Parental Burnout Around the Globe: A 42-Country Study

International Investigation of Parental Burnout (IIPB) Consortium*

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Abstract

High levels of stress in the parenting domain can lead to *parental burnout*, a condition that has severe consequences for both parents and children. It is not yet clear, however, whether parental burnout varies by culture, and if so, why it might do so. In this study, we examined the prevalence of parental burnout in 42 countries (17,409 parents; 71% mothers; M_{age} = 39.20) and showed that the prevalence of parental burnout varies dramatically across countries. Analyses of cultural values revealed that individualistic cultures, in particular, displayed a noticeably higher prevalence and mean level of parental burnout. Indeed, individualism plays a larger role in parental burnout than either economic inequalities across countries, or any other individual and family characteristic examined so far, including the number and age of children and the number of hours spent with them. These results suggest that cultural values in Western countries may put parents under heightened levels of stress.

Keywords: exhaustion, culture, individualism, collectivism, prevalence

1. Introduction

At all times and in all cultures, the majority of adults become parents. The experience is so mundane that, for centuries, parenthood was considered deserving of little comment. However, several major sociological changes over the past few decades (including, but not limited to, the International Child Convention, 1989, and increased state regulation (Daly, 2007)) have profoundly changed parenting, leading to increased parental involvement, more intensive parenting, and child overprotection and optimization (Bristow, 2014; Craig et al., 2014). It is in this zeitgeist that the notion of parental burnout has emerged – a condition characterized by intense exhaustion related to parenting, emotional distancing from one's children, a loss of pleasure and efficacy in one's parental role, and a contrast between previous and current parental self (Mikolajczak et al., 2019).

Recent work suggests that parental burnout can be very damaging. As regards the parents themselves, parental burnout can give rise to suicidal and escape ideations (Mikolajczak et al., 2019), which are much more frequent in parental burnout than in job burnout or even depression (Mikolajczak et al., 2020). This finding is not surprising considering that one cannot resign from one's parenting role or be put on sick leave from one's children. In addition to increasing the desire to physically escape from the parenting situation, parental burnout is also related to psychological forms of escape such as alcohol use (Mikolajczak et al., 2018). At the biological level, parental burnout causes a dysregulation in the hypothalamic-pituitary-adrenal (HPA) axis (Brianda, Roskam, & Mikolajczak, 2020), which is most likely causally involved in the somatic complaints and sleep disorders reported by burned out parents (Sarrionandia-Pena, 2019) and potentially also in the increase in child-directed violence (Martorell & Bugental, 2006; Moons et al., 2010). Indeed, in addition to affecting the parents themselves, parental burnout has serious repercussions on children by

leading previously good parents (Chen et al., 2019) to become neglectful or even violent towards their offspring (Mikolajczak et al., 2018). All these effects are causal because when parental burnout is treated via a targeted psychological intervention, suicidal and escape ideations and parental violence and neglect decrease proportionally to the decrease in parental burnout, and HPA axis activity normalizes (Brianda, Roskam, Gross, et al., 2020).

What makes parental burnout a worrying condition is not only the gravity of its consequences but also its prevalence. Life-long prevalence data are not available, but studies conducted in European and Anglo-Saxon countries (Belgium, France, England, US) have shown that an alarming number of parents have parental burnout. Conservative point prevalence estimates (Roskam et al., 2018) suggest that at least 5% of parents have burnout. However, in the absence of cross-cultural studies including non-Western countries, it is unclear whether this pattern is also evident in the rest of the world. Given that parenting norms and practices dramatically vary across cultures (Bornstein, 2013), it seems plausible that the prevalence of parental burnout would also vary substantially across the globe.

Preliminary studies conducted on parental burnout in various parts of the world (i.e., Belgium, France, The Netherlands, UK, Sweden, Japan) suggest important variation in parental burnout prevalence (with prevalence varying between 1 and 30%, see e.g. Kawamoto et al., 2018; Lindhal-Norberg, 2007; Lindhal-Norberg et al., 2014; Lindstrom et al., 2010; Roskam et al., 2018; Roskam et al., 2017; Sánchez-Rodríguez et al., 2019; Van Bakel et al., 2018). Yet, this variation in prevalence is admittedly difficult to interpret due to variation in the instruments used to measure parental burnout, the varying cutoff scores adopted, and the different target populations (e.g., community samples versus parents with severely ill children). It therefore remains unclear (i) whether the prevalence of parental burnout varies across the globe and, if so (ii) whether culture helps to explain these differences in parental

burnout. Based on the literature, we expected that the prevalence of parental burnout would vary across countries, and that culture would help to explain this variation.

To address these questions, we assessed parents from 42 countries using the same instrument. Countries were selected to be geographically distributed across the five continents and to differ on economic and cultural indicators (Forum., 2018; Hofstede, 2001; Programme, 2018) (see Table 1). To answer question (i), we examined the prevalence and the mean level of parental burnout in each country. To address question (ii), we tested the association between parental burnout and Hofstede's six cultural values (Hofstede, 2001) (i.e. Power Distance, Individualism, Masculinity, Uncertainty Avoidance, Long Term Orientation, and Indulgence) as the most widely used indicators of cross-cultural differences (Bleidorn et al., 2016; Taras et al., 2010). Given that the parents came from culturally, economically, and geographically diverse settings, we controlled for a large set of sociodemographic characteristics (age, sex, educational level, number of biological children and children in the household, age of the youngest and the oldest child, hours spent with children per day, number of women and men living in the household and caring for the children on a daily basis, working status, years spent in the country, ethnicity, family types, and neighborhood profile).

2. Methods

2.1. Participants

A total of 17,409 parents (12,364 mothers and 5,045 fathers) from 42 countries participated in the study. Data collection started in January 2018 and ended in November 2019 in 40 countries. The two last countries, i.e. Burundi and Egypt, collected the data in February and March 2020. Note that all the data collection took place before the lock down periods caused by the Covid-19 pandemic in all the countries involved. The recruitment

procedure (e.g., newspaper advertisement, word of mouth, social networks, door-to-door) and the presentation of the survey (i.e., paper and pencil, or online) varied from country to country according to local practices. A summary of the data collection procedures in each country is provided in Table 2. Table 3 presents the sociodemographic characteristics of respondents in each country. In order to avoid (self-) selection bias, participants were not informed that the study was about parental burnout. Instead, it was presented as a study of designed to better understand parental satisfaction and exhaustion around the world. Parents were eligible to participate only if they had (at least) one child, regardless of their age, still living at home.

2.2. Procedure

The data were collected through the International Investigation of Parental Burnout (IIPB) Consortium. The IIPB Consortium was set up by the first and last authors of the study (I.R. and M.M.) in 2017. The authors aimed to include in the consortium as many countries as possible that differed from each other in terms of their geographical position, cultural values, and socio-economic level. Thus, in a first step, based on the foregoing criteria, the authors contacted a number of collaborators to invite them to participate in the project. Twenty-two countries, including Belgium as the coordinating country, joined the consortium through this process (Australia, Brazil, Cameroun, Chile, Costa Rica, Cuba, France, Italy, Lebanon, Peru, Poland, Portugal, Romania, Rwanda, Spain, Switzerland, The Netherlands, Togo, UK, USA, and Vietnam). In a second step, the first author contacted well-known experts in parenting in order to supplement this initial pool and to increase the diversity of cultural values. Eight more countries were recruited through this process (Algeria, Canada, China, Finland, Germany, Japan, South Korea, and Sweden). In the last step, to further extend the number of countries included in the study, when an author from a non-participating country wrote to I.R. or M.M. to inquire about parental burnout (e.g., about the Parental Burnout Assessment-PBA, (Roskam et al., 2018)), they invited him/her to join the consortium. Twenty more countries

were invited to join the consortium through that means (Argentina, Austria, Burundi, Colombia, Congo, Ecuador, Egypt, Greece, Iran, Israel, Mexico, Morocco, Norway, Pakistan, Russia, Serbia, Singapore, South Korea, Thailand, and Uruguay).

Countries that expressed interest received a "Call for participation" explaining the background and aims of the study, the larger goals of the IIPB Consortium, the commitments of the IIPB members and coordinators, and the deadlines that would need to be met for translating the instrument, obtaining ethical approval, and collecting the data. Then, countries that confirmed their wish to join the consortium (i.e., 46 countries out of the 50 countries who received the call; Congo, Israel, Norway, and Singapore did not confirm their participation) received the English and French versions of the study protocol. This protocol included the informed consent, demographic questions, and a few questionnaires (see Measures section below) measuring the variables of interest in this study. Countries were free to add other measures at the end of the study protocol if they wish. In the end, 42 countries out of the 46 completed the data collection. Researchers from Greece, Mexico, Morocco, and South Korea withdrew from the consortium due to unforeseen personal or professional circumstances.

Non-English speaking or non-French speaking countries first translated (and back-translated) the study protocol. The "Call for participation" recommended following the WHO standards for the process of translation and adaptation of instruments (http://www.who.int/substance_abuse/research_tools/translation/en/). Translation and back-translations were made once for each of the 21 different languages, i.e. Arabic, Basque, Chinese, Dutch, English , Finnish , French, German, Japanese, Persian, Polish, Portuguese, Romanian, Russian, Serbian, Spanish, Swedish, Thai, Turkey, Urdu, and Vietnamese. All countries submitted the study to the local Ethics committee for approval except where ethics approval was not mandatory (see Table 2), and started the recruitment once the study was approved. As shown in Table 2, the recruitment mode varied according to local practices: the

study was completed online in 19 countries, mostly online in 7 countries, exclusively on paper and pencil in 11 countries, mostly on paper and pencil in 2 countries, and a mix of both in 3 countries. The majority of the countries in which the study was conducted fully online included three attentional check questions to enable researchers to identify people who did not respond seriously to the study. These questions were randomly inserted in the survey and the instruction had the same length as the other items. They required participants to select, for instance, “every day” for that particular question. Participants who failed to select the right answer to the three attentional check questions were removed.

2.3. Measures

We measured the socio-demographic characteristics of the parents. While reporting sex, age, or number of years in the country seemed very simple, asking about household/family composition, occupational status, or ethnicity in a cross-cultural study involving very diverse countries was much more difficult. In order to formulate the best items, we used a twofold strategy. First, we discussed with several consortium members to approve this specific part of the IIPB protocol to ensure that the questions captured the socio-demographic characteristics of respondents in a way that was valid in all countries. For example, working status was assessed by the notion of "paid professional activity," because the meaning of "work" (i.e., what is considered a professional activity) varies considerably across cultures. Since we wanted to focus on work as a source of financial support for the family (i.e., the breadwinner function), we referred to the notion of "paid work activity" rather than simply "work". Next, we consulted the literature. For example, the way we measured ethnicity drew on previous research, particularly that of Jacobs et al. (2009).

Beyond demographic measures, the common protocol included several measures designed to address different research questions and goals (e.g., comparing the prevalence of parental burnout across countries; investigating the relations between parental burnout and

perceived-ideal parental self-discrepancies; examining the contribution of different parental duties to parental burnout). Because these questions are too diverse to be addressed in the same article, we describe below only the measures used in the current paper. The full protocol is available on Open Science Framework (OSF) at https://osf.io/94w7u/?view_only=a6cf12803887476cb5e7f17cfb8b5ca2.

Demographic questions. Participants were first asked about their sex [*Are you a father/a mother?*]; age [*How old are you? (in years; e.g. 45; just write the number)*]; educational level [*What is your level of education? (number of successfully completed school years from the age of 6; e.g. 5; just write the number)*]; number of biological children [*How many biological children do you have? (e.g. 2; just write the number)*], number of children living in the household [*How many children live in your household (your biological children and / or children of your partner in case of a step-family and / or children of relatives in case of a multigenerational family and / or children of your spouse's other partners in case of polygamy)? (e.g. 5; just write the number)*]; age of the youngest child [*How old is the youngest? (in years; e.g. 15; just write the number; if the child is less than 12-month-old, write 0)*]; age of the oldest child [*How old is the oldest? (in years; e.g. 15; just write the number; if the child is less than 12-month-old, write 0)*]; number of hours spent with children per day [*On average, how many hours a day do you spend with your child(ren) (without taking the night into account)? (in hours; e.g. 5; just write the number)*]; number of women living in the household/direct entourage and caring for the children on a daily basis [*How many women (e.g. co-wife, grandmother, servant, etc.) live in your household / direct entourage and care for the children on a daily basis (including yourself if you are a woman)? (e.g. 3; just write the number)*]; number of men living in the household/direct entourage and caring for the children on a daily basis [*How many men (e.g. grandfather, uncles, etc.) live in your household / direct entourage and care for the children on a daily basis (including*

yourself if you are a man)? (e.g. 3; just write the number)]; working status [*Do you have a paid professional activity? Yes/No*]; years spent in the country [*How long have you lived in this country? (in years; e.g. 25; just write the number)*]; ethnicity [*Are you born in your current country of residence? Yes/No; Are your parents born in your current country of residence? Both my mother and my father are born in my current country of residence/Either my mother or my father is born in my country of residence/Neither my mother nor my father are born in my country of residence*]; family type [*What type is your family? Two-parent (you are raising your children with a partner who is the parent of the children)/Single parent (you are raising your children alone)/Step-family (you are raising your children with a partner who is not necessarily the parent of the children and who may have children from another union, whether living in your household or not)/Homo-parental (you are raising your children with a same-sex parent)/Multigenerational (parents, grandparents, uncles or aunts and their children are living together)/Polygamous (multiple partners with children in the same household)/Other*]; and neighborhood profile [*In what kind of neighborhood is your home? In a relatively disadvantaged neighborhood/In an average neighborhood/In a relatively prosperous neighborhood*].

Parental burnout. Parental burnout was assessed with the Parental Burnout Assessment (PBA (Roskam et al., 2018)), a 23-item questionnaire assessing the four core symptoms of parental burnout: Emotional exhaustion (9 items) (e.g., *I feel completely run down by my role as a parent*), Contrast with previous parental self (6 items) (e.g., *I tell myself I'm no longer the parent I used to be*), Loss of pleasure in one's parental role (5 items) (e.g., *I don't enjoy being with my children*), and Emotional distancing from one's children (3 items) (e.g., *I am no longer able to show my children that I love them*) using a 7-point frequency scale from 0 to 6 (never, a few times a year, once a month or less, a few times a month, once a week, a few times a week, every day). The parental burnout score is computed by summing

the item scores: higher scores reflect higher parental burnout levels. The internal consistency (Cronbach's alpha) of the scale in each country figures in Table 1 (range: .85 to .97).

Cultural values. Cultural values were assessed by the six dimensions identified by Hofstede (Bleidorn et al., 2016; Hofstede, 2001; Taras et al., 2010). Cultural value scores range between 0 and 100 (retrieved from https://www.hofstede-insights.com/product/compare-countries/). *Power Distance* expresses the degree to which less powerful members of a society accept and expect that power is distributed unequally. In the present sample, power distance scores ranged between 11 (Austria) and 93 (Russia). *Individualism* describes a preference for a loosely knit social framework in which individuals are expected to take care of only themselves and their immediate families (as opposed to Collectivism, which describes a preference for a tightly knit framework in society in which individuals are integrated into strong, cohesive in-groups). In the present sample, Individualism scores ranged between 8 (Ecuador) and 90 (Australia). *Masculinity* describes a preference in society for achievement, heroism, assertiveness, and material rewards for success (as opposed to Femininity, which refers to a preference for cooperation, modesty, caring for the weak, and quality of life). In the present sample, Masculinity scores ranged between 5 (Sweden) and 95 (Japan). *Uncertainty Avoidance* describes the degree to which the members of a society feel uncomfortable with uncertainty and ambiguity. In the present sample, Uncertainty Avoidance scores ranged between 29 (Sweden) and 99 (Uruguay). *Long Term Orientation* relates to how a society deals with the challenges of the present and the future. In the present sample, Long Term Orientation scores ranged between 7 (Egypt) and 87 (China). *Indulgence* describes a society that allows relatively free gratification of basic and natural human drives related to enjoying life and having fun. In the present sample, Indulgence scores ranged between 0 (Pakistan) and 83 (Colombia).

2.4. Statistical Analyses

Before merging samples, we conducted a number of checks on the individual database of each country. In concrete terms, when we received a database, we first checked whether people responded seriously: participants who failed to select the right answer to the three attentional check questions (see section "Procedure") were removed from the database. We then searched for the presence of outliers. For instance, the level of education [i.e., number of successfully completed school years from the age of 6] cannot be higher than the participant's age minus 6; the number of hours spent with children per day cannot be greater than 24; the number of years spent in the country cannot be greater than the age of the parent, etc. Outlier values were removed. Then, missing data (identified as 99 or 999 in some countries) were all set to "system missing". Finally, in order to avoid mixing apples and oranges, we ensured that all variables were coded according to the grid provided by the consortium coordinator (I.R.). For instance, the PBA had to be coded from 0 to 6 and not from 1 to 7. Sex had to be coded 1 for fathers and 2 for mothers. Family types had to be coded the same way even if some family types were removed in some countries (see Measures section). We made the corrections when necessary.

After proceeding to these preliminary checks, we performed the statistical analyses. All syntax is available on OSF at https://osf.io/94w7u/?view_only=a6cf12803887476cb5e7f17cfb8b5ca2.

We first examined the internal consistency of the PBA in each country separately via Cronbach's Alpha coefficients. One country had a very low internal consistency coefficient (.29), which led us suspect a problem with the data, especially as all other countries had internal consistencies above .85 (which is well above the widely used threshold of .70). The authors of the country in question asked us to disregard this database, and put another person in charge of the data collection. We received a new database from this country six months later. The reliability of the PBA was .88, suggesting that this database was indeed more

reliable and could be merged with the others. After ensuring that all variables were encoded in the exact same way and that they were in the exact same order in all the databases, we merged the data from all countries.

Next, we tested the first-order four-factor model and the higher order factor structure of the PBA on the pooled sample, in the mothers' and the fathers' subsamples, and in each of the 21 languages, through Confirmatory Factor Analyses (CFA) using Structural Equation Modelling Lisrel software. Skewness and kurtosis values indicated that several items displayed deviations from normality. Conceptually, these deviations from normality make sense: like most mental health indicators, burnout is expected to present an asymmetric distribution (i.e., to be positively skewed). The estimation method used was diagonally weighted least squares (DWLS) with asymptotic covariance and polychoric correlation matrices. We then tested the factorial invariance (including metric and scalar invariance) of the PBA across sex and languages. We used several goodness-of-fit indices to determine the acceptability of the models: Satorra-Bentler scaled chi-square statistics (S-Bχ^2; Satorra & Bentler, 1994), the root mean square error of approximation (RMSEA), the standardized root mean square residual (SRMR), the comparative fit index (CFI), and the Tucker-Lewis index (TLI). For CFI and TLI, values close to 0.90 or greater are acceptable to good. RMSEA and SRMR should preferably be less than or equal to 0.08 (Hu & Bentler, 1999). For measurement invariance, we implemented a set of nested models with gradually increasing parameters and constraints using a stepwise multiple group confirmatory factor analysis or MG-CFA. In the first step, we tested the parental burnout model for configural invariance as the basic level of measurement invariance. In the second step, we assessed item factor loadings in a metric invariance model. In the third step, we tested scalar invariance with the intercepts set as equal across groups. Finally, we verified the invariance of measurement errors for a model in which all error variances were constrained to be equal across groups. For

measurement invariance, we reported change in S-Bχ^2 and we applied a criterion of a -.01 change in CFI, paired with a change in RMSEA of .015 (Cheung & Rensvold, 2002; Rutkowski & Svetina, 2014).

We examined the mean level and prevalence of parental burnout in each country. Comparing prevalence across countries requires a common cut-off score on the PBA. Since the choice of diagnostic thresholds is always debatable, we worked with two cut-off scores and we estimated parental burnout prevalence twice. The first cut-off score was based on the response scale: parents were judged to have parental burnout if their score was equal to or greater than 92 (i.e., if they experience *all* 23 parental burnout symptoms at least once a week or if they experience at least 16 symptoms daily). The second cut-off score was derived from the combination of several parental burnout indicators, based on a preregistered multi-method and multi-informant analysis strategy (i.e. self-reported measures (provided by participants), clinical judgments (completed by external judges based on a five-minute speech provided by participants on their parenting experience), and a biological measure of stress (the analysis of cortisol levels contained in participants' hair) : parents were judged to have parental burnout if their score was equal to or greater 86 (see https://osf.io/ujfb3 for more details about the analysis strategy). We then considered the most stringent cut-off, i.e. the most conservative prevalence scores, for subsequent analyses. The idea to use the most conservative prevalence values stems from our wish to avoid overdiagnosis of parental burnout.

Because country samples were unequal in size and in sex distribution, we then reassessed prevalence rates after controlling for these inequities. We dealt with sample size inequity by randomly selecting 200 parents in all samples with more than 299 subjects. To control for overrepresentation of mothers in the survey (and the related risk of overestimating the prevalence of parental burnout in countries where mothers report more burnout), we used a post-stratification weight by adding a value to each case in the data file which indicates how

much each case will count in the statistical procedure. The value was obtained by dividing the sex proportion in the general population (i.e. the sex distribution in the population is 50% females) by the sex distribution in each sample (e.g. in the Algerian sample, the sex distribution is 60% mothers). Thus, the weight value of .50/.60 = .83 was obtained for Algerian mothers and the corresponding weight obtained for fathers was .50/.40 = 1.25. The prevalence rates were then estimated using mothers' and fathers' weights in each country with the SVY procedure in Stata15.

We examined the Pearson-moment correlations between both the prevalence and mean level of parental burnout in each country and the six cultural values. We then performed Multilevel Random Coefficient Modelling Analyses in Stata 15. We first ran the unconditional model. After checking for the absence of multicollinearity, individual- and country-level variables were entered in three-steps. In step 1 (conditional model 1), we controlled for sociodemographic variables (age, sex, educational level, and type of neighborhood [disadvantaged, average, prosperous], working status [having or not a paid professional activity]; all of these being measured at the individual level). In step 2 (conditional model 2), we introduced variables influencing parental workload (number of children, family type [single parent, two parents, multigenerational], age of the youngest child, number of women taking care of the children on a daily basis, number of men taking care of the children on a daily basis, average number of hours spent with the child(ren) on a daily basis; all these variables being measured at the individual level). In step 3 (conditional model 3), we included the Growth National Product (database), 2019) (GNP) and the six cultural values (i.e. Power Distance, Individualism, Masculinity, Uncertainty Avoidance, Long Term Orientation, and Indulgence), all of these being obtained at the country level. The Multilevel Random Coefficient Modelling Analyses take into account that many covariates vary both within and between countries. Thus, the effect of all sociodemographic

characteristics that we entered in the two first steps was controlled for when we introduced cultural values in the third model.

For the readability of the results, we translated the estimates of the standard deviation between ($\sqrt{\psi}$) and within ($\sqrt{\theta}$) countries into R^2 as the percentage of variance explained by the covariates considered in each of the three steps. Following the suggestion of Raudenbush and Bryk (Raudenbush & Bryk, 2002), we considered the proportional reduction in each of the variance components separately. R_2^2, referring to the percentage of explained variance between countries, was computed with the formula $R_2^2 = \frac{\psi_0 - \psi_1}{\psi_0}$, where ψ_0 is the between countries variance estimated under the unconditional model and ψ_1 is the between countries variance estimated under the model of interest (i.e. conditional models 1 to 3). R_1^2, referring to the percentage of explained variance within countries, was computed with the formula $R_1^2 = \frac{\theta_0 - \theta_1}{\theta_0}$, where θ_0 is the within countries variance estimated under the unconditional model and θ_1 is the within countries variance estimated under the model of interest (i.e. conditional models 1 to 3). Greater values indicate greater explanatory power.

3. Results

Analyses first revealed that the measure of parental burnout used in this research (i.e., the Parental Burnout Assessment (Roskam et al., 2018) has excellent reliability across all 42 countries (all Cronbach's alphas > .85; see Table 1). Both the original four-factor structure (Roskam et al., 2018) and the second-order factor model fitted the data, not only in the pooled sample, but also in fathers and mothers subsamples and in the 21 languages separately (see Table 4). Because we used the total score of parental burnout in the current study, we tested measurement invariance of the second-order factor model across both sex and the 21 languages. As shown in Table 5, adequate model fit indices, ΔRMSEA, and ΔCFI indicated

the same number and pattern of dimensions across sex and languages. Metric and scalar invariances were supported as well, and measurement errors in item responses were also equivalent across sex and languages.

This allowed us to examine the mean level and prevalence of parental burnout in each country (cut-off scores: 92 and 86 on a scale from 0 to 138). The resulting prevalence rates corrected for inequities in sample size and sex, respectively, figure in the penultimate and last column of Table 1. As shown in Figure 1 and Table 1, the prevalence of parental burnout greatly varies from country to country. This is true even when we control for sample size or sex imbalance (see Table 1). These differences between countries are also reflected in the mean level of parental burnout in each country (see Table 1). There is a difference of 33 points between the country with the lowest mean level (i.e., Thailand) and the country with the highest mean level of parental burnout (i.e., Poland).

Fig. 1 Percentage of parents who have parental burnout (i.e., scoring 92 or above on the Parental Burnout Assessment) in each country

The size of the differences in parental burnout between countries suggested that cultural factors might be operative. To investigate whether cultural values are associated with parental burnout, and knowing that there is no cultural indicator specifically related to parenting that would be available for the majority of the countries included in this study, we obtained the position of each country on the six cultural values defined by Hofstede (Hofstede, 2001), i.e. Power Distance, Individualism, Masculinity, Uncertainty Avoidance, Long Term Orientation, and Indulgence[1]. The correlations between each cultural value and both the prevalence and

[1] *Power Distance* expresses the degree to which the less powerful members of a society accept and expect that power is distributed unequally; *Individualism* can be defined as a preference for a loosely-knit social framework in which individuals are expected to take care of only themselves and their immediate families; *Masculinity* represents a preference in society for achievement, heroism, assertiveness, and material rewards for success; *Uncertainty Avoidance* expresses the degree to which the members of a society feel uncomfortable with uncertainty and ambiguity; *Long Term Orientation* relates to how a society deals with the challenges of the

mean level of parental burnout in each country are displayed in Table 6. Individualism was the sole value to be significantly associated with both the mean level and prevalence of parental burnout. We represented the association between Individualism and the mean level of parental burnout on the Scatter Plot depicted in Figure 2. As shown in this figure, the higher the individualism of a given country, the higher the mean level of parental burnout in that same country. The effect-size is large (d = 1.16) according to Cohen's norms. As also shown in Figure 2, the overwhelming majority of individualistic countries are Euro-American countries.

Fig. 2 Correlation between the level of parental burnout in a country and the position of that country on the level of individualism[2]. Individualistic countries exhibit much higher levels of parental burnout.

To examine whether individualism predicted parental burnout over and above sociodemographic variables, parental workload, economic inequalities across countries and the other cultural values (i.e. Power Distance, Masculinity, Uncertainty Avoidance, Long Term Orientation, and Indulgence), we used Multilevel Random Coefficient Modelling analyses. We found significant effects for several sociodemographic variables. In particular, parental burnout was higher among younger parents, mothers, parents in disadvantaged neighborhoods, non-working parents, parents with more children, parents with younger children, parents in two-parent families (compared to those in multigenerational families), single parents (compared to those in both two-parent and multigenerational families), and parents in step-families (compared to those in both two-parent and multigenerational families). The findings (Table 7) confirm that individualism is significantly predictive of

present and the future; *Indulgence* stands for a society that allows relatively free gratification of basic and natural human drives related to enjoying life and having fun.

[2] Five countries (Algeria, Cameroon, Cuba, Rwanda, Togo) are not represented in Figure 2 because the level of individualism in these countries has not been reported by Hofstede.

parental burnout beyond sociodemographic variables, parental workload, economic inequalities across countries, and the five other cultural values (B = .24, p<.001).

4. Discussion

The results of this study demonstrate that the prevalence of parental burnout varies across the globe and that parental burnout is linearly related to individualism. This relation held even when sociodemographic variables (i.e. age, sex, educational level, and type of neighborhood, working status), parental workload (i.e. number of children, family type, age of the youngest child, number of women and men taking care of the children on a daily basis, hours spent with the child(ren)), economic inequalities across countries, and the other cultural values (i.e. Power Distance, Masculinity, Uncertainty Avoidance, Long Term Orientation, and Indulgence) were controlled for in the Multilevel Random Coefficient Modelling Analyses. The strength of this study follows from the use of data on a large number of parents (N = 17,409) from culturally, economically, and geographically diverse settings including many diverse non-Western countries. This study is the first ever to examine the role played by culture in parental burnout and, as such, constitutes an important extension of previous studies focused on individual and family predictors (Mikolajczak & Roskam, 2018).

The findings suggest that culture has a major impact on parental burnout and that parents from individualistic countries seem particularly exposed. The mechanisms that link individualism and parental burnout remain to be studied. But the current results dovetail with sociologists' observation that parenting norms in Euro-American countries, i.e. the most individualistic ones, have become increasingly demanding over the last 50 years (Geinger et al., 2014; Nelson, 2010), resulting in intensification of parental investment (Faircloth, 2014; Glausiusz, 2016; Hays, 1996; Nelson, 2010) and growing psychological pressure on parents (Rizzo et al., 2013). Whereas parenting is the subject of relatively little social or political

discourse in some parts of the world, in Euro-American countries, parenting has become a matter of increasing public interest and normative prescriptions (Faircloth, 2014). What parents feed their children, how they discipline them, where they put them to bed, how they play with them: all of these have become politically and morally charged questions (Faircloth, 2014, p. 27). The expectations towards parents have drastically evolved over the last 50 years, to such an extent that parents who would have been considered as good and attentive parents 50 years ago would now be viewed as neglectful at best (Nelson, 2010). According to many scholars, Euro-American countries have entered the era of what Hays called "intensive motherhood/parenting," a child-centered, expert-guided, emotionally absorbing, labor-intensive, and financially expensive view of parenting (Hays, 1996, p. 8). Parents are expected to both reduce the slightest risks to offspring and to optimize their children's physical, intellectual, social, and emotional development. The distinction between what children need and what might enhance their development has disappeared, and anything less than optimal parenting is framed as perilous (Wolf, 2011, p. XV).

Implication for Science and Practice

The current results have important implications for both science and practice. Regarding science, these findings illustrate the richness and importance of large-scale cross-cultural studies which go beyond the largely "Western" samples. This is important in all domains of psychological science, and also in the parenting domain, where 90% of the studies have been conducted on US parents (Arnett, 2008; Bornstein, 2013; Mistry & Dutta, 2015; see Keller et al., 2006; Super & Harkness, 1986 for notable exceptions). Regarding the implications for practice, our findings show the limits of individualism, and invite reflection on solutions to counter its adverse effects on parents. The much lower prevalence of parental burnout in collectivistic countries -- even when socioeconomic inequalities and other factors

are controlled – suggests that strengthening the social network of mutual aid and solidarity around families might well help to decrease the prevalence of parental burnout in individualistic countries. This accords with recent findings obtained in Poland (a rather individualistic country) showing that the availability of social support is a very strong protective factor vis-à-vis parental burnout (Szczygiel et al., 2020). This is clearly not the only potential pathway, and further studies are needed to clarify why parents in more individualistic countries are more exposed to parental burnout than those from less individualistic countries. Such research will provide much-needed prevention or treatment avenues that can be tailored to specific individual and cultural contexts.

Limitations

In interpreting our findings, several limitations bear noting. First, sample sizes vary across countries from 95 (Colombia) to 1,730 (Finland). However, when prevalence rates were reassessed on samples of approximately 200 randomly selected parents in all samples with more than 299 participants, the resulting prevalence remained essentially unchanged. Second, mothers were overrepresented in the survey in almost all countries. Again, when prevalence rates were reassessed weighting for sex frequencies in each country, the resulting prevalence remained essentially unchanged. Third, although we adjusted for several potential confounding factors, residual confounding by unmeasured factors cannot be ruled out. Finally, we cannot rule out the possibility that the measure of parental burnout used in this study captures a type of parenting that is more relevant to individualistic cultures than to collectivistic cultures. However, this would not fully explain the correlation found between parental burnout and individualism.

These limitations do not diminish the robustness of our main finding that individualism is associated to a much higher risk of exhaustion in the parental role. Raising a

child in Euro-American countries, i.e. the most individualistic countries, represents a risk factor for parental burnout. This 42-country study provides the first window onto the role of culture in parental burnout. It points to the importance of considering parental burnout not only at the level of the individual but also at the level of the culture, highlighting its relevance to world psychiatry.

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Competing Interests

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Availability of data and material

The full protocol, database, and syntaxes are available on OSF https://osf.io/94w7u/?view_only=a6cf12803887476cb5e7f17cfb8b5ca2.

Authors' Contribution

Original idea of the study: I.R. Study design: I.R., M.M. and M.V.P. Data collection: All authors. Data Management and Data Analysis: I.R. and D.M.. Writing of the first draft of the paper: M.M., I.R. and J.J.G. Comments and Approval of final version: All authors.

Table 1 | Hofstede's cultural values, growth national product, means and standard deviations of parental burnout, parental burnout prevalence and reliability in each country

	Power Distance	Individualism	Masculinity	Uncertainty Avoidance	Long Term Orientation	Indulgence	Growth National Product	Parental Burnout		Parental Burnout Assessment Reliability (Cronbach α)	Prevalence of Parental Burnout (86) %[1]	Prevalence of Parental Burnout (92) %[2]	Prevalence of Parental Burnout (92) % random sample[3]	Prevalence of Parental Burnout (92) % weighting sample[4]
								M	*SD*					
Algeria	-	-	-	-	-	-	180.44	16.56	20.64	.92	2.5	1.3	0.6	1.3
Argentina	49	46	56	86	20	62	518.09	20.50	20.85	.94	1.1	1.1	-	1.0
Australia	36	90	61	51	21	71	1418.28	24.57	25.07	.96	3.3	2.4	-	2.2
Austria	11	55	79	70	60	63	457.64	21.58	19.41	.94	1.6	1.6	-	1.8
Belgium	65	75	54	94	82	57	533.15	36.67	31.10	.97	9.8	8.1	9.2	7.9
Brazil	69	38	49	76	44	59	1868.18	16.01	19.31	.95	1.3	1.3	-	1.3
Burundi	-	-	-	-	-	-	3.44	30.30	30.38	.95	6.4	5.9	-	5.9
Cameroun	-	-	-	-	-	-	38.52	19.06	17.26	.86	0.5	0.5	-	0.5
Canada	39	80	52	48	36	68	1711.39	32.82	29.48	.97	6.8	6.5	-	6.5
Chile	63	23	28	86	31	68	298.17	28.99	25.70	.96	5.1	3.9	5.8	3.8
China	80	20	66	30	87	24	13407.40	10.82	17.94	.95	1.4	1.4	1.0	1.4
Colombia	67	13	64	80	12	83	333.11	17.95	19.71	.95	2.1	1.1	-	1.0
Costa Rica	35	15	21	86	-	-	59.01	24.15	25.12	.96	4.0	2.0	-	1.8
Cuba	-	-	-	-	-	-	97.00	6.79	9.61	.85	0.0	0.0	-	0.0
Ecuador	78	8	63	67	-	-	107.51	19.47	19.97	.95	2.1	1.4	-	1.3
Egypt	70	25	45	80	7	4	249.56	33.43	24.01	.92	2.6	2.6	-	2.6
Finland	33	63	23	59	38	57	275.32	31.96	27.37	.97	6.2	4.9	4.2	4.9
France	68	71	43	86	63	48	275.25	29.25	28.22	.97	6.2	5.5	5.5	5.3
Germany	35	67	66	65	83	40	4000.39	24.90	21.66	.95	1.8	1.5	-	1.5
Iran	58	41	43	59	14	40	452.28	15.49	21.02	.93	1.5	1.3	1.6	1.2
Italy	50	76	70	75	61	30	2072.20	16.08	17.03	.94	0.6	0.6	1.1	0.5
Japan	54	46	95	82	88	42	4917.93	12.76	22.63	.97	2.8	1.8	2.0	1.7
Lebanon	75	40	65	50	14	25	56.41	19.47	26.71	.98	5.5	5.5	-	5.3
Pakistan	55	14	50	70	50	0	312.57	17.70	14.68	.88	0.0	0.9	-	0.0
Peru	64	16	42	87	25	46	225.20	18.40	18.29	.93	1.0	1.3	0.5	0.0
Poland	68	60	64	93	38	29	586.02	39.41	30.46	.97	9.6	7.7	6.8	7.3
Portugal	63	27	31	99	28	33	238.51	17.06	20.70	.96	2.0	2.0	2.1	1.8
Romania	90	30	42	90	52	20	239.85	22.26	25.71	.97	5.2	3.8	3.6	3.8
Russia	93	39	36	95	81	20	1630.66	27.51	29.54	.97	6.6	5.3	5.0	4.9
Rwanda	-	-	-	-	-	-	9.51	28.97	21.25	.88	2.5	2.1	-	2.2
Serbia	86	25	43	92	52	28	50.65	18.90	18.96	.94	0.9	0.9	-	0.4
Spain	57	51	42	86	48	44	1425.87	22.58	25.24	.96	3.9	3.4	5.0	3.2
Sweden	31	71	5	29	53	78	551.14	20.26	21.97	.96	2.6	2.0	1.9	2.0
Switzerland	34	68	70	58	74	66	703.75	33.73	28.78	.97	7.1	4.8	3.2	4.6
Thailand	64	20	34	64	32	45	487.24	5.72	9.13	.89	0.2	0.3	0.0	0.0
The Netherlands	38	80	14	53	67	69	912.90	19.29	21.31	.96	2.2	2.2	-	2.1
Togo	-	-	-	-	-	-	5.36	18.00	20.29	.91	1.9	1.9	-	1.7

Turkey	66	37	45	85	46	49	766.43	12.21	14.17	.90	0.4	0.0	0.0	0.0
UK	35	89	66	35	51	69	2828.64	28.01	24.68	.96	3.3	3.0	-	2.9
Uruguay	61	36	38	99	26	53	60.18	12.03	13.58	.91	0.3	0.3	-	0.3
USA	35	89	66	35	51	69	20494.05	32.59	33.02	.97	8.9	7.9	5.6	8.4
Vietnam	70	20	40	30	57	35	241.27	12.17	16.44	.94	0.7	0.4	-	0.4

[1]The prevalence was estimated using a cut-off score of 86.

[2] The prevalence was estimated using a cut-off score of 92.

[3]To control for sample size differences, prevalence rates were reassessed on samples of approximately 200 randomly selected parents in all samples with more than 299 subjects.

[4]To control for overrepresentation of mothers in the survey, prevalence rates were reassessed weighting for sex frequencies in each country.

Table 2 | Data collection procedure in each country[1]

	Ethics Approval[2]	Translation and back-translation[3]	Survey Language	Sampling Procedure	Location of Data Collection[4]	Survey Type[5] (% Online)	Response Rate (%)	Attrition Rate (%)[6]	Period of Data Collection
Algeria	Yes	Yes	Arabic	Snowball	Oran, Mostaganem, Tlemcen, Ain Temouchent, Relizane, Chlef, El Bayadh, Annaba, Constantine et Oum El Bouaghi	0	90	5	March-May 2018
Argentina	Yes	Yes	Spanish	Snowball and convenience	San Miguel de Tucumán	100	Not applicable[7]	29	December 2018-March 2019
Australia	Yes	Not applicable[8]	English	Snowball	New South Wales, Victoria, Queensland, Western Australia, South Australia, Tasmania, Australian Capital Territory	100	Not applicable	45.6	May 2019
Austria	Yes	Yes	German	Snowball and convenience	Undefined	100	Not applicable	50.8	February-May 2019
Belgium	Yes	Yes (Dutch version)-Not applicable (French version)	French Dutch	Snowball	Flanders and Wallonia	100	Not applicable	26	February-June 2018
Brazil	Yes	Yes	Portuguese	Snowball and convenience	São Paulo and Rio de Janeiro states: Amazonas, Ceará, Mato Grosso do Sul, Minas Gerais, Paraíba, Paraná, Pernambuco, Piauí, Rio de Janeiro, São Paulo, Sergipe	65.1	Not applicable	Not available	November 2018-March 2019
Burundi	Not requested	Not applicable	French	Stratified	Bujumbura Mairie, Bujumbura rural, Bururi, and Rutana	0	Not applicable	0	February-March 2020
Cameroun	Yes	Not applicable	French	Convenience	Yaounde	0	61	11	December 2017-April 2018

Canada	Yes	Not applicable	French	Snowball	Ontario, Manitoba, Saskatchewan, Alberta, Québec, territoires du Nord-Ouest	100	Not applicable	55	May-December 2018
Chile	Yes	Yes	Spanish	Snowball and convenience	Santiago, Los Lagos (Puerto Montt), Del Maule (Talca)	100	Not applicable	56	February-October 2018
China	Not requested	Yes	Chinese	Convenience	Zhejiang	100	77	16	January 2018
Colombia	Not requested	Yes	Spanish	Snowball and convenience	Undefined	100	Not applicable	Not available	December 2017-April 2018
Costa Rica	Yes	Yes	Spanish	Snowball and convenience	San José, San Ramon, Heredia, Cartago, Alajuela	94	Not applicable	88	March-June 2018
Cuba	Yes	Yes	Spanish	Snowball and convenience	La Havane, Mariel (Artemesia)	0	98.3	1	September-December 2018
Ecuador	Not requested	Yes	Spanish	Convenience	Quito, Latacunga, Ibarra Otavalo, Saquisilí, Salcedo, El corazón, Guaranda, Tulcán, Cuenca, Guayaquil, Portoviejo, Esmeraldas, Lago Agrio/Sucumbíos, Puyo	100	Not applicable	40	March-September 2018
Egypt	Yes	Yes	Arabic	Snowball and convenience	Menoufia regions- 10 cites; Shebin el kom, Sadat, Menoufa, Bagour, Ashmon, Quessna, Shodaa, sir elayan, Tala, and birkt-elsaba	0	90	10	February-March 2020
Finland	Yes	Yes	Finnish	Snowball and convenience	Hyvinkää, Posio, Jyväskylä	86.3	99.4	Not available	February-April 2018
France	Yes	Not applicable	French	Snowball and convenience	Provence-Alpes-Côte d'Azur, Ile-de-France	100	Not applicable	33	January-July 2018
Germany	Yes	Yes	German	Convenience	Ulm, Baden-Württemberg	100	20	49	May-November 2019
Iran	Not requested	Yes	Persan	Convenience	Tehran	0	Not available	3	August-September 2018

Italy	Yes	Yes	Italian	Snowball and convenience	Padova	98	Not applicable	28	March-December 2018
Japan	Yes	Yes	Japanese	Quota sampling (by a research company)	The 47 prefectures in Japan	100	Not applicable	34	July 2018
Lebanon	Yes	Yes	French Arabic	Stratified	Mont Liban, Beyrouth, Liban North, Liban South, Nabatieh, Beqaa	100	46	Not available	August-September 2018
Pakistan	Not requested	Yes	Urdu	Convenience	Lahore	0	98	0	July 2018
Peru	Not requested	Yes	Spanish	Convenience	Lima, Arequipa, Cajamarca, San Martin, La Libertad, Lambayeque	46	Not available	19	February-May 2018
Poland	Yes	Yes	Polish	Snowball and convenience	Warsaw	85	Not available	1	February-June 2018
Portugal	Yes	Yes	Portuguese	Snowball and convenience	Coimbra, Porto	81	50 (for paper pencil version)	22	April-December 2018
Romania	Yes	Yes	Romanian	Convenience	Bucharest, Timisoara	86	Not available	51	December 2017-May 2018
Russia	Yes	Yes	Russian	Snowball and convenience	Undefined	100	Not applicable	<1	April-December 2018
Rwanda	Not requested	Not applicable	English French	Snowball and convenience	Undefined	58	90 (for paper pencil version)	Not available	June-July 2019
Serbia	Yes	Yes	Serbian	Snowball and convenience	Belgrade	100	Not applicable	22	November 2018-June 2019
Spain	Yes	Yes	Spanish	Snowball and convenience	Spain (undefined) and Basque Country (Galdakao and Igorre, Azpeitia and Errenteria, Vitoria-Gasteiz, Leitza)	68	15	23.4	February - September 2018
Sweden	Yes	Yes	Swedish	Snowball	Undefined	100	Not applicable	27	March-May 2019

Switzerland	Yes	Not applicable	French	Snowball and convenience	Canton of Vaud	100	Not applicable	44	May-October 2018
Thailand	Yes	Yes	Thai	Convenience	Chiand Mai	0	Not available	0	July-September 2018
The Netherlands	Yes	Yes	Dutch	Snowball and convenience	Tilburg	100	Not applicable	28	March 2018-February 2019
Togo	Not requested	Not applicable	French	Convenience	Tsévié, Lomé	10	50	33	January 2017-February 2018
Turkey	Yes	Yes	Turkish	Convenience	Ankara, Istanbul	0	63	5	April-June 2018
UK	Yes	Not applicable	English	Snowball and convenience	England, Scotland, Wales and Northern Ireland	100	Not applicable	41	October 2018-March 2019
Uruguay	Yes	Yes	Spanish	Snowball and convenience	Montevideo	0	0	0	October 2018
USA	Yes	Not applicable	English	Convenience and quota	Stanford, Florida	100	Not applicable	Not available	March 2018-September 2019
Vietnam	Yes	Yes	Vietnamese	Snowball and convenience	Ho Chi Minh City, Thanh Hoa, Cam Ranh province, Lam Dong, Mekong Delta area	12.5	Not applicable	11	March-May 2018

[1] More information about the data collection procedure in each country is available upon request to the first author. [2] Ethics Approval number in each country is available upon request to the first author. [3] Translation and back-translations were made once for each language. The questionnaire was translated in a concerted manner by countries using the same version. For example, Spanish-speaking countries coordinated the Spanish translation. Some minor adjustments could however be made by each country. [4] Location is larger for countries where online survey was used because it has been spread all over the country. The location that is mentioned is where the sampling and data collection started. [5] Survey Type: Online vs. Paper-Pencil. [6] Percentage of participants who did not complete the survey completely. [7] For online surveys, the response rate is impossible to estimate. [8] The French and English version of the IIPB survey were already available for use.

Table 3 | Sociodemographic characteristics of respondents in each country (standard deviations are in brackets).

	Sample size	Age	Sex (% mothers)	Educational level	Working status (% paid professional activity)	Ethnicity (% natives)	Family types[1]						Number of biological children	Number of children in the household	Age of the youngest child	Age of the oldest child	Number of women caring for children	Number of men caring for children	Years in the country	Hours with children	Neighborhood profiles		
							Two opposite-sex parents	Two same-sex parents	Single parent	Step-family	Multigenerational	Polygamous									% disadvantaged	% average	% prosperous
Algeria	318	41.62 (10.43)	60.4	14.02 (4.89)	70.1	89.9	68.2	0	1.6	0	30.2	0	2.67 (1.65)	2.66 (1.64)	7.71 (7.90)	12.61 (10.38)	1.58 (1.06)	1.42 (.97)	39.97 (11.92)	8.67 (6.17)	5.0	83.3	11.6
Argentina	177	40.02 (9.88)	66.7	16.45 (4.08)	87.6	98.9	65.0	0	13.6	9.6	9.6	0.6	2.34 (1.48)	2.20 (1.11)	9.30 (8.07)	13.67 (10.04)	1.65 (.93)	1.15 (.73)	39.25 (10.60)	10.28 (5.18)	2.3	72.9	24.9
Australia	212	44.80 (10.60)	51.4	13.17 (2.78)	56.6	79.2	69.3	0	17.9	7.5	3.3	0	2.05 (1.03)	1.75 (.86)	9.74 (7.49)	14.27 (9.18)	.99 (.49)	.92 (.55)	40.15 (14.79)	6.49 (3.81)	5.7	74.1	20.3
Austria	185	33.81 (6.47)	89.2	13.27 (3.08)	70.8	91.4	86.5	0.5	6.5	3.8	2.7	0	1.61 (.92)	1.58 (.82)	2.49 (3.98)	4.52 (5.69)	1.08 (.36)	.96 (.39)	32.37 (8.12)	10.68 (5.83)	2.7	69.2	28.1
Belgium	1689	38.41 (7.53)	86.3	16.55 (2.61)	90.9	86.5	79.2	0.8	10.7	7.9	0.4	0	2.07 (.96)	2.09 (1.06)	5.98 (5.92)	8.87 (7.11)	1.19 (.67)	.98 (.54)	35.13 (11.09)	5.65 (3.39)	3.1	47.5	49.4
Brazil	301	42.03 (9.09)	63.5	15.89 (4.22)	75.4	97.6	90.6	0	3.4	4.0	1.0	0	1.61 (.81)	1.52 (.76)	8.82 (7.54)	11.10 (7.94)	1.19 (.56)	1.01 (.48)	-	5.70 (4.57)	14.5	66.6	18.9
Burundi	187	38.9 (9.51)	49.7	10.78 (5?31)	67.4	97.3	86.6	0	12.8	0.5	0	0	3.61 (2.03)	3.94 (2.24)	4.97 (5.50)	12.71 (8.11)	1.57 (1.01)	1.41 (1.03)	37.61 (11.19)	5.84 (4.33)	20.3	44.9	19.8
Cameroun	208	38.31 (9.72)	50	14.35 (3.20)	72.6	99.0	69.2	0	16.3	3.4	5.8	1.4	3.08 (2.22)	3.74 (2.90)	5.39 (6.64)	14.19 (9.36)	1.57 (1.15)	1.19 (.88)	37.94 (10.12)	8.57 (5.33)	21.2	71.2	7.7
Canada	279	34.08 (6.66)	92.1	15.89 (2.80)	84.2	95.7	91.4	0.4	9.0	8.4	0.7	0	2.08 (.87)	2.12 (.86)	3.70 (4.21)	7.04 (5.81)	1.05 (.69)	.98 (.51)	33.04 (8.08)	8.90 (6.70)	7.5	60.6	31.9
Chile	431	36.57 (6.56)	85.6	17.93 (3.36)	76.3	93.3	72.4	0.5	11.1	8.1	6.5	0	1.74 (.91)	1.80 (1.33)	4.70 (5.86)	8.23 (7.33)	1.51 (.80)	.99 (.57)	34.40 (9.34)	10.54 (7.45)	2.6	59.6	37.8
China	722	38.75 (4.68)	55.5	10.28 (2.87)	91.4	66.9	82.8	0.3	3.7	2.4	9.7	0	1.48 (.59)	1.49 (.59)	8.64 (4.48)	14.18 (3.29)	1.78 (.94)	1.62 (.88)	29.75 (12.75)	3.84 (2.60)	5.3	89.6	5.1
Colombia	95	-	74.7	-	84.2	93.7	63.2	0	23.2	4.2	8.4	0	1.62 (.76)	1.57 (.72)	8.31 (7.22)	12.28 (8.57)	1.57 (.95)	.98 (.77)	36.40 (13.51)	7.58 (6.02)	3.2	63.2	33.7
Costa Rica	248	37.79 (8.15)	58.9	16.41 (4.47)	84.7	93.5	74.5	0.4	6.9	7.7	7.3	0	1.62 (.88)	1.51 (.72)	7.31 (6.90)	9.16 (8.33)	1.50 (.83)	1.16 (.71)	36.35 (9.60)	9.28 (6.30)	4.4	64.9	30.6
Cuba	241	40.09 (10.24)	57.3	13.69 (3.09)	83.8	99.2	51	0	7.1	11.6	28.6	0.4	1.70 (.61)	1.51 (.58)	10.20 (7.26)	14.17 (9.33)	1.66 (.74)	1.27 (.70)	40.07 (10.21)	10.93 (4.39)	9.5	61.4	29.0
Ecuador	146	32.45 (7.50)	69.9	17.21 (3.03)	85.6	91.8	65.1	0	11.6	6.8	15.1	0.7	1.64 (.78)	1.63 (.74)	5.92 (4.71)	8.23 (6.68)	1.97 (1.05)	1.39 (.89)	29.62 (10.26)	7.57 (4.92)	2.7	70.5	26.7
Egypt	267	47.99 (6.47)	56.2	11.30 (3.54)	98.5	89.5	79.0	0.4	12.7	0.7	7.1	0	3.33 (1.34)	3.00 (1.38)	13.96 (6.41)	23.19 (7.02)	1.34 (.98)	1.05 (1.10)	43.57 (14.61)	8.33 (3.51)	16.1	62.9	21.0

Finland	1730	36.47 (6.49)	90.7	17.69 (3.40)	75.5	98.7	78.7	0.5	8.7	9.7	0.3	0	2.15 (1.18)	2.24 (1.29)	4.34 (4.24)	7.52 (5.31)	.92 (.37)	.87 (.43)	35.54 (7.12)	7.71 (3.72)	0.0	99.9	0.1
France	1357	38.06 (8.42)	81.4	15.01 (2.83)	83.0	90.3	75.9	0.7	11.6	10.1	0.8	0.1	1.97 (.90)	1.85 (.85)	6.47 (5.99)	9.66 (7.64)	1.38 (1.18)	.97 (.69)	34.81 (11.37)	8.30 (5.22)	2.9	57.0	40.0
Germany	204	35.63 (7.90)	68.6	13.49 (4.89)	74.0	85.3	72.5	1.0	13.2	8.8	2.9	0	1.79 (1.01)	1.70 (0.89)	4.97 (4.89)	7.97 (6.76)	1.01 (.49)	.90 (.53)	33.16 (10.78)	7.31 (4.13)	4.9	74.5	20.6
Iran	448	40.33 (8.71)	50.4	13.73 (3.45)	67.6	98.2	85.4	0	10.1	2.9	0.9	0	1.88 (1.01)	1.73 (.77)	9.74 (7.30)	13.98 (9.24)	1.08 (.40)	1.00 (.31)	39.94 (8.74)	5.84 (3.49)	11.7	59.7	28.6
Italy	350	43.53 (8.97)	71.4	14.99 (3.93)	85.7	90.0	87.4	0	4.9	4.6	2.0	0	1.78 (.75)	1.74 (.74)	9.44 (7.12)	12.48 (8.86)	1.13 (.52)	1.02 (.39)	41.55 (11.83)	7.30 (5.21)	2.0	74.9	23.1
Japan	500	54.36 (14.65)	50.0	14.29 (2.49)	59.6	100	80.6	0.4	7.4	1.2	5.0	0	1.96 (.76)	1.56 (.73)	15.00 (11.64)	23.23 (14.36)	1.07 (.47)	.92 (.48)	53.27 (15.77)	4.80 (4.15)	1.6	83.0	15.4
Lebanon	201	37.44 (8.43)	67.2	16.17 (3.67)	67.7	96.0	93.5	0	5.0	1.0	0.5	0	2.33 (1.15)	2.18 (1.03)	7.74 (6.24)	10.51 (8.02)	1.22 (.49)	1.00 (.28)	35.00 (11.51)	7.45 (3.11)	6.5	69.7	23.9
Pakistan	228	50.5 (10.27)	56.1	11.95 (3.68)	40.7	91.4	75.5	0	8.8	2.0	5.9	1.0	4.48 (1.91)	4.78 (2.86)	14.62 (7.79)	21.69 (10.45)	2.83 (2.39)	2.40 (1.43)	45.94 (9.77)	7.12 (5.64)	29.4	57.5	13.1
Peru	312	40.18 (10.68)	69.9	14.88 (4.78)	84.6	92.6	65.4	0.6	14.7	8.3	10.6	0	1.96 (.89)	1.95 (1.05)	9.08 (8.49)	13.20 (9.96)	1.86 (1.14)	1.36 (1.06)	37.37 (13.74)	8.35 (5.58)	6.4	66.0	27.6
Poland	457	34.76 (6.89)	71.1	17.52 (3.51)	75.5	96.1	86.4	0	5.0	3.5	4.8	0	1.72 (.95)	1.71 (.93)	4.85 (4.86)	6.44 (5.78)	1.20 (.84)	.98 (.62)	33.73 (8.70)	7.97 (4.82)	4.4	76.1	19.5
Portugal	407	41.85 (8.12)	50.4	14.85 (3.83)	92.8	84.0	88.8	0	3.3	6.3	1.5	0.3	1.73 (.84)	1.66 (.71)	8.30 (6.47)	11.14 (8.18)	.99 (.44)	.88 (.41)	29.31 (16.84)	4.86 (2.84)	1.2	62.9	35.9
Romania	344	37.15 (5.58)	62.5	16.78 (2.86)	90.7	96.2	91.6	0	3.2	2.6	2.3	0	1.56 (.64)	1.56 (.62)	4.00 (4.04)	7.02 (5.17)	1.4 (.73)	1.10 (.61)	36.01 (8.09)	7.32 (6.17)	2.6	26.7	70.6
Russia	365	34.41 (6.71)	72.1	14.45 (4.19)	83.6	92.1	78.1	0	6.6	9.0	4.9	0	1.69 (.82)	1.71 (.83)	4.04 (3.88)	8.01 (6.25)	1.27 (.65)	1.04 (.53)	32.70 (8.75)	7.63 (5.25)	0.5	59.7	39.7
Rwanda	240	37.54 (10.02)	52.5	13.17 (5.18)	78.8	83.3	71.3	0.4	19.2	0.8	4.6	1.3	2.83 (2.08)	3.12 (2.03)	6.37 (5.99)	13.83 (9.50)	1.40 (.83)	.90 (.95)	34.32 (10.80)	6.31 (6.08)	14.6	54.2	31.3
Serbia	228	38.10 (5.70)	77.2	14.90 (5.16)	86.0	79.8	92.5	0	3.9	0	1.8	0	1.61 (.64)	1.63 (.69)	4.20 (4.38)	6.81 (5.63)	1.14 (.63)	1.03 (.53)	33.36 (11.04)	7.67 (4.58)	2.6	48.2	49.1
Spain	696	40.91 (8.13)	76.7	15.14 (4.11)	82.3	89.8	80.6	0	8.4	6.2	2.9	0.1	1.72 (.71)	1.72 (.77)	8.06 (7.24)	9.95 (8.37)	1.42 (.94)	1.14 (.70)	38.74 (11.45)	8.92 (6.47)	6.4	78.5	15.1
Sweden	796	40.66 (5.04)	93.0	15.35 (3.16)	87.3	90.3	73.2	0.8	12.?2	9.3	0.5	0	2.17 (.95)	2.14 (.94)	6.42 (4.79)	11.17 (6.16)	1.00 (.55)	.98 (.57)	38.06 (8.71)	6.41 (3.14)	4.8	75.2	20.1
Switzerland	419	40.18 (6.86)	64.7	16.42 (3.58)	92.1	67.8	81.6	0.5	10.7	6.9	0.2	0	1.93 (.82)	1.96 (.81)	6.08 (5.37)	8.96 (6.30)	1.10 (.54)	.95 (.46)	31.24 (14.28)	6.66 (4.14)	0.2	49.6	50.1
Thailand	398	43.08 (5.99)	52	3.32 (1.05)	97.2	99.2	69.4	0.3	2.3	1.3	25.8	0.3	1.78 (.65)	1.79 (.74)	8.76 (3.90)	12.51 (4.89)	1.82 (.99)	1.47 (.84)	42.55 (6.63)	5.94 (3.66)	1.0	51.7	47.3
The Netherlands	221	37.21 (8.82)	71.9	16.31 (2.40)	93.2	93.6	88.2	0.5	5.4	3.6	0.5	0.5	1.83 (.84)	1.71 (.83)	5.76 (5.78)	6.76 (6.85)	1.50 (1.04)	1.14 (.62)	35.64 (11.20)	6.43 (3.08)	2.3	53.4	44.3
Togo	103	37.80 (8.75)	35.9	13.62 (2.99)	86.4	95.1	68.0	0	21.4	1.9	1.0	7.8	2.46 (1.59)	2.93 (1.69)	4.45 (5.48)	11.12 (8.64)	1.38 (.70)	1.20 (1.14)	35.52 (10.76)	9.10 (6.38)	20.6	73.5	5.9
Turkey	452	36.77 (6.51)	59.7	16.67 (3.56)	74.8	99.1	86.2	0	6.4	0.4	0	6.7	1.71 (.72)	1.65 (.65)	4.41 (3.64)	7.54 (5.92)	1.15 (.52)	1.00 (.42)	36.44 (6.88)	6.64 (3.80)	4.6	73.0	22.3
UK	271	39.15 (8.52)	60.1	15.41 (3.32)	83.4	76.0	89.3	0	7.4	2.6	0.4	0	1.88 (.92)	1.72 (.73)	6.96 (6.64)	9.32 (7.91)	1.01 (.25)	.95 (.40)	33.22 (14.79)	6.59 (3.88)	4.4	52.0	43.5
Uruguay	299	35.09 (6.37)	62.9	12.86 (4.77)	89.6	94.6	77.3	0	9.7	5.4	5.4	0	1.62 (.75)	1.62 (.73)	2.72 (1.69)	6.14 (5.09)	1.41 (.75)	1.06 (.55)	33.60 (8.85)	11.78 (5.37)	11.7	59.7	28.6

USA	406	38.20 (9.03)	68.7	15.42 (3.51)	76.1	91.1	72.4	0.2	16.5	5.7	3.9	0.2	1.95 (1.06)	1.90 (1.03)	6.20 (5.79)	10.55 (7.47)	1.12 (.79)	.93 (.72)	35.29 (11.73)	7.55 (5.13)	9.6	68.5	21.9
Vietnam	271	36.83 (7.81)	55.7	14.12 (4.14)	95.5	95.9	77.4	0.8	1.9	0.4	18.5	0	1.68 (.79)	1.66 (1.05)	5.74 (5.47)	8.21 (7.48)	1.46 (.82)	1.18 (.72)	36.37 (8.36)	4.63 (3.01)	5.2	48.5	46.3
Pooled sample	17,409	39.20 (8.90)	71.0	14.89 (4.34)	80.2	90.8	78.7	0.3	9.0	5.9	4.6	0.3	2.00 (1.12)	1.98 (1.19)	6.67 (6.42)	10.55 (8.42)	1.29 (.85)	1.07 (.69)	36.39 (11.54)	7.23 (4.92)	5.0	67.3	27.6

Note. [1] The total frequency may be lower than 100% when some participants in the country checked "other" as family type.

Table 4 | Model fit indices for the first-order and the second-order factor model of the PBA in the pooled sample, in fathers' and mothers' subsamples, and in each language.

	First-order Factor Model					Second-Order Factor Model				
	S-Bχ² (224)	RMSEA	SRMR	CFI	TLI	*S-Bχ²* (226)	RMSEA	SRMR	CFI	TLI
Pooled Sample	17112.04	0.066	0.040	0.99	0.99	17498.05	0.067	0.041	0.99	0.99
Fathers	2955.05	0.050	0.036	0.99	0.99	2982.63	0.050	0.037	0.99	0.99
Mothers	14350.72	0.072	0.043	0.99	0.99	14768.63	0.073	0.044	0.99	0.99
Arabic	1095.04	0.073	0.056	0.99	0.99	1128.02	0.074	0.056	0.99	0.99
Basque	373.08	0.055	0.085	0.99	0.99	386.29	0.056	0.090	0.99	0.99
Chinese	514.98	0.042	0.042	1.00	0.99	519.52	0.042	0.042	1.00	1.00
Dutch	980.76	0.081	0.054	0.99	0.98	1000.73	0.082	0.055	0.99	0.98
English	1407.82	0.074	0.046	0.99	0.99	1435.99	0.074	0.046	0.99	0.99
Finnish	2559.54	0.078	0.048	0.99	0.98	2616.29	0.079	0.048	0.99	0.98
French	5826.92	0.078	0.047	0.99	0.98	5864.95	0.078	0.049	0.99	0.98
German	616.87	0.067	0.064	0.99	0.98	622.14	0.067	0.064	0.99	0.98
Japanese	428.98	0.043	0.037	1.00	1.00	432.80	0.043	0.037	1.00	1.00
Persian	729.47	0.077	0.076	0.99	0.98	733.33	0.077	0.076	0.99	0.98
Polish	984.56	0.086	0.056	0.98	0.98	1020.15	0.088	0.056	0.98	0.98
Portuguese	882.32	0.068	0.060	0.99	0.99	904.21	0.069	0.062	0.99	0.99
Romanian	979.58	0.099	0.059	0.98	0.98	1015.13	0.10	0.059	0.98	0.98
Russian	1025.38	0.071	0.051	0.99	0.98	1051.40	0.072	0.053	0.99	0.99
Serbian	559.55	0.081	0.082	0.98	0.98	582.40	0.083	0.085	0.98	0.98

Spanish	3098.03	0.074	0.051	0.99	0.99	3300.00	0.076	0.058	0.99	0.98
Swedish	782.65	0.056	0.046	0.99	0.99	797.42	0.057	0.046	0.99	0.99
Thai	379.47	0.043	0.077	1.00	1.00	383.47	0.043	0.079	1.00	1.00
Turkey	575.76	0.060	0.074	0.99	0.99	583.36	0.060	0.074	0.99	0.99
Urdu	842.07	0.110	0.110	0.95	0.95	902.46	0.12	0.12	0.95	0.94
Vietnamese	326.51	0.042	0.050	1.00	1.00	329.06	0.042	0.050	1.00	1.00

Table 5 | Measurement invariance of the Parental Burnout Assessment across samples

Model	*S-Bχ² (df)*	RMSEA	CFI	Δ *S-Bχ²(Δ df)*	ΔRMSEA	ΔCFI
Across languages						
Configural	17654.51 (4662)	.058	.992	-	-	-
Metric	21804.88 (4746)	.066	.989	4150.37 (84)	.008	.003
Scalar	33829.65 (5206)	.082	.982	12824.77 (460)	.016	.007
Error	34264.78 (5742)	.078	.982	435.13 (536)	-.004	.000
Across sex						
Baseline	14899.43 (444)	.062	.992			
Metric	17671.10 (452)	.067	.990	2771.67 (8)	.005	.002
Scalar	27570.08 (475)	.082	.984	9898.98 (23)	.015	.006
Error	31879.86 (498)	.086	.982	4309.78 (23)	.004	.002

Note. Baseline invariance model tests equivalence form of all the relationships by imposing configural invariance, i.e. the same indictors loading on the latent variables for each group. Metric model is a model where only the factor loadings are equal across groups but the intercepts are allowed to differ between groups. This is called metric invariance and tests whether respondents across groups attribute the same meaning to the latent construct under study. Scalar model is a model where the loadings and intercepts are constrained to be equal. This is called scalar invariance and implies that the meaning of the construct (the factor loadings), and the levels of the underlying items (intercepts) are equal in both groups. Error model is the most restrictive invariance measurement. This is achieved when both loadings and the error variances are invariant across groups. It is considered as the ideal level.

Table 6 | Bivariate correlations between Hofstede's cultural values and parental burnout

	Prevalence of Parental Burnout	Mean Level of Parental Burnout	Individualism	Masculinity	Uncertainty Avoidance	Long-Term Avoidance	Indulgence
Mean Level of Parental Burnout	.83***	-					
Power Distance	-.03	-.22	-.58***	-.04	.38*	-.03	-.60***
Individualism	.53***	.50***	-	.16	-.33	.21	.49**
Masculinity	.09	.03		-	-.07	.24	-.09
Uncertainty Avoidance	.02	.10			-	-.07	-.26
Long-Term Orientation	.07	.00				-	-.10
Indulgence	.12	.14					-

Note. Correlations are computed at the country level. *$p < .05$ **$p < .01$ ***$p < .001$

Table 7 | Multilevel unconditional and conditional models predicting parental burnout

	Unconditional Model		Conditional Model 1		Conditional Model 2		Conditional Model 3	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Fixed part								
Intercept	21.79***	1.23	16.84***	2.09	14.92***	2.82	-12.01***	10.28
Individual level								
Age			-.20***	.02	-.10*	.04	-.08	.05
Sex			6.83***	.45	7.42***	.57	7.58***	.64
Educational level			.01	.05	-.01	.07	.12	.08
Neighborhood			-2.06***	.38	-2.75***	.46	-3.04***	.53
Working status			4.78	.51	5.01***	.68	5.26***	.75
Number of children					.72*	.21	.69*	.29
Family type					.74***	.21	.73**	.24
Age youngest child					-.36***	.06	-.45***	.06
Number of women in household					.03	.34	.11	.40
Number of men in household					-.43	.40	-.97	.49
Number of hours with children					.01	.06	.03	.06
Country level								
Growth National Product (GNP)							.00	.00
Power distance							.12	.09
Masculinity							.04	.06
Uncertainty avoidance							.06	.06
Long-term orientation							.01	.09
Indulgence							-.01	.05
Individualism							.24***	.06
Random part								
$\sqrt{\psi}$ (between countries)	7.86		7.25		7.49		5.47	
$\sqrt{\theta}$ (within countries)	24.44		24.15		24.93		25.40	
Derived estimates								
R_2^2 (between countries)			15%		9%		52%	
R_1^2 (within countries)			2%		-4%		-8%	
ρ	.09		.08		.08		.04	

Note. The first model is the unconditional model with no predictor. This baseline model is useful to estimate the reduction in prediction error variance comparing the model without covariates (unconditional model) with the model of interest (i.e. conditional models 1 to 3). Since many covariates vary both within and between countries, the estimate of the standard deviation between countries ($\sqrt{\psi}$) and within counties ($\sqrt{\theta}$) in a conditional model can increase by the addition of some covariates resulting in a negative R^2. R_2^2 refers to the percentage of explained variance between countries; R_1^2 refers to the percentage of explained variance within countries. ρ refers to intraclass correlations.

Figure 1 | Prevalence of parental burnout across countries

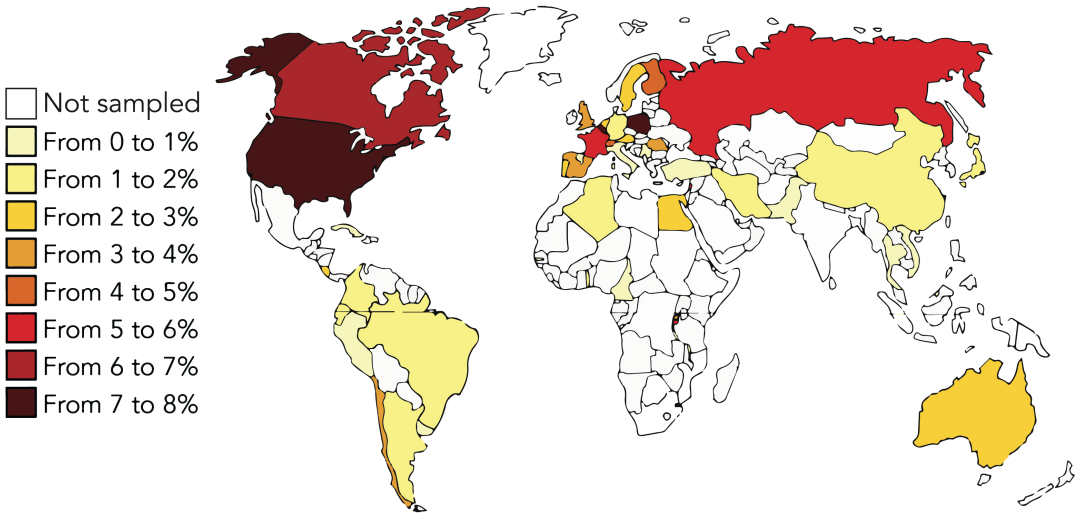

Figure 2 | Parental burnout and individualism across countries