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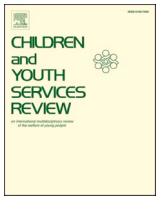

Adolescents' posttraumatic growth during the COVID-19 pandemic: The links between differentiation of self, parents' posttraumatic growth, and adolescents' gender

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ABSTRACT

The COVID-19 outbreak produced a threatening and chaotic environment for adolescents, potentially affecting adolescent developmental tasks such as differentiation of self. Yet positive psychological changes such as post-traumatic growth (PTG) may also occur when adolescents struggle with such challenging circumstances. In this study, we focused on 134 parent–child pairs comprising Israeli adolescents (ages 11–17) and one of their parents (ages 30–59), two years after the initial COVID-19 outbreak. Participants were recruited using snowball and convenience sampling methods and completed online self-report questionnaires, which included background data, the post-traumatic growth inventory, and the differentiation of self inventory. We explored a moderated mediation model where parents' PTG served as a mediator in the association between adolescents' differentiation of self and adolescents' PTG, with adolescents' gender moderating this mediation. Results revealed a positive association between adolescents' PTG and parents' PTG, and negative associations between adolescents' differentiation of self and adolescents' PTG/parents' PTG. Further, results confirmed the moderated mediation model for the association between parents' and adolescents' PTG, but not for the association between adolescents' differentiation of self and adolescents' PTG. Adolescents' higher differentiation of self was associated with parents' lower PTG, which in turn was associated with adolescents' lower PTG, among male adolescents only. Overall, the study results shed light on the importance of tailoring crisis interventions to the family system as a whole, given that at traumatic times in particular the mutual effect of parent–child distress may foster a positive outcome such as PTG. In addition, clinicians might wish to consider how to utilize adolescents' differentiation of self in family therapy, as it was found in this study to be a resource facilitating recovery after negative life events and may thus enhance well-being.

1. Introduction

The COVID-19 pandemic has been described as having been a potentially traumatic event (Bower et al., 2022; Shevlin et al., 2020; Xiong et al., 2020; Watson et al., 2020), as it posed a genuine threat to physical and emotional health. This recent global pandemic embodied collective traumatic experiences and/or potential sources of trauma, such as quarantines and closures; fear of contagion and the risk of death for oneself and loved ones; possible recurrences that could be unpredictable, extreme, or prolonged; and potential losses of employment, social interactions, and health (Bonsaksen et al., 2021; Hertz-Palmor et al., 2021; Qiu et al., 2021; Shanahan et al., 2022; Zhao et al., 2021).

Children and adolescents may have been particularly vulnerable to the threatening and chaotic environment that the pandemic produced (Bhushan et al., 2022; Ellis et al., 2020; Ettekal & Agans, 2020; Shoshani & Kor, 2022). Global efforts to control the pandemic through mass quarantines, social distancing, and school closures disrupted the social and physical routines and settings in which children and adolescents typically develop, live, and learn (Bhushan et al., 2022; Ellis et al., 2020; Guessoum et al., 2020; Imran et al., 2020). Additionally, family life was affected as parents worked remotely from home and engaged in new forms of supporting and caring for their children and adolescents (Kapetanovic et al., 2021; Shoshani & Kor, 2022.

These disruptions were part of the broader impact of the COVID-19

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pandemic, which profoundly affected daily life by posing threats of illness and mortality. The pandemic was described as one of several "collective traumas" impacting the global community at the time (Shevlin et al., 2020; Silver et al., 2021). In this context, Griffin (2020) argued that because COVID-19 occurred globally, most of the population encountered this event. He suggested defining COVID-19 as a trauma not only by the presence of the event itself but also by the experiences and effects it created. In this regard, Wall et al. (2023) argued that the event's centrality was one factor that might have been linked to positive/negative outcomes during the COVID-19 pandemic. Centrality refers to the extent to which an event is pivotal to an individual's identity and personal narrative; the more central the event, the higher the growth potential. In line with this perspective, Tedeschi et al. (2018) proposed focusing on trauma through the lens of an individual's subjective reaction. Furthermore, according to Janoff-Bulman (1989), a traumatic event can shatter individuals' stable belief systems, resulting in cognitive disequilibrium, which engenders negative cognitions about the self, others, and the world—a concept known as the "shattered assumptions theory." In this vein, Calhoun and Tedeschi (1998) introduced the phrase "seismic psychological event" to describe an event that disrupts individuals' fundamental beliefs about society, their guiding schemas, future plans, and overall understanding of the world. Nevertheless, the cognitive disequilibrium elicited by a traumatic event also activates deliberate rumination, enabling individuals to reconstruct a positive understanding of the adverse life event (Janoff-Bulman, 2014). Scholars (Calhoun & Tedeschi, 1999; Tedeschi & Calhoun, 1995, 2004) have termed this phenomenon posttraumatic growth (PTG).

Posttraumatic growth suggests that positive psychological changes can be experienced as a result of struggling with highly challenging life circumstances and can occur in parallel with developmental changes, and it is the individual's cognitive, social, and emotional abilities that represent the background against which the PTG takes place (Tedeschi et al., 2018). Specifically, PTG is an adaptive process whereby an adverse life event is re-appraised, and new and positive life narratives are developed (Neimeyer, 2004; Park, 2010). Tedeschi and Calhoun (2004) postulated that traumatic experiences might challenge one's core beliefs, leading to revised worldviews and positive changes that manifest in five domains: greater appreciation of life and changed priorities; strengthening of relationships; bolstering of personal strengths; openness to new possibilities; and spiritual development (Tedeschi & Calhoun, 1996). The growth process might be directly influenced by the person's particular characteristics and the challenging circumstances, management of emotional distress, cognitive engagement, and sociocultural aspects (Tedeschi & Calhoun, 2004). It should be noted that PTG can be understood as a coping strategy (a process) or as an outcome of positive psychosocial adjustment. The difference between PTG as a process and PTG as an outcome depends on time (Tedeschi et al., 2018). Namely, Helgeson et al. (2006) argued that PTG assessed early after a traumatic experience may reflect a cognitive strategy used to reduce stress, whereas PTG assessed after a longer time period may reflect actual positive change. In this study, we refer to PTG as an outcome (i.e., we assessed PTG more than two years after the initial COVID-19 outbreak in Israel, in February 2020), and our aim was to explore this outcome among adolescents (11–17 years of age) and their parents who were exposed to the COVID-19 pandemic in Israel. To date, adolescents' PTG has been examined in a few studies in the context of the COVID-19 pandemic. In China (Jian et al., 2023; Zhen & Zhou, 2022), during the first six months of the outbreak (February 2020 – July 2020), such studies revealed that PTG existed and was associated with posttraumatic stress disorder (PTSD) (Jian et al., 2023) or with depressive symptoms (Zhen & Zhou, 2022). In Norway (Ulset & von Soest, 2022), six weeks into the first lockdown, Norwegian adolescents' worries about the consequences of the pandemic were associated with higher levels of PTG. In India (Bhushan et al., 2022), during the second wave of COVID-19 (between March and May 2021), 68.9 % of children and adolescents (aged 9–20 years) reported posttraumatic stress, and 39.8 % of those reporting posttraumatic stress also experienced PTG. Nevertheless, as PTG is a process that may take some time to develop, an assessment of PTG later in the pandemic (i.e., two years after the initial COVID-19 outbreak in Israel) may provide a deeper understanding of PTG among adolescents.

Various researchers (Cohen et al., 2012; Hafstad et al., 2010; Kilmer, 2014; Kilmer et al., 2014) have acknowledged parents as an important part of the PTG process; the way parents cope with stress may serve as a model for the child's evaluation of an adverse event's severity and choice of coping strategies. This perspective aligns with Bronfenbrenner's ecological systems theory (1979, 1989), which underscores the importance of family as a foundational structure in the child's immediate environment, shaping and fostering different aspects of a child's development (i.e., emotions, beliefs, and behaviors). However, research assessing parent- and family-related variables concerning PTG in children and adolescents is limited (Bernstein & Pfefferbaum, 2018). Our aim was thus to contribute to this area by examining the association between adolescents' PTG and parents' PTG. To the best of our knowledge, this association has not yet been explored in the context of COVID-19. In a recent study (Ulset & von Soest, 2022) it was found that parental care was associated with adolescents' PTG. The authors suggested that parents who were willing to discuss the pandemic with their adolescent children may have helped them engage in more constructive thinking about the pandemic which, in turn, may have fostered the adolescents' PTG.

In terms of the PTG process, Tedeschi and Calhoun (2004) emphasized the role of available resources, as they may facilitate coping and regulate distress. In this study, we focused on one such resource – differentiation of self. Differentiation of self represents the level of differentiation experienced by adolescents from their parents/families. It begins in early infancy, progresses throughout childhood and adolescence, and has been found to be positively associated with resilience (Sadeghi et al., 2020). Specifically, differentiation of self refers to individuals' ability to maintain an emotional balance between their sense of self and their sense of togetherness with others. This balance allows individuals to develop a healthy ego identity while creating reciprocal and satisfying interpersonal relationships. Differentiation of self involves the capacity to make a distinction between the thinking and feeling systems, and to choose whether to be guided by intellect or emotion (intrapersonal), alongside the ability to preserve autonomy within the context of intimacy with important others (interpersonal) (Bowen, 1976, 1978). Greater differentiation of self is thought to lead to greater interpersonal competence, emotional maturity, and lower psychological distress as it enables one to better modulate the emotional arousal experienced during challenging interpersonal situations. By contrast, individuals who are less differentiated may be less comfortable with intimacy and/or autonomy, less effective in relationships, experience more interpersonal problems, and have greater difficulty regulating emotion (Bowen, 1978; Kerr & Bowen, 1988; Skowron & Friedlander, 1998). Hence, well-differentiated individuals may be more resistant to the negative effects of stress, may function better in stressful situations, and may have more satisfying relationships compared to less-differentiated individuals (Bowen, 1978; Kerr & Bowen, 1988). In the context of the COVID-19 pandemic, we found only one study (Kazemi & Sadeghi, 2020) in which adolescents' differentiation of self was examined: A positive direct path was found between adolescents' differentiation of self and anxiety about COVID-19, and a positive indirect path was also found in this association, with mother–child conflict resolution styles serving as a mediator in this association. In the current study, we hypothesized that adolescents' differentiation of self would be negatively associated with both adolescents' PTG and parents' PTG.

In terms of adolescents' PTG and gender differences, it was found in previous trauma studies (Felix et al., 2015; Hafstad et al., 2011; Meyerson et al., 2011) that female adolescents experienced higher levels of PTG than did male adolescents. By contrast, in the context of the pandemic, recent studies (Jian et al., 2023; Tang et al., 2022; Zhen &

Zhou, 2022) indicated that male adolescents were more likely to exhibit higher PTG than female adolescents. In the current study, we examined adolescents' gender as a moderator of the associations between adolescents' PTG and parents' PTG.

1.1. The current study

The focus of the current study was on adolescents (11–17 years of age) and their parents two years after the initial COVID-19 outbreak in Israel in February 2020. The COVID-19 pandemic in Israel unfolded in five distinct waves, each characterized by varying nationwide lockdown measures and impacts on everyday life. Namely, during the first wave, from February to May 2020, a sudden nationwide lockdown was enforced, leading to the closure of schools and non-essential businesses, with education shifting to remote learning. In the second wave, spanning June to October 2020, a hybrid model was introduced for middle and high schools, allowing in-person classes on a rotating schedule. However, as case numbers increased, restrictions were reimposed. The third wave, from December 2020 to March 2021, saw a return to remote education and another nationwide lockdown. It was during this period that Israel initiated its first vaccination campaign, prioritizing ill and elderly pepole. The fourth and fifth waves, occurring from June to October 2021 and December 2021 to April 2022, respectively, were characterized by high infection and hospitalization rates among the unvaccinated. To mitigate the virus's spread, the government introduced a Green Pass system, which required proof of vaccination or a negative COVID-19 test for entry into certain venues and public events. Despite these challenges, this period was relatively stable, with schools reopening and resuming normal operations. During these waves, adolescents were exposed to high levels of stress ~~of~~ given the impact of the pandemic on everyday life, alongside the critical and sensitive developmental phase they occupied as adolescents, one fraught with both opportunities and risks (Steinberg, 2013; Teurel & Gentaz, 2018). We aimed to explore the positive psychological changes that could occur as a result of struggling with highly challenging life circumstances, namely PTG. Given the scarcity of research assessing family-related variables concerning PTG in adolescents (Bernstein & Pfefferbaum, 2018), and based on Bronfenbrenner's ecological systems theory (1979, 1989) and Bowen's family systems theory (1976, 1978), we sought to explore the links between adolescents' PTG, parents' PTG, adolescents' differentiation of self, and adolescents' gender. We formulated the following hypotheses: (1) Adolescents' PTG would be positively associated with parents' PTG; (2) Adolescents' differentiation of self would be negatively associated with both adolescents' PTG and parents' PTG; and (3) Parents' PTG would mediate the association between adolescents' differentiation of self and adolescents' PTG.

Additionally, we examined adolescents' gender in relation to the mediation model. We had no a priori hypothesis regarding the moderating effect of adolescents' gender on the associations between adolescents' differentiation of self and adolescents' PTG, nor regarding the association between adolescents' PTG and parents' PTG.

2. Method

2.1. Participants

A power analysis using G*Power 3.1 software (Faul et al., 2007; Faul et al., 2009) was conducted to calculate the sample size. For a multiple regression analysis with ten predictors, a moderate effect size $f^2 = 0.15$ (equals $R^2 = 0.13$), $\alpha = 0.05$, and power = 0.80, the required sample size would be N = 118 participants. For the lowest correlation that was found (r = -0.21), with N = 134, and one-tailed $\alpha = 0.05$, the achieved power is 0.79.

Given the above, the sample comprised 134 adolescent participants, of whom 71 were male (53 %), with a mean age of 13.86 (SD = 1. 88, range 11–17). Among the adolescents, 60 (44.8 %) were firstborn children, 28 (20.9 %) were middle children, and 46 (34.3 %) were last-born children. Most of the adolescents were native Israelis (97.8 %). In terms of their grade at school, 22.4 % were in fifth to sixth grade, 43.3 % were in seventh to eighth grade, 20.9 % were in ninth to tenth grade, and 13.4 % were in eleventh to twelfth grade. The vast majority of the adolescents described their self-rated health as good or excellent (93.3 %).

Regarding the parent participants, their ages ranged from 30 to 59 years (M = 45.67, SD = 5.42), and the mean number of children in the family under the age of 18 was two (M = 2.41, SD = 1.21, range 1–10). Of these parents, 119 (88.8 %) were mothers and 15 (11.2 %) were fathers. The majority of the families comprised family units of two parents in a committed relationship (113 participants, 84.3 %). All of the parents had more than 12 years of education (M = 16.57, SD = 3.23, range 12–25); 94 % of them were native Israelis; the vast majority rated their health as good or excellent (94.8 %); and 84.3 % described their current economic status as good to excellent.

2.2. Measures

2.2.1. Adolescents and parents completed the following self-report questionnaires

Background data. Adolescents were asked about their gender, educational grade, and self-rated health. Parents were asked to note their gender, age, marital status, number of children under 18, education, and current economic status (1 = bad to 4 = excellent). Their self-rated health was assessed with a single question: "In general, how do you rate your health?" The scale ranged from 1 to 4 (1 = bad to 4 = excellent). This measure has been found to be valid and highly associated with objective indicators of health (Benyamini et al., 2003).

Post-Traumatic Growth Inventory (PTGI). This scale was developed by Tedeschi and Calhoun (1996) and consists of 21 items, aiming to examine positive changes in individuals after a traumatic event. The statements are divided into five areas: (1) new opportunities (e.g., "new opportunities are available which wouldn't have been otherwise"); (2) relationships with others (e.g., "I learned a great deal about how wonderful people are"); (3) personal resilience (e.g., "I know better that I can handle difficulties"); (4) spiritual change (e.g., "I have a better understanding of spiritual matters"); and (5) appreciation of life (e.g., "I can better appreciate each day"). Participants were asked to evaluate the extent to which change occurred as a result of COVID-19, on a 4-point Likert scale ranging from 1 (no change) to 4 (changed to a great extent), with higher scores reflecting greater PTG. In the original study, Cronbach's alpha internal reliability value was 0.90, and test–retest reliability was 0.70 (Calhoun et al., 2000; Tedeschi & Calhoun, 1996). In this study, Cronbach's alpha was 0.90 for adolescents and 0.94 for parents.

Differentiation of Self-Inventory (DSI; Skowron & Friedlander, 1998). This scale was completed only by the adolescent participants. The scale was translated into Hebrew and adapted for adolescents (Peleg-Popko, 2004). It includes four subscales: emotional reactivity (e.g., "People have remarked that I'm overly emotional"), emotional cutoff (e.g., " I'm often uncomfortable when people get too close to me"), fusion with others (e.g., " Arguments with my parent(s) or sibling(s) can still make me feel awful"), and I-position (e.g., "No matter what happens in my life, I know that I'll never lose my sense of who I am"). The inventory consists of 25 items on a six-point Likert-type scale, ranging from 1 to 6 (1 = not at all true for me, 6 = very true for me), with higher scores reflecting greater differentiation of self (less emotional reactivity, less difficulty in maintaining the I-position, less emotional cutoff, and less fusion). Internal consistency (Cronbach's alpha) was 0.88 for the total score in the original measurement (Skowron & Friedlander, 1998), and in the current research Cronbach's alpha was 0.76.

2.3. Procedure

The study was conducted from May– July 2022. The second author's

university's institutional review board (IRB) examined and approved the study protocol (XXX Academic College, research proposal no. A-18–2022). The following were the eligibility criteria for study participation: adolescents between the ages of 11 and 17 and one of their parents; the adolescents and their parents could read and speak Hebrew fluently; and informed consent was required for both parents and adolescents. Accordingly, snowball and convenience sampling methods were used via an online survey run on QUALTRICS (a direct link to an electronic questionnaire), which was advertised through social media (mainly Facebook) and a smartphone application (i.e., WhatsApp). Parents and adolescents were informed of the study's purpose, were assured of their confidentiality (anonymity) and their right to decline or withdraw at any point, and were required to provide their consent electronically (by clicking "I agree to participate"). Only then participants were able to complete the questionnaire set, which took approximately 12 min. The survey was anonymous and no personal information could be identified. Two-hundred-and-nineteen parents opened the link leading to the questionnaire set; 37 parents opened the link and discontinued; and 48 parents completed the parts relevant to them, but their adolescent children discontinued the parts relevant to them. As such, all 85 of the abovementioned questionnaires were excluded from the sample, resulting in a sample of 134 pairs of Israeli adolescents and parents.

2.4. Data analysis

Data were analyzed with SPSS ver. 28. Descriptive statistics were calculated for the background variables and the study variables. Pearson correlations between the study variables were calculated. The relationships between the background variables and the study variables were assessed with Pearson correlations and t-tests to identify control variables for the study model. The study model, assessing moderated mediation, was examined with Hayes' (2022) PROCESS procedure, using model 15, with 5,000 bootstrap samples and 95 % confidence intervals. Significant interactions were interpreted with the analysis of simple slopes.

3. Results

Descriptive statistics for the study variables are presented in Table 1. Means were around mid-scale, and significant correlations were found between the study variables. Adolescents' differentiation of self was negatively, although weakly, related to both adolescent and parent PTG, whereas adolescent PTG and parent PTG were positively associated. That is, higher adolescent differentiation of self was related to lower adolescent and parent PTG, whereas higher adolescent PTG was associated with higher parent PTG.

The relationships between the background variables and the study variables were assessed to identify control variables for the study model. Adolescent and parent age, number of children in the family under age 18, and current economic status were not meaningfully correlated with any of the study variables. Other background variables (e.g., marital status, country of birth) had low variance. Parent years of education was negatively related with parent PTG (r = -0.19, $p = 0.029$) and therefore was used as a covariate in the study model.

Table 1
Means, standard deviations, and correlations for the study variables (N = 134 parents and 134 adolescents).

	M(SD)	1.	2.	3.
Parent:				
1. PTG	42.01 (24.13)	1		
Adolescent:				
2. Differentiation of self	98.77 (15.96)	−0.23**	1	
3. PTG	47.31 (20.84)	0.44***	−0.21*	1

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.
Note: Range of adolescent differentiation was 25–150, Range of PTG was 0–105.

Next, the study model was examined with Hayes' (2022) PROCESS procedure, model 15 for moderated mediation. Results in Fig. 1 show a negative significant relationship between adolescent differentiation of self and parent PTG, such that higher adolescent differentiation of self was related to lower parent PTG. The moderated mediation effect was significant (coefficient = -1.60, SE = 1.04, 95 %CI = −4.066, −0.037); namely, adolescents' gender (defined as 1-males, 0-females) moderated the relationship between adolescent PTG and parent PTG, for the mediation effect of parent PTG in the relationship between adolescent differentiation of self and adolescent PTG. Interpreting the significant interaction with simple slopes (see Fig. 2) revealed a significant relationship for male adolescents (coefficient = -2.60, SE = 1.22, 95 %CI = −5.310, −0.499), and a non-significant relationship for female adolescents (coefficient = -1.00, SE = 0.71, 95 %CI = −2.686, 0.065).

The moderating effect of adolescents' gender in the relationship between adolescents' differentiation of self and adolescents' PTG was not significant (B = 1.50, SE = 3.48, p = 0.668, 95 %CI = −5.388, 8.383), nor was the direct effect significant for adolescents' differentiation of self with adolescents' PTG (B = −2.08, SE = 2.58, p = 0.423, 95 %CI = −7.186, 3.034). The direct effect between parent PTG and adolescent PTG was also not significant (B = 4.87, SE = 2.63, p = 0.067, 95 %CI = −0.341, 10.073).

In sum, parents' PTG was found to mediate the relationship between adolescents' differentiation of self and adolescents' PTG, such that higher adolescents' differentiation of self was associated with lower parents' PTG, and lower parents' PTG was then associated with lower adolescents' PTG, but only for male adolescents.

4. Discussion

In the present study we focused on Israeli adolescents (ages 11–17) and examined their PTG, two years after the initial outbreak of the COVID-19 pandemic in Israel. Results revealed a positive association between adolescents' PTG and parents' PTG (Hypothesis 1), negative associations between adolescents' differentiation of self and adolescents' PTG/parents' PTG (Hypothesis 2), and mediation of parents' PTG in the association between adolescents' differentiation of self and adolescents' PTG, but only for male adolescents (Hypothesis 3). Further, the moderating effect of adolescents' gender on the associations between adolescents' differentiation of self and adolescents' PTG was not confirmed; however, adolescents' gender moderated the association between parents' PTG and adolescents' PTG.

The positive association between adolescents' PTG and parents' PTG was previously supported in a study that measured PTG among youth cancer survivors (ages 13–20 years) and their parents (Turner-Sack et al., 2016), and in a study about children and adolescents (ages 6–17 years) who had been directly exposed to the 2004 tsunami in Thailand and their parents (Hafstad et al., 2010). A possible explanation for the positive association between adolescents' PTG and their parents' PTG might stem from the ecological systems theory (Bronfenbrenner, 1979). Namely, in the ecological systems theory, the microsystem level encompasses the relationships and interactions between adolescents and those in their immediate surroundings, such as their parents. At this level, the relationships between parents (i.e., caregivers) and their adolescents are transactional; both affect and are affected by the other (Schweiger & O'Brien, 2005). In line with this notion, the positive association between adolescents' PTG and parents' PTG might be the consequence of the bi-directional relationships and transactions between adolescents and their parents: Both experienced the same health stressor (i.e., COVID-19), and the behaviors and emotions of one affected the other. A complementary explanation might relate to the family systems theory (Bowen, 1978), which views the family as comprising multiple subsystems, where members' subsystems interact with and influence each other, and create a dynamic family functioning network (Bowen, 1978). The parent–child subsystem is one of the most

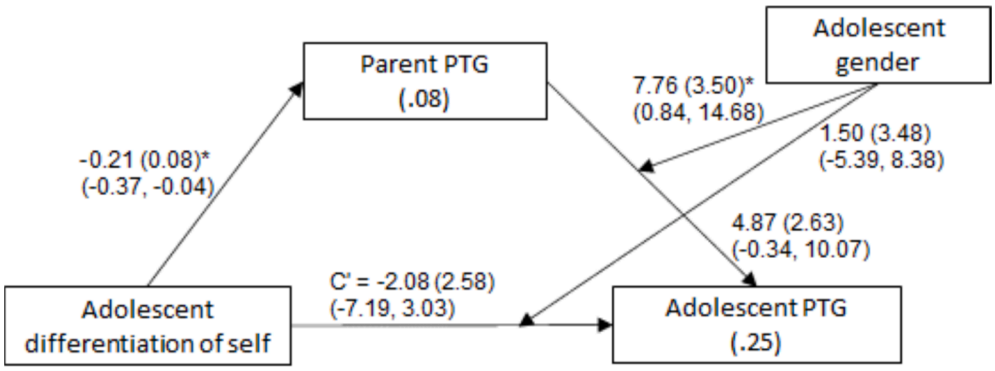

Fig. 1. Moderated mediation model for parents' PTG and adolescents' gender, in the relationship between adolescents' differentiation of self and adolescents' PTG. *Note:* Values on arrows: B (SE) (95 %CI), values within rectangles: R^2, C' = direct effect. $*p < 0.05$.

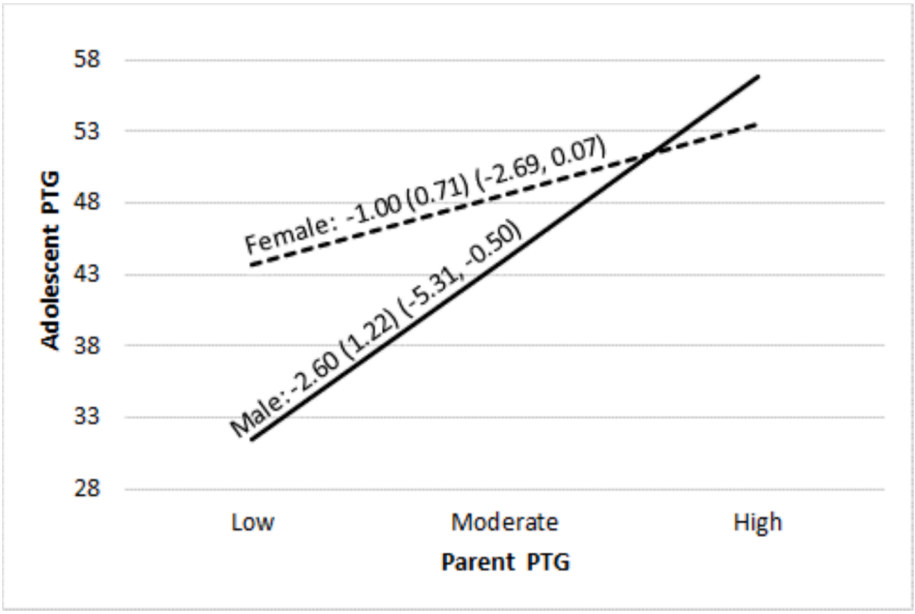

Fig. 2. The moderating effect of adolescents' gender in the relationship between parents' PTG and adolescents' PTG. *Note:* Values on arrows: B (SE) (95%CI).

important subsystems that highly influences children's development and adaptation (Popov & Ilesanmi, 2015), and plays a crucial role in their mental health (Vieira et al., 2016). Within the parent–child subsystem, parents can have a profound influence on their children through monitoring, organizing, and regulating the children's contact with the external world, providing nurturance and emotional support, assisting with the interpretation of and understanding of a particular event (i.e., COVID-19), sharing their perspective, and modeling responses and coping strategies (Kearney & Bussey, 2015; Tabak et al., 2012; Ulset & von Soest, 2022). In parallel, adolescents can share thoughts and feelings that reflect the way they appraise and evaluate the particular event, disclose their stress/traumatic experiences, and regulate negative emotions (Kilmer et al., 2014; Tabak et al., 2012). The parent–child subsystem thus creates an environment that might foster mutually positive changes in self-perception, in interpersonal relationships, and in life philosophy.

The second study finding refers to adolescents' differentiation of self, which was negatively related to both adolescents' and parents' PTG. To the best of our knowledge, these associations have not been explored in previous studies; thus, our study makes a unique contribution to the field of adolescents' PTG. Drawing on conservation of resources theory (COR; Hobfoll, 1989), differentiation of self can be considered a type of personal characteristic resource. Bowen (1978) hypothesized that differentiation of self is an individual (intrapsychic) stable trait. In the long term, individuals who are more differentiated are less emotionally reactive, better able to regulate emotion, think more clearly under stress, and are more capable of remaining connected to significant others while maintaining a clearly defined sense of self in and out of relationships (Bowen, 1978; Skowron & Friedlander, 1998). Conservation of resources theory (Hobfoll, 1989) suggests that we understand the acquiring and sustaining of resources as basic motivators for the improvement and/or maintenance of well-being, and for the successful adjustment to stressors. In this vein and in the context of the developmental influence of COVID-19, adolescents who have "differentiated" successfully (Bowen, 1978; Kerr & Bowen, 1988) are thought to be more capable of reflecting on, experiencing, and modulating their emotions regarding the effects of COVID-19. In addition, they are thought to be more capable of coping with the uncertainty and ambiguity evoked by the pandemic, and they were able to remain in relationships with significant others even though the pandemic removed them from their social networks. As such, these adolescents may not have experienced the COVID-19 pandemic as an event that rose to the level of traumatic stress, as reflected in the negative association between adolescents' differentiation of self and adolescents' PTG. Moreover, scholars have suggested that high differentiation of self relates to high resilience among adolescents (Finklestein et al., 2020; Sadeghi et al., 2020) as well

as among adults (Süloğlu & Güler, 2021). Future research is therefore needed to clarify this finding, especially among adolescents who experience adversities that have negative effects on those in their immediate and wider environment.

As for the negative association between adolescents' differentiation of self and parents' PTG, this finding might be explained via the joint assumptions underlying the family systems theory (Bowen, 1978) and the ecological systems theory (Bronfenbrenner, 1979, 1989). Bowen's family systems theory (Bowen, 1978; Kerr & Bowen, 1988) views the family as an emotional unit and suggests that differentiation of self is a multigenerational transmission process, as well as a nuclear family emotional process. For its part, the ecological systems theory (Bronfenbrenner & Evans, 2000) proposes the term "proximal processes" in referring to the significant, long-lasting, and dynamic relations between children and their immediate environment (e.g., parents), meaning that children can both be influenced by other people in their environment and be the "influencers" – changing the beliefs and actions of other people. In line with the above, adolescents' differentiation of self can be understood as a concept associated with the family system and might be viewed as a family resource, reducing the adversity related to the COVID-19 pandemic.

With regard to the moderated mediation effect, our results revealed that the negative association between adolescents' differentiation of self and adolescents' PTG was mediated via parents' PTG, but only for male adolescents. This finding has not been found previously and as such represents a novel contribution of the present study to the scientific literature. A possible explanation for this result may be related to parent–adolescent attachment and interpersonal relationships. Specifically, Shomaker and Furman (2009) found that girls had higher ratings of secure working models, expressed more secure representations concerning parent–child interactions, and showed easier access to emotions related to attachment experiences, than did boys. In this regard, female adolescents seem to be more oriented toward secure interpersonal relationships, which is one of the changes that comprises PTG. Thus, it might be that for female adolescents, parents' PTG was not a resource contributing to the link between adolescents' differentiation of self and adolescents' PTG. Another explanation may be related to the fact that boys, in contrast to girls, spend more time with friends without adult supervision (Weerman et al., 2016; Weerman & Hoeve 2012). Given that during COVID-19 peer group interactions were restricted due to fears of contagion, male adolescents found themselves much more at home than they ordinarily would have been. Similarly, the pandemic also created a situation in which many parents spent more time with their children than they ordinarily would have, making the examination of parents' adjustment especially compelling (Skinner et al., 2021). Thus, it may be that male adolescents' relationships with their parents became closer as a result of the decrease in time with their peers, providing them with the opportunity to see changes taking place in their parents (i.e., PTG). It is thus reasonable to have found that parents' PTG was associated positively with male adolescents' PTG.

As for the moderating effect of adolescents' gender on the association between adolescents' differentiation of self and adolescents' PTG, our findings did not confirm this moderating effect. In fact, previous studies have looked at gender differences with regard to differentiation of self and PTG, separately. Namely, with respect to differentiation of self, a few studies demonstrated that female adolescents were higher on emotional reactivity scores, and male adolescents were higher on emotional cutoff (Peleg-Popko, 2004; Skowron & Friedlander, 1998). Nevertheless, a recent study (Sadeghi et al., 2020) revealed that male adolescents had high mean scores on I-position whereas female adolescents had high mean scores on emotional cutoff, and there was no difference (i.e., between female and male adolescents) on emotional reactivity or fusion with others. These ambiguous findings may suggest culture-related gender differences in differentiation of self, along with differences in parenting of female/male adolescents with regard to emotional reactivity and interpersonal competence (Sadeghi et al., 2020). Similarly, in referring to PTG, a systematic review of PTG in children and adolescents (Meyerson et al., 2011) revealed inconclusive findings; namely, a few studies found higher rates of PTG for female children/adolescents, some found higher rates for male children/adolescents, and most found no significant gender differences in adolescents' PTG. This last finding was also supported in a recent study (Bernstein & Pfefferbaum, 2018) among youth exposed to natural disaster; no gender differences emerged in PTG. Nevertheless, in the arena of COVID-19, Senejko et al. (2022) showed that female adolescents in Poland, as opposed to male adolescents, took advantage of the pandemic situation to make changes in their own functioning; namely, they experienced a greater appreciation of everyday life and made changes in their relations with others and in spiritual and existential matters. The authors pointed to parenting style and social expectations toward daughters as a possible explanation for this finding. As such, the moderating effect of gender on the association between adolescents' differentiation of self and adolescents' PTG should be replicated in future studies with large sample sizes.

4.1. Limitations

Our research should be interpreted in light of several limitations. First, the sample consisted exclusively of adolescent children and their parents who volunteered to participate in this research project. The participating parents tended to be highly educated, financially well-off (the vast majority described their current economic status as good to excellent), and with good to excellent self-rated health. In this context, Ikizer et al. (2021) found that education level was the only predictor of PTG related to COVID-19, with higher educational attainment being associated with lower PTG. In contrast, Lau et al. (2021) discovered that possessing a university degree was linked to a higher likelihood of experiencing PTG, as was having a monthly household income above the sample average. Therefore, caution should be exercised when generalizing our findings to populations that do not share these characteristics, and future studies are warranted to explore these dynamics further. Moreover, data were collected via an online survey, and most of the parent participants consisted of mothers; therefore, we were unable to undertake an examination of the effect of the parent's gender. Future studies are advised to use gender-balanced parent samples and compare them. Replicating our findings among other samples (e.g., fathers, parents with low socioeconomic status, single parents or parents not in committed relationships, parents with lower self-rated health and lower education levels) would address this limitation. Second, we relied solely on self-report data, which can be influenced by cognitive biases such as denial, idealization, and social desirability bias. Future research would benefit from the use of alternative data gathering methods. Third, our research was cross-sectional and as such does not enable us to evaluate any causality between the variables investigated. Furthermore, in the current study we did not assess the link between PTSD/PTSS (post-traumatic stress symptoms) and adolescents' or parents' PTG, nor did we examine the potential bidirectional relationship between parents' PTG and adolescents' PTG. Therefore, the results should be interpreted with caution, as these factors might be associated with PTG induced by COVID-19. Utilizing a longitudinal design to further examine our research model is warranted. Fourth, in the present study, we did not examine parenting styles, which have been found to be related to adolescents' differentiation of self and gender (e.g., Ragelienė & Justickis, 2016). Future studies should therefore include parenting styles in the context of testing the current study model. Fifth, the focus of this study was solely on one child in each family; important dynamics involving siblings may therefore have been missed. Future studies should consider analyzing how outcomes differ between siblings within the same family. Finally, as the study was conducted among an Israeli population with its own specific cultural aspects, caution should be applied in generalizing the findings to other cultures.

5. Conclusion

Despite the limitations noted above, this study makes several important contributions. Theoretically, our results highlight the indirect role of parents' PTG in the association between male adolescents' differentiation of self and adolescents' PTG. This finding suggests that during crises and stressful situations, parents' coping outcomes might be strongly related to their adolescent sons' developmental processes and coping outcomes. In this regard, it is worth mentioning the lack of specific studies on the bidirectional relationship between adolescents' and parents' PTG. Future studies could explore how parents' PTG might influence their children's ability to develop PTG, and vice versa. Doing so might involve longitudinal designs that measure PTG in both adolescents and parents over time, examining how they influence each other's growth processes. In addition, this study represents a modest effort at extending the investigation of the development of differentiation of self among adolescents during stressful events, and the association between this differentiation and PTG. Practically, our results shed light on the importance of tailoring crisis interventions to the family system as a whole, given that at traumatic times in particular the mutual effect of parent–child distress may foster a positive outcome such as PTG. In addition, clinicians might wish to consider how to utilize adolescents' differentiation of self in family therapy, as it was found in this study to be a resource that facilitates a return to routine after negative life events and may thus enhance well-being.

A comprehensive approach that integrates support for children, youth, and their families during collective crises such as pandemics should be adopted by policy makers who work with children and youth services. For example, family-centered intervention programs should be implemented to address the interconnected coping mechanisms of parents and adolescents. These programs should focus on the bidirectional dynamics of PTG between parents and adolescents, facilitating discussions that allow family members to share and learn from each other's growth experiences. Additionally, children and youth services should provide longitudinal support and monitoring of PTG in both parents and adolescents, using follow-ups appointments to track progress and adjust interventions as needed. By implementing these recommendations, services can foster resilience and positive outcomes, enhancing the mental health and development of children and youth in the face of adversity.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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