estimates in some context, measuring ecological processes at higher levels of aggregation have produced lower estimates of shared variation. For example, 21% of the variance in ratings of neighborhood collective efficacy was shared among residents in the Project on Human Development in Chicago Neighborhoods Study ( Sampson, Raudenbush, & Earls, 1997). A similar degree of correspondence was found in a national survey of teachers assessing organizational climate in U.S. high schools (Rowan, Raudenbush, & Kang, 1991). The 46% shared variation found in our study estimates the average reliability of ratings provided by a single family member. This estimate is consistent with the average reliabilities (squared factor loadings) reported in prior research that has used SEMs and ratings of individual family members to measure aspects of family functioning (Cook & Goldstein, 1993; Jacob & Windle, 1999).

### Family-Level Influences on Shared Perceptions of Family Functioning

In the present study, measures of family status and capacity accounted for about 30% of between-family differences in ratings of whole family functioning (i.e., shared perceptions). In most instances, these associations were consistent with a priori hypotheses based on theory or previous research. For example, sibling composition based on age and sex exhibited differential associations with average levels of family functioning as predicted. There was a negative association between household size and average levels of family functioning, albeit one that became nonsig-
significant when controlling for individual-level variables. As expected, family SES and average levels of well-being in the family exhibited strong positive associations with whole family functioning.

Running counter to expectations was the positive association between lone-parent family status and levels of family functioning. In subanalyses, it was discovered that this association only emerged after adjusting for the effects of average family well-being—an adjustment that caused the effect for lone-parent status to change from a statistically nonsignificant effect ($\beta = 0.17, SE = 0.47$; not shown) in Model 3, with family well-being removed, to a significant positive association ($\beta = 0.47, SE = 0.14$) in Model 3, when family well-being was included. The absence of this effect in the presence of individual well-being demonstrates the importance of disaggregating individual- and family-level effects.

The pattern of findings discussed above suggests that ratings of whole family functioning can be used to represent family processes meaningfully. This conclusion is based on the relatively high levels of shared variation associated with these ratings and their coherent pattern of associations with hypothesized covariates (construct validity).

Variables Associated With the Unique Perceptions of Family Members

In the multilevel framework, the unique perceptions of family members were represented as within-family differences. In the present study, all of the variables assessed at the individual level (Level 1) were associated with the unique perceptions of individual family members. The inclusion of Level 1 variables in Model 3 accounted for an additional 5.61% of the variability in family functioning assessments. Even allowing for 20% of the Level 1 variation to be composed of random error, there is still a substantial amount of unexplained variation in our study associated with the unique perceptions of family members.

In the examination of individual-level variables, three findings stand out. First, ratings of family functioning obtained from dependents were substantially lower overall than ratings obtained from other family members. Clinicians and researchers should be mindful that low ratings of family functioning by dependents are likely to be normative. In addition, ratings obtained from dependents exhibited wide family-to-family variability—an indication that these ratings are subject to considerably more unique perception.

Second, there was a strong positive association between family functioning and well-being assessed at the individual level. Thus, well-being operates at two levels: It has a large influence on family functioning as an ecological phenomenon and also explains within-family differences in the ratings obtained from individual family members.

Third, family SES was associated with higher levels of disagreement among family members in their ratings of family functioning. Thus, family SES also operates at two levels but in different ways from well-being: (a) At the family level, it has a substantive influence on levels of functioning overall, and (b) at the individual level, it has a substantive influence on informant discrepancies. It is noteworthy that the relationship between SES and within-family variability in assessments ran counter to our expectations. To replicate this finding, we computed difference scores in ratings of family functioning for pairs of family members and correlated them with family SES. All of these associations were positive.

Whole Family Functioning and the Unit of Measurement

Selecting a unit of measurement to assess family functioning has important implications for representing family processes. The assessments collected in this study were directed at whole family functioning, and we assumed that averaging these assessments could provide useful measurement. This assumption is borne out to some extent by the associations observed in the study. However, it is not possible from these measures to identify the component processes that contribute to whole family functioning. It was important to disaggregate these component processes to serve clinical, administrative, or research objectives, then additional assessments would be required that target the various configurations of family members that make up each family (dyads, triads, etc.).

SRM proponents have argued that it is not necessary to target whole family functioning because directed-relationship items contain multiple levels of systematic variance, one of them being at the family level (Cook, 2005). Although it is true that family effects are derived in the SRM, it is an empirical question as to whether these represent an optimal measure of whole family functioning. Dyadic assessments will capture whole family functioning if higher order effects (triadic and above) are composites of lower order effects (dyadic and below). However, family-level processes may operate differently than dyadic processes. If this is so, then the unit of measurement is an important consideration in the assessment of whole family functioning. Just as items directed at whole family functioning are insensitive to component processes lower in the family system, it may be that items directed at dyadic functioning may be insensitive to processes higher in the family system. This would explain the relatively low levels of variability associated with family effects in the SRM cited earlier.

The merit of targeting higher versus lower levels of system functioning to devise ecological measures of family processes will depend on the purpose of measurement (e.g., to serve the needs of clinical practice vs. public health), practical constraints (e.g., cost, burden, and methods of data collection), and scientific concerns (reliability and validity of measurement). The use of directed relationship items within the SRM framework can serve clinical practice needs by identifying specific dyadic relationships within the family and/or specific individuals that require intervention (Cook & Kenny, 2004). In contrast, targeting whole family functioning can serve public health needs in screening for family dysfunction, monitoring the effects of interventions, or studying factors that influence whole family functioning.
Methodological Strengths and Limitations

The findings from the present study are applicable to the general population. The large sample and availability of multiple assessments within families made it possible to disaggregate shared and nonshared perceptions of family members and to study variables that might influence these perceptions. However, the cross-sectional design makes it impossible to determine the temporal relationship between family functioning and the measured characteristics; the reliance on a single measure of family functioning limits the dimensions available for analysis; interesting covariates such as marital satisfaction are unavailable for study; the relatively large sample loss may have introduced some bias; the age composition of dependents is confounded with the absence of assessments from children less than 12 years old, which could introduce a conservative bias associated with this variable; and measurement error is confounded with unique rater variance at Level 1, though it would be possible to disentangle this using a three-level model—families, individuals, and items. Assessment instruments that take the whole family as the unit of measurement have been criticized for assuming that all family members are similar, ignoring family roles and dynamics of subsystems within the family, and for the use of “double-barreled” items (Cook, 2005; Cook & Kenny, 2006). The measurement impact of these concerns, applicable more generally to ecological measures of social processes in groups (e.g., classrooms, neighborhoods), needs to be clarified in future research with a view to strengthening our approach to measuring whole family processes. Finally, the lack of previous research on factors related to shared versus unique perspectives of whole family functioning made it difficult to generate meaningful, theoretically based hypotheses for examining the construct validity of the FAD. A replication of these findings using different models and measures is needed.

Study Implications

This study has a number of implications. First, in the study of family assessment, it is important to separate individual- from group-level influences. For example, at the group level, there is the general finding that family functioning improves as developmental processes unfold (i.e., as children get older), suggesting that families can expect early challenges to lessen with time. Longitudinal data are now required to confirm that this is in fact the actual developmental sequence. Furthermore, the same variables can influence both collective and unique perceptions of the family. For example, well-being, measured as both a family- and an individual-level characteristic, exerted similar positive influences on between- and within-family ratings. However, the positive association between lone-parent status and family functioning was only revealed after controlling for well-being at the family level. Family SES also exerted dual influences on ratings of family functioning. The strong positive association between SES and family functioning at the family level is consistent with SES gradients for health. However, the positive association between SES and within-family variability in ratings is a new, unexpected finding that deserves further study.

Second, large discrepancies exist in perceptions of family functioning reported by parents, dependents, and other household residents. Researchers and clinicians should take this into account when assessing family functioning and not make the assumption that discrepancies necessarily reflect abnormal functioning. In addition, studies that rely on family ratings obtained from dependents must be cautious in interpreting their findings: There is considerable, unexplained family-to-family variability in these assessments. This raises a more general concern about relying on assessments of single informants to measure whole family functioning; there is some urgency to learn more about the substantive implications of using this strategy. Reliance on a single informant may provide useful information, but there is no guarantee that the patterns of association with external covariates will be consistent from one family member to another. In studies restricted to one informant, we suggest that the same informant (e.g., the mother) be used across families. This perspective on the use of single informants is in line with other researchers’ (Cook & Goldstein, 1993; Jacob & Windle, 1999).

Third, this study provides empirical evidence of the reliability and validity of efforts to measure whole family functioning directly. Ratings obtained from multiple family members can be combined to provide useful information on whole family functioning. In our view, it would be a mistake to dismiss such ratings as incapable of furthering our understanding of family processes. However, the need to better understand the relative merits—both practical and scientific—of assessing whole family functioning directly versus inferring whole family functioning from dyadic assessments should be a high priority for future research.

References


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Received May 8, 2007
Revision received December 6, 2007
Accepted January 18, 2008