Innovative Methods in the Science of Parent-Child Relations

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The study of parent-child relations is an active area of inquiry given that it plays a role in both child and adult (parent) development and has implications for the broader family system and society as a whole (Bornstein, 2005; Collins, Maccoby, Steinberg, Hetherington & Bornstein, 2000). Research on parent-child relations has important implications that range from basic (e.g., effects on child development) to applied (e.g., optimal techniques in family intervention). Yet the benefits of this research are constrained by the quality of employed methods and the conclusions that can or cannot be drawn as a result. Some methodological constraints have plagued this field from the outset, while others have emerged more recently, stemming from the difficulty inherent in developing methods that capture the complexity of contemporary conceptualizations of parenting and parent-child relations. As argued by Bornstein (2005; pp. 311–312), 'the family generally, and parenting specifically, are today in a greater state of flux, question, and re-definition than perhaps ever before.' Accordingly, it has become increasingly important to develop, refine, and apply methods that effectively capture the complexity of parenting and parent-child relations.

As such, the papers in this special issue fall under three themes. The first theme is exemplified by three papers that use novel measures to address methodological challenges that have plagued this field for decades. The second theme is represented by three papers that utilize analytic approaches that capture the complexity of dynamic and dyadic interaction patterns between parent and child. The third theme is featured by two papers that leverage methodological and analytic approaches to disentangle effects of influence within and across families.

New Measures to Address Long-Term Methodological Problems

A number of methodological challenges have plagued parenting researchers for decades. First, it is difficult to experimentally manipulate key conditions (e.g., child characteristics) that may influence parenting (Collins et al., 2000). Second, observational measures of parent-child interaction are the gold standard, but they are not without limitations. It can be difficult to observe target behaviours that are infrequent or relatively brief (e.g., responsiveness to distress) (Leerkes, Parade, & Gudmundson, 2011) and particularly when there is social desirability bias (e.g., harsh discipline) (Zolotor, Theodore, Runyan, Chang, & Laskey, 2010). Finally, observations may not be feasible depending on the research

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question, sample, or design; for example, the required cost and protocol standardization of observational measures often make it prohibitive to include them in large-scale multi-site studies. The first three articles in the special issue employ new measures or methods to address some of these issues.

In the first article, Bakermans-Kranenburg and colleagues demonstrate that an infant simulator (i.e., doll) that can be pre-programmed to behave in a standardized fashion with all participants is a valid measure of individual differences in parenting. Doll simulators have become more popular in recent years and can be used to experimentally manipulate infant traits such as temperament and gender. To our knowledge, this is the first published study to demonstrate a significant positive correlation between mothers' sensitive behaviour with the doll and with her own infant, offering strong evidence for the validity of this approach. This work may also have applied implications such as using simulators to screen for parenting risk.

Martin and colleagues present evidence to support the use of an audiotaped interview to measure maternal affect about the child. Typically, maternal affect about the child has been coded from videotapes. Impressively, this interview was administered to nearly 2,000 diverse mothers participating in the multi-site Fragile Families and Child Wellbeing Study. The authors present evidence of the convergent and discriminant validity of this measure in relation to observed parenting and evidence of the predictive validity of the positive and negative affect scales in relation to relevant child outcomes. The authors suggest that this measure could be administered in large-scale phone surveys, filling the need for a time-efficient and cost-effective measure that captures one important aspect of parenting: affect towards the child.

Sturge-Apple and colleagues provide initial evidence of the validity of a Go/No-Go Association Test to assess implicit parental attitudes about physical punishment. Measuring implicit attitudes may be especially important given the stigma attached to the use of physical discipline, which may lead to systematic underreporting. The authors successfully administered the task in a lab setting and online with a similar pattern of results, suggesting that the measure could be employed in large-scale online survey research. Evidence from other fields suggests that measures of implicit attitudes have stronger predictive validity in relation to key outcomes than do explicit attitudes that may be more susceptible to the effects of social desirability.

Capturing Dynamic, Dyadic Parent-Child Interaction Processes

Although researchers have studied parent-child interaction dynamics for over 30 years (e.g., Cohn & Tronick, 1988; Wahler & Dumas, 1986), integration and progress in this subfield have proven difficult. Challenges have centered on heterogeneity in the content studied, in labels for dynamic processes (e.g., coregulation and synchrony), and in measurement (e.g., macro-level and micro-level). There has been a dearth of analytic methods that sufficiently capture the complexity of dynamic processes and model the dyad as the primary unit of analysis, but that are also accessible to new users. Although theorists agree that the parent-child dyad is greater than the sum of its parts (MacPhee, Lunkenheimer, & Riggs, 2015),

observing and quantifying those unseen forces and the parameters that govern them are a daunting analytic task. The next three articles in this special issue employ innovative approaches to address these issues and examine the complex dynamics of dyadic parent-child interactions.

Guo and colleagues use the dynamic systems-based method of State Space Grids (SSGs) to examine changes in mother-child emotion coregulation patterns in the context of the strange situation paradigm and their relation to attachment. Although SSGs are not novel (Lewis, Lamey, & Douglas, 1999), relatively few researchers to date have adopted this user friendly method to model interaction dynamics. Importantly, the authors organize dynamic processes into content-specific (i.e., positive vs negative) and content-free emotion coregulation (i.e., affective flexibility), providing a parsimonious organizational structure with which to understand dynamic processes.

Coburn and colleagues also use SSGs, in their case to examine the effects of prenatal distress and depressive symptoms in low-income Mexican–American mothers on dyadic affective engagement and flexibility at 12 weeks postpartum. Notably, these authors combine micro-and macro-level measurements to more comprehensively capture dynamic interaction processes and to demonstrate the external validity of micro-level dynamic methods. Few researchers have made the effort to validate dynamic measures in this way; thus, this work represents an important step in further incentivizing new users to employ dynamic systems-based methods.

Stifter and Rovine use the analytic method of hidden Markov modelling to determine how profiles of dyadic mother-infant coregulatory patterns during immunizations change from two to six months of age. This cutting-edge analysis provides novel empirical evidence on the development of mother-infant coregulation over time. Theorists agree that dyadic systems self-organize into stable patterns over time (Granic & Patterson, 2006), but few studies have been able to capture these changes in dyadic organizational processes. By using hidden Markov modelling, which allows for the modelling of the latent (unknown) states that govern dyadic interactions, these authors move the field forward by uncovering the intricacies of these relational dynamics.

Leveraging Research Designs and Analyses to Disentangle Competing Hypotheses

Due to the multi-faceted nature of family research, a perennial challenge has to do with disentangling effects, whether those are genetic versus environmental effects, spillover or crossover effects across multiple family subsystems, or the effects of sociodemographic factors such as race or income. Examining multiple and complex pathways of influence in the family within or across time can yield findings that are challenging to synthesize across studies. Accordingly, the field is in need of approaches that aid in the disentangling of multiple effects. The final two articles in this special issue tackle this challenge with innovative study designs and analytic methods.

Roben and colleagues employ an adoption sample with data on target children, adoptive mothers, and biological mothers to test the extent to which adoptive mothers' depression, child characteristics, and mutual negativity are related over time in a transactional manner. Their results support the transactional model by demonstrating mother-and child-driven effects on the quality of dyadic interaction over time. Of note, biological mothers' depressive symptoms serve as an indirect measure of the child's genetic risk for problem behaviour. Their design eliminates the possibility that observed associations are a function of passive gene-environment correlations, strengthening the conclusions that can be inferred from the results.

Zvara and colleagues employ propensity score matching and the actor-partner independence model (APIM) in order to disentangle the effects of race and income on the interdependence between interparental and parent-child relationship quality. By matching African–American and European–American couples based on propensity scores, the authors reduce the risk that observed differences in patterns of association are a function of sociodemographic characteristics rather than cultural differences. The use of the APIM also strengthens their ability to examine interrelations among family subsystems and test for differences in patterns of associations for mothers vs fathers.

Future Directions

This special issue offers an exciting collection of innovative methodological and analytic contributions to the study of parent-child relations. There are other analytic methods not represented in this special issue that also merit attention for their abilities to address the complexities of parent-child relations, such as ecological momentary analysis (Moses, Passini, Pahet, & Favez, 2014), latent differential equation modelling (Boker & Laurenceau, 2007), and multilevel survival analysis (Stoolmiller & Snyder, 2006). The field is in need of other advancements as well, such as research that effectively integrates across multiple persons, domains of functioning (e.g., affect, behaviour, and physiology), time scales, and/or academic disciplines to comprehensively and accurately model the realities of families in the present day. A better understanding of the contributions of neuroscience and physiology to parenting and parent-child relations will be crucial; although burgeoning, we are in need of more information on the influence of neurological or physiological processes on parenting (Bakermans-Kranenburg & van Ijzendoorn, 2008; Kim et al., 2014; Leerkes et al., 2015) and on the coordination of these processes between parents and children (Feldman, Magori-Cohen, Galili, Singer, & Louzoun, 2011; Lunkenheimer et al., in press). In terms of applied research, we have seen the emergence of the technological and digital delivery of parenting and family interventions (Breitenstein, Gross, & Christopherson, 2014); it will be crucial to understand the opportunities and constraints raised by these novel methods and consider analytic approaches to effectively examine them. Finally, across existing and new methods, there is a need to study diverse samples and to do so with methodological care, such as establishing measurement invariance across groups, to ensure that appropriate conclusions are drawn from such research (Haltigan et al., 2014). We hope that this special issue stimulates further development in these and related areas in an effort to discover and utilize optimal methods for the science of parent-child relations.

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