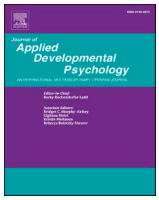
Journal of Applied Developmental Psychology 95 (2024) 101717

Contents lists available at ScienceDirect

Journal of Applied Developmental Psychology

journal homepage: www.elsevier.com/locate/jappdp



Parental burnout stages and their link to parental violence: A longitudinal study

Alice Schittek *, Isabelle Roskam, Moïra Mikolajczak

Department of Psychology, UCLouvain, Place Cardinal Mercier 10, 1348 Louvain-la-Neuve, Belgium

ARTICLE INFO

Keywords:
Parenthood
Exhaustion
Emotional distancing
Fed up
Contrast
Cross-lagged
Maltreatment

ABSTRACT

Background: Parental burnout's (PB) literature has blossomed, showing that PB is a major predictor in child maltreatment. But it is unclear at what PB stage parents become violent.
Methods: 1466 parents answered a pre-registered three-wave longitudinal survey.
Results: PB seems to start with exhaustion, which catalyzes the development of all other PB symptoms. There seems to be a process relating PB symptoms to violence towards the offspring: exhaustion is prospectively linked to an increase in emotional distancing and feeling fed up, which are then linked to a prospective increase in violence.
Conclusions: Researchers would benefit from focusing more on the symptoms of PB, to increase nuance and give even more concrete suggestions for clinical practice. Clinicians should focus on reducing exhaustion as it seems to be the starting point of PB, and be alert to child maltreatment when *emotional distancing* or *feeling fed up* are mentioned. Implications are discussed.

Parenthood has long been regarded as a major transition in an individual's life, that is often followed by physiological, psychological, relational (Kuersten-Hogan & McHale, 2021), and neurological changes (Abraham et al., 2014; P. Kim, 2021), which involve a great deal of adjustment. Although parenthood is very rewarding and meaningful, it can be difficult, especially when demands and stresses increase, without a corresponding increase in internal and external resources. When parenthood demands exceed resources *chronically*, some parents (around 8 % in Belgium, see Roskam et al., 2021) may experience parental burnout (PB) (Mikolajczak et al., 2019; Mikolajczak & Roskam, 2018). PB has recently been conceptualized as a stress-related syndrome, manifesting in four symptoms: exhaustion, emotional distancing with the children, feeling fed up with the parental role, and perceiving a contrast with the parent that one used to be (Roskam et al., 2018).

Yet, parents do not seem to suddenly exhibit all four PB symptoms at once. Some studies have suggested that exhaustion is the entry point to PB (Kalkan et al., 2022; Le Vigouroux et al., 2022), whereas others suggested that it is emotional distancing (Blanchard et al., 2021). However, the conclusions of these studies are limited by their cross-sectional design. A longitudinal study (Roskam & Mikolajczak, 2021) observed that there are prospective relations between symptoms: exhaustion seems to be the starting point, followed by emotional distancing from one's child. However, this study measured burnout with an outdated measure of PB: the Parental Burnout Inventory (PBI; Roskam et al., 2017). In recent years, the Parental Burnout Assessment (PBA; Roskam et al., 2018) has become the gold standard for measuring PB. It is thought to be a better measure than the PBI as it was created using an *inductive* approach, generating the items from exhausted parents' speeches and experiences. The PBA encompasses four symptoms as mentioned in the first paragraph. Although Roskam and Mikolajczak (2021)'s study shows a process in PB symptoms, the temporal succession of symptoms as measured by the PBA is not known. Thus, the first aim of the current study is to identify, if any, systematic prospective relationships between PB symptoms using the PBA.

Even though PB is specific to the parental role, it does not only affect the parents, but the whole family system (i.e., parental couple relationship and relationship with the child, e.g., for a meta-analysis, see Mikolajczak et al., 2023). Specifically, PB increases violence against one's children. The robustness of this effect has shown through different *empirical methodologies* (e.g., for cross-sectional, see Mikolajczak et al., 2018; for longitudinal, see Mikolajczak et al., 2019; for causal, see Brianda et al., 2020), different *instruments* measuring PB (e.g., for the PBI, see Mikolajczak et al., 2019; for the PBA, see Szczygieł et al., 2020), different *samples around the world* (e.g., for Belgian and English-speaking

* Corresponding author.
E-mail address: alice.schittek@uclouvain.be (A. Schittek).

https://doi.org/10.1016/j.appdev.2024.101717
Received 13 March 2024; Received in revised form 15 October 2024; Accepted 15 October 2024
Available online 20 October 2024
0193-3973/© 2024 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY license (http://creativecommons.org/licenses/by/4.0/).

samples, see Roskam & Mikolajczak, 2020; for Hispanic samples, see Manrique-Millones et al., 2022; for Finnish sample, see Aunola et al., 2021; for Polish sample, see Szczygieł et al., 2020), and different *approaches* (e.g., for person-centered, see Hansotte et al., 2020; for variable-centered, see Mikolajczak et al., 2018). However, most research solely focused on the global PB score. Only few cross-sectional studies have investigated the relation of *each PB symptom* on violence towards the offspring, which suggested that the symptom of emotional distancing would contribute the most to violence (Blanchard et al., 2021; Hansotte et al., 2020; Kalkan et al., 2022; Mikolajczak et al., 2018) and, even, that violence may appear only when the stage of emotional distancing is reached (Hansotte et al., 2020). However, the cross-sectional nature of these studies does not allow us to safely say whether violence appears at the first stage of PB, or whether it appears later on. Understanding this is not only crucial for better identifying and treating the parent, but also for prevention purposes and further protecting the children. Thus, the second aim of the study is to understand whether there is the *process* in PB symptoms that leads to violence.

Hypotheses

Based on the rationale, two hypotheses have been posited (one per study aim).

Hypothesis 1. The process of PB: we expect exhaustion to be the first symptom, associated with a prospective increase in emotional distancing. For the remaining symptoms (i.e., feeling fed up, and contrast with the previous parental self), past PB research does not allow us to make a priori hypotheses.

Hypothesis 2. The process of PB that leads to violence: we expect exhaustion to be prospectively associated to an increase in emotional distancing, which in turn will be prospectively related to an increase in violence. For the two remaining symptoms (i.e., feeling fed up, and contrast with the previous parental self), previous literature is too scarce to postulate hypotheses relating to violence.

Transparency and Openness

Preregistration and open data

Aims, hypotheses and analyses have been pre-registered on Open Science Framework prior to analyzing the data. Pre-registration and data are available at https://osf.io/z39wy/?view_only=c6be8b517e4b45a5903206c15977cb44. Supplemental Materials can be accessed by using the link at the end of the manuscript.

Method

Participants

At time 1, a total of 1490 participants answered the survey (888 English-speaking, 602 French-speaking). Missing value analyses revealed that participants who dropped out at time 2 were on average younger (M missing = 37.82, M non-missing = 40.36, $t(1488) = 6.84$, $p < .001$), more fed up with the parental role (M missing = 5.27, M non-missing = 3.39, $t(1488) = -5.95$, $p < .001$), more emotionally distant (M missing = 3.00, M non-missing = 2.00, $t(1488) = -5.80$, $p < .001$), and more violent (M missing = 1.90, M non-missing = 1.22, $t(1488) = -6.47$, $p < .001$). χ^2 also showed that participants who dropped out at time 2 were more likely to be: women ($\chi^2(1) = 48.65$, $p < .001$, $\phi = 0.18$), more educated ($\chi^2(5) = 78.39$, $p < .001$, $\phi = 0.23$), work part time ($\chi^2(10) = 201.53$, $p < .001$, $\phi = 0.37$), and earned slightly more money ($\chi^2(5) = 12.95$, $p < .001$, $\phi = 0.09$), than expected by chance. Participants who dropped out at time 3 were not significantly different to participants at time 2. Considering the *amount* and the *non-random nature* of the missingness between waves, it is preferred to avoid using imputation (Bennett, 2009), Full Information Maximum Likelihood (FIML) was therefore preferred, and the aforementioned reasons for missingness were all controlled for in the estimated models. 24 multivariate outliers were detected and, thus, removed (> 3SD). The total final sample consisted of 1466 participants. Of the final sample, participants were mostly mothers (73.7 %), on average 39.3 years old ($SD = 7.27$), and on average had 2 children ($M = 2.15$, $SD = 0.97$). Most participants (56 %) were married, and mostly completed upper secondary education (26.4 %) or a bachelor's degree (36.1 %). Professionally, most parents worked full time (56.2 %) and mostly earned between 2500 and 4000£ monthly (38.1 %) or between 1000 and 2500£ monthly (23.6 %).

Procedure

Prior to data collection, the study received the approval of the ethics committee (masked for review). The current study was part of a larger project conducted between July 2022 and May 2023, regarding parental burnout and children's outcomes (every wave spaced 4 months apart: Time 1 in July–August 2022, Time 2 in November–December 2022, Time 3 in April–May 2023). The participants were recruited using two strategies: a French-speaking snowball sample, and an English-speaking Prolific sample. French-speaking parents were recruited through social-media, word of mouth, and schools. The English-speaking sample was recruited through Prolific, a participant-recruitment platform that aims to connect researchers to high quality samples, in exchange for remuneration. Researchers can use filters to reach only specific participants (in this case, parents). Considering that the past studies showed similar relationships between PB and violence in French-speaking and English-speaking samples (e.g., Mikolajczak et al., 2019), both samples were merged together into a single final sample. Prior to participating to the study, participants first gave their informed consent. They were informed that they could withdraw at any moment, and that their data would remain anonymous. Participants who decided to take part in the study were required to answer each item without the option to skip or omit any. Moreover, participants who answered wrongly to one of three attention checks were immediately dismissed from analyses. Participants who wished to take part in the study answered an online survey (more details about the questionnaires in the "Measures"' section)". Participants who did not meet the following criteria were excluded from all analyses: participants who did not have at least one child still living at home, who did not answer correctly to one of the three attention-checks, who were underage (under 18 years of age), and who did not respond to all three measurement occasions. Three attention-check items (e.g., "It is important that you pay attention to this study. Please select Disagree") were randomly inserted in the survey to make sure that participants did not respond randomly or inattentively.

Measures

After the informed consent, the following sociodemographic variables were collected: gender, age, number of children, educational level, working regimen, and net monthly household income. All measures were assessed at three time points.

Parental burnout symptoms were measured using the *Parental Burnout Assessment* (PBA). The PBA is a 23-item questionnaire (Roskam et al., 2018), in which parents rate each symptom on a 7-point frequency scale: from *never (0)* to *every day (6)*. The scale is quadri-factorial, measuring namely: *exhaustion* (e.g., "I'm so tired out by my role as a parent that sleeping doesn't seem like enough") (time 1: $\alpha = 0.95$, $\omega = 0.96$; time 2: $\alpha = 0.96$, $\omega = 0.96$; time 3: $\alpha = 0.96$, $\omega = 0.96$), *emotional distancing* (e.g., "Outside the usual routines (lifts in the car, bedtime, meals) I'm no longer able to make an effort for my child(ren)") (time 1: $\alpha = 0.76$, $\omega = 0.78$; time 2: $\alpha = 0.78$, $\omega = 0.79$; time 3: $\alpha = 0.81$, $\omega = 0.82$), *feeling fed up* (e.g., "I can't stand my role as a father/mother anymore") (time 1: $\alpha = 0.90$, $\omega = 0.91$; time 2: $\alpha = 0.91$, $\omega = 0.91$; time

3: α = 0.93, ω = 0.93), and *contrast in the previous parental self* (e.g., "I don't think I'm the good father/mother that I used to be to my child (ren)") (time 1: α = 0.92, ω = 0.93; time 2: α = 0.93, ω = 0.93; time 3: α = 0.92, ω = 0.93). Each score is calculated by summing the answers to the items. Higher scores reflect a higher level of the measured factor. Due to (expected) deviation in normality, McDonald's ω (McDonald, 1999, p. 89) should be interpreted when reviewing the scale's internal consistency, as it is more robust (Yang & Green, 2011). However, considering that Cronbach's α (Cronbach, 1951) is still the most used in research, we decided to provide both indices for every scale in the study.

Violence towards offspring was assessed using a shortened version of the *Parental Violence Scale* (full scale first used in Mikolajczak et al., 2018; short-form subsequently used in Mikolajczak et al., 2019, Mikolajczak et al., 2020). The shortened version is a 3-item self-report questionnaire, to which participants respond to each item on a frequency scale: from *never (0)* to *several times a day (7)*. The scale measures *verbal* ("I sometimes say things to my child that I then regret (threats, insults, use of silly nicknames etc.)"), *physical* ("When I am angry, I sometimes throw things at my child"), and *psychological* violence ("I sometimes threaten to abandon my child if s/he is not good"). Higher scores reflect a higher presence of violent behaviors. Note that the original scale from which the three items are drawn from shows good internal reliability (α = 0.82; see Mikolajczak et al., 2018).

Statistical analyses

Based on sample size estimations, following the N:q rule (Jackson, 2003; Kline, 2016), the final sample size was large enough to carry out the path analyses. Variables were centered to reduce potential multicollinearity. Statistical tests' assumptions were checked prior to carrying on with the analyses. Correlations were performed using Jamovi's "Regression" package (The jamovi project, 2021), and cross-lagged models were estimated using the open software R (RStudio Team, 2020), with "lavaan"'s package (Rosseel, 2012).

First, correlation analyses were computed. Then, we performed Mardia's test prior to estimating each cross-lagged model, which allowed to determine whether there was a violation in multivariate normality (Korkmaz et al., 2014; Korkmaz et al., 2024). After that, cross-lagged models were estimated (one model per study aim), using FIML estimation method. Considering that missingness between time 1 and time 2 is not at random, the only way to estimate the models using FIML (which requires MAR data; see Enders, 2008), is by adding the variables causing MNAR as auxiliary variables (Enders, 2008). We therefore controlled for the reasons of missingness, namely: gender, age of the parent, working status, and income. Fit indices of each model were reviewed prior to interpreting paths. Considering that the χ^2 and the Root Mean Square Error of Approximation (RMSEA) are particularly sensitive to sample size (Kenny et al., 2015; Kline, 2016), we opted for less sensitive fit estimates. Thus, we considered adequate fit when at least two of the less sensitive indices (i.e., Comparative Fit Index - CFI, Standardized Root Mean Square Residual - SRMR, Tucker Lewis Index - TLI) met the following criteria: the CFI above 0.90, the SRMR below 0.08 (Kline, 2016), and the TLI above 0.90 (Tucker & Lewis, 1973). X^2 and RMSEA were reported as they are still one of the most reported indices in path analysis (χ^2 should ideally be non-significant and RMSEA should be below 0.08). Finally, we estimated two cross-lagged models. Model 1 estimated the prospective relationships between PB symptoms. Model 2 estimated the prospective relationships between PB symptoms in the prediction of violence towards the offspring.

Results

Correlations between variables at each time point can be viewed in Table 1. Spearman's ρ was preferred over Pearson's r, considering the non-normal (but expected) data distribution observed in Q-Q plots. Exhaustion, emotional distancing, feeling fed up, and contrast, all significantly and positively correlated with violence towards the offspring. Correlations were consistent across the three time points.

Table 1
Descriptive statistics and Spearman's ρ correlations for study variables.

Bivariate correlations	*n*	Spearman's ρ
Exhaustion Time 1 and Violence Time 1	1466	0.39***
Exhaustion Time 2 and Violence Time 2	794	0.42***
Exhaustion Time 3 and Violence Time 3	754	0.39***
Emotional Distancing Time 1 and Violence Time 1	1466	0.40***
Emotional Distancing Time 2 and Violence Time 2	794	0.39***
Emotional Distancing Time 3 and Violence Time 3	754	0.39***
Fed Up Time 1 and Violence Time 1	1466	0.46***
Fed Up Time 2 and Violence Time 2	794	0.43***
Fed Up Time 3 and Violence Time 3	754	0.42***
Contrast Time 1 and Violence Time 1	1466	0.43***
Contrast Time 2 and Violence Time 2	794	0.46***
Contrast Time 3 and Violence Time 3	754	0.39***

Note. Exhaustion at time 1 ($M = 16.00$, $SD = 13.65$), time 2 ($M = 14.40$, $SD = 13.10$), and time 3 ($M = 14.10$, $SD = 13.23$). Emotional distancing at time 1 ($M = 2.41$, $SD = 3.34$), time 2 ($M = 1.74$, $SD = 2.71$), and time 3 ($M = 1.76$, $SD = 2.82$). Fed up at time 1 ($M = 4.16$, $SD = 6.02$), time 2 ($M = 2.88$, $SD = 4.73$), and time 3 ($M = 2.97$, $SD = 5.00$). Contrast at time 1 ($M = 6.89$, $SD = 8.02$), time 2 ($M = 5.95$, $SD = 7.26$), and time 3 ($M = 6.02$, $SD = 7.48$). Violence at time 1 ($M = 1.48$, $SD = 1.98$), time 2 ($M = 0.96$, $SD = 1.26$), and time 3 ($M = 0.89$, $SD = 1.42$). *$p < .05$, **$p < .01$, ***$p < .001$.

Multivariate normality was assessed using Mardia's coefficient and showed to be (expectedly) violated (Model 1: for skewness: $\chi^2 = 7287$, $p < .001$; for kurtosis: $z = 137.11$, $p < .001$; Model 2: for skewness: $\chi^2 = 10{,}999$, $p < .001$; for kurtosis: $z = 167.18$, $p < .001$). Considering that the assumption was violated in both path models, we opted for a more robust method of estimation, using the Bollen-Stine bootstrapping method (H. Kim & Millsap, 2014; Kline, 2016; Thakkar, 2020).

Model 1 (controlling for gender, age of the parent, working status, and income) investigating the prospective links between PB symptoms (see Fig. 1) showed acceptable fit ($\chi^2(16) = 289.79$, $p < .001$; CFI = 0.98; TLI = 0.84; RMSEA = 0.11, 95 % CI = [0.14, 0.18], SRMR = 0.04). Autoregressive paths were all significant across time points, as well as some cross-lagged paths. Exhaustion at time 1 significantly predicted emotional distancing at time 2 ($\beta = 0.11$, $p = .03$), feeling fed up at time 2 ($\beta = 0.16$, $p < .001$) and contrast at time 2 ($\beta = 0.22$, $p < .001$). Moreover, feeling fed up at time 1 predicted emotional distancing at time 2 ($\beta = 0.20$, $p = .02$). Exhaustion at time 2 predicted contrast at time 3 ($\beta = 0.15$, $p = .004$). The remaining non-significant paths can be viewed in Supplementary Table 1. Covariances between PB symptoms, as expected, were all significant and had positive standardized estimates (see Supplementary Table 2).

Model 2 (controlling for gender, age of the parent, working status, and income) estimating the process of PB symptoms that lead to violence (see Fig. 2) showed acceptable fit: $\chi^2(25) = 332.71$, $p < .001$; CFI = 0.98; TLI = 0.86; RMSEA = 0.09, 95 % CI = [0.08, 0.10], SRMR = 0.03. Autoregressive paths were all significant, and many cross-lagged paths were significant as well. Exhaustion at time 1 significantly predicted emotional distancing at time 2 ($\beta = 0.10$, $p = .04$), feeling fed up at time 2 ($\beta = 0.15$, $p < .001$), and contrast at time 2 ($\beta = 0.21$, $p < .001$). Feeling fed up at time 1 predicted emotional distancing at time 2 ($\beta = 0.19$, $p = .02$). Emotional distancing ($\beta = 0.16$, $p = .02$) and feeling fed up at time 2 ($\beta = 0.20$, $p = .02$) predicted violence at time 3. Exhaustion at time 2 predicted contrast at time 3 ($\beta = 0.15$, $p = .004$). The remaining paths were non-significant and can be viewed in Supplementary Table 3. Covariances between PB symptoms, and between PB symptoms and violence were all significant and had positive standardized estimates (see Supplementary Table 4).

Discussion

The current study aimed to answer two important questions in the

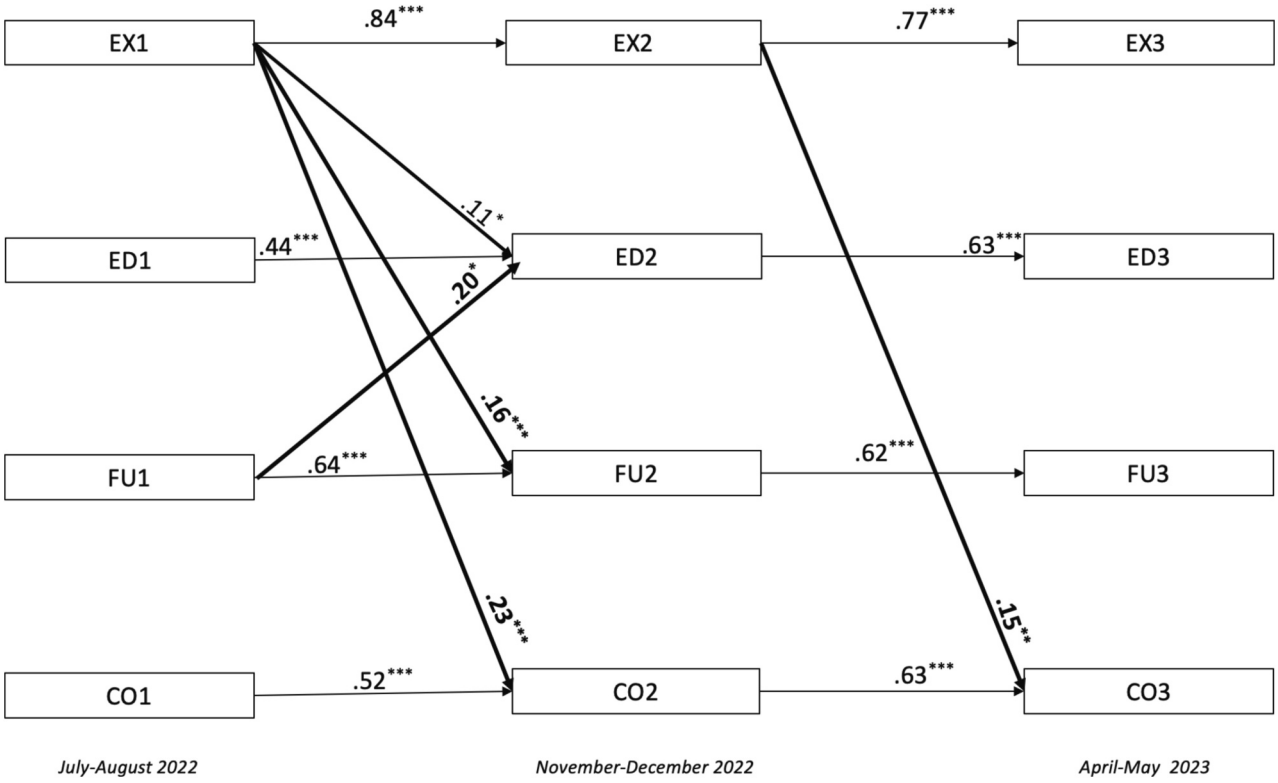


Fig. 1. Cross-Lag Model 1 for prospective links of parental burnout symptoms.
Note. EX = Exhaustion; ED = Emotional distancing; FU = Feeling fed up; CO = Contrast with the previous self; 1, 2, 3 = Time 1, Time 2, Time 3. Significant paths are in black and their standardized coefficients are marked in bold with asterisks (*$p < .05$, **$p < .01$, ***$p < .001$). Non-significant paths and covariances can be viewed in Supplementary Table 1 and Supplementary Table 2 respectively. The model was estimated controlling for auxiliary variables, such as gender, age, working status, and income.

process of PB and its consequences. Each one will be discussed in this section. The first aim was to understand whether PB's processual nature replicates when using the PBA as a measure. The results of the current study both replicate past research and give new insight into the PB process. It replicates past results by showing that exhaustion seems to be the entry point in PB (Kalkan et al., 2022; Le Vigouroux et al., 2022; Roskam & Mikolajczak, 2021), and that indeed exhaustion at time 1 predicts emotional distancing at time 2 (Roskam & Mikolajczak, 2021). Not only does the effect *significance* replicate, but the effect *size* also replicates (in Roskam & Mikolajczak's, 2021; study 1: $\beta = 0.10$, $p = .003$; in their study 2: $\beta = 0.13$, $p = .015$; in the current study: $\beta = 0.10$, $p = .06$), emphasizing the robustness of the results across measures. Although these results suggest that the aforementioned links are conceptually replicated, attention should be given to the current results that indicate that exhaustion seems to be the entry point to the spiral of PB, being prospectively associated with an increase in all PB symptoms, and not just emotional distancing. It is also interesting to note that exhaustion seems to be particularly influential with contrast with the previous parental self, as shown by the highest standardized estimate. This, however, is not surprising: an exhausted parent might be more likely to notice that they are not as they once were, compared to emotionally distance from their offspring. More broadly, these results further emphasize that PB, like any other type of burnout, is a developmental process (Brunsting et al., 2022; Houkes et al., 2011; Roskam & Mikolajczak, 2021; Taris et al., 2005), and that the process of PB insidiously moves the problem from the parent (i.e., exhaustion) to the relationships surrounding the parent (i.e., emotional distancing).

The second aim was to understand how PB as a process is prospectively related to violence. The hypothesized mediating effect that exhaustion would be related to emotional distancing, which in turn would be linked to violence, is not the only effect that we observed. The relation between exhaustion and violence seems to also be mediated by a prospective increase in feeling fed up. Both findings suggest that maltreating behaviors in burnt out parents may happen in a processual manner, as PB symptoms further develop and set in. It is also interesting to note the small size of prospective paths from PB to violence. They should not be regarded as qualifying past results and even less as good news. PB symptoms share a lot of variance between them (since they have high intercorrelations) and it is therefore not surprising that the cross-lagged paths have small effect sizes (both in models with and without violence), because they represent the effects that are not comprised by the shared variance. Since it is the first time that the effect of each symptom in the presence of other symptoms is estimated, this should be kept in mind when interpreting the results. However, this does not undermine the important predictive nature of PB in child maltreatment, against other predictors (Schittek et al., 2023). Taken together, these results suggest that (i) there is a process in PB symptoms that is related violence, (ii) both emotional distancing and feeling fed up are prospective risk factors in violence towards children, and (iii) the symptom of feeling fed up seems to have the strongest predictive weight.

Beyond the foregoing contributions, the current findings hold important implications for both research and clinical practice. In regards to research, *first*, considering that focusing research on the symptoms of PB (and not just its global score) could allow to have more nuanced and clinically relevant results, cut-off scores for each symptom should be created (as it has been done for the global score of PB, see Brianda et al., 2023), allowing then to determine whether parents significantly exhibit each symptom or not. *Second*, knowing that PB starts with exhaustion, which is then associated to a cascade of symptoms, should prompt research to make sure that the current PB treatment specifically reduces exhaustion (Brianda et al., 2020). So far, this treatment was only tested using the composite score of PB, and not the sub-symptoms, which

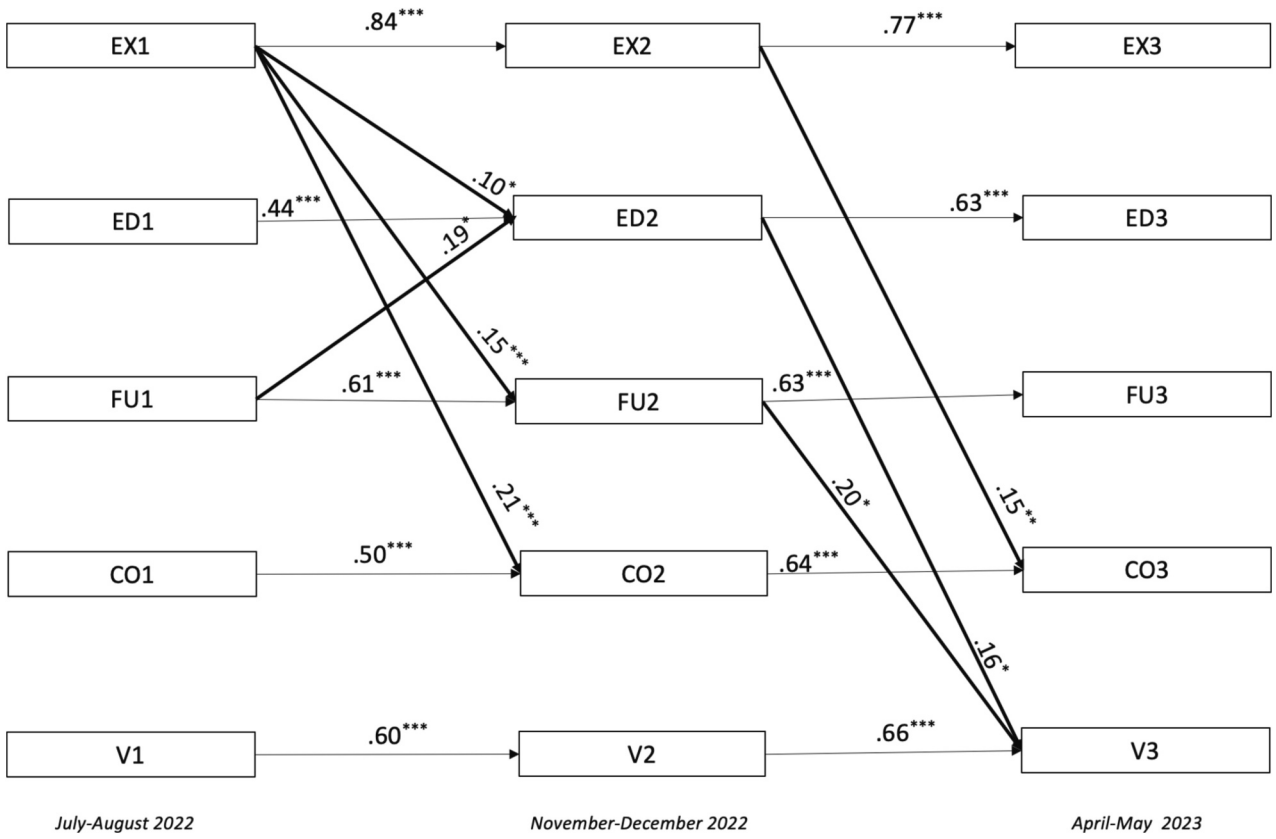


Fig. 2. Cross-Lag Model 2 investigating the process in parental burnout symptoms that lead to violence.
Note. EX = Exhaustion; ED = Emotional distancing; FU = Feeling fed up; CO = Contrast with the previous self; V = Violence towards the offspring; 1, 2, 3 = Time 1, Time 2, Time 3. Significant paths are in black and their standardized coefficients are marked in bold with asterisks (*$p < .05$, **$p < .01$, ***$p < .001$). Non-significant path estimates and covariances can be viewed in Supplementary Table 3 and Supplementary Table 4 respectively. The model was estimated controlling for auxiliary variables, such as gender, age, working status, and income.

precludes from safely assuming that it significantly impacts the symptoms. If this should not prove fruitful, the reduction of exhaustion should be tested through relaxation techniques, which have shown to greatly reduce exhaustion in job burnout ($d = 0.51$; for a meta-analysis, see Maricuţoiu et al., 2016). *Third*, researchers should also start to consider feeling fed up as central in both the development of PB and as a risk factor in violence. Relatedly, the present findings nuance those of Hansotte et al. (2020) that suggested that violence would only kick-in when parents distance themselves from their children and rather advise clinicians to remain alert to potential maltreating behaviors when parents mention *feeling fed up* as well. *Fourth*, PB literature majorly focuses on observed-variable cross-lagged models, as does the present manuscript. This adds measurement error that could impact results. Future research should try to collect enough data to allow latent-variable models to be tested. *Fifth,* the fact that some paths present between Time 1 and Time 2 do not replicate between Time 2 and Time 3 could indicate that: (i) the major drop-out between Time 2 and Time 3 has precluded from detecting effects that were present between the two first measurement points; (ii) the non-normal distribution of both PB and violence could have had an effect on the estimation of parameters and standard errors, and thus on *p*-values, even though FIML is one of the most robust methods against non-normality; (iii) the mis-matched variability between PB symptoms and violence (the latter showing less variability compared to the former) could have reduced test-statistics, thus resulting in higher *p*-values. Taking these points into account, future research in PB should be alert to the effects of drop-outs, non-normality, and variability when designing studies and interpreting results. In regard to *clinical* work, knowing that exhaustion is the entry point to PB's slippery slope, clinicians should be alert to (i) parents mentioning exhaustion as the sign to treat for PB immediately, and (ii) to be alert to child maltreatment when the parent mentions feeling emotionally distant from their offspring, or even feeling fed up.

More broadly, the current results impact fields other than psychology. First, for *neuroscience,* our findings underly the importance of understanding the brain changes that could explain the link between PB symptoms and violence (e.g., Heatherton & Wagner, 2011; Siever, 2008). Second, for *developmental psychology*, it would be fruitful to test the potential mediating effect of PB symptoms, between known maltreatment risk factors and violence (for systematic reviews and meta-analyses, see Milner et al., 2022; Stith et al., 2009; White et al., 2015). Third, for social work, researchers should try to find the most useful ways to help families that experience child violence, specifically in the case of PB symptoms.

Limitations of the current study should also be considered when interpreting results. *First*, the sample is WEIRD (White, Educated, Industrialized, Rich, Democratic) and European, which precludes to generalize results to other samples and other cultures. In fact, it is probable that PB can manifest and develop differently in less fortunate families, and in other cultures. For the latter, some preliminary studies have shown that not all symptoms in the PBA converge in some parts of the world (e.g., emotional distancing showing low consistency in Persian, Basque and African samples, see Mousavi et al., 2020; Sarrionandia & Aliri, 2021; Sodi et al., 2020). Being careful in generalizing results is also suggested by the high standard errors observed in the cross-lagged paths. This means that the observed links in the sample might not represent the population, thus precluding generalization of results. To make sure that the results are robust, there's a need to replicate the current findings in different samples. *Second*, results should not be

generalized across genders as the sample is composed of twice as many mothers than fathers. Considering that parenthood is very gender-typed, and that PB seems to have different consequences in fathers and mothers (Roskam & Mikolajczak, 2020), the current cross-lagged models should also be replicated in more gender-equal samples. Additionally, knowing that PB in fathers seems to increase more neglect-type behaviors, whereas in mothers it seems to increase more violence (Roskam & Mikolajczak, 2020), it would be fruitful to understand whether gender moderates the prospective relations between PB symptoms and violence and neglect, thus providing more nuance. *Third*, violence towards children is a difficult construct to measure considering its legal implications, as well as its self-report nature adding potential informant bias in the current study. Thus, it is possible that parents under-reported potential violent behaviors, potentially adding bias in interpreting results. Longer questionnaires or other measures of violence (not self-report) should be considered for future research. *Fourth,* violence was measured using three items that each assess different types of violence. This approach makes it difficult to test the reliability of the overall violence measure, adding potential bias in the results. Future research should aim to replicate these findings using more robust measures of violence that allow for proper reliability testing. *Fifth*, the path models were estimated using observed variables rather than latent ones, which means that measurement error is not accounted for. Future studies should replicate the current findings using latent models.

In conclusion, the take-home message of the current study is two-fold: (i) PB is a developmental process that starts with exhaustion, no matter the measurement used; (ii) there is a process that links PB symptoms to violence: exhaustion being the starting point that catalyzes emotional distancing and feeling fed up, both predicting more prospective violence.

Ethical approval

The current study was approved by the ethical committee of Cliniques Universitaires Saint-Luc (Belgium) and follows the principles of the Declaration of Helsinki.

Funding

A.S. is a FRESH grantee of the Fonds de la Recherche Scientifique – FNRS. This fund did not exert any influence or censorship on the present work.

CRediT authorship contribution statement

Alice Schittek: Writing – original draft, Formal analysis, Conceptualization. **Isabelle Roskam:** Writing – review & editing, Methodology, Investigation, Conceptualization. **Moïra Mikolajczak:** Writing – review & editing, Methodology, Investigation, Conceptualization.

Declaration of competing interest

The authors declare that there were no conflicts of interest with respect to the authorship or the publication of this article.

Data availability

Pre-registration and data have been made available on Open Science Framework. The links to both have been inserted in the manuscript

Appendix A. Supplementary data

Supplemental materials can be viewed at https://osf.io/z39wy/?view_only=c6be8b517e4b45a5903206c15977cb44.

References

Abraham, E., Hendler, T., Shapira-Lichter, I., Kanat-Maymon, Y., Zagoory-Sharon, O., & Feldman, R. (2014). Father's brain is sensitive to childcare experiences. *Proceedings of the National Academy of Sciences, 111*(27), 9792–9797. https://doi.org/10.1073/pnas.1402569111

Aunola, K., Sorkkila, M., Tolvanen, A., Tassoul, A., Mikolajczak, M., & Roskam, I. (2021). Development and validation of the brief parental burnout scale (BPBS). *Psychological Assessment, 33*(11), 1125–1137. https://doi.org/10.1037/pas0001064

Bennett, D. A. (2009). How can I deal with missing data in my study? *Australian and New Zealand Journal of Public Health, 25*(5), 464–469. https://doi.org/10.1111/j.1467-842X.2001.tb00294.x

Blanchard, M. A., Roskam, I., Mikolajczak, M., & Heeren, A. (2021). A network approach to parental burnout. *Child Abuse & Neglect, 111*, Article 104826. https://doi.org/10.1016/j.chiabu.2020.104826

Brianda, M. E., Mikolajczak, M., Bader, M., Bon, S., Déprez, A., Favez, N., … Roskam, I. (2023). Optimizing the assessment of parental burnout: A multi-informant and multimethod approach to determine cutoffs for the parental burnout inventory and the parental burnout assessment. *Assessment*. https://doi.org/10.1177/10731911221141873, 10731911221141873.

Brianda, M. E., Roskam, I., Gross, J. J., Franssen, A., Kapala, F., Gérard, F., & Mikolajczak, M. (2020). Treating parental burnout: Impact of two treatment modalities on burnout symptoms, emotions, hair cortisol, and parental neglect and violence. *Psychotherapy and Psychosomatics, 89*(5), 330–332. https://doi.org/10.1159/000506354

Brunsting, N. C., Bettini, E., Rock, M. L., Royer, D. J., Common, E. A., Lane, K. L., … Zeng, F. (2022). Burnout of special educators serving students with emotional-behavioral disorders: A longitudinal study. *Remedial and Special Education, 43*(3), 160–171. https://doi.org/10.1177/07419325211030562

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*(3), 297–334. https://doi.org/10.1007/BF02310555

Enders, C. K. (2008). A Note on the Use of Missing Auxiliary Variables in Full Information Maximum Likelihood-Based Structural Equation Models. *Structural Equation Modeling: A Multidisciplinary Journal, 15*(3), 434–448.

Hansotte, L., Nguyen, N., Roskam, I., Stinglhamber, F., & Mikolajczak, M. (2020). Are all burned out parents neglectful and violent? A latent profile analysis. *Journal of Child and Family Studies, 1–11*. https://doi.org/10.1007/s10826-020-01850-x

Heatherton, T. F., & Wagner, D. D. (2011). Cognitive neuroscience of self-regulation failure. *Trends in Cognitive Sciences, 15*(3), 132–139. https://doi.org/10.1016/j.tics.2010.12.005

Houkes, I., Winants, Y., Twellaar, M., & Verdonk, P. (2011). Development of burnout over time and the causal order of the three dimensions of burnout among male and female GPs. A three-wave panel study. *BMC Public Health, 11*(1), 240. https://doi.org/10.1186/1471-2458-11-240

Jackson, D. L. (2003). Revisiting sample size and number of parameter estimates: Some support for the N:Q hypothesis. *Structural Equation Modeling: A Multidisciplinary Journal, 10*(1), 128–141. https://doi.org/10.1207/S15328007SEM1001_6

Kalkan, R. B., Blanchard, M. A., Mikolajczak, M., Roskam, I., & Heeren, A. (2022). Emotional exhaustion and feeling fed up as the driving forces of parental burnout and its consequences on children: Insights from a network approach. *Current Psychology*. https://doi.org/10.1007/s12144-022-03311-8

Kenny, D. A., Kaniskan, B., & McCoach, D. B. (2015). The performance of RMSEA in models with small degrees of freedom. *Sociological Methods & Research, 44*(3), 486–507. https://doi.org/10.1177/0049124114543236

Kim, H., & Millsap, R. (2014). Using the Bollen-Stine bootstrapping method for evaluating approximate fit indices. *Multivariate Behavioral Research, 49*(6), 581–596. https://doi.org/10.1080/00273171.2014.947352

Kim, P. (2021). How stress can influence brain adaptations to motherhood. *Frontiers in Neuroendocrinology, 60*(January 2021). https://www.sciencedirect.com/science/article/pii/S0091302220300662?casa_token=ziNOpmUgdkQAAAAA:fR_VF-WYgYH40bxRcAFrrDhQCXJEsSAYmg5wr_XTehJgiI8XoY9ZbFA_On_nbZPqo2x-gTPEKw.

Kline, R. B. (2016). *Principles and practice of structural equation modeling* (4th ed.). Guilford Press (pp. xvii, 534).

Korkmaz, S., Goksuluk, D., & Zararsiz, G. (2014). MVN: An R package for assessing multivariate normality. *The R Journal, 6*(2), 151–162.

Korkmaz, S., Goksuluk, D., & Zararsiz, G. (2024). *MVN: Multivariate normality tests*.

Kuersten-Hogan, R., & McHale, J. P. (2021). The transition to parenthood: A theoretical and empirical overview. In R. Kuersten-Hogan, & J. P. McHale (Eds.), *Prenatal family dynamics: Couple and Coparenting relationships during and Postpregnancy* (pp. 3–21). Springer International Publishing. https://doi.org/10.1007/978-3-030-51988-9_1.

Le Vigouroux, S., Charbonnier, E., & Scola, C. (2022). Profiles and age-related differences in the expression of the three parental burnout dimensions. *European Journal of Developmental Psychology, 19*(6), 885–904. https://doi.org/10.1080/17405629.2021.1990749

Manrique-Millones, D., Vasin, G. M., Dominguez-Lara, S., Millones-Rivalles, R., Ricci, R. T., Abregu Rey, M., … Roskam, I. (2022). Parental burnout assessment (PBA) in different Hispanic countries: An exploratory structural equation modeling approach. *Frontiers in Psychology, 13*. https://doi.org/10.3389/fpsyg.2022.827014

Maricuţoiu, L. P., Sava, F. A., & Butta, O. (2016). The effectiveness of controlled interventions on employees' burnout: A meta-analysis. *Journal of Occupational and Organizational Psychology, 89*(1), 1–27. https://doi.org/10.1111/joop.12099

McDonald, R. P. (1999). *Test theory: A unified treatment* (pp. xi, 485). Lawrence Erlbaum Associates Publishers.

Mikolajczak, M., Aunola, K., Sorkkila, M., & Roskam, I. (2023). 15 years of parental burnout research: Systematic review and agenda. *Current Directions in Psychological Science, 32*(4), 276–283.

Mikolajczak, M., Brianda, M. E., Avalosse, H., & Roskam, I. (2018). Consequences of parental burnout: Its specific effect on child neglect and violence. *Child Abuse and Neglect, 80*, 134–145. https://doi.org/10.1016/j.chiabu.2018.03.025

Mikolajczak, M., Gross, J. J., & Roskam, I. (2019). Parental burnout: What is it, and why does it matter? *Clinical Psychological Science, 7*(6), 1319–1329. https://doi.org/10.1177/2167702619858430

Mikolajczak, M., Gross, J. J., Stinglhamber, F., Lindahl Norberg, A., & Roskam, I. (2020). Is parental burnout distinct from job burnout and depressive symptoms? *Clinical Psychological Science, 8*(4), 673–689. https://doi.org/10.1177/2167702620917447

Mikolajczak, M., & Roskam, I. (2018). A theoretical and clinical framework for parental burnout: The balance between risks and resources (BR2). *Frontiers in Psychology, 9* (886), 1–11. https://doi.org/10.3389/fpsyg.2018.00886

Milner, J. S., Crouch, J. L., McCarthy, R. J., Ammar, J., Dominguez-Martinez, R., Thomas, C. L., & Jensen, A. P. (2022). Child physical abuse risk factors: A systematic review and a meta-analysis. *Aggression and Violent Behavior, 66*, Article 101778. https://doi.org/10.1016/j.avb.2022.101778

Mousavi, S. F., Mikolajczak, M., & Roskam, I. (2020). Parental burnout in Iran: Psychometric properties of the Persian (Farsi) version of the parental burnout assessment (PBA). *New Directions for Child and Adolescent Development, 2020*(174), 85–100. https://doi.org/10.1002/cad.20369

Roskam, I., Aguiar, J., Akgun, E., Arikan, G., Artavia, M., Avalosse, H., … Mikolajczak, M. (2021). Parental burnout around the globe: A 42-country study. *Affective Science, 2*(1), 58–79. https://doi.org/10.1007/S42761-020-00028-4

Roskam, I., Brianda, M. E., & Mikolajczak, M. (2018). A step forward in the conceptualization and measurement of parental burnout: The parental burnout assessment (PBA). *Frontiers in Psychology, 1*(758), 1–12. https://doi.org/10.3389/fpsyg.2018.00758. www.frontiersin.org.

Roskam, I., & Mikolajczak, M. (2020). Gender differences in the nature, antecedents and consequences of parental burnout. *Sex Roles, 83*(7), 485–498. https://doi.org/10.1007/s11199-020-01121-5

Roskam, I., & Mikolajczak, M. (2021). The slippery slope of parental exhaustion: A process model of parental burnout. *Journal of Applied Developmental Psychology, 77*. https://doi.org/10.1016/J.APPDEV.2021.101354

Roskam, I., Raes, M.-E., & Mikolajczak, M. (2017). Exhausted parents: Development and preliminary validation of the parental burnout inventory. *Frontiers in Psychology, 8* (163), 1–12. https://doi.org/10.3389/fpsyg.2017.00163

Rosseel, Y. (2012). Lavaan: An R package for structural equation modeling. *Journal of Statistical Software, 48*(2). https://doi.org/10.18637/jss.v048.i02

RStudio Team. (2020). *RStudio: Integrated development for R. RStudio, PBC, Boston [computer software]*.

Sarrionandia, A., & Aliri, J. (2021). Initial validation of the Basque version of the parental burnout assessment (B-PBA). *Scandinavian Journal of Psychology, 62*(3), 348–354. https://doi.org/10.1111/sjop.12707

Schittek, A., Roskam, I., & Mikolajczak, M. (2023). Parental burnout and borderline personality stand out to predict child maltreatment. *Scientific Reports, 13*(1). https://doi.org/10.1038/s41598-023-39310-3. Article 1.

Siever, L. J. (2008). Neurobiology of aggression and violence. *American Journal of Psychiatry, 165*(4), 429–442. https://doi.org/10.1176/appi.ajp.2008.07111774

Sodi, T., Kpassagou, L. B., Hatta, O., Ndayizigiye, A., Ndayipfukamiye, J.-M., Tenkué, J. N., … Sezibera, V. (2020). Parenting and parental burnout in Africa. *New Directions for Child and Adolescent Development, 2020*(174), 101–117. https://doi.org/10.1002/cad.20386

Stith, S. M., Liu, T., Davies, L. C., Boykin, E. L., Alder, M. C., Harris, J. M., … Dees, J. E. M. E. G. (2009). Risk factors in child maltreatment: A meta-analytic review of the literature. *Aggression and Violent Behavior, 14*(1), 13–29. https://doi.org/10.1016/J.AVB.2006.03.006

Szczygieł, D., Sekulowicz, M., Kwiatkowski, P., Roskam, I., & Mikolajczak, M. (2020). Validation of the polish version of the parental burnout assessment (PBA). *New Directions for Child and Adolescent Development, 2020*(174), 137–158. https://doi.org/10.1002/cad.20385

Taris, T. W., Le Blanc, P. M., Schaufeli, W. B., & Schreurs, P. J. G. (2005). Are there causal relationships between the dimensions of the Maslach burnout inventory? A review and two longitudinal tests. *Work & Stress, 19*(3), 238–255. https://doi.org/10.1080/02678370500270453

Thakkar, J. J. (2020). *Structural equation modelling: Application for research and practice (with AMOS and R)* (Vol. 285). Springer. https://doi.org/10.1007/978-981-15-3793-6

The Jamovi Project. (2021). Jamovi (version 1.6). https://www.jamovi.org.

Tucker, L. R., & Lewis, C. (1973). A reliability coefficient for maximum likelihood factor analysis. *Psychometrika, 38*(1), 1–10.

White, O. G., Hindley, N., & Jones, D. P. (2015). Risk factors for child maltreatment recurrence: An updated systematic review. *Medicine, Science and the Law, 55*(4), 259–277. https://doi.org/10.1177/0025802414543855

Yang, Y., & Green, S. B. (2011). Coefficient alpha: A reliability coefficient for the 21st century? *Journal of Psychoeducational Assessment, 29*(4), 377–392. https://doi.org/10.1177/0734282911406668