

V. What Does It Mean When Fathers Are Involved in Parenting?

Bernhard Piskernik and Lieselotte Ahnert

Abstract The present study examines fathers' direct engagement with children using experience sampling methods with 190 fathers in two-parent families in Austria with 1 to 5-year-old children. Father-child activities were sampled at random times over 1 week and three home visits were conducted to gather interview, questionnaires, and observational data. Latent Class Analysis uncovered three different profiles of father-child activities: (a) *Enriched*, (b) *Balanced*, and (c) *Restricted*. Boosted Classification Trees explored the associations between these profiles and the quality of father-child relationships and family functioning. Fathers who showed enriched, as opposed to restricted activities with the target children formed close attachments with them, displayed better interparental relationships and were less likely to be exposed to family stress, underlining paternal involvement as stronger affected by relationship dynamics in the family.

The nature of father involvement has become a central focus of research on fatherhood. Fathers' direct engagement with children, defined as interactions and engagement activities with the child, as well as passive supervision and control, has received considerable research attention as a central component of father involvement (e.g., Cabrera, Tamis-LeMonda, Bradley, Hofferth, & Lamb, 2000; Fagan, Day, Lamb, & Cabrera, 2014; Pleck, 2010). In line with the developmental ecological systems model (see Volling & Cabrera, 2019) the present study views paternal involvement as a complex nonlinear dynamic system that is affected by a multitude of (interdependent) factors, which, in turn, are affected by paternal involvement. In these self-organizing complex systems spanning the micro-, meso-, macro-, and exosystems of the fathers' ecology, small changes in one part of the system can lead to large effects in another part and vice versa (see Barton, 1994). Consequently, the complexity of these dynamic systems and the interrelations among variables may be obscured and misinterpreted if treated in a linear fashion, thus calling for nonlinear modeling strategies. In the current study, we applied this conceptual perspective to the assessment of paternal

Corresponding author: Bernhard Piskernik, Faculty of Psychology, University of Vienna
Liebiggasse 5, 1010 Vienna, Austria, email: bernhard.piskernik@univie.ac.at

Citation Information: Piskernik, B., & Ahnert, L. (2019). What does it mean when fathers are involved in parenting? In B. L. Volling & N. J. Cabrera (Eds.), *Advancing research and measurement on fathering and children's development. Monographs of the Society for Research in Child Development*, **84**(1), 64–78.

DOI: 10.1002/mono.12404

© 2019 Society for Research in Child Development

involvement with a focus on father–child activities as part of the family microsystem, and the relations between father–child activities and the family environment. The present study focused on father–child activities performed throughout a typical week and then adopted a person-centered approach (Bergman & Trost, 2006) that investigated patterns among the father–child activities to extract different groups or classes of fathers and children based on weekly activities. Once these classes were uncovered, a nonparametric supervised learning method was applied using features of fathers and their families to predict the different classes.

The Nature of Paternal Involvement

Although there are multiple disciplinary perspectives, paternal involvement from an anthropological perspective is often viewed as more voluntary than maternal involvement, and the equality in the interparental relationship between mother and father may be important for determining paternal engagement (Geary, 2008). Family systems perspectives view fathers as equal parents (Cabrera, Volling, & Barr, 2018) even though they underscore that intrafamilial and extrafamilial factors play a role in determining father involvement. Prior research has indeed demonstrated that fathers are more engaged in families with harmonious marital relations, but less engaged in families with high levels of maternal gatekeeping (Schoppe-Sullivan, Brown, Cannon, Mangelsdorf, & Sokolowski, 2008). Some studies have found that fathers used more negative and intrusive parenting in families with more marital conflict and less positive marital relations (e.g., Belsky, Youngblade, Rovine, & Volling, 1991; Cox, Paley, Payne, & Burchinal, 1999). Paternal involvement was also related to overall relationship dynamics in the family (e.g., Volling et al., 2014) where the relationship quality may strengthen paternal involvement (e.g., Brown, Mangelsdorf, & Neff, 2012) and the family distress may hinder active fatherhood (e.g., Yoo, Adamsons, Robinson, & Sabatelli, 2015). Given the many family factors that covary with father involvement, it is necessary to consider these various family factors in predicting patterns of father involvement, and the activities fathers engaged with their children.

Aims and hypotheses

Based on Fagan et al.'s (2014) suggestion “to take a step back and reassess how fathering is measured” (p. 391), the present study used a novel means of conceptualizing and analyzing paternal involvement, one of the core issues noted by Cabrera and Volling (2019). The first aim of the study focused on the activities that fathers do with their children in everyday life and used a person-centered approach (latent class analysis [LCA]) to find different groups of fathers that varied on active

engagement. The second aim was to focus on different features of fathers and their families to predict variability in classes by examining fathers' personality and attitudes; marital relationship quality, family relationship dynamics, and family stress. Searching for variations of paternal involvement in diverse family systems, we hypothesized that in families with highly involved fathers there would be better interparental relationships, more balanced relationship dynamics in the family, and less family stress than in families with less involved fathers.

Method

Participants

A sample of 200 two-parent families was recruited in Austria as part of a study by the Central European Network on Fatherhood (see Ahnert et al., 2017). Ten nonbiological fathers were excluded from analyses so the final sample consisted of $N = 190$ families with two biological parents having 1.8 ($SD = 0.8$) children. The target children (99 girls) averaged 33.0 ($SD = 16.5$) months, and range from 12 months to 5 years. Nearly two-thirds (60.5%) of the children went to public child care centers for 27.2 hr/week on average. Fathers were 38.5 ($SD = 6.0$) and mothers 35.6 ($SD = 5.0$) years of age, on average. In 41.1% of the families, both parents had a master's degree or above; in 29.4% of the families, one parent had completed university, and in 29.5% of families, neither parent had a university degree. All fathers were in the paid labor force and worked, on average, 42.3 ($SD = 9.0$) hr/week. Only 56.3% of mothers were employed and worked 23.3 ($SD = 11.7$) hr/week, on average. Families lived in the city of Vienna (53.2%), or in the surrounding towns.

Procedures

Three home visits were conducted by two research assistants within 2 weeks to gather information from families. During the first visit, sociodemographic characteristics of the families were collected, and the families were interviewed about daily routines in order to individually tailor the sampling scheme for the paternal activities assessment. Both research assistants, finally, observed the child's attachment to one, randomly chosen parent, using the Attachment Q-Sort (Waters, 1995). During the second visit, the father was introduced to the experience sampling procedure to assess father-child activities, which would begin the following day. Fathers were given a package of questionnaires on parental relations, relationship dynamics in the family, and family stress either to complete it during the visit or to return it at the third visit. During the third visit, the child's attachment to the other parent was observed by both research assistants. The Parent Development Interview was carried out with the fathers, and the remaining questionnaires were gathered.

Measures of Paternal Involvement

Timetable Interview

In order to tailor the paternal activity assessments for each individual father, fathers and mothers were interviewed on the first visit regarding their everyday routines throughout an entire week. To calculate the total time fathers were accessible to the child, the following time frames were excluded from consideration: father's paid working hours, the child's out-of-home hours (e.g., in child care), and sleeping hours, leaving only overlapping time frames in which father and child were available to engage in activities with one another.

Experience Sampling Procedure

The software *movisensXS* (2014) was employed for experience sampling on the Android operating system and installed on either the father's own smartphone or on a provided device. Fathers were instructed to carry the smartphones everywhere and to respond reliably to a set of questions. These questions were to be answered across the individualized time frames derived from the timetable interview. Eight to 15 sets of questions were sent out randomly per day. The sets needed to be short and concise to prevent interruption of the normal flow of routines. Hektner, Schmidt, and Csikszentmihalyi (2006) demonstrated high ecological validity showing that subjects go about their normal everyday activities during experience sampling with very few thoughts about the fact that they will be asked to report on a small sample of their randomly selected daily experiences.

Questions on Father–Child Activities

Four different sets of questions were used during different times of the day. Each was kept as short as possible (less than half a minute), so as to not interfere with the father's ongoing activities. The *main set* was sent out multiple times over the entire time frame to obtain detailed information on a father's immediate location, anyone in his vicinity, and his current activities. The stylized questions of this survey were organized hierarchically, worded generally at first and then followed by increasingly detailed questions regarding father's activities. For example, Where are you?—at home/in the street/shopping/etc.—Is someone with you? (yes/no)—if yes: Who?—partner/<name of child>/etc.—if child: Are you doing something with <name of child>? (yes/no)—if yes: What are you doing?—supervising/caretaking/cuddling/playing/RTP/watching TV/etc.—if playing: What are you playing?—ball, sports/building blocks/etc. These activities were later categorized into seven generalized father–child activities: *supervision*, *basic care*, *joint play*, *rough-and-tumble play (RTP)*, *cuddling*, *scaffolding–teaching–encouraging (STE)*, and *watching television* (with the target child). In addition, three short sets of questions were used at key times of the day: (a) the *morning set* was sent out in the morning at 9:34 a.m. on average, $SD = 91$ min, and asked whether the

father had engaged in *night care* (Were you called by your child last night? yes/no); (b) the *noon set* was sent at 11:58 a.m., on average, $SD = 82$ min, and asked whether father and child had a shared breakfast (Did you have breakfast with your child? yes/no); and finally (c) the *evening set* inquired at 9:12 p.m., on average, $SD = 70$ min, whether father and child had a shared dinner (Did you have dinner with your child? yes/no). Finally, fathers were asked to move a slider control as part of the phone app to indicate how typical the day was (1 = *typical* to 100 = *atypical*).

Data Aggregation on Father–Child Activities

Response rates were calculated from the number of questions sent out within the individually determined time frames as the proportion of responses based on total questions asked (% of responses). The response rates also yielded a duration time relative to the timeframe in which they occurred. As a result, each father–child activity yielded a measure of the probability of occurrence, as well as of duration (in minutes), which were later aggregated separately for workdays and days off work (see Yeung, Sandberg, Davis-Kean, & Hofferth, 2001). Days with response rates lower than 25% or those categorized by the father as atypical (cut-off criterion > 90 on the slider control) were excluded (5.9%). Preliminary analyses revealed bimodal distributions with excess zeros and nonoccurrence of certain father–child activities (see Table 10).

Characteristics of Fathers and Families

Characteristics of the fathers (e.g., parental characteristics) and their families (e.g., sociodemographics, family stress) were extracted from interviews,

TABLE 10
DESCRIPTIVE STATISTICS OF FATHER–CHILD ACTIVITIES

Father–Child Activities	Workdays			Days Off		
	Nonoccurrence	<i>M</i>	<i>SD</i>	Nonoccurrence	<i>M</i>	<i>SD</i>
Supervision (time)	51	0:35	0:29	48	1:55	1:13
Basic care (time)	21	0:58	0:37	28	2:09	1:19
Joint play (time)	29	0:40	0:29	28	2:13	2:08
Rough-and-tumble play (time)	72	0:24	0:15	74	1:01	0:28
Cuddling (time)	63	0:25	0:14	77	0:56	0:28
Scaffolding–teaching– encouraging (time)	77	0:25	0:16	81	1:37	1:11
Watching television (time)	82	0:23	0:13	89	1:32	0:11
Night care (rel. frequency)	55	52	30	74	78	26
Shared meals (rel. frequency)	05	61	26	06	83	24

Note. *M* = means; rel. = relative; *SD* = standard deviations. Nonoccurrences were omitted for *M* and *SD*. Nonoccurrence reflects percentages. Means and standard deviations of the time represents hours:minutes or the relative frequencies in percentages.

questionnaires, and observations of father–child and mother–child interactions. Two trained observers observed one parent during home visits conducted for at least 2 hr and then completed the Attachment Q-Sort independently. Resulting scores represent correlations with a criterion sort of the hypothetically most secure child and range from -1.00 to $+1.00$, with higher scores indicating a more securely attached child. Interrater reliability yielded $ICC = .93$ for the maternal AQS and $ICC = .94$ for the paternal AQS scores; mean scores were calculated across observers and used in analyses. Table 11 provides details of the AQS and other assessments of the fathers and the family environments.

Plan of Analysis

The first analysis involved a LCA, a person-centered strategy to model separate profiles of paternal involvement. Model fit was assessed by relative entropy, E , ranging from 0 to 1, with values closer to 1 indicating a better separation of the patterned profiles. The optimal number of profiles (classes) was determined by the *bootstrapped likelihood ratio test* (BLRT), which was given priority over criteria like AIC or BIC, as recommend by Nylund, Asparouhov, and Muthén (2007). BLRT assessed whether the k class solution fits the data significantly better than the $k - 1$ class solution ($p < .05$). To investigate the second aim of how the different characteristics of fathers and the family environment predicted paternal involvement profiles, the *gradient boosted classification tree* (BCT) machine learning technique (Friedman, 2001) was applied. BCT can discriminate between important and irrelevant predictors, and handles nonlinear relationships very well while producing easily interpretable results. It combines multiple classification trees to an ensemble (see Breiman, Friedman, Stone, & Olshen, 1984). Each tree in the ensemble is built on the basis of the principle of recursive partitioning, where the feature space is recursively split into regions containing observations with similar response values (for a detailed explanation see Strobl, Malley, & Tutz, 2009). In contrast to other ensemble methods, gradient boosting does not just combine parallel trees, but iteratively adds trees while reweighting the data to focus on the remaining classification errors while ignoring already correctly classified cases (Friedman, 2001). To avoid overfitting of the data, randomly selected 75% of available data (training sample) were used to train the model, while the remaining 25% were used to evaluate out of sample model quality. Following Breiman and Spector (1992), a fivefold cross-validation, in which the training sample was split into five equal parts, was performed to learn the optimal hyperparameters (i.e., model specifications such as number and depth of trees). Models were learned on four parts of the training sample with a given set of hyper-parameters and evaluated on the remaining part. Hyper-parameters that performed best in all splits were finally applied to the entire training sample. Once defined, this model was then verified on the remaining 25% of the data (test sample). To assess model quality, the *area under the ROC curve* (AUC_m) was calculated in its multiclass generalization (see Hand & Till, 2001) in the training

TABLE 11
CHARACTERISTICS OF FATHERS AND FAMILY ENVIRONMENT: ASSESSMENTS, DESCRIPTIONS, AND IMPACTS

Assessments	Descriptions of Features	Reliability	VI	IR
AQS: Attachment-Q Set (AQS: Waters, 1995): With father	Parental relations and characteristics Degree of child's attachment quality toward the parent, for example ranging from feelings of closeness and trust to feelings of being left alone and mistrust	ICC = .93 ICC = .94	1.00	1
With mother			0.64	4
RSA: Relationship Assessment (RAS: Hendrick, 1988)	Degree of satisfaction with child's mother, love, and realistic positive expectations	$\alpha = .87$	0.41	9
Maternal Gatekeeping (Fagan & Barnett, 2003)	A mother's tendency to supervise (or even restrict) the father's involvement	$\alpha = .92$	0.67	3
BFI: Big Five Inventory (BFI: John, Donahue, & Kentle, 1991)				
Extraversion	Extent of seeking stimulation in the company of others	$\alpha = .82$	0.53	7
Agreeableness	Tendency to be compassionate and cooperative	$\alpha = .59$	0.63	5
Neuroticism	Degree of responding worse to stressors, and interpreting ordinary situations as threatening	$\alpha = .71$	0.25	15
Openness	Degree of intellectual curiosity, creativity, and preference for novelty	$\alpha = .69$	-	-
Conscientiousness	Tendency to be organized and dependable	$\alpha = .68$	-	-
Work centrality: (Carr, Boyar, & Gregory, 2008)	Importance of work compared to family: Higher scores reflect a stronger emphasis on work	$\alpha = .82$	0.25	16
RF: Reflective functioning (Slade, Aber, Berger, Bresgi, & Kaplan, 2003)	Ability to understand internal states and how they influence behaviors and emotions of the child and oneself (coded from the Parent Development Interview)	Kendall's $\tau-b = .82$	-	-
PSI: Parental Stress Index (PSI: Abidin, 1995)	Family stress			
Role restriction	Degree of restrictions in maintaining former freedom and	$\alpha = .81$	0.30	11

(Continued)

TABLE 11. (Continued)

Assessments	Descriptions of features	Reliability	VI	IR
Competence	identity Degree of lack of practical knowledge and management skills of parenting	$\alpha = .78$	-	-
Isolation	Tendency to feel social isolation due to child-rearing responsibilities	$\alpha = .61$	-	-
Adaptability	Child's inability to adjust to environmental changes	$\alpha = .69$	0.45	8
Demandingness	Child's tendency to insist	$\alpha = .63$	-	-
Mood	Child's display of negative emotions	$\alpha = .75$	-	-
BSI-18: Brief Symptom Inventory (BSI-18: Derogatis, 2000)	Extent of overall psychological distress (Global Severity Index)	$\alpha = .82$	0.60	6
MSI-R: Marital Satisfaction Inventory (MSI-R: Snyder, 1997)				
Family history of distress	Degree of severe family disruptions in the father's family of origin	$\alpha = .78$	0.90	2
Dissatisfaction with children	Degree of disappointment in child-rearing, and overt conflicts with the child	$\alpha = .43$	-	-
Conflicts over child rearing	Extent of conflicts over child-rearing between the parents	$\alpha = .72$	-	-
Role orientation	Father's tendency towards more egalitarian attitudes	$\alpha = .76$	-	-
	Socio-demographic characteristics			
Ages: father/mother			-/0.13	-/.20
University degree (Y/N): father/mother			-/-	-/-
Working hours: father/mother			0.24/0.30	17/10
Income (father)			0.15	19
Children in household (number)/siblings of the target child (Y/N)			-/-	-/-
Age/gender (target child)			0.27/0.26	12/14
Grandparents' support (Y/N)/target child's out-of-home care (hours/week)			0.22/0.27	18/13

Note. IR = importance rank; N = no; VI = variable importance; Y = yes; - = not predictive in any tree.

and the test sample. Values of AUC_m between 0.5 and 1.0 indicated model fits from “better than chance” to “perfect fit.”

Results

Profiles of Paternal Involvement

Because of the large proportion of fathers who did not engage in some activities, the data were dichotomized into those fathers engaged in an activity and those not engaged (see Table 10). Using this binary information, LCA was carried out in Mplus 7.1 (Muthén & Muthén, 1998–2012); information about shared meals was omitted from analyses because it hardly varied. As a result, BLRT indicated a three-class solution for paternal involvement (3 vs. 2 classes, $p = .006$; 4 vs. 3 classes, $p = .526$) with $E = .762$. This justified good discrimination of three paternal involvement profiles with similar sizes of $n = 57, 63,$ and 70 . The three profiles of paternal involvement were labeled *Enriched*, *Balanced*, and *Restricted* based on significant differences across certain father–child activities. All differences between the displayed occurrence probabilities that were greater than .2 proved to be significant according to the Benjamini–Hochberg α -correction with a *false discovery rate* (FDR) = .05. As seen in Figure 2, the *Enriched*

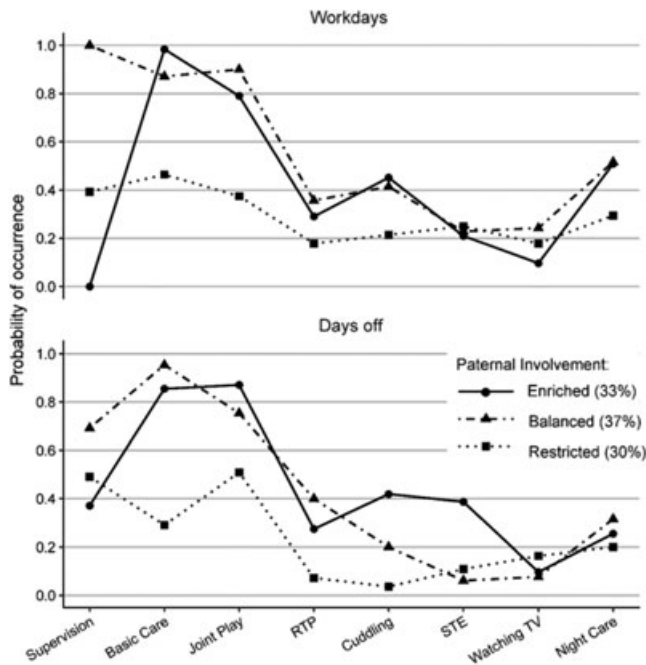


FIGURE 2.—Father–child activities in different paternal involvement profiles.
Note. All differences greater than .2 are statistically significant. RTP = rough-and-tumble play; STE = scaffolding–teaching–encouraging.

paternal involvement class had high probabilities on *basic care* and *play* on fathers' workdays and days off; *STE* on fathers' days off, and more affection (*cuddling*) than the other two classes. The *Balanced* class resembled the *Enriched* class with respect to *basic care* and *play*, but fathers in the *Balanced* class supervised children more than the other classes on both workdays and days off, and were lower on cognitively stimulating activities and *cuddling* on their days off. Finally, the *Restricted* class was low on most father-child activities but relatively higher on *supervision*, *basic care*, and *play* than the other activities.

Paternal Involvement: Versatility and Duration of Father-Child Activities

To describe the versatility of father-child activities, generalized linear model adequate for Poisson distribution analyzed the number of different activities per profile based on their occurrence. The three profiles were treated as between-group factors and the workday-day-off distinction as a within-group factor. Results revealed the *Enriched* class engaged in more activities than the *Restricted* class, $b = -0.34$, $p = .002$, but fewer activities than the *Balanced* class, $b = 0.32$, $p < .001$. The number of father-child activities did not differ on workdays as compared to days off, $b = 0.07$, $p = .50$, in general, but did differ based on class. On days off, fathers in the *Enriched* class engaged in more activities than fathers in the *Balanced*, $b = -0.38$, $p = .004$, and the *Restricted* classes, $b = -0.32$, $p = .048$ (see Table 12).

The estimated duration of the father-child activities were subjected to an analogous mixed-effect ANOVA model (see Table 13), which revealed that fathers, in general, spent more time engaging with children on days off than on workdays, $F(1, 187) = 312.2$, $p < .001$, *generalized eta-squared effect size* $\eta_G^2 = .42$. Furthermore, fathers of the *Enriched* and *Balanced* classes spent more time overall with their children than those of the *Restricted* class, $F(2, 187) = 6.9$, $p = .001$, $\eta_G^2 = .04$. No significant interaction between the profiles and type of day was found.

TABLE 12
 VARIETY OF FATHER-CHILD ACTIVITIES IN THE PATERNAL INVOLVEMENT PROFILES

Profiles	Workdays			Days Off		
	Count	2.5% CI	97.5% CI	Count	2.5% CI	97.5% CI
Enriched	3.3	2.9	3.7	3.5	3.1	4.0
Balanced	4.5	4.0	5.0	3.3	2.9	3.8
Restricted	2.3	2.0	2.7	1.8	1.5	2.2

Note. CI = confidence interval; Count = estimated marginal mean counts.

TABLE 13
DURATIONS OF FATHER–CHILD ACTIVITIES IN THE PATERNAL INVOLVEMENT PROFILES

Profiles	Workdays		Days Off	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Enriched	2:09	0:16	6:28	0:16
Balanced	2:25	0:15	5:57	0:15
Restricted	1:42	0:17	4:54	0:17

Note. *M* = means; *SD* = standard deviation (in hours:minutes).

Paternal Involvement: Relations With Characteristics of Fathers and Their Families

BCT analyses were conducted with the R package *gbm* v2.1.1 (Ridgeway, 2019). The training sample fit well with $AUC_m = 0.71$, and when this model was applied to the test sample, AUC_m stayed at 0.72, indicating excellent generalizability and good overall prediction quality. The 35 variables representing fathers and the family environment were used in the BCT analyses to test their impact in predicting the three paternal involvement classes. Only 20 of the variables were predictive, with the highest variable importance, relevance of the variable per tree averaged over all trees, for the security of the father–child attachment. The variable importance for father–child attachment served as the benchmark for comparing all other environmental features. Interparental relations, like *maternal gatekeeping* and *fathers’ satisfaction with child’s mother*, *mother–child attachment*, and family stress indicators like *perceived distress with difficult children* and *fathers’ manifested distress* also had relatively high variable importance. Fathers’ personalities, like *agreeableness*, *extraversion*, and *neuroticism*, yielded high to moderate variable importance and sociodemographic characteristics, like *mother’s weekly working hours*, *age of child*, *child’s weekly hours in out-of-home care*, *child’s gender*, *father’s weekly working hours*, *grandparents’ support*, *father’s monthly income*, and *age of mother* ended the series of predictive variables—see variable importance and ranks for all predictive variables in Table 11.

The four factors with the highest variable importance in predicting the classes were *father–child attachment* (1.0), *family history of distress* (.90), *maternal gatekeeping* (.67), and *mother–child attachment* (.64). Figure 3 shows in greater detail how these variables predicted the three father involvement classes. The *Enriched* profile was more likely when father–child attachment security was higher, regardless of mother–child attachment security and maternal gatekeeping. Fathers’ with low family histories of distress were also more likely to be in the *Enriched* class. In contrast, there was a greater likelihood of being in the *Restricted* profile, when father–child attachment security was low and mother–child attachment security was high, there was a higher incidence of a family history of distress. Interestingly, father–child attachment security

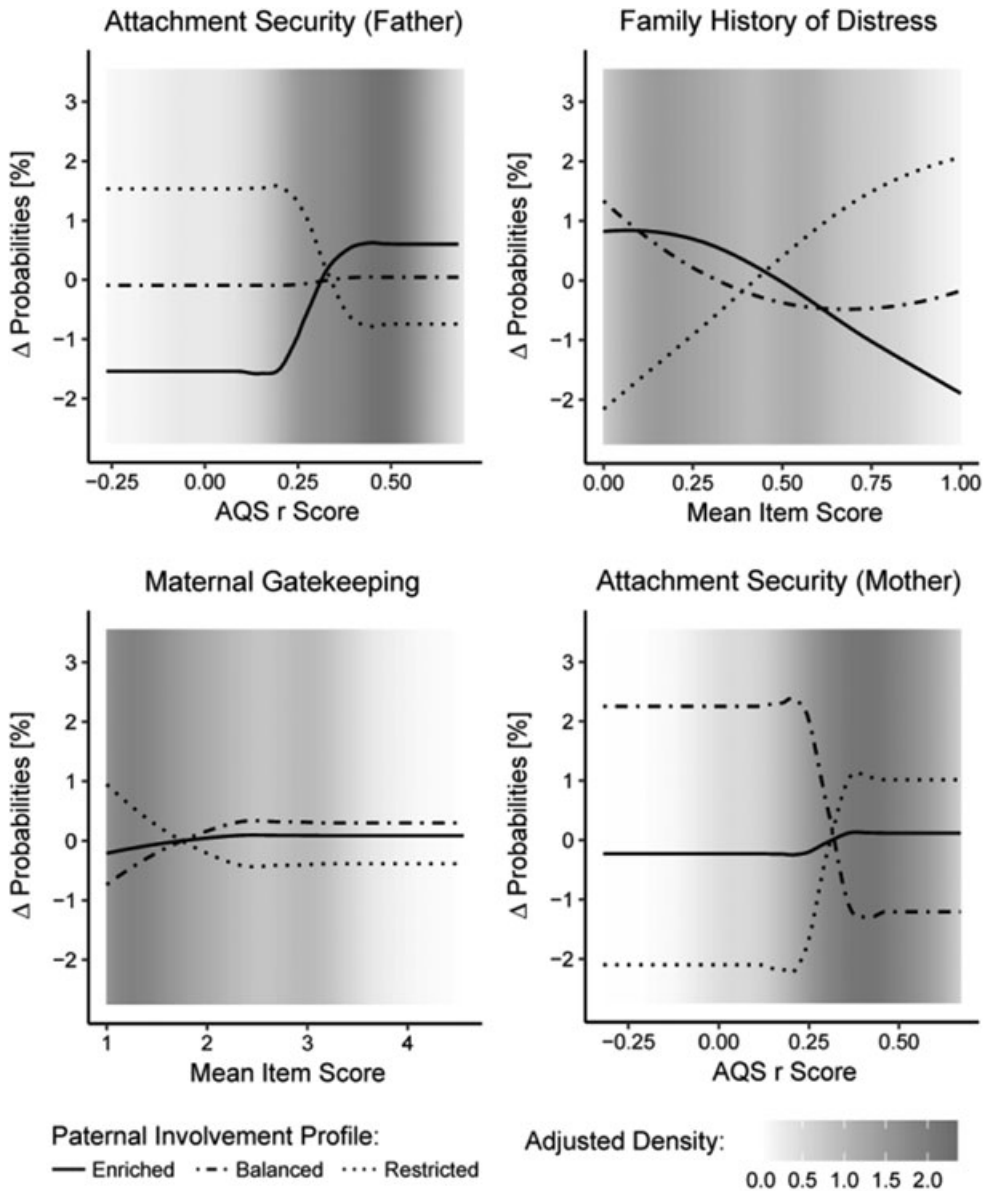


FIGURE 3.—Paternal involvement profiles as related to selected characteristics of the fathers and their families.

Note. The curves are LOESS-smoothed (see Cleveland, Grosse, & Shyu, 1992) for better legibility. The background gradient indicates how dense the respective feature is distributed along the scales (density adjusted for the scale’s amplitude).

did not appear to be related to the *Balanced* class; rather the *Balanced* class was more likely when mother–child attachment security was low and maternal gatekeeping was high; the *Balanced* class was also more likely when the father had the low family history of distress scores.

Discussion

The present study conceptualized paternal involvement as a nonlinear dynamic system, comprising an enormous variety of father–child activities that were associated with a multitude of factors characterizing fathers and their families. The study was inspired by the mathematical field of nonlinear dynamic systems (Barton, 1994), which provided a novel means of describing father–child activities within a high dimension feature space. First, father–child activities were operationalized as person-centered descriptions of father involvement (Bergman & Trost, 2006). The activities were collected using experience sampling to obtain ecologically valid assessments of daily activities. Various types of father–child activities comprise father involvement (see also Fagan et al., 2019), and we included supervision and basic care to playing, scaffolding, teaching, and encouraging children. Second, these activities were then classified into three types of paternal involvement profiles or classes (*Enriched*, *Balanced*, or *Restricted*) using LCA, which revealed qualitatively different patterns of father involvement. The profiles were based on the occurrence of father–child activities on workdays and days off, but also on the different types of activities and the time invested in those activities. The *Enriched* class was characterized by high involvement in basic care and play, and a focus on education and affection, particularly on fathers’ days off from work. This profile excelled in the amount of time made for parenting, in general, and contained the greatest versatility of father–child activities among the assessed fathers. Implications of this result suggest that enriched father–child activities might have impacts on child development as children grow optimally based on rich adult–child interaction allowing cultural learning (Cabrera & Tamis-LeMonda, 2013; Lamb, 2010). Furthermore, the *Balanced* class of paternal involvement was similar to the *Enriched* class in terms of basic care and play, but with higher levels of supervision, and lower frequencies of cuddling and affection. The *Restricted* class was low on all father–child activities, with involvement in basic care, play, and supervision, suggesting that fathers spent less time in activities with their children overall. These findings provide strong support for the variability among fathers even of normal middle-class families, and the many activities in which fathers can and do engage in with their children.

Predicting Father Involvement Profiles From Characteristics of Fathers and Families

A wide array of variables characterizing fathers and their families, including marital relations and family dynamics, were then evaluated for their prediction of the different classes of father involvement. In this regard, gradient boosted decision trees, an innovative data mining approach mainly applied in technical science, was applied to investigate many simultaneously

acting and interdependent nonlinear impacts. Recent studies have demonstrated how multiple facets of fathers and family functioning predict fathering behaviors (Cabrera & Tamis-LeMonda, 2013; Lamb, 2010), but gradient boosted decision trees allowed us to explore systematically the impact of multiple father and family characteristics obtained from interviews, questionnaires, and observations. The impact of these predictors was differential for the individual profiles. For instance, the *Enriched* profile was more likely when father–child attachment security was high and independent of mother–child attachment. This suggests that this profile assures father–child relationships that are formed and maintained through and within the father–child dyads themselves and relatively independent of influences from the mother. Not surprisingly, the *Restricted* profile was more likely with low father–child attachment security, yet high mother–child attachment security. In contrast, the *Balanced* profile seemed to be unrelated to father–child attachment security, but occurred more likely when mother–child attachment security scores were low. This can be interpreted as an involvement aimed to compensate for deficits in the mother–child relationship. The fact that maternal gatekeeping (see also Lee et al., 2019) is high in these profiles might speak to maternal backlashes. Other correlates were also more probabilistically related to the profiles. For example, distress in the fathers’ family of origin was less likely for fathers in the *Enriched* and *Balanced* profiles than those in the *Restricted* profile. Overall, security of the father–child attachment relationship was central in predicting the different father–child activities profiles, with other variables reflecting the dynamics of families coming into play (see also Feinberg et al., 2019), particularly the quality of the interparental relationship (e.g., marital satisfaction, maternal gatekeeping), mother–child attachment security, and a past history of family distress.

Limitations

These results must be interpreted with regard to their limitations. Experience sampling provides a novel means of assessing day-to-day activities between fathers and children, but low-frequency activities, such as scolding or praising the child are difficult to capture. Thus, the profiles are based on activities that occurred often enough to be included in analyses. These other activities could have enhanced the description of paternal involvement by yielding additional insights into the quality of paternal involvement. For example, fathers who cuddle a lot with their children may also be more sensitive and use more praise, so even these brief activities, due to their covariance with cuddling, could complete the present profiles. Second, fathers’ and mothers’ working hours, children’s time spent in out-of-home care, and fathers’ income played a subordinate role in the prediction of paternal involvement profiles. Perhaps the

homogeneous sample, which only involved Austrian fathers from intact two-parent families of primarily middle class, obscured the effects of these other variables.

Future Directions

Father–child activities and their correlates in other demographic groups and cultures may also differ, as prior research has indicated that different societal structures can either hinder or facilitate men’s family and parenting time (Gauthier & DeGusti, 2012) and future research should examine activities between fathers and children from other family backgrounds. The present study focused only on activities fathers did with children while accessible and available. A growing body of literature underscores the effects of spillover from men’s work to family life (see e.g., Bumpus, Crouter, & McHale, 2006), with significant impacts on parenting behavior. Understanding these experiences in men’s lives may be worth including in future research on fathering. Finally, the present study focused on paternal activities, but given that fathers and mothers parent in a complex system of activities (see Volling et al., 2019), future research would benefit from utilizing experience sampling with mothers, as well as fathers.

Conclusion

The current paper used a novel, person-centered approach to transform the quantity of time fathers spent with the children into qualitative patterns of father–child activities that uncovered three different classes of paternal involvement. By focusing on different types of father–child activities, including supervision, basic care, play, educating, and cuddling the child, different patterns were associated with time spent on these activities. Thus, different profiles reflect both the quality of activities and the quantity of time spent in these activities. Embracing a wider view that embraces the ecology of fatherhood, the security of the father–child attachment, as well as current and past family relationships, emerged as particularly influential on paternal involvement.

Acknowledgments

This work was supported by the Jacobs Foundation (AZ: 2013-1049) and awarded to Lieselotte Ahnert as head of CENOF (the Central European Network on Fatherhood with headquarters at the University of Vienna). We thank Barbara Supper who recruited the families, coordinated the data collection, and guided the student teams.