

The Interplay Between Change and Growth: A Serial Mediation Model to Predict Personal Growth Following the Transition to Motherhood

Elad Mijalevich-Soker

Bar-Ilan University

Orit Taubman-ben-ari

taubman@biu.ac.il

Bar-Ilan University

Research Article

Keywords: Personal growth, transition to motherhood, disposition to change, intolerance of uncertainty

Posted Date: October 23rd, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-11056495/v1>

License:  This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Additional Declarations: No competing interests reported.

Abstract

Purpose

Personal growth during the transition to motherhood refers to the positive transformation that new mothers experience following stress encountered in the perinatal period. Although personal growth is a process of change by definition, the role of individuals' dispositions toward change and the way they handle uncertainty in this context remains largely unexplored. This study examined the impact of intolerance of uncertainty during pregnancy (T1) on personal growth at 3–6 months post-partum (T3) through the mediating effects of perceived stress and resistance to change at 0–3 months post-partum (T2).

Methods

Primiparous women ($n = 381$; $M_{\text{age}} = 29.64$) were recruited via healthcare providers and social media and completed a set of self-report questionnaires at three phases.

Results

The results indicated a significant serial mediation, revealing an indirect effect of intolerance of uncertainty on personal growth via perceived stress and resistance to change.

Conclusions

The current study suggests a novel pathway to personal growth originating in the prenatal period and, for the first time, presents the role of an individual's disposition to change in this experience. Clinical interventions could focus on developing uncertainty-management skills during the perinatal period, helping expectant mothers to better manage it to promote positive psychological outcomes, such as personal growth.

Highlights

- Difficulty coping with uncertainty during pregnancy may hinder personal growth postpartum
- Stress in early motherhood was associated with greater resistance to change
- Women who were less resistant to change reported greater personal growth
- Stress and resistance to change may explain how prenatal intolerance of uncertainty relates to later personal growth

Introduction

The transition to motherhood is a developmental milestone in women's lives, often a desirable and positive life event, while also having the potential to be stressful due to hormonal disturbances, childbirth-related anxiety, and post-traumatic stress symptoms (Cook et al., 2018; Refaeli et al., 2024; Saxbe et al., 2018). Nevertheless, this life transition also provides the opportunity for personal growth (also known as post-traumatic growth; PTG) (Brandão et al., 2020; Taubman – Ben-Ari, 2019). While growth is an ongoing dynamic process that requires individuals to undergo fundamental changes as they navigate unfamiliar pathways (Tedeschi & Blevins, 2015), empirical knowledge about individuals' personal dispositions toward uncertainty and change remains surprisingly limited. Therefore, this longitudinal study aimed to broaden the current understanding and examine their role in personal growth during the transition to motherhood.

Personal growth is defined as positive changes that individuals experience following coping with stressful circumstances, manifesting in five main domains: appreciation of life, personal strength, spirituality, relating with others, and perception of new opportunities (Tedeschi & Calhoun, 1996). These outcomes are a byproduct of a process that is initiated by an encounter with a stressful event that disrupts one's assumptions about the self, the world, and the future. This triggers a variety of cognitive and emotional processes (e.g., a shift from intrusive ruminations to deliberate reflection and improved emotional regulation) that enable individuals to positively reframe their stressful experiences, reorganize their set of core beliefs, and recognize newfound internal strengths (Cann, Calhoun, Tedeschi & Kilmer et al., 2010; Tedeschi et al., 2018). Given that the transition to motherhood spans a long period, various psychological dimensions may be salient at different stages. According to the perinatal literature, uncertainty may be particularly prominent at the prenatal phase, as women await childbirth and their new maternal role (Borrelli et al., 2018; Colciago et al., 2022; Saxbe et al., 2018). A concept relevant to this period is *intolerance of uncertainty* (Carleton, 2016), namely, difficulty enduring discomfort arising from insufficient information or essential knowledge.

As pregnancy is inherently characterized by uncertainty, women exhibiting higher levels of this disposition are at increased risk for adverse psychological outcomes, such as post-traumatic stress symptoms, emotional dysregulation, and higher levels of fear of childbirth (Costello et al., 2025; Ring et al., 2024; Rondung et al., 2019). However, higher intolerance of uncertainty has also been associated with greater personal growth across a variety of contexts (Short et al., 2025; Vazquez et al., 2021), including the perinatal period (Chasson et al., 2022).

Intolerance of uncertainty is also recognized as a significant contributor to perceived stress (Albani et al., 2023; Demirtas & Yildiz, 2019), with several studies finding a robust direct link between this disposition and increased levels of perceived stress (Wu et al., 2021; Xu et al., 2023). *Perceived stress* refers to how individuals evaluate a situation as unpredictable, uncontrollable, and overwhelming (Cohen et al., 1983). In the perinatal context, perceived stress is likely to gradually increase in the first few months post-partum (Leonard et al., 2020).

The relationship between perceived stress and personal growth is considered highly complex. Some studies indicate negative linear associations (e.g., Abu Sharkia & Taubman – Ben-Ari, 2024), while others suggest a curvilinear relationship, showing that moderate levels of perceived stress are associated with greater personal growth (e.g., Mijalevich-Soker et al., 2024; Rozen et al., 2018). Moreover, studies over the years have established that perceived stress (subjective appraisal of stress) is a better predictor of growth than “objective” stressors (e.g., pre-term birth) or actual risks (Rozen et al., 2018; Taubman – Ben-Ari, 2019; Tedeschi et al., 2018).

Furthermore, although growth is a process of change by definition, the tendency to *accept or resist change* remains largely underexplored in the literature dealing with growth. Whereas individuals tend to avoid change and prefer to maintain a status quo (Samuelson & Zeckhauser, 1988), the capacity to adapt to evolving environmental demands is a critical determinant of one’s mental health and psychological well-being (Di Fabio & Gori, 2016; Wanberg & Banas, 2000).

In the context of personal growth, several studies have examined “change-related constructs” that represent some dimensions of individuals' orientation toward change. Among them is the concept of coping flexibility, which has been found to significantly predict the trajectory of personal growth in the post-partum period (Taubman – Ben-Ari et al., 2024) and to moderate the relationship between perceived stress and personal growth among women dealing with infertility (Abu-Sharkia et al., 2023). Notably, Bruno et al. (2024) examined individuals following the COVID-19 pandemic and demonstrated that while perceived stress and psychological flexibility did not show significant bivariate correlations with personal growth, they emerged as significant predictors within a path analysis model, indicating that higher perceived stress was associated with increased psychological inflexibility, which in turn predicted lower levels of growth.

Other concepts relating to one’s disposition to change include openness and acceptance, both of which have been identified as significant contributors to personal growth across diverse contexts (Shakespeare-Finch et al., 2003; Tedeschi et al., 2018). Specifically, various forms of acceptance, such as acceptance of the event (e.g., chronic illness), or acceptance that certain situations are uncontrollable, play a vital role in fostering personal growth (Wong & Yeung, 2017; Zoellner & Maercker, 2006). Similar patterns have been observed regarding openness to experience, which was also found to be a significant contributor to personal growth (Knaevelsrud et al., 2010; Shakespeare-Finch et al., 2003).

The current study

At the core of this study lies a fundamental, yet surprisingly overlooked, research question: What is the role of individuals' dispositions toward uncertainty and change in the experience of personal growth? Although the growth process requires individuals to navigate a variety of unfamiliar cognitive and emotional processes alongside numerous internal and external changes over time (Tedeschi et al., 2018), the literature has yet to establish the role of these dispositions in the experience of growth. We explored the transition to motherhood as a significant life event that constitutes an opportunity for personal growth. Based on both theoretical frameworks (Schaefer & Moos, 2001; Taubman – Ben-Ari, 2019;

Tedeschi et al., 2018) and empirical evidence (Bruno et al., 2024; Chasson et al., 2023; Satıcı et al., 2022; Wu et al., 2021), the present longitudinal study examines the serial mediating roles of perceived stress and resistance to change in the link between intolerance of uncertainty during pregnancy and personal growth post-partum. The variables in the proposed pathway were assessed and positioned on a timeline according to the perinatal literature, such that intolerance of uncertainty was measured during the third trimester of pregnancy, perceived stress and resistance to change during the first three months post-partum, and personal growth between three and six months post-partum.

Based on the existing literature, we hypothesized that the relationship between intolerance of uncertainty and personal growth would be serially mediated by perceived stress and resistance to change. Specifically, higher levels of intolerance of uncertainty would be linked to higher perceived stress, which would be linked to greater resistance to change, which in turn would be associated with lower personal growth.

Methods

Participants and Procedure

The current study employed a longitudinal design spanning over ten months. Following approval from the University's Institutional Review Board, participants completed a set of self-report questionnaires at three phases: Phase 1, during the third trimester of pregnancy ($M_{\text{week}} = 28.19$, $SD = 5.9$); Phase 2, within three months post-partum ($M_{\text{months}} = 2.25$, $SD = 1.12$); Phase 3, between three to six months post-partum ($M_{\text{months}} = 3.90$, $SD = 1.73$). Participants were eligible if they were over 18 years old, in their third trimester of pregnancy, and primiparous (expecting their first child). Recruitment began in October 2024 via healthcare providers (e.g., gynecologists, nurses, and doulas) and social media platforms (e.g., Facebook). The final sample consisted of 381 women, aged 20 to 43 ($M = 29.64$, $SD = 3.76$). Demographically, 95% of the women were married or in a spousal relationship; 78% had an academic degree. Regarding income, 50% reported above-average monthly income, 30% reported average, and 20% reported below-average. Self-reported physical health indicated that 63% rated it very good, 33% rated it good, and 4% rated it fair.

Measures

Intolerance of Uncertainty Scale (IUS; Carleton et al., 2007) is a self-report measure consisting of 12 items assessing individuals' reactions to uncertainty in the present and future (e.g., "It frustrates me not having all the information I need"). In the current study, women completed this scale during their third trimester of pregnancy. Responses range on a 5-point Likert scale from 1 (*not at all characteristic of me*) to 5 (*entirely characteristic of me*). To calculate a total score, all item responses are averaged, with a higher score reflecting a greater level of intolerance of uncertainty. Cronbach's alpha of the scale in the study was $\alpha = .89$.

Perceived Stress Scale (PSS; Cohen et al., 1983) is a 14-item self-report questionnaire measuring the subjective experience of stress. In this study, the scale was administered to women within three months post-partum, and participants were asked to report their stress levels during the recent days (e.g., “How often have you felt that things were going your way?”). Responses were indicated on a 5-point Likert scale, ranging from 0 (*never*) to 4 (*very often*). Each participant’s total score was calculated by averaging their responses to all items, with higher scores indicating greater perceived stress. Cronbach’s alpha for the scale in the present study was $\alpha = .88$.

Resistance to Change (RTC; Oreg, 2003) is a 17-item scale designed to evaluate one’s dispositional resistance to change. It is a multi-dimensional tool, including emotional, cognitive, and behavioral orientations and reactions to change (e.g., “When I am informed of a change in plans I get a bit stressed out”). Responses were indicated on a 6-point Likert scale from 1 (*strongly agree*) to 6 (*strongly disagree*). Women completed this scale within three months post-partum and two items were removed because they were formulated in the context of employment. Each participant’s total score was calculated by averaging their answers to all remaining items, with higher scores indicating greater resistance to change. Cronbach’s alpha in the current study was $\alpha = .84$.

The Post-traumatic Growth Inventory- Short Form (PTGI-SF; Cann, Calhoun, Tedeschi & Taku et al., 2010) is a 10-item measure that evaluates positive changes in the aftermath of stressful circumstances or life events (e.g. “I appreciate the value of my life more”). The current study used a validated version adapted to examine personal growth within the context of the transition to motherhood (Taubman – Ben-Ari et al., 2011). Participants rated the degree to which they experienced change for each item in the period between three to six-month post-partum. Responses were indicated on a 6-point Likert scale from 0 (*I did not experience this change*) to 5 (*I experienced this change to a very great degree*). A total score was calculated by averaging responses to all items, with higher scores indicating greater personal growth. Cronbach’s alpha in the present study was $\alpha = .84$.

Data Analyses

First, descriptive statistics and Pearson correlations were computed between the study variables. To examine the mediation roles of perceived stress and resistance to change in the relationship between intolerance of uncertainty and personal growth, a serial mediating model was tested using PROCESS procedure (Hayes, 2017, 2022; model 6). The significance of the indirect effects was evaluated using bootstrapping with 5,000 resamples to compute 95% percentile confidence intervals (CIs) (Preacher & Hayes, 2008). Missing data across the three time points were handled using Full Information Maximum Likelihood (FIML), which utilizes all available data points without resorting to listwise deletion, thereby providing unbiased parameter estimates under ignorable missing data conditions (Enders & Bandalos, 2001). This method has been demonstrated to yield more reliable and unbiased estimates compared to other techniques (Allison, 2012; Graham, 2009).

Patient and public involvement

Patients and members of the public were not directly involved in the design, data analysis, or interpretation of the study findings.

Results

Preliminary analyses

Table 1 displays the means, standard deviations, and correlation coefficients of the study variables. Among the sociodemographic variables, results indicated that younger age and lower economic status were associated with higher levels of intolerance of uncertainty and personal growth. Additionally, women who reported lower education levels experienced higher growth. Furthermore, better physical health was associated with lower intolerance of uncertainty and perceived stress. Regarding the main variables, results indicated that intolerance of uncertainty was positively and significantly associated with both perceived stress and resistance to change, while it was non-significantly related to personal growth. Additionally, higher perceived stress was significantly associated with greater resistance to change and lower personal growth. Finally, a significant negative relationship was found between resistance to change and personal growth.

Table 1
Means, standard deviations, and correlations among the study variables.

Variable	M	SD	1	2	3	4	5	6	7	8
1. Age	29.64	3.78	-							
2. Education	3.64	0.71	.27**	-						
3. Economic level	2.19	0.81	.29**	.24**	-					
4. Health Status	4.55	0.62	.05	.07	.24**	-				
5. Intolerance of uncertainty (T1)	2.85	0.74	-.15**	-.02	-.17**	-.11**	-			
6. Perceived stress (T2)	2.25	0.48	.02	.01	-.08	-.24**	.36**	-		
7. Resistance to Change (T2)	3.54	0.68	-.08	.05	-.06	-.06	.53**	.37**	-	
8. Personal Growth (T3)	3.20	0.87	-.15*	-.21**	-.20**	-.09	-.03	-.18*	-.22**	-
* $p < 0.05$, ** $p < 0.01$.										

Serial Mediation Model

A serial mediation analysis was conducted to examine whether perceived stress (M1) and resistance to change (M2) mediated the relationship between intolerance of uncertainty (X) and personal growth (Y). This model includes three indirect effects (Indirect 1: $X \rightarrow M1 \rightarrow Y$; Indirect 2: $X \rightarrow M2 \rightarrow Y$; Indirect 3: $X \rightarrow M1 \rightarrow M2 \rightarrow Y$). The direct effects of the serial mediation model are presented in Fig. 1. As presented in Table 2, the analysis revealed that the indirect effect of intolerance of uncertainty on personal growth through perceived stress was non-significant ($B = -0.06$, $SE = 0.03$, 95%CI [-0.129, 0.005]). However, resistance to change significantly mediated the association between intolerance of uncertainty and personal growth ($B = -.11$, $SE = 0.05$, 95%CI [-0.215, -0.019]). Furthermore, perceived stress and resistance to change sequentially mediated the path between intolerance of uncertainty and personal growth ($B = -0.02$, $SE = 0.01$, 95%CI [-0.043, -0.000]). Results are presented after controlling for covariates: age, economic level, education, and health status.

Table 2

Intolerance of uncertainty, perceived stress, resistance to change, and personal growth: testing a serial mediation model.

Model pathway	95% CI				
	Estimate	SE	Lower	Upper	p
Intolerance of uncertainty T1 $\Rightarrow$ Perceived stress T2 $\Rightarrow$ Personal growth T3	-0.062	0.034	-0.129	0.005	.070
Intolerance of uncertainty T1 $\Rightarrow$ Resistance to change T2 $\Rightarrow$ Personal growth T3	-0.117	0.050	-0.215	-0.019	.019
Intolerance of uncertainty T1 $\Rightarrow$ Perceived stress T2 $\Rightarrow$ Resistance to change T2 $\Rightarrow$ Personal growth T3	-0.022	0.010	-0.043	-0.000	.041
CI, confidence interval. * $p < 0.05$. Bootstrap sample size = 5000.					

Discussion

The present longitudinal study examined a novel pathway to personal growth during the transition to motherhood. Grounded in both PTG theory and perinatal literature, our main hypothesis was that intolerance of uncertainty during pregnancy would predict post-partum personal growth through a serial mediation of perceived stress and resistance to change. Overall, the findings provide support for this model. While the indirect path through perceived stress alone was non-significant, resistance to change significantly mediated the association between intolerance of uncertainty and personal growth, and a significant serial mediation emerged through perceived stress and resistance to change. These findings enhance our understanding of the contribution of basic dispositions to personal growth and, for the first time, show empirically that the tendency toward change is a meaningful psychological mechanism in this process, within the context of the transition to motherhood.

Preliminary analyses revealed several noteworthy associations among the study variables and personal growth. Aligning with previous research, women who were more challenged in terms of sociodemographic factors during the perinatal period, including being younger, with lower educational and economic status, tended to experience significantly greater personal growth (Mijalevich-Soker et al., 2024; Navon-Eyal & Taubman – Ben-Ari, 2025). This can be explained by the ‘core belief disruption hypothesis’ (Cann, Calhoun, Tedeschi & Kilmer et al., 2010). Accordingly, women who are initially at a disadvantage in terms of demographic resources have fewer coping resources to handle the perinatal stress, and thus their fundamental beliefs are more likely to be shattered, which is associated with higher personal growth (Tedeschi et al., 2018; Silva et al., 2025).

Additionally, the findings revealed that personal growth is significantly and negatively associated with perceived stress and resistance to change. In line with the latest studies within the perinatal period, the results showed that the simple correlation between personal growth and perceived stress was negative (Mijalevich-Soker et al., 2024; Zelkin & Taubman – Ben-Ari, 2025). These prior indications, however, were

observed during pregnancy, so knowledge of both constructs, as measured at different points along the post-partum period, is limited. It is possible that lower stress levels at the beginning of motherhood, as measured during the first three months after birth, enable new mothers to focus their cognitive, emotional, and social resources in favor of growth-promoting processes rather than contemplating their distress. For example, allocating their attention to social interactions is likely to help them receive support and space to share their experiences so far, which can help them process their experiences better and enable growth (Chasson & Taubman – Ben-Ari, 2024; Tedeschi et al., 2018).

In terms of the disposition to change, findings indicated that the less resistant women were to change, the greater their experienced personal growth. While this is the first study to examine these two constructs together, the results align with prior research on change-related constructs in both the perinatal period (Taubman – Ben-Ari et al., 2024) and other stressful settings (Shakespeare-Finch et al., 2003).

Consistent with our hypothesis, we found that resistance to change significantly mediated the association between intolerance for uncertainty and growth, such that women with greater intolerance for uncertainty were more likely to resist change, which is subsequently associated with lower growth. Conversely, women with lower intolerance of uncertainty were less resistant to change and therefore were likely to experience greater growth. These findings correspond with previous studies demonstrating the mediating role of change-related constructs, such as psychological flexibility, in the relationship between intolerance of uncertainty and psychological outcomes during stressful circumstances (Godara et al., 2023; Okayama et al., 2024)

The literature indicates that individuals characterized by lower intolerance of uncertainty exhibit greater openness during life transitions (Bardi et al., 2009) and manage stress through adaptive emotion regulation strategies, including acceptance and reappraisal (Sahib et al., 2023). Consequently, a greater capacity to manage the negative impact of uncertainty during pregnancy may enable women to more readily embrace the unknown and acknowledge their limited control, positioning them to be more open to change. This acceptance of change, combined with effective emotional regulation strategies, can help women navigate the challenging processes of this life transition with more adaptability (e.g., redefining their identity as mothers and accepting shifts in life priorities), ultimately fostering personal growth (Tedeschi et al., 2018).

Regarding the research question, the results revealed that perceived stress did not mediate the association between intolerance of uncertainty and personal growth on its own. Although studies in this context have identified perceived stress as a significant contributor to personal growth (Mijalevich-Soker et al., 2024; Taubman – Ben-Ari et al., 2022; Zelkin & Taubman – Ben-Ari, 2025), there is limited knowledge about its contributions post-partum from a longitudinal perspective. A study conducted during the COVID-19 pandemic found no significant relationship between perceived stress and personal growth measured one year later (Bruno et al., 2022). Thus, while perceived stress correlated significantly with both intolerance of uncertainty and personal growth, it did not serve as a significant mediator between these variables. This may suggest that, unlike personal dispositions, perceived stress is a state-

like component that may lack the structural robustness necessary to sustain a mediating effect across different time phases (Castro-Alvarez et al., 2022; Geiser et al., 2015).

Nevertheless, confirming our hypothesis, the findings demonstrated a significant serial mediation role of perceived stress and resistance to change in the relationship between intolerance of uncertainty and personal growth, so that greater intolerance of uncertainty was associated with increased stress, which was related to greater resistance to change, which in turn hindered personal growth. The first path of the model is consistent with previous studies indicating that individuals higher in intolerance of uncertainty are more likely to experience psychological distress (Rosser, 2019) and to perceive greater stress across a variety of contexts (Abdollahi & Dehghanidowlatabadi, 2026; Demirtas & Yildiz, 2019).

The subsequent path, in which perceived stress positively and directly affected resistance to change, also received some empirical support from previous studies, which have shown that individuals tend to be more flexible and open to change when perceiving situations as less stressful (Bruno et al., 2024; Demirtas & Yildiz, 2019). The literature on the impact of stress on executive functioning has shown that stress can significantly impair one's cognitive flexibility (Shields et al., 2016) and increase effort avoidance (Bogdanov et al., 2021). Thus, it is possible that greater perceived stress during the demanding period of early motherhood further depletes mothers' cognitive and emotional resources and limits their openness to change and ability to navigate unfamiliar processes.

The last path indicated that greater resistance to change was associated with lower levels of personal growth three months afterward. Although the link between the two constructs is understudied, previous studies across diverse stressful settings have shown that change-related constructs (e.g., self-acceptance, proactive acceptance of events, and flexibility) significantly contribute to personal growth (Bruno et al., 2022; Zhao et al., 2020). Our findings address the foundation of the concept of personal growth as an inherently transformative process that requires acceptance of change or, more specifically, less resistance to it (e.g., allowing the redefinition of core beliefs and the changing reality) (Cann, Calhoun, Tedeschi & Kilmer et al., 2010; Tedeschi et al., 2018). Taken together, these findings emphasize that the general disposition toward change is a significant factor in personal growth and, specifically, that resistance to change may have a long-term impact on mothers' levels of personal growth post-partum.

Limitations, Implications, and Further Directions

This study has several limitations that should be noted. First, it is based solely on self-report measures, which are prone to various biases, primarily social desirability bias, that can affect women's responses. However, this is the most appropriate way to examine subjective experiences. Additionally, the study benefits from examining participants' experiences at three phases. Second, women's stress was assessed solely through their subjective experiences; thus, future investigations can integrate objective perinatal data (e.g., at-risk pregnancy) into such a model to provide a comprehensive picture of the sources of uncertainty and stress. A third limitation concerns women's sociodemographic profile, in that most participants in this sample reported having an academic degree. This is a wide bias in social

science (Henrich et al., 2010) and may limit the generalizability of the results. Further research may place more attention on this issue to achieve greater socio-demographic diversity.

Aside from these limitations, this study joins the few studies that have examined personal growth over time during the transition to motherhood. Its innovation lies in examining the role of women's dispositions toward uncertainty and change in personal growth during such life transitions. The study's findings concerning both concepts provide valuable empirical knowledge for the growth literature and, indirectly, for mental health implications among first-time mothers. This is particularly salient given that while personal growth is studied extensively, knowledge of its underlying mechanisms remains limited (Majdandzic & du Plooy, 2025; Tedeschi et al., 2018). Finally, the insights of this study can be used by clinicians to strengthen women's ability to manage uncertainty and stress better during the perinatal period, thereby increasing the likelihood of positive long-term psychological outcomes during this significant life transition.

Declarations

Conflicts of interest:

The authors have no relevant financial or non-financial conflicts of interest to disclose.

Clinical trial number

Not applicable.

Author Contribution

E.M.S.: Conceptualization, Methodology, Investigation, Writing-original draft preparation, Writing-review and editing. O.T.B.A.: Conceptualization, Methodology, Supervision, Writing-review & editing.

Acknowledgement

N/A

Informed Consent: Informed consent was obtained from all individual participants included in the study.

Declaration of generative AI use: The authors declare that generative AI was not used in their research or preparation of this manuscript

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

References

1. Abdollahi A, Dehghanidowlatabadi S (2026) Moderating Role of Psychological Flexibility in the Relationship Between Intolerance of Uncertainty and Perceived Stress Among Women Undergoing in Vitro Fertilization Treatment. *Brain Behav* 16:e71436. [10.1002/brb3.71436](https://doi.org/10.1002/brb3.71436)
2. Abu-Sharkia S, Ben-Ari T, O., Mofareh A (2023) Personal growth and life satisfaction during fertility treatment—A comparison between arab and jewish women. *Int J Environ Res Public Health* 20(3):2187. <https://doi.org/10.3390/ijerph20032187>
3. Albani A, Ambrosini F, Mancini G, Passini S, Biolcati R (2023) Trait Emotional Intelligence and Self-regulated Learning in University Students during the COVID-19 pandemic: the mediation role of Intolerance of Uncertainty and COVID-19 Perceived Stress. *Pers Indiv Differ* 203:111999. <https://doi.org/10.1016/j.paid.2022.111999>
4. Allison PD (2012), April Handling missing data by maximum likelihood. In *SAS Global Forum* (Vol. 2012, No. 312, pp. 1–21). <http://www.statisticalhorizons.com/wp-content/uploads/MissingDataByML.pdf>
5. Birrell J, Meares K, Wilkinson A, Freeston M (2011) Toward a definition of intolerance of uncertainty: A review of factor analytical studies of the Intolerance of Uncertainty Scale. *Clin Psychol Rev* 31(7):1198–1208. <https://doi.org/10.1016/j.cpr.2011.07.009>
6. Bogdanov M, Nitschke JP, LoParco S, Bartz JA, Otto AR (2021) Acute psychosocial stress increases cognitive-effort avoidance. *Psychol Sci* 32(9):1463–1475. <https://doi.org/10.1177/09567976211005465>
7. Borrelli SE, Walsh D, Spiby H (2018) First-time mothers' expectations of the unknown territory of childbirth: Uncertainties, coping strategies and 'going with the flow'. *Midwifery* 63:39–45. <https://doi.org/10.1016/j.midw.2018.04.022>
8. Bruno F, Vozzo F, Arcuri D, Maressa R, La Cava E, Malvaso A, Chiesi F (2024) The longitudinal association between perceived stress, PTSD Symptoms, and post-traumatic growth during the COVID-19 pandemic: The role of coping strategies and psychological inflexibility. *Curr Psychol* 43(15):13871–13886. <https://doi.org/10.1007/s12144-022-03502-3>
9. César-Santos B, Bastos F, Dias A, Campos MJ (2024) Family nursing care during the transition to motherhood: A Scoping Review. *Healthcare* 12(5):515. <https://doi.org/10.3390/healthcare12050515>
10. Cann A, Calhoun LG, Tedeschi RG, Kilmer RP, Gil-Rivas V, Vishnevsky T, Danhauer SC (2010) The Core Beliefs Inventory: A brief measure of disruption in the assumptive world. *Anxiety Stress Coping* 23(1):19–34. <https://doi.org/10.1080/10615800802573013>
11. Cann A, Calhoun LG, Tedeschi RG, Taku K, Vishnevsky T, Triplett KN, Danhauer SC (2010) A short form of the Posttraumatic Growth Inventory. *Anxiety, Stress, & Coping*, 23(2), 127–137. [/10.1080/10615800903094273](https://doi.org/10.1080/10615800903094273)Castro-Alvarez, S., Tendeiro, J. N., Meijer, R. R., & Bringmann, L. F.

- (2022). Using structural equation modeling to study traits and states in intensive longitudinal data. *Psychological Methods*, 27(1), 17–43. <https://doi.org/10.1037/met0000393>
12. Chasson M, Taubman – Ben-Ari O (2024) Paths from adverse and benevolent childhood experiences to personal growth after childbirth: The role of psychological distress, social support, and self-compassion. *Psychol Trauma: Theory Res Pract Policy* 16(Suppl 1):S28–S38. <https://doi.org/10.1037/tra0001664>
 13. Cheng C, Lau HPB, Chan MPS (2014) Coping flexibility and psychological adjustment to stressful life changes: a meta-analytic review. *Psychol Bull* 140(6):1582. <https://doi.org/10.1037/a0037913>
 14. Choi S, Kim D, Cho A, An S, Kim C, Yoo I (2023) Pathways to post-traumatic growth in Korean female cancer patients: the mediation effects of coping strategies and resilience. *Eur J Psychotraumatology* 14(1):2187187. <https://doi.org/10.1080/20008066.2023.2187187>
 15. Chopko BA, Palmieri PA, Adams RE (2018) Relationships among traumatic experiences, PTSD, and posttraumatic growth for police officers: A path analysis. *Psychol Trauma: Theory Res Pract Policy* 10(2):183. <http://dx.doi.org/10.1037/tra0000261>
 16. Colciago E, Brown AM, Ornaghi S, Antolini L, Nespoli A, Fumagalli S, Robinson A (2022) The unpredictable nature of labour and birth: a qualitative investigation regarding expectations of Italian parents to-be. *Midwifery* 108:103286. <https://doi.org/10.1016/j.midw.2022.103286>
 17. Costello K, Timko CA, Anderson D, Hormes JM (2025) Validation of the intolerance of uncertainty scale-12 in a sample of pregnant people. *BMC Pregnancy Childbirth* 25(1):363. <https://doi.org/10.1186/s12884-025-07434-1>
 18. Demirtas AS, Yildiz B (2019) Hopelessness and perceived stress: The mediating role of cognitive flexibility and intolerance of uncertainty. *Dusunen Adam J Psychiatry Neurol Sci* 32(3):259–267. 10.14744/DAJPNS.2019.00035
 19. Di Fabio A, Gori A (2016) Developing a new instrument for assessing acceptance of change. *Front Psychol* 7:802. <https://doi.org/10.3389/fpsyg.2016.00802>
 20. Enders CK, Bandalos DL (2001) The relative performance of full information maximum likelihood estimation for missing data in structural equation models. *Struct Equ Model* 8(3):430–457. https://doi.org/10.1207/S15328007SEM0803_5
 21. Geiser C, Keller BT, Lockhart G, Eid M, Cole DA, Koch T (2015) Distinguishing state variability from trait change in longitudinal data: The role of measurement (non) invariance in latent state-trait analyses. *Behav Res Methods* 47(1):172–203. <https://doi.org/10.3758/s13428-014-0457-z>
 22. Godara M, Everaert J, Sanchez-Lopez A, Joormann J, De Raedt R (2023) Interplay between uncertainty intolerance, emotion regulation, cognitive flexibility, and psychopathology during the COVID-19 pandemic: a multi-wave study. *Sci Rep* 13(1):9854. <https://doi.org/10.1038/s41598-023-36211-3>
 23. Graham JW (2009) Missing data analysis: Making it work in the real world. *Ann Rev Psychol* 60(1):549–576. <https://doi.org/10.1146/annurev.psych.58.110405.085530>

24. Hayes AF (2017) Introduction to mediation, moderation, and conditional process analysis: A regression-based approach. Guilford
25. Hayes AF (2022) Introduction to mediation, moderation, and conditional process analysis: A regression-based approach, 3rd edn. The Guilford Press
26. Knaevelsrud C, Liedl A, Maercker A (2010) Posttraumatic growth, optimism and openness as outcomes of a cognitive-behavioural intervention for posttraumatic stress reactions. *J Health Psychol* 15(7):1030–1038. <https://doi.org/10.1177/1359105309360073>
27. Kunz S, Joseph S, Geyh S, Peter C (2018) Coping and posttraumatic growth: A longitudinal comparison of two alternative views. *Rehabil Psychol* 63(2):240–249. <https://doi.org/10.1037/rep0000205>
28. Lorén H, Weineland S, Rembeck G (2024) Facing a new life-The healthy transition to motherhood: What individual and environmental factors are needed? A phenomenological-hermeneutic study. *Midwifery* 130:103917. <https://doi.org/10.1016/j.midw.2024.103917>
29. Machulska A, Klucken T (2025) The interplay between perceived stress, psychological flexibility, and interpretation biases in undergraduate mental health. *Sci Rep* 15(1):38992. <https://doi.org/10.1038/s41598-025-26492-1>
30. Mahoney AE, McEvoy PM (2012) Trait versus situation-specific intolerance of uncertainty in a clinical sample with anxiety and depressive disorders. *Cogn Behav Ther* 41(1):26–39. <https://doi.org/10.1080/16506073.2011.622131>
31. Majdandzic N, du Plooy DR (2025) Posttraumatic growth, coping, and distress: A systematic review of longitudinal studies. *J Loss Trauma* 30(8):1170–1188. <https://doi.org/10.1080/15325024.2025.2487483>
32. McEvoy PM, Hyett MP, Shihata S, Price JE, Strachan L (2019) The impact of methodological and measurement factors on transdiagnostic associations with intolerance of uncertainty: A meta-analysis. *Clin Psychol Rev* 73:101778. <https://doi.org/10.1016/j.cpr.2019.101778>
33. Mijalevich-Soker E, Horowitz E, Azuri J, Davidi O, Friedler M, J., Ben-Ari T, O (2024) Personal growth during early and advanced pregnancy according to women's mode of conception. *J Reproductive Infant Psychol* 1–18. <https://doi.org/10.1080/02646838.2024.2441878>
34. Navon-Eyal M, Taubman – Ben-Ari O (2025) The Contribution of Dispositional Gratitude and Different Stress Sources to Personal Growth Among Women Pregnant with Their First Child. *Behav Sci* 15(10):1315. <https://doi.org/10.3390/bs15101315>
35. Nelson AM (2003) Transition to motherhood. *J Obstetric Gynecologic Neonatal Nurs* 32(4):465–477. <https://doi.org/10.1177/0884217503255199>
36. Okayama S, Minihan S, Andrews JL, Daniels S, Grunewald K, Richards M, Schweizer S (2024) Intolerance of uncertainty and psychological flexibility as predictors of mental health from adolescence to old age. *Soc Psychiatry Psychiatr Epidemiol* 59(12):2361–2368. <https://doi.org/10.1007/s00127-024-02724-z>

37. Oreg S (2003) Resistance to change: Developing an individual differences measure. *J Appl Psychol* 88(4):680. [10.1037/0021-9010.88.4.680](https://doi.org/10.1037/0021-9010.88.4.680)
38. Preacher KJ, Hayes AF (2008) Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behav Res Methods* 40(3):879–891. <https://doi.org/10.3758/BRM.40.3.879>
39. Rondung E, Ekdahl J, Sundin Ö (2019) Potential mechanisms in fear of birth: The role of pain catastrophizing and intolerance of uncertainty. *Birth* 46(1):61–68. <https://doi.org/10.1111/birt.12368>
40. Rosser BA (2019) Intolerance of uncertainty as a transdiagnostic mechanism of psychological difficulties: A systematic review of evidence pertaining to causality and temporal precedence. *Cogn Therapy Res* 43(2):438–463. <https://doi.org/10.1007/s10608-018-9964-z>
41. Sahib A, Chen J, Cárdenas D, Caele AL (2023) Intolerance of uncertainty and emotion regulation: A meta-analytic and systematic review. *Clin Psychol Rev* 101:102270. <https://doi.org/10.1016/j.cpr.2023.102270>
42. Samuelson W, Zeckhauser R (1988) Status quo bias in decision making. *J Risk Uncertain* 1(1):7–59. <https://doi.org/10.1007/BF00055564>
43. Satıcı B, Saricali M, Satıcı SA, Griffiths MD (2022) Intolerance of uncertainty and mental wellbeing: Serial mediation by rumination and fear of COVID-19. *Int J Mental Health Addict* 20(5):2731–2742. <https://doi.org/10.1007/s11469-020-00305-0>
44. Schultz JM, Tallman BA, Altmaier EM (2010) Pathways to posttraumatic growth: The contributions of forgiveness and importance of religion and spirituality. *Psychol Relig Spiritual* 2(2):104. <https://doi.org/10.1037/a0018454>
45. Shakespeare-Finch JE, Smith SG, Gow KM, Embelton G, Baird L (2003) The prevalence of post-traumatic growth in emergency ambulance personnel. *Traumatology* 9(1):58–71. <https://doi.org/10.1177/153476560300900104>
46. Shields GS, Sazma MA, Yonelinas AP (2016) The effects of acute stress on core executive functions: A meta-analysis and comparison with cortisol. *Neurosci Biobehavioral Reviews* 68:651–668. <https://doi.org/10.1016/j.neubiorev.2016.06.038>
47. Short LB, Xia R, O'Brien WH (2025) Post-traumatic stress, cognitive fusion, and intolerance of uncertainty as longitudinal predictors of post-traumatic growth from the COVID-19 pandemic. *J Context Behav Sci* 36:100894. <https://doi.org/10.1016/j.jcbs.2025.100894>
48. Silva R, Prata AP, Abreu W, Brandão T, Brandão S, Riklikienė O, Thompson G (2025) Posttraumatic growth and its associations with perceived stress and core beliefs in women after traumatic childbirth during the COVID-19 pandemic. *Birth* 52(3):462–471. <https://doi.org/10.1111/birt.12865>
49. Taubman – Ben-Ari O, Ramon D, Ben-Yaakov O (2024) Trajectories of personal growth among first-time parents: The predicting role of coping flexibility and parental distress. *J Happiness Stud* 25(8):119. <https://doi.org/10.1007/s10902-024-00832-w>
50. Tedeschi RG, Calhoun LG (2004) Posttraumatic growth: conceptual foundations and empirical evidence. *Psychol Inq* 15(1):1–18. https://doi.org/10.1207/s15327965pli1501_01

51. Tindle R, Moustafa AA (2021) Psychological distress, social support, and psychological flexibility during COVID-19. In *Mental health effects of COVID-19* (pp. 89–101). Academic Press.
<https://doi.org/10.1016/B978-0-12-824289-6.00012-X>
52. Tsai J, Sippel LM, Mota N, Southwick SM, Pietrzak RH (2016) Longitudinal course of posttraumatic growth among US military veterans: Results from the National Health and Resilience in Veterans Study. *Depress Anxiety* 33(1):9–18. <https://doi.org/10.1002/da.22371>
53. Vazquez C, Valiente C, García FE, Contreras A, Peinado V, Trucharte A, Bentall RP (2021) Post-traumatic growth and stress-related responses during the COVID-19 pandemic in a national representative sample: The role of positive core beliefs about the world and others. *J Happiness Stud* 22(7):2915–2935. <https://doi.org/10.1007/s10902-020-00352-3> 1 3
54. Wanberg CR, Banas JT (2000) Predictors and outcomes of openness to changes in a reorganizing workplace. *J Appl Psychol* 85(1):132. <https://doi.org/10.1037/0021-9010.85.1.132>
55. Wersebe H, Lieb R, Meyer AH, Hofer P, Gloster AT (2018) The link between stress, well-being, and psychological flexibility during an Acceptance and Commitment Therapy self-help intervention. *Int J Clin Health Psychol* 18(1):60–68. <https://doi.org/10.1016/j.ijchp.2017.09.002>
56. Wong CCY, Yeung NC (2017) Self-compassion and posttraumatic growth: Cognitive processes as mediators. *Mindfulness* 8(4):1078–1087. <https://doi.org/10.1007/s12671-017-0683-4>
57. Wu D, Yang T, Hall DL, Jiao G, Huang L, Jiao C (2021) COVID-19 uncertainty and sleep: the roles of perceived stress and intolerance of uncertainty during the early stage of the COVID-19 outbreak. *BMC Psychiatry* 21(1):306. <https://doi.org/10.1186/s12888-021-03310-2>
58. Xu X, Yan X, Zhang Q, Xu C, Li M (2023) The chain mediating role of psychological resilience and neuroticism between intolerance of uncertainty and perceived stress among medical university students in Southwest China. *BMC Psychiatry* 23(1):861. <https://doi.org/10.1186/s12888-023-05345-z>
59. Zoellner T, Maercker A (2006) Posttraumatic growth in clinical psychology—A critical review and introduction of a two component model. *Clin Psychol Rev* 26(5):626–653.
<https://doi.org/10.1016/j.cpr.2006.01.008>

Figures

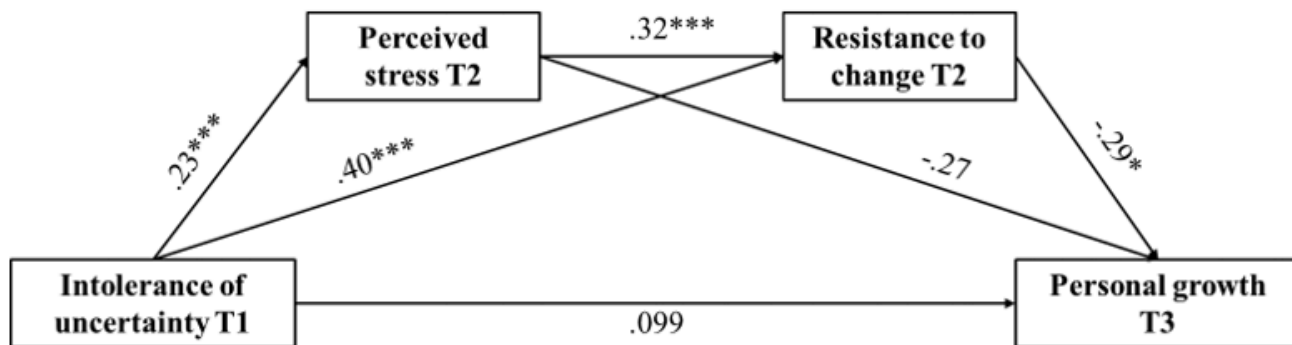


Figure 1

The serial multiple mediation model. Illustration of the mediating roles of perceived stress and resistance to change in the association between intolerance of uncertainty and personal growth. * $p < .05$. *** $p < .01$.