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UNPREDICTABLE FAMILY SUPPORT DURING CHILDHOOD AS A PREDICTOR OF WELL-BEING AND UNPREDICTABILITY BELIEFS DURING A PANDEMIC

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ABSTRACT

Life History Theory explains how environmental conditions can lead to adaptive behaviors in adulthood. One of the factors that impact early psychological development and adult well-being is family unpredictability experienced during childhood, i.e., inconsistent parental provision of basic needs (e.g., emotional nurturance, financial stability, and meal regularity). The aim of this study was to explore the impact of childhood family unpredictability on subjective well-being and unpredictability beliefs among adults during the COVID-19 pandemic. We conducted survey-type research with a quasi-experimental design involving 438 participants who completed online questionnaires on perceptions of childhood family unpredictability and current levels of subjective well-being and unpredictability beliefs. Based on their childhood perceptions, participants were categorized into three groups: low overall unpredictability, mixed unpredictability, and high overall unpredictability. We found that the low overall unpredictability group reported higher levels of subjective well-being and lower levels of self-unpredictability beliefs compared to the other two groups. Participants in the mixed unpredictability group reported moderate levels of both subjective well-being and self-unpredictability beliefs compared to the other two groups. Regarding levels of world unpredictability beliefs, all groups exhibited similar patterns. In this case, the pandemic may increase perceptions of world unpredictability, potentially overshadowing childhood experiences of predictability. Notably, the predictability in family emotional support during childhood had a significant influence on adult well-being and predictability beliefs, surpassing the impact of financial unpredictability. Our findings stress the pivotal role of predictable family care and consistent support in fostering higher subjective well-being and more positive self-beliefs in adulthood, highlighting its importance for long-term psychological health.

Keywords: life history theory, childhood unpredictability, subjective well-being, self-efficacy, COVID-19

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INTRODUCTION

The COVID-19 pandemic has led to a rise in mental disorders, particularly anxiety and depression (Bourmistrova et al., 2022). These issues have been linked to fears of infection, containment measures such as social isolation, and economic challenges (Meier et al., 2021). Although the pandemic has had widespread effects—including health risks, economic instability, and disruptions to daily life—individuals' psychological responses have varied. While existing research has primarily focused on immediate factors associated with the pandemic, such as personal exposure to the virus, social distance measures, or changes in employment interactions (da Silva Neto et al., 2021; Rodríguez-Fernández et al., 2021), there has been limited attention to *predictive* factors of psychological responses during the pandemic.

Life History Theory— when applied to the study of human behavior—is a model that explains how distinct environmental conditions influence development and result in individual variations in responses to these environments (Del Giudice, 2020; Nettle & Frankenhuis, 2020; Silva Júnior et al., 2024) via the development of different life history strategies. Life history strategies range along a continuum from slow to fast. Slow life strategies tend to develop in environments with low adversity and low unpredictability, favoring the allocation of resources and energy towards growth and development over reproduction. Individuals with this strategy typically exhibit behaviors such as higher risk aversion, lower future discounting, and low unpredictability beliefs —that is, a perception that the world, other people, and one's internal experiences are generally predictable (Loureto et al., 2020; Szepsenwol et al., 2019). Conversely, fast life strategies emerge in environments characterized by high adversity and unpredictability, prioritizing the allocation of resources towards reproduction at the expense of growth and development. In such cases, individuals tend to display higher risk propensity, higher future discounting, and stronger unpredictability beliefs (Simmons et al., 2019; Szepsenwol et al., 2019). Among the many variables that can impact the development and expression of life history strategy, childhood perceptions of family unpredictability stand out.

It is widely recognized that childhood experiences play a pivotal role in cognitive development and significantly influence how individuals handle challenges in adulthood (Beck, 1967; Ross et al., 2022). One useful way to assessing these experiences is to measure family unpredictability, since the family environment has a considerable influence on children's cognitive development (Brumbach et al., 2009; French et al., 2020) and is associated with better mental health and well-being outcomes in both children and adults. This impact extends to the formation of cognitive schemas, such as unpredictability beliefs (Ross et al., 2016) and is associated with conditions like depression (Wuth et al., 2021). Family unpredictability relates closely to how consistently parents meet children's basic needs and can be measured through three key factors: nurturance, financial stability, and meal regularity (Howat-Rodrigues & Tokumaru, 2014). Although other factors may contribute to family unpredictability, these specific factors collectively offer insight into the level of unpredictability experienced during a child's formative years. Their central role in establishing a foundation of support and security in a family context is well supported (Howat-Rodrigues & Tokumaru, 2014).

The first factor, nurturance, refers to the inconsistency of parents in meeting their children's emotional needs during stressful situations. The second factor, money, represents uncertainty in providing financial resources, often pointing to socio-economic challenges. Lastly, the third factor, meals, involves uncertainty about mealtime regularity and the presence of others during those moments. Inconsistent parental care is strongly correlated with higher rates of anxiety, depression, and symptoms of eating disorder in adulthood (Ross et al., 2016). On the other hand, consistent parental care (and a higher level of family predictability) is linked to higher subjective well-being in adults (Ross et al., 2022). Therefore, higher levels of childhood unpredictability are closely connected to various aspects that negatively impact quality of life (Maner et al., 2023), including the development of negative cognitive schemas in adulthood, as well as a negative impact on subjective well-being.

From an evolutionary perspective, subjective well-being (SWB) may serve as a signal of progress toward adaptative goals, directly or indirectly enhancing fitness (Kenrick & Krems, 2018). SWB is closely associated with higher quality of life (Medvedev & Landhuis, 2018), increased perceived self-efficacy (Azizli et al., 2015), and better mental health maintenance (Lombardo et al., 2018). It is well-documented that the constraints and changes brought about by the pandemic have negatively impacted SWB and increased the occurrence of mental disorders (Holmes et al., 2020). Studies show significant individual differences in resilience based on people's experiences during the pandemic (Gayatri & Irawaty, 2022). Despite this, little is known about how earlier experiences, such as childhood unpredictability, may have influenced these outcomes.

Childhood unpredictability not only affects mental health outcomes directly but also influence how individuals cognitively represent unpredictability in their daily lives. This internal representation is captured by the concept of unpredictability beliefs, which refer to a set of beliefs about how unpredictable the world, other people, or one's internal experiences are (Ross & Hill, 2002). Specifically, world unpredictability beliefs pertain to the perception that the world is a chaotic place; people unpredictability beliefs are tied to the perception that people are unreliable; and self-unpredictability beliefs relate to the perception of a lack of internal control. During the pandemic, individuals were continuously exposed to information about the unfolding events, contributing to a general atmosphere of uncertainty and unpredictability (Satici et al., 2022). As a result, this situational context influenced people's perceptions of unpredictability regarding the world, others, and themselves. However, beyond the unpredictability caused by the pandemic, childhood experiences of unpredictability may have further shaped individuals' unpredictability beliefs during this time. This is because unpredictability beliefs formed in childhood shape how we perceive unpredictability in others (Ross et al., 2016). Moreover, childhood unpredictability beliefs may also contribute to a higher tendency towards anxiety, depression, and lower self-efficacy in adulthood, negatively affecting these individuals' subjective well-being (Ross et al., 2016).

Thus, this study aimed to explore whether the level of unpredictability experienced in childhood contributes to the understanding of subjective well-being and unpredictability beliefs during the pandemic. We hypothesized that individuals who recall less family unpredictability in their childhood would (1) experience a smaller impact of the pandemic on their subjective well-being and (2) hold weaker current unpredictability beliefs.

METHOD

Sampling procedures

Participants were recruited via institutional email and social networks. The sample was a convenience sample. A target sample size of N = 252 was calculated using *GPower 3.1* (Mayr et al., 2007) with the following parameters: alpha value 5%, expected power 95% and an effect size of $f = 0.25$. The effect size was chosen based on Cohen's (1988) conventions, where $f = 0.25$ represents a medium effect size. This is commonly used in psychological and behavioral research, particularly when prior effect estimates are unavailable or variable.

A total of N = 438 participants were recruited (280 women). Data collection was conducted online between November 2021 to May 2022 using the Google Forms platform. Participants volunteered and did not receive payment. The study was approved by the Human Research Ethics Committee of the Federal University of Rio Grande do Norte (approval number 45297521.6.0000.5537). All participants provided informed consent for participation

and data publication using the standard Free and Informed Consent Form (FICF) approved by the committee[1].

Participants

All participants resided in Brazil and were over the age of 18. The mean age of participants was 31.7±10.9 years. The Brazilian Association of Research Companies (ABEP, 2021) classifies economic status into five categories, from A (highest economic power) to E (lowest). Based on this classification, 15.8% of participants were in class A, 56.9% in class B, 24.4% in class C, and 3.0% in classes D and E.

Measures and instruments

Participants provided sociodemographic data and rated perceived unpredictability during childhood, subjective well-being, and current unpredictability beliefs.

The *Sociodemographic Measures* included questions about the participants' ownership of certain consumer goods (e.g., refrigerators, computers, cars) and their level of education, which were used to compute socioeconomic status according to the Brazilian Association of Research Companies (ABEP, 2021).

The *Scale of Family Unpredictability During Childhood*, adapted and validated for Brazilian Portuguese by Howat-Rodrigues and Tokumaru (2014), was used to assess perceived inconsistency in how parents met children's basic needs. This instrument is based on the original Retrospective Family Unpredictability Scale developed by Ross and McDuff (2008). The Brazilian version of the scale uses a 5-point Likert format, with higher scores indicating greater perceived unpredictability in the childhood environment. The questionnaire has 18 items divided into three dimensions: nurturance ("I knew my family would be there to take care of me"), money ("When I was a child, my family was never sure how we would pay our bills from month to month"), and meals ("During my childhood, the same people sat down and ate dinner Monday through Friday"). The internal consistency of the scale as measured by Cronbach's alpha was $\alpha = 0.75$.

The *Subjective Well-Being Scale* was originally developed and validated in Brazilian Portuguese by Albuquerque and Tróccoli (2004) and was used to measure participants' life satisfaction. Life satisfaction corresponds to the cognitive component of subjective well-being. It is a 5-point Likert-type scale, with higher scores indicating greater well-being. The scale has 15 items, divided into two dimensions: satisfaction with life ("I evaluate my life positively") and dissatisfaction with life (reverse items, "My life is bad"). Items from the dissatisfaction dimension were reverse-scored and combined with the satisfaction items to compute the total subjective well-being score. The internal consistency of the scale as measured by Cronbach's alpha was $\alpha = 0.94$.

The *Scale of Unpredictability Beliefs* (Ross et al., 2016) was used to measure participants' cognitive schemas related to unpredictability. This scale was originally developed in English, but a translation/reverse translation process was performed for application in Brazilian Portuguese. It is a 6-point Likert-type scale, with higher scores indicating more perceived unpredictability. There are 16 questions divided into three dimensions of beliefs: self-unpredictability ("My day-to-day functioning is variable"), people unpredictability ("People often make promises they are not capable of keeping"), and world unpredictability ("The world seems unstable"). The scale was adapted by the researchers for use during the COVID-19 pandemic, with the verb tense modified to reflect the participants' current experiences rather than their general life circumstance (e.g., "My day-to-day functioning has

[1] Available at https://cep.propesq.ufrn.br/documentos/formularios-modelos/204358709

been variable"; "People have often made promises they have not been able to keep"; "The world has seemed unstable"). The internal consistency of the subscales as measured by Cronbach's alpha was $\alpha = 0.87$ for self-unpredictability beliefs and $\alpha = 0.85$ for world unpredictability beliefs." The internal consistency for people's unpredictability beliefs was considerably lower ($\alpha = 0.55$); therefore, this subscale was excluded from subsequent analyses.

Formation of groups

The study had a quasi-experimental design with non-random assignment. The independent variable was the natural grouping of participants based on their experience of childhood unpredictability. This grouping was derived from a Cluster analysis conducted by Tasso and Castro (2023), using participants' scores on the Scale of Family Unpredictability during Childhood (Howat-Rodrigues & Tokumaru, 2014). The number of clusters was determined by grouping participants based on their responses, using the linkage method with squared Euclidean distance. The optimal number of groups was identified by the greatest distance coefficient in the agglomeration schedule. The result of the cluster analysis was the categorical variable "cluster", which grouped participants according to the level of unpredictability experienced in childhood.

The best solution identified three clusters. Cluster 1 consisted of individuals who experienced a high level of predictability in the family environment during childhood. These individuals reported consistency in interactions with family members regarding their basic needs for care, support, and protection. Additionally, they also reported stability in the family's financial situation, characterized by low unpredictability regarding the ability to cover expenditures and purchase goods. Lastly, these individuals experienced low unpredictability in mealtime routines, meaning there was consistency in mealtimes and predictability regarding who would be present during those occasions. For this reason, this cluster was named "low overall unpredictability". Clusters 2 and 3 consisted of individuals who reported greater unpredictability in financial aspects and mealtime routines, with the main difference between them being the predictability of family support. Cluster 2 included individuals who perceived consistent family support, similar to Cluster 1, but experienced inconsistency in mealtime routines and the highest financial unpredictability among the three clusters. Therefore, this cluster was named "mixed unpredictability". Finally, Cluster 3 included individuals who perceived general inconsistency across all three assessed aspects and was therefore named "high overall unpredictability". Thus, we obtained the independent variable "cluster," consisting of three groups, used to test the research hypotheses.

Statistical methods

We conducted General Linear Model (GLM) tests to investigate whether childhood unpredictability affected subjective well-being, self-unpredictability beliefs, and beliefs about world unpredictability. In all analyses, the cluster variable served as the independent variable, while scores from the other instruments were the dependent variables. An exploratory analysis using Pearson's correlation tests showed that age was positively correlated with income ($r(436)$=.176; p<.001) and negatively correlated with current unpredictability beliefs ($r(436)$=-.343; p<.001), indicating that older participants tended to have higher incomes and fewer unpredictability beliefs. Consequently, age was controlled for in the analysis to isolate the impact of unpredictability beliefs on the variables of interest. Statistical significance was set at a 5% level for all analyses. Data were analyzed using *IBM SPSS Statistics*, Version 26.

RESULTS

The GLM test showed differences between the clusters concerning subjective well-being and self-unpredictability beliefs (see Table 1 and Figure 1). For subjective well-being, the Bonferroni post-hoc analysis revealed that the "low overall unpredictability" cluster reported the highest mean scores (M = 51.96, 95% CI [50.26, 53.66]), followed by the "mixed unpredictability" cluster (M = 46.28, 95% CI [44.09, 48.46]), which scored higher than the "high overall unpredictability" cluster (M = 41.15, 95% CI [38.52, 43.78]) (Table 2). For self-unpredictability beliefs, the order was reversed: the "low overall unpredictability" cluster had the lowest score (M = 16.80, 95% CI [16.04, 17.56]), followed by the "mixed unpredictability" cluster (M = 18.91, 95% CI [17.94, 19.89]), and the "high overall unpredictability" cluster, which had significantly higher scores (M = 20.84, 95% CI [19.67, 22.02]) (Table 2). Finally, no significant differences were found among the clusters in terms of world unpredictability beliefs (low overall unpredictability cluster: M = 20.43, 95% CI [19.86, 21.01]; mixed unpredictability cluster: M = 21.17, 95% CI [20.44, 21.91]; high overall unpredictability cluster: M = 20.92, 95% CI [20.04, 21.81]; see Figure 1 and Table 2).

Table 1

Results of the GLM analysis comparing the clusters in terms of subjective well-being, self-unpredictability beliefs, and world unpredictability beliefs.

	df	*F*	*p*	$\eta^2_{Partial}$	Power
Subjective well-being					
Age	1, 431	43,82	<.001	0,09	1,00
Sex	1, 431	0,12	0.727	0,00	0,06
Clusters	2, 431	24,65	**<.001**	0,10	1,00
Sex*Cluster	2, 431	0,26	0.769	0,00	0,09
Self-unpredictability beliefs					
Age	1, 431	74,92	<.001	0,15	1,00
Sex	1, 431	2,03	0.155	0,00	0,30
Clusters	2, 431	17,23	**<.001**	0,07	1,00
Sex*Cluster	2, 431	0,44	0.642	0,00	0,12
World unpredictability beliefs					
Age	1, 431	24,92	<.001	0,05	1,00
Sex	1, 431	3,77	0.053	0,01	0,49
Clusters	2, 431	1,31	0.053	0,01	0,28
Sex*Cluster	2, 431	0,77	0.463	0,00	0,18

Table 2

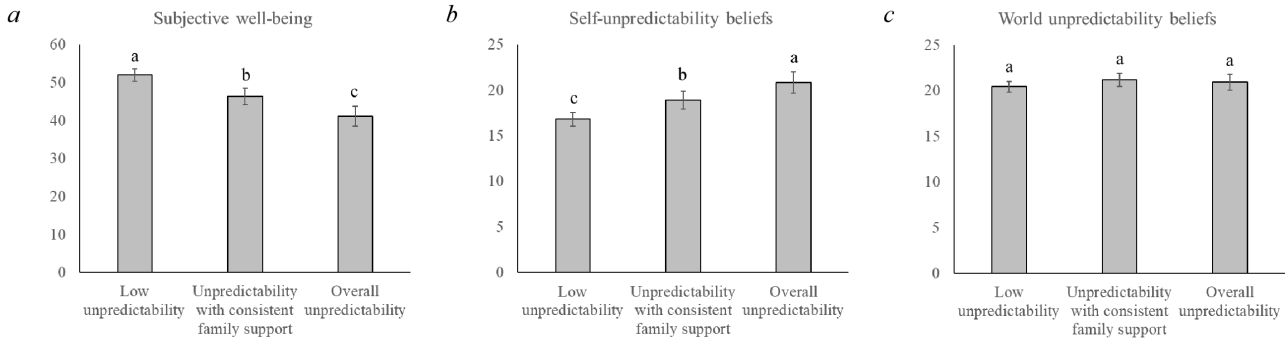
Results of Bonferroni post hoc tests comparing the clusters in terms of subjective well-being, self-unpredictability beliefs, and world unpredictability beliefs.

(I) Cluster	(J) Cluster	Mean Difference (I-J)	*SE*	*p*	95% Confidence Interval	
					Lower Bound	Upper Bound
Subjective well-being						
Low overall unpredictability	High overall unpredictability	10.81	1.60	<.001	6.97	14.65
	Mixed unpredictability	5.68	1.41	<.001	2.29	9.06
Mixed unpredictability	Low overall unpredictability	-5.68	1.41	<.001	-9.06	-2.29
	High overall unpredictability	5.13	1.74	0.010	0.94	9.31
High overall unpredictability	Low overall unpredictability	-10.81	1.60	<.001	-14.65	-6.97
	Mixed unpredictability	-5.13	1.74	0.010	-9.31	-0.94
Self-unpredictability beliefs						
Low overall unpredictability	High overall unpredictability	-4.04	0.71	<.001	-5.76	-2.32
	Mixed unpredictability	-2.11	0.63	0.003	-3.62	-0.60
Mixed unpredictability	Low overall unpredictability	2.11	0.63	0.003	0.60	3.62
	High overall unpredictability	-1.93	0.78	0.040	-3.80	-0.06
High overall unpredictability	Low overall unpredictability	4.04	0.71	<.001	2.32	5.76
	Mixed unpredictability	1.93	0.78	0.040	0.06	3.80
World unpredictability beliefs						
Low overall unpredictability	High overall unpredictability	-0.49	0.54	1.000	-1.78	0.80
	Mixed unpredictability	-0.74	0.47	0.355	-1.87	0.39
Mixed unpredictability	Low overall unpredictability	0.74	0.47	0.355	-0.39	1.87
	High overall unpredictability	0.25	0.59	1.000	-1.15	1.65
High overall unpredictability	Low overall unpredictability	0.49	0.54	1.000	-0.80	1.78
	Mixed unpredictability	-0.25	0.59	1.000	-1.65	1.15

Note. P-values were Bonferroni-adjusted.

Figure 1

Mean scores and 95% confidence intervals for (a) subjective well-being, (b) self-unpredictability beliefs, and (c) world unpredictability beliefs, by cluster.



Note. Bars sharing the same letter are not significantly different from each other based on Bonferroni-adjusted post hoc comparisons (see Table 2).

DISCUSSION

This study explored whether childhood experiences of family unpredictability predict subjective well-being and unpredictability beliefs in adults during stressful events, specifically the COVID-19 pandemic. Overall, our findings suggest that adults who perceived higher levels of unpredictability in childhood reported lower subjective well-being and higher unpredictability beliefs during this stressful event. However, a more detailed analysis revealed certain nuances that warrant further considerations.

Individuals in the low overall unpredictability group—who experienced greater predictability and consistent support in family care during childhood—reported higher levels of subjective well-being, in line with findings by Ross and colleagues (2022). Additionally, our results extend existing research by demonstrating that, among individuals who experienced some level of childhood unpredictability, variations in adult subjective well-being are particularly linked to the degree of predictability in family care and support. Although both the mixed unpredictability and high overall unpredictability groups reported financial instability and irregular meal routines, it was the perceived consistency of family care that emerged as a key factor in promoting higher subjective well-being in adulthood. These findings reinforce the importance of the early developmental environment, as proposed by Life History Theory, which posits that stable and predictable parenting fosters the development of slower life-history strategies (Kaplan, 1996; Lu et al., 2023). This, in turn, contributes to a higher baseline of subjective well-being—a key component of overall subjective well-being (Medvedev & Landhuis, 2018) and essential for maintaining mental health (Lombardo et al., 2018).

Regarding self-unpredictability beliefs, individuals in the low overall unpredictability group reported the lowest levels of self-unpredictability, followed by those in the mixed unpredictability group, and finally those in the high overall unpredictability group. Evidence suggests that self-unpredictability is inversely related to positive self-beliefs, and well-being is associated with cognitive schemas such as self-efficacy and locus of control (Ross et al., 2022; Strong & Gore, 2020; Tomlinson et al., 2017). Consequently, unpredictable childhood environments may shape beliefs about self-unpredictability, affecting baseline levels of subjective well-being in adulthood (Ross et al., 2016). Moreover, the positive link between self-predictability and self-efficacy is associated with healthier coping strategies when dealing with challenges, particularly non-normative events (Bandura, 1992; Cattelino et al., 2023). It is also possible that beliefs about self-unpredictability are associated with a greater tendency toward risk-taking behaviors (Ross & Hill, 2002; Ross et al., 2016), which, during the pandemic, may have impacted individuals' consistency in following public health guidelines. Thus, childhood experiences of high predictability and consistent family support may have played a protective role in how individuals coped during the pandemic. Our findings highlight the close relationship between subjective well-being and self-unpredictability beliefs, both influenced by childhood predictability in family care. Therefore, we reiterate the importance of a predictable and supportive family environment during childhood as a key factor influencing adult well-being.

Finally, regarding beliefs about world unpredictability, our findings warrant a nuanced interpretation. Existing literature suggests that individuals exposed to higher levels of childhood unpredictability tend to perceive greater unpredictability in adulthood, often reflected in behaviors such as increased risk-taking and a greater number of sexual partners (Ross & Hill, 2002; Ross et al., 2016; Simpson et al., 2012). However, our results diverge from these findings. The context of the COVID-19 pandemic—marked by widespread uncertainty, lack of knowledge about the disease, asymptomatic transmission, financial instability, and political distrust—appears to have significantly influenced participants' perceptions of the world as unpredictable. This pervasive situational unpredictability seems to have overridden any lasting influence of childhood family predictability. While some individuals did report heightened concerns about world unpredictability, childhood experiences of unpredictability

did not significantly predict these differences in our sample. This suggests that other factors, such as ideological bias (Gramacho et al., 2021; Ruisch et al., 2021), socioeconomic status (Xavier et al., 2022), or technical knowledge about the disease (Gramacho et al., 2021; Xavier et al., 2022), may provide stronger explanatory power for individual variation in world unpredictability beliefs during the pandemic.

The study had limitations. Firstly, due to the pandemic, data was collected online, resulting in a convenience sample mostly composed of individuals from upper-middle-class backgrounds with high education levels. Future research should aim for more representative samples to improve generalizability. Another limitation is relying solely on self-report measures in online data collection. Although widely used, self-report measures are subject to biases such as social desirability, recall errors, and inaccurate self-perception, especially in retrospective assessments (Paulhus & Vazire, 2007). Incorporating implicit measures in future research would be advisable. Finally, our findings can only provide a cross-sectional snapshot. To definitively disentangle childhood predictors and the pandemic's impact it would be crucial to compare pre- and post-pandemic data within the same sample.

In summary, our findings highlight the significant impact of family unpredictability during childhood on unpredictability beliefs and subjective well-being in adulthood, particularly during the COVID-19 pandemic. Extending beyond pre-pandemic literature, our results reveal that predictability in family care and consistent support play a pivotal role in fostering higher subjective well-being and more positive self-beliefs in adulthood. This is true even for individuals who experienced financial difficulties and an inconsistent meal routine during childhood. These findings contribute to our understanding of the intricate interactions between past experiences, unpredictability in family support, and subjective well-being in challenging contexts.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest.

DECLARATION

We declare that all work herein is original and our own. All authors have reviewed and approved the manuscript for submission, and it is not being considered for submission elsewhere whilst it is under consideration for *Human Ethology.*

TRANSPARENCY

The datasets generated by the survey research during and/or analyzed during the current study are available in the OSF Registres repository at https://osf.io/v5ehn/?view_only=a796aeb83d304e489b4f276b145629fe.

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