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Adolescents' Perceived Changes in Internalizing Symptoms during the COVID-19 Pandemic: The Role of Father Internalizing Symptoms and Parent Support in Germany and Slovakia

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Citation: Skinner, A.T.; Ondrušková, T.; Klotz, E.; Çiftçi, L.; Jones, S.; Hoyle, R.H. Adolescents' Perceived Changes in Internalizing Symptoms during the COVID-19 Pandemic: The Role of Father Internalizing Symptoms and Parent Support in Germany and Slovakia. *Youth* **2023**, *3*, 1194–1211. <https://doi.org/10.3390/youth3040076>

Academic Editors: Selma Salihovic and Terese Glatz

Received: 3 August 2023

Revised: 29 September 2023

Accepted: 13 October 2023

Published: 24 October 2023



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Abstract: This preregistered study examined the relation between adolescents' perceived changes in internalizing symptoms during the COVID-19 pandemic and four different family and peer relationships in two countries. Using a bioecological framework, we interviewed mothers, fathers, and adolescents from 212 families in Germany and Slovakia during the COVID-19 pandemic. In both countries, we found that higher levels of father internalizing symptoms exacerbated the relation between pandemic disruption and increases in pandemic-related adolescent internalizing symptoms. Similarly, parental support buffered the relation between adolescent perceptions of COVID-19 disruption and increases in the adolescents' internalizing symptoms. Peer support and parental warmth were not associated with changes in adolescent-reported internalizing symptoms during the study period. The fathers' symptoms of anxiety and depression during stressful life events may impact the parent–child relationship by changing the children's perceptions of parent–child attachment, which may, in turn, be associated with higher levels of adolescent internalizing symptoms. Higher levels of parental support, however, may have helped protect adolescents from some of the more negative aspects of the pandemic.

Keywords: adolescence; father mental health; internalizing; COVID-19; parenting; parent–child relationships

1. Introduction

In early 2020, the outbreak of the coronavirus disease (COVID-19) caused unprecedented changes to people's lives, resulting in increases in adverse mental health symptoms and decreases in well-being across populations [1,2]. The COVID-19 pandemic became a global public health threat, leading many governments to impose strict containment measures including nation-wide lockdowns, social distancing, and quarantine measures [3,4]. Such intense disruption to community life, feelings of uncertainty and insecurity, and no

effective treatment all contributed to an increase in psychological distress and a decline in mental health and well-being globally [5]. Children and adolescents were particularly vulnerable to the negative impacts of the COVID-19 pandemic as it led to restrictions of social contacts, isolation from peers, unexpected loss of family members and loved ones, and disruptions to education, which are all critical predictors of adolescents' adjustment as they transition to adulthood [6–9]. As such, the novel stressors introduced by this pandemic may have long-term adverse consequences on adolescents' development and well-being [4].

1.1. COVID-19 and Mental Health

Studies comparing the rates of internalizing symptoms among youth before and during the pandemic confirmed significant mental health concerns. Deng et al. (2023) conducted a systematic review and meta-analysis to provide a global estimate of the prevalence of symptoms of anxiety, depression, and sleep disturbances among youth post-pandemic onset. This study found the pooled prevalence of anxiety symptoms among 1,241,604 youths to be 31%, which is considerably higher than the pre-pandemic estimates [10]. Rosen et al. (2021) looked at changes in psychopathology in a sample of 224 children aged 7–15 years before and during the COVID-19 pandemic and found that pandemic-related stressors were associated with significant increases in internalizing and externalizing symptoms marking from when the pandemic started (April to May 2020) and 6 months later (November 2020 to January 2021) [11]. Understanding the factors that put young people at risk of developing internalizing problems in response to the pandemic is crucial for promoting positive mental health outcomes and adolescent resilience.

1.2. Bronfenbrenner's Model and Resilience

Resilience can be defined as “a process linking a set of adaptive capacities to a positive trajectory of functioning and adaptation after disturbance” [12]. Exposure to stressful situations and difficult conditions such as the COVID-19 pandemic are sometimes associated with improved skills and self-efficacy that better equip people to handle future challenges [13], but this is only possible if support and resources are in place to foster the development of these new skills. To understand how the COVID-19 pandemic (e.g., a disturbance) affected adolescent well-being, we used Bronfenbrenner's bioecological systems theory [14–16] to illustrate how various levels of influence on the adolescent were impacted by the pandemic. In this model, the person is placed at the center and directly interacts with people in their microsystem such as family, peers, and school systems. The microsystems play a crucial role in the person's development. For example, positive parenting practices and parental mental health as well as high levels of social support from parents and peers are related to positive adjustment in children [17,18]. Bronfenbrenner further places the person within mesosystems (e.g., connections between home and school, relationships between family and friends), an exosystem (e.g., organizations available to the individual and their microsystem), and a macrosystem (e.g., politics, media, cultural views, and customs that represent the society the person lives in). Overall, Bronfenbrenner's model demonstrates the interdependence between individual resilience and community resilience and thus offers a means to understand the impact of the COVID-19 pandemic, which has disrupted all systems that contribute to a person's development and resilience.

1.3. COVID-19 and Parent–Child Relationships

Families are a crucial part of an adolescent's microsystem. Several family and parent-related factors such as parental warmth, control, and support can promote or hinder adolescent resilience. The warmth dimension of the parent–child relationship can be defined as parental acceptance expressed by care, comfort, emotional support, and nurturing [19]. Parenting behaviors that are characterized by acceptance and warmth foster positive parent–child relationships and are linked to positive child adjustment [20–24]. For example, a meta-analysis based on 30 studies from 16 countries found that perceived

parental warmth was positively linked to better child psychological adjustment and greater emotional stability [25]. In turn, lack of parental affection and warmth can increase the risk of maladaptive symptoms including internalizing and externalizing behaviors [26,27]. As such, positive parenting behaviors are associated with positive parent–child relationships and can promote adolescent resilience during stressful life events.

Parental emotional support is also known to promote resilience in youth who are exposed to poverty and other hardships [28]. Family connections and support are a buffer against child psychopathology, as children in families with higher levels of connection to their parents have lower levels of depression [29]. Conversely, poor parental mental health can have an impact on the quality of the parent–child relationship through changes in parenting behaviors [30,31]. For instance, stress-related parental mental health problems were associated with increases in negative parenting behaviors (e.g., harsh parenting) and decreases in positive parenting behaviors (e.g., parental warmth) [32,33]. Therefore, several parent-related factors such as parental warmth, support, and mental health have a crucial role in fostering positive parent–child relationships and adolescent resilience.

Stressful life events that occur at the community level are related to both parental mental health and parenting behavior [34]. As such, it is likely that the novel stressors and disruptions to family life introduced by the COVID-19 pandemic could have directly contributed to young people’s vulnerability for developing internalizing symptoms. Indeed, studies indicate that poor parent–child relationships during this time contributed to decreases in the children’s mental health and well-being [35–37]. Furthermore, pandemic-related stress and parental depression and anxiety have been found to be associated with increases in internalizing and externalizing symptoms in children and adolescents [38–40]. In contrast, several family factors such as supportive parenting or higher parental control acted as a buffer to the negative effects of the pandemic on the internalizing symptoms of youth [41,42]. As such, several parent-related factors could promote adolescent resilience against negative effects of the pandemic, whereas the pandemic-related disruptions to the family could have exacerbated stress and be associated with further internalizing problems among youth.

1.4. COVID-19 and Peers

The importance of social relations grows during adolescence, as young people start being more independent from their parents and begin to identify more with their peers. The COVID-19 pandemic disrupted a crucial protective factor for many adolescents as strong social distancing regulations were introduced. Indeed, studies report increased levels of loneliness associated with the national lockdowns and quarantines [43]. Though these lockdowns were major disruptions, many adolescents relied on alternative ways of staying connected with their peers, for example, through the increased use of social media. Findings are mixed regarding whether or not social media use during the pandemic protected against or exacerbated adjustment problems [44]. Thus, even though the adolescents’ social support systems may have been altered during the pandemic, they may have still experienced some protective effects that contributed to resilience through feelings of connectedness to their peers [45]. Because social media use is not the focus of the current study, we explored whether peer support—among other factors—played a role in the adolescents’ responses to the disruptions caused by the pandemic, regardless of the source of peer support, which may have varied between adolescents.

In summary, although adolescence is defined by an increased need for independence and more emphasis on peer interactions, we are interested in whether parent characteristics and parent–child relationship quality still play an important role in adolescents’ lives when experiencing stressful life events. To examine this, we aimed to examine the possibility that parents still play a protective role against stress and internalizing problems, even during adolescence.

1.5. *The Current Study*

To explore how family and social systems interact to promote or thwart resilience, we addressed three research questions, embedded within Bronfenbrenner's bioecological systems model. The COVID-19 pandemic impacted adolescents' lives within the chronosystem (e.g., an historical event that continued over time), but also had effects at the mesosystem level through school closures and reduced access to resources such as mental health care as well as at the microsystem level through altered interactions with peers and parents. Although the pandemic effects reached across all levels of Bronfenbrenner's model, our study most directly explored those at the microsystem level (e.g., adolescents' interactions with peers and parents). (1) Are parent-child interactions, parent mental health symptoms, and/or social support directly associated with adolescent adjustment during the pandemic? We hypothesized that evidence of parental warmth, parental support, and peer support would be evident in significant negative associations with increases in youth internalizing symptoms. (2) Do parental characteristics (e.g., parental warmth, parent internalizing symptoms, or parental support) moderate the relation between pandemic disruption and changes in youth perceptions of their own internalizing symptoms? We hypothesized that higher levels of mother and father internalizing symptoms would be associated with higher increases in adolescent internalizing symptoms. We further hypothesized that parental warmth and parental support would contribute to resilience by buffering the relation between pandemic disruption and increases in internalizing symptoms, and that higher levels of parental internalizing symptoms would exacerbate the effect of the disruption on adolescent adjustment. (3) Does peer support during the pandemic moderate the relation between pandemic disruption and adolescent adjustment? Like parental warmth and support, we hypothesized that higher levels of peer support would buffer the association between COVID disruption and increases in adolescent anxiety and depression. To test these hypotheses, we ran multi-group path analyses examining simple and moderated effects, as described below.

Few studies have employed a cross-national sample to examine how aspects of the parent-child relationship, parental mental health, and adolescent social support relate to changes in anxiety and depression in adolescents during the COVID-19 pandemic. This study used a multiple group path model for two countries to examine the moderating role of parent-child relationships and other social supports in the association between pandemic-related disruption and changes in adolescent internalizing symptoms during the pandemic. Data were collected from mothers, fathers, and adolescents aged 14-15 years old in Slovakia and Germany. These European countries responded somewhat differently to the pandemic, as described below, and are relatively understudied in the developmental literature. The inclusion of adolescents and their parents from these countries broadens the scope of how the pandemic may have affected a more diverse representation of the world's population. Understanding how familial and social factors are associated with adolescent anxiety and depression (broadly understood as internalizing symptoms) across these understudied countries also advances our understanding of adolescent mental well-being and can inform prevention and intervention strategies in the context of major negative life events.

2. **Materials and Methods**

2.1. *COVID-19 Context*

Slovakia and Germany have had varied experiences with the pandemic, in relation to infection rates, containment efforts, and vaccine distribution. Our aim was to examine the effects of the pandemic in adolescents both in comparison and independent of country-specific progressions of infections, restrictions, and vaccine accessibility or uptake.

2.1.1. *Germany*

In Germany, the outbreak was first recognized as a pandemic in mid-March 2020, in parallel with the declaration of a pandemic by the WHO, which was followed by restrictions

in public life including nation-wide closures of educational facilities, non-essential shops, and cultural and leisure institutions to curb the spread of the virus and reduce social contacts. These restrictions were expanded by the end of March 2020 including the closure of restaurants and a maximum number of two people allowed to meet outdoors. These rules were extended until June 2020. At the same time, social protection policies (e.g., an extension of the short-term work scheme for employees) were introduced. In January 2021, when data collection in Germany began, the country had already been in a second, partial lockdown since November 2020, in which schools remained open but cultural institutions and restaurants were closed, and social distancing rules as well as a mask mandate were in place. This lockdown was extended in December 2020 and led to a second period of complete school closures until March 2021. From April to July 2021, following further infection waves, schools were reopened but schooling was disrupted depending on the local infection rates. In June 2021, a vaccine rollout for the general population began and restrictions were loosened based on complete vaccination status.

Until data collection was completed in January 2022, over 8.6 million infections and over 117,000 deaths in relation to COVID-19 were registered and Germany had been through four major infection waves and several fluctuating strict or partial lockdowns and restrictions of public life.

2.1.2. Slovakia

On 6 March 2020, Slovakia confirmed the first case of COVID-19 [46], followed by a swift response from the Slovak Government providing advice for Slovak citizens to enact voluntary quarantine in their households. This also included strict containment measures of a 14-day quarantine upon entry from abroad, border controls, closures of airports, recreational centers, restaurants, schools, and shops. However, just a few days later, on 21 March 2020, the results from national elections meant a change in the Slovak government, thus changing the body that made decisions about pandemic response. This change possibly resulted in increased mistrust in the government's decisions. In 2021 Zeman collected views through a national survey of 1021 individuals, revealing that the majority of participants did not trust the Slovak government [47]. As such, the political situation in Slovakia could have contributed to the feelings of uncertainty that were already associated with the pandemic and may have led to increases in worry and stress among Slovak citizens. On the other hand, Slovakia had a relatively low number of positive cases until August 2020. This may have created a sense of safety and increased the motivation to adhere to the strict contamination measures. However, the positive cases started increasing in September 2020 and by the time data collection for this study was completed in January 2022, there were over 850,000 infections and over 17,000 deaths in Slovakia.

Although both countries responded to the COVID-19 outbreak with containment measures, Slovakia is generally credited early on with having successfully “flattened the curve” in rising infections and hospitalizations more than most other European nations [48]. This is largely attributable not to easier access to protective equipment or health care, but to a swift governmental lockdown response after the first, single case of coronavirus was detected in Slovakia, and to the near universal compliance among its citizens, at least early on in the pandemic [48]. Our aim in including both countries in a multi-group model, as described in Section 2.4 below, is not because we intend to make cultural comparisons about the similarities or differences between nations, but because we hope to explore whether parent–child relationships and pandemic responses are driven largely by within-family and between-family differences, irrespective of governmental response to the pandemic. In addition, along with existing literature from other countries more prevalent in the pandemic literature (e.g., China, USA, UK), by including data from families in these two understudied countries, we can gain a broader view of adolescent adjustment and parental factors during the pandemic.

2.2. Participants

Recruitment

Families in both countries were recruited through opportunity and snowball sampling via targeted social media posts on Facebook and Instagram, online parenting groups, parent listservs, printed flyers in and near Berlin and Munich, MTurk (Germany only), and through contacting schools, youth centers, and youth sports teams from different parts of each country to create a socioeconomically diverse sample. We also utilized an ISO-certified international survey company (Respondi) in Germany and ACRC in Slovakia; each recruited participants through an established panel of research participants or by recruiting new participants. In all cases, data collection was completed via Qualtrics surveys maintained on a secure server at the host university, and online participant answers were not accessible to the survey company. In all cases, parents were recruited first to provide consent for their children to be enrolled, after which they were asked to provide their children's contact details for them to complete the survey separately. Youth provided assent. In the case of families with multiple children, we only allowed one child per family, chosen by the parents, to participate in the study. A second link, separate from the consent link, identified only with a study ID number, was sent to the parent and adolescent participants to complete the survey questions. To be included in the study, at least one parent needed to complete the survey and provide consent for youth participation. The youth needed to be born in 2006 or 2007 and participants had to live in the country of interest (either Germany or Slovakia) during a COVID-19 quarantine period prior to completing the interview. The online survey took the parents and youth approximately 15–20 min to complete, and all measures and procedures were approved by the sponsoring university's Institutional Review Board. For their participation in the survey, families received small Amazon or other gift vouchers, or the equivalent amount in their survey account.

Data were collected in Germany from January to December of 2021, spanning several COVID-19 infection waves and varied government responses to the pandemic. However, approximately two-thirds of the sample (67%) were interviewed in November and December 2021. In Slovakia, recruitment spanned from January 2021 to May 2022, with 79% of the families interviewed in May 2022.

Correlations between all study variables are provided in Table 1. The sample included 106 youth from each country ($M_{\text{age}} = 14.64$; $SD = 0.88$); 175 mothers (75 from Germany and 100 from Slovakia) and 175 fathers (81 from Germany and 94 from Slovakia). Data from both parents were provided from 46% of the families in Germany and 84% of the families in Slovakia. On average, parents reported 13.33 years of education ($SD = 4.14$), and 54% of youth reported their gender as male.

Table 1. Bivariate correlations.

	<i>n</i>	Gender (1 = Male) (1)	Parental Years of Education (2)	Weeks Since Pandemic Began (3)	COVID Disruption (4)	Youth Changes in Internalizing (5)	Mother Warmth (6)	Father Warmth (7)	Mother In- ternalizing (8)	Father In- ternalizing (9)	Parent Support (10)	Peer Support (11)
(1)	212											
(2)	205	0.213 **										
(3)	212	−0.089	−0.357 ***									
(4)	212	−0.053	0.119	−0.084								
(5)	212	−0.148 *	−0.018	−0.190 **	0.156 *							
(6)	211	−0.020	−0.082	0.148 *	−0.075	−0.065						
(7)	209	−0.023	−0.116	0.178 *	−0.111	−0.112	0.699 ***					
(8)	173	−0.052	0.142	−0.087	0.233 **	0.121	−0.221 **	−0.283 ***				
(9)	173	−0.047	0.141	−0.047	0.190 *	0.329 ***	−0.199 **	−0.204 **	0.454 ***			
(10)	210	0.035	0.053	0.035	−0.063	−0.190 **	0.449 ***	0.331 ***	−0.255 ***	−0.284 ***		
(11)	210	−0.053	0.016	0.016	−0.035	−0.153 *	0.244 ***	0.293 ***	−0.312 **	−0.236 **	0.548 ***	

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

2.3. Measures

2.3.1. Changes in Perceived Internalizing Behavior

The dependent variable—changes in the youths' internalizing behavior—was measured using the self-report instrument "Experiences Related to COVID-19" [41]. Participants rated changes in their levels of anxiety and depression now compared to before the outbreak of COVID-19 in their community (e.g., "How has the pandemic affected your feelings of sadness/depression?" and "How has the pandemic affected your feelings of anxiety?"). Item responses ranged from 1 = *made it a lot better*, to 5 = *made it a lot worse*. On average, the youth reported a total internalizing score of 6.48 ($SD = 1.27$) with sums ranging from 2 to 10. The correlation between these items was $r = 0.68$ in the overall sample, 0.62 in Germany and 0.73 in Slovakia. The measure and two item composite have been utilized in several prospective, cross-national studies (e.g., [22,49]).

2.3.2. COVID-19 Disruption

The "Experiences Related to COVID-19" questionnaire was also used to capture disruption due to COVID-19 using an item on which adolescents rated how disruptive the pandemic had been to them personally, taking into account daily routines and family life, using a Likert-type scale from 1 to 10, with 1 = *not very disruptive* and 10 = *extremely disruptive*. The mean score across the sample was 6.53 ($SD = 2.25$), with scores ranging from 1 to 10.

2.3.3. Parental Warmth

Parental warmth was measured using mother, father, and child reports of the Parental Acceptance–Rejection/Control Questionnaire-Short Form (PARQ) [50] with a change in the response scale consistent with prior cross-national studies (e.g., [22]). Adolescents and both parents rated items such as "I make my child feel wanted and needed" or "My father makes me feel wanted and needed" for each parent on the modified scale, with 1 = *never or almost never*, 2 = *once a month*, 3 = *once a week*, or 4 = *every day* to describe the parent–child relationship with each parent. Youth completed each set of questions once referring to each parent. The PARQ has been translated into more than 50 languages and has shown high reliability and cross-cultural validity [50]. To create a maternal warmth variable, mother self-reports and youth reports about mothers were combined from eight items of the PARQ for each respondent. The same procedure was followed for paternal warmth. In similar work using this scale, strong internal consistency was found across reporters at ages 8, 9, 10, 12, and 13 (α s = 0.84 to 0.89). Internal consistencies for the combined reports of mother warmth in this sample were $\alpha = 0.91$ for the full sample, 0.90 for Germany, and 0.91 for Slovakia. Internal consistencies for the combined reports of father warmth were $\alpha = 0.93$ for Germany, Slovakia, and the full sample. Mean scores ranged from 3.25 for child reported mother affection ($SD = 0.80$) to 3.73 ($SD = 0.50$) for mother reported affection, with the full range of scores from 1 to 4 being reported.

2.3.4. Parental Depression

The Beck Depression Inventory (BDI, 4-item version; [51]) was used to measure self-reported parental depression separately for the mothers and fathers. The BDI assesses parents' depressive symptoms over the most recent two-week period. Each question included a series of four options, and respondents chose the one that best described their feelings over the past two weeks. Answer options, for example, ranged from "I do not feel sad" (scored 0) to "I am so unhappy or sad that I can't stand it" (scored 3). The BDI has been shown to be a valid and reliable instrument in several studies and cross-nationally (e.g., [52,53]). For this sample, the BDI $\alpha = 0.69$ for the full sample of mothers, and was 0.72 and 0.66 for mothers in Germany and Slovakia, respectively. For fathers, $\alpha = 0.77$ for the full sample, and 0.84 and 0.67 for fathers in Germany and Slovakia, respectively. Mean scores for mother and father self-reported depression were 1.52 ($SD = 1.66$) and 1.50 ($SD = 1.90$), respectively, on a possible scale of 0 to 3.

2.3.5. Parental Anxiety

Parental anxiety was measured using the parent self-report of the Spielberger State-Trait Anxiety Inventory [54]. The STAI has been validated in a number of studies (e.g., [55,56]). Parents responded to the 20 trait anxiety items (“I worry too much over something that really doesn’t matter”) on a 4-point Likert scale with answer options ranging from 1 = *not at all* to 4 = *very much so*. Trait anxiety reliability in the current sample was $\alpha = 0.91$ for the full sample of mothers, and 0.94 and 0.89 for mothers in Germany and Slovakia, respectively. For fathers, $\alpha = 0.93$ for the full sample, and 0.95 and 0.91 for the fathers in Germany and Slovakia, respectively. Summed scores were $M = 38.22$ ($SD = 9.75$) for mothers, and 36.17 ($SD = 10.63$) for fathers with a possible range of 4 to 80.

To create the composite parental internalizing variable used in analyses, the mean was taken of the standardized score of the BDI and STAI for each reporter (mother or father), and then the standardized score of that mean was used in analyses so that the results could be described across the study in terms of standard deviations.

2.3.6. Social Support

The adolescents’ perception of social support was assessed using the parent and peer items from the Social Support Scale for Children and Adolescents [57]. The measure has strong psychometric properties, which were updated in 2012 [57]. For each item, participants were first asked to choose which of two opposite statements about support was true for them (e.g., either “Some kids have parents who don’t really understand them” or “Some kids have parents who really do understand them”); once decided, the youth chose whether that statement was *sort of true* or *very true* for them. Each item then received a score from 1 to 4. A score of 1 or 2 was given when the negatively worded statement was indicated as *very true* or *sort of true*, respectively, and a score of 3 or 4 was given when the positively worded statement was rated as *sort of true* or *very true*, so that higher scaled scores reflected higher perceived support. Six items formed the parent support scale, and 12 items formed the peer support scale ($M_{\text{parent}} = 3.30$; $SD = 0.62$ and $M_{\text{peer}} = 3.22$; $SD = 0.62$). Internal consistency for parent support in this sample was $\alpha = 0.76$ for the full sample, and 0.76 and 0.77 for Germany and Slovakia, respectively. For the peer support scale, internal consistency was $\alpha = 0.84$ for the full sample, 0.82 for Germany, and 0.86 for Slovakia.

Covariates were adolescent self-reported gender and SES. As a proxy for SES, parents provided years of formal education and the highest form of education (high school, college degree, etc.) completed; the maximum value was taken when both parents responded. We also calculated a variable to indicate the number of weeks that had passed since the start of the initial declaration of the pandemic and associated lockdown in each country in March 2020 ($M_{\text{weeks}} = 93.9$; $SD = 18.3$).

In the variables described above, COVID-19 disruption was an independent (predictor) variable in predicting adjustment both in the main effect and moderation models. The remaining variables—parental warmth, parental anxiety and depression, parental support, and peer support—were also independent variables that were examined in both main effect models and as moderators when used in interaction terms, multiplied by COVID-19 disruption to predict the outcome variable, increases in adolescent perceptions of increases in anxiety and depression.

2.4. Analytic Plan

Multiple group path analyses were estimated using Mplus version 8.3 [58]. Full information maximum likelihood estimation (FIML) was used to account for missing data. Models were estimated allowing the intercepts, covariance, and residual variances to vary between countries, but path coefficients were constrained to be equal for Germany and Slovakia. When this constrained model did not fit the data well, a coefficient was released to vary between countries to see if this improved the model fit. Omnibus tests of model fit

were considered good if the following fit statistics were true: CFI greater than 0.90, RMSEA less than or equal to 0.06, and SRMR less than or equal to 0.08 [59].

First, the simple effects model was estimated to examine the impact of youth-reported COVID-19 disruption, parental warmth, parental support, peer support, and parental internalizing behavior on the youth-reported perceptions of increases in internalizing symptoms due to the COVID-19 pandemic. The models also included estimates for the covariates. In all models, the non-binary variables were standardized so that the coefficients were reported in standard deviations. To test the moderation effects, six models were estimated, one for each potential moderator: mother and father internalizing behavior, parent support, peer support, and mother and father warmth.

3. Results

3.1. Simple Effects

Results from the simple effects model are presented in Table 2. The model fit the data well when father internalizing symptoms were allowed to vary freely between the countries. Greater number of weeks elapsed since the initial lockdown was related to fewer perceived increases in internalizing symptoms in both countries, and in Slovakia, greater father internalizing symptoms predicted more perceived increases in internalizing symptoms in adolescents.

Table 2. Multiple group model results.

Variables	Main Model	Moderation by Father Internalizing	Moderation by Parental Support
	Increases in Youth Internalizing Behaviors β (SE)		
Child gender	−0.20 (0.12)	−0.23 (0.12)	−0.256 * (0.13)
Parents’ education	−0.095 (0.08)	−0.10 (0.08)	−0.097 (0.08)
Weeks since pandemic began	−0.015 ** (0.01)	−0.17 ** (0.01)	−0.012 * (0.01)
Pandemic disruption	0.093 (0.06)	0.116 (0.06)	0.258 ** (0.09)
Mother internalizing	−0.044 (0.11)	—	—
Father internalizing	0.196 (0.14)	0.284 *** (0.07)	—
Maternal warmth	0.105 (0.12)	—	—
Paternal warmth	−0.039 (0.11)	—	—
Parental support	−0.094 (0.08)	—	−0.189 ** (0.07)
Peer support	−0.050 (0.07)	—	—
Father internalizing x disruption	—	0.136 ** (0.05)	—
Parental support x disruption	—	—	−0.148 * (0.06)
<i>Country Specific coefficients</i>			
Slovakia, father internalizing	0.393 ** (0.12)	—	—
<i>Model Fit Statistics</i>			
Chi-square test (degrees of freedom), p-value	10.17 (9), 0.34	5.64 (6), 0.46	6.77 (5), 0.23
CFI	0.948	1.0	0.94
RMSEA	0.035	0.000	0.058
SRMR	0.020	0.026	0.022

Note: β = Standardized coefficient. CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual. * p < 0.05. ** p < 0.01. *** p < 0.001.

3.2. Moderating Role of Parental Characteristics, Parent Behavior, and Parent–Adolescent Relationship

Results from the moderation analyses are also presented in Table 2. We ran six interaction (moderation) models that included the interaction between adolescent reports of pandemic disruption and mother (1) and father (2) internalizing, mother (3) and father (4) warmth, peer support (5), and parent support (6). Only significant results from adequately fitted models are presented in Table 2.

In examining the interaction between mother internalizing symptoms and COVID-19 disruption, omnibus tests of model fit showed that the data did not fit the model well,

and the interaction term was not significant (model results and fit statistics for models that did not fit the data well or were non-significant are available from the corresponding author). For fathers, the interaction term was significant; paternal internalizing symptoms moderated the association between COVID-19 disruption and youth-reported internalizing symptoms such that the relation between disruption and increased youth perceptions of internalizing symptoms was stronger for fathers that reported higher levels of depression and anxiety. Figure 1 shows the regions of significance for this interaction effect, which plots the value of the moderator on the x -axis (father internalizing) against the slope of the relation between the predictor (COVID disruption) and youth reports of increases in internalizing symptoms (the outcome) on the y -axis. This type of plot allows us to see at what values of the moderator the slope is significant (e.g., where confidence intervals do not include zero), and is a more precise and nuanced interpretation of interaction effects beyond simple slope tests. The slope was significant and positive for all values of father internalizing above 0.06 SD from the mean, which represents 38% of the father respondents (see Figure 1).

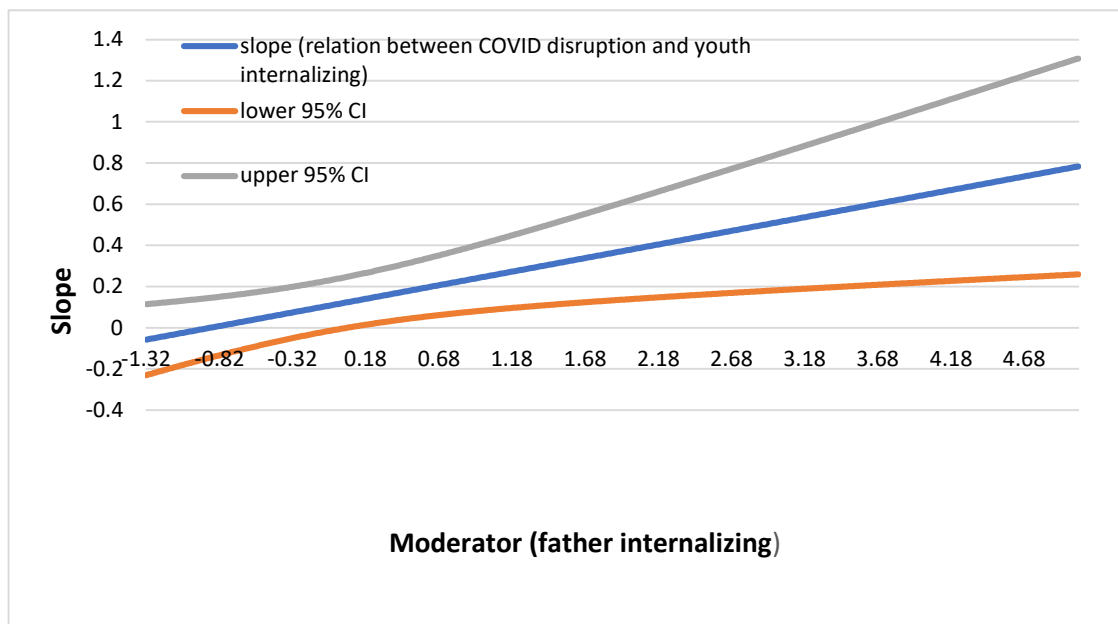


Figure 1. Moderation by father internalizing: regions of significance.

In examining the moderating role of parental warmth, the model fit was deemed inadequate for both mothers and fathers, and the interaction term was non-significant. Higher levels of parent support, however, buffered the relation between disruption and increases in internalizing symptoms for adolescents, such that the relation between disruption and perceived internalizing was weaker when there were higher levels of parental support. Regions of significance testing (see Figure 2) showed that the slope of the relation between COVID disruption and youth internalizing was significant and negative for all values of parental support that were below 0.22 SD from the mean, which includes 49% of the overall sample. Model fit was good when the path between disruption and perceived increases in internalizing symptoms was allowed to vary freely between countries.

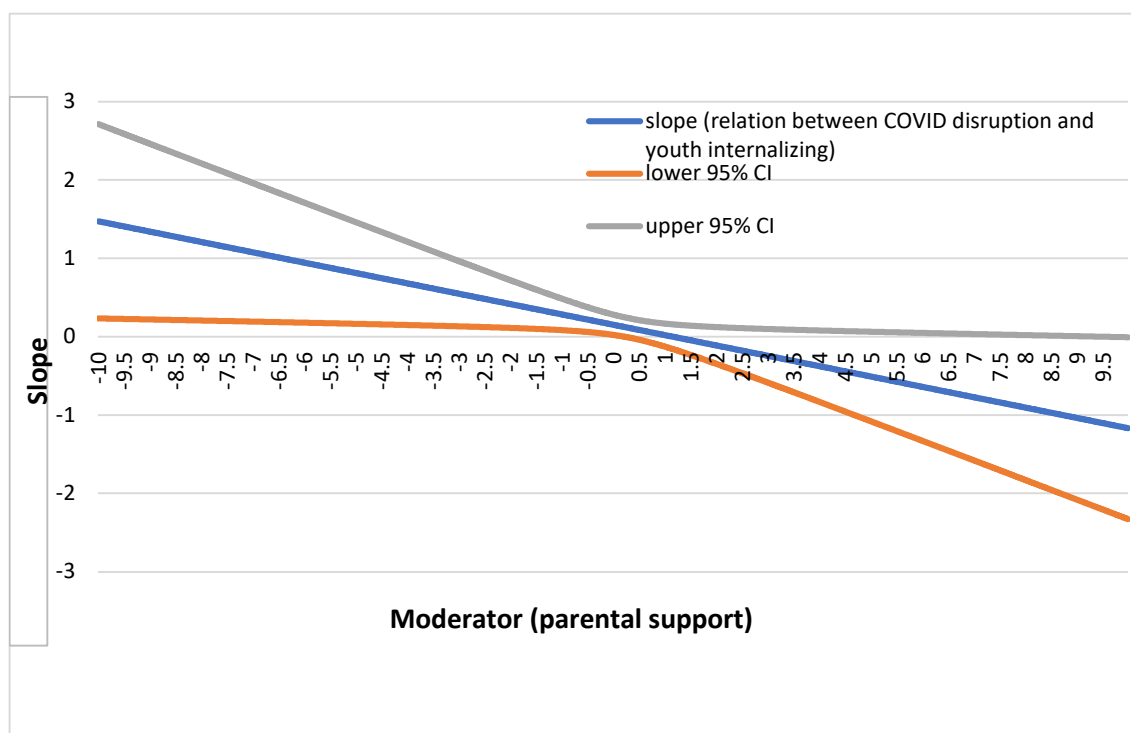


Figure 2. Moderation by parental support: Regions of significance.

3.3. Moderating Role of Peer Support

In the model examining the interaction between disruption and peer support, the model fit the data well, but the interaction term was not significant.

3.4. Deviation from Pre-Registration

This manuscript was pre-registered through the Open Science Framework (osf.io/evsxq). Our analyses deviated from the pre-registration in two ways. First, our final moderation models included only the terms involved in the interaction and the covariates to capture the true moderation effect. The pre-registration originally listed the other predictors (parental warmth, social support, and parental anxiety and depression) as additional terms in each model. Second, we created a combined variable of parental internalizing symptoms, as described above, rather than analyze the associations separately for parental anxiety and depression so that the parental symptoms of internalizing more closely aligned with how the outcome variable of the adolescents' perceptions of comparative internalizing symptoms were measured.

4. Discussion

Although the COVID-19 pandemic has been shown to adversely affect youth adjustment and well-being in several studies (e.g., [60,61]), the associations between the parent-child relationship and adolescent adjustment during the pandemic remains comparatively understudied. The current study highlights two findings that inform how the parent-child relationship and adolescent well-being may have been altered and how they may have interacted during the COVID-19 pandemic. These findings broaden our understanding of how pandemic disruptions impacted microsystems, namely, parent-child interactions, and perceptions of the parent-child relationship measured by parental warmth and support, and how those impacts are manifest in adolescents' reports of their own anxiety and depression compared to before the pandemic started.

First, more than one-third (38%) of fathers who responded had levels of self-reported anxiety and depression that had a significant exacerbating effect on the relation between COVID-19 disruption and perceived changes in youth internalizing symptoms. These

fathers reported levels of internalizing behavior just 0.06 *SD* or higher above the sample mean. In other words, it did not require that fathers report exceedingly high levels of internalizing symptoms to detect an interaction effect; rather, approximately mean levels were enough. In Slovakia, the fathers' internalizing also had a direct effect on adolescent perceived increases in symptoms of anxiety and depression. In prior research, higher levels of adolescent-reported depression and hopelessness were predicted by higher levels of parental depression and lower levels of parent–adolescent support 18 months earlier [62], pointing to a longitudinal effect of both parental mental health and well-being and parent–adolescent relationship quality on adolescent well-being. A systematic review of the relation between paternal depression and child and adolescent behavior prior to the COVID-19 pandemic shows that paternal depression is strongly related to adolescent internalizing symptoms, with multiple potential mediators contributing to this relation [63]. At younger ages, paternal hostility [64] and reduced emotional security [65] mediated the relation between paternal and child internalizing symptoms and did so independently of maternal depression [64]. Thus, the relation between paternal and adolescent internalizing symptoms may be explained by changes in the parent–child relationship that may include increased hostility, reduced involvement, or adolescent feelings of emotional insecurity in the parent–child relationship. These potential indirect pathways are beyond the scope of this study and require further examination in longitudinal and expanded work, especially since—compared to studies that include young children—fewer studies include adolescent populations in examining the indirect pathways from parent to adolescent internalizing symptoms.

Although we were surprised not to find similar moderating pathways for mother internalizing symptoms in the relation between COVID disruption and adolescent anxiety and depression, prior research about the mediating pathways from parental depression to adolescent adjustment may help explain this result. In longitudinal research that examined the linkages between mother and father depressive symptoms and adolescent adjustment, researchers found that fathers' depressive symptoms were related to children's negative perceptions of father–child attachment, which in turn predicted adolescent behavior problems [66]. Interestingly, in the same model, mother depressive symptoms were also related to adolescent adjustment problems, but through a pathway that included not just the mothers' decreased emotional responsiveness to stress, but then, in turn, insecure father–child attachment. Thus, while the end results may be the same, both mother and father internalizing symptoms are associated with child adjustment difficulties during times of stress, the explanatory pathways through the mothers' and fathers' parenting behavior and parent–child relationship quality are different, yet both pathways are impacted by the father–child relationship and attachment. In our study, we did not include enough direct measures of the parent–child relationship or attachment to sort out these differences in detail, but the gender differences we found support the attachment pathway of this earlier work. Furthermore, in a meta-analysis of the effect of parental acceptance and rejection using data from 22 countries, the authors found that children's perceptions of fathers' acceptance was a stronger predictor of child adjustment than mothers' acceptance [67]. Together, these studies indicate that children's perceptions of fathers' warmth, affection, and attachment—all which may be reduced by the fathers' own experience with depression and anxiety—may be more closely related to children's adjustment than children's perceptions of mother–child attachment. The mechanisms for such an effect are not known, but some research hypothesizes that perceptions of greater power and prestige toward fathers may play a role [68].

Although adolescence is typically a time when peer groups take on a larger role than parents in importance and influence in young people's lives, our second hypothesis was only partially supported and our third hypothesis was not supported; our study found that parental support was a significant moderator in the relation between youth-reported disruption and perceived worsening of internalizing symptoms compared to before the pandemic, but the parental warmth and peer support moderation results were not significant.

Furthermore, our regions of significance testing revealed that nearly half the youth in the sample reported levels of parental support that significantly and inversely moderated the relation between COVID-19 disruption and youth internalizing behaviors. Extant literature on parent–child relationships during the pandemic may explain why parental support plays a protective role during the pandemic. For example, higher levels of parental support are associated with lower levels of internalizing symptoms among adolescents across various cultural contexts (e.g., [69] in Qatar; [70] in Poland). Other researchers have documented decreases in parental support and positive parenting compared to before the COVID-19 outbreak, but they have also documented simultaneous declines in negative parent–child interactions [37]. In another study with 170 adolescents during the COVID-19 pandemic in the U.S., parent–child relationship characteristics impacted child adjustment in ways that were similar to pre-pandemic associations, regardless of pandemic-related stress [71], indicating a possible increased impact of positive parent–child relationship characteristics during the pandemic. Parent–child conflict resolution techniques during adolescence three years prior to the pandemic were also shown to impact young adult adjustment during the first year of the pandemic across multiple countries [42]. Our findings support the existing literature showing that the parent–child relationship continues to impact adjustment into middle and late adolescence, particularly during stressful events.

Even though the mechanism for how parental support moderates the relation between pandemic disruption and adolescent adjustment is not known, it may be that parents who demonstrated higher levels of support also demonstrated increased warmth and affection toward their adolescents, which is well-demonstrated to have a positive effect on child adjustment across many countries (see [25] for meta-analyses). In our sample, parental warmth and parental support were significantly and moderately correlated ($r = 0.45$ for mothers and 0.33 for fathers).

One reason that peer support may not have emerged as a significant moderator may be related to the impact the pandemic lockdowns in both countries had on the reduction in adolescents' face-to-face interaction with their peers. Pandemic conditions in these two countries and around the world meant a sudden and drastic removal of multiple avenues for the development of peer socialization skills including school, sports, romantic relationships, and friendships. It may be that higher levels of parental support due to increased time together served had a protective effect against what may have been even greater adjustment problems due to a loss of peer support.

A few limitations should be noted in generalizing our results beyond the samples, research design, and measures that we used. First, because our samples were not nationally representative of the countries from which they were drawn, generalizability to cultural interpretations of the findings is limited. The use of convenience samples may also limit the generalizability of our results because our data could disproportionately represent families who want to share their pandemic experiences, which may not be true of families experiencing either very high or very low rates of internalizing problems. We also do not have longitudinal data by which we can compare prior levels of internalizing symptoms in adolescents before the pandemic began to those obtained during the pandemic and must rely on their self-reports of perceived changes in anxiety and depression. Nonetheless, these perceived changes are indicative of how youth may interact with others based on the interpretation of their "now" versus "before the pandemic". When longitudinal data collection is possible, future studies should aim to explore changes in adjustment over time through repeated measurement of well-being. Indeed, this has been carried out by other researchers throughout the pandemic, and their findings about increases in substance use [72], internalizing symptoms [73], and positive and negative affect [60] measured before the COVID-19 pandemic compared to time points throughout periods of pandemic restrictions mirror our results. Other than the association between weeks since the pandemic began and father anxiety and depression in Slovakia, our results did not reveal any significant simple effects between any of our predictors and changes in adolescent internalizing symptoms. This may mean that our measures were not able to

detect these associations (e.g., measurement error) or that these associations do not exist. However, given that interaction effects for father internalizing and parental support as moderators are significant and meaningful, we do not read too much into the lack of significant simple effects between the independent and dependent variables.

Finally, although we measured parental warmth with both adolescent and parent reports, parental mental health was measured only with the parents' self-report data, and based on the rationale explained in the Introduction, is a proxy for parent–child relationship quality. Observational studies that explore how parent–child interactions are impacted by parental depression and anxiety would provide a more detailed measure of the parent–child relationship quality.

Despite these limitations, several strengths should be noted. First, our study included reports from mothers, fathers, and youth. Fathers are relatively underrepresented in the developmental psychology literature compared to mothers, and our inclusion of them here allowed us to highlight parent–child relationship characteristics that otherwise would not have been evident, particularly since an exacerbating effect of parental internalizing symptoms was found for fathers, but not for mothers. Second, we included two countries that experienced trajectories of restrictions and COVID-19 disease spread unlike many of their European neighbors, and our inclusion of families in these nations enlarges the generalizability of COVID-19 studies with adolescents and their families. Finally, although we cannot be certain about the direction of effect, aspects of the parent–child relationship were measured concurrently during the pandemic, which strengthens our ability to assess how the disruption may impact various family members transactionally. The pandemic's impact was felt by all family members, and as such, our measures provide both historical context for parent characteristics (e.g., STAI directions, "say how you feel generally") and "in the moment" feelings (e.g., BDI directions "...best describes the way you have been feeling the last two weeks") that may both influence the parent–child relationship.

5. Conclusions

In two countries, fathers' anxiety and depression and parental support moderated the relation between adolescent reports of disruption due to the COVID-19 pandemic and perceived increases in adolescents' internalizing symptoms. In both Germany and Slovakia, parental characteristics and aspects of the parent–child relationship had a significant moderating impact for those at or above (for internalizing) or at or below (for parental support) the sample means. In other words, it was not only for those individuals who showed extremely low levels of internalizing or extremely high levels of support for whom an effect was found. Paternal internalizing symptoms may impact the parent–child relationship through several mediating factors, which in turn can impact adolescent anxiety and depression. During the pandemic, higher levels of parental support for adolescents appeared to fill in the gap where peer support was lacking and help buffer the association between disruption and adolescent anxiety and depression. Notably, nearly half of our sample reported levels of parental support that had this buffering effect. Understanding how parental mental health and behavior impacts adolescent well-being is key to providing comprehensive family services and interventions to mitigate negative impacts from COVID-19 and other community-wide stressors.

Author Contributions: Conceptualization, A.T.S., T.O., E.K., L.Ç. and S.J.; Methodology, A.T.S., T.O., E.K., L.Ç., S.J. and R.H.H.; Formal analysis, A.T.S.; Writing—original draft preparation, A.T.S., T.O., E.K. and L.Ç.; Writing—review and editing, A.T.S., T.O., E.K., L.Ç., S.J. and R.H.H. All authors have read and agreed to the published version of the manuscript.

Funding: Funding for this project was provided in part by the Center for Child and Family Policy at Duke University, USA.

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki and approved by the Institutional Review Board of Duke University (protocol 2017-1191, 6 May 2021).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study. Parents provided consent for their children who were minors to participate and the youth provided assent.

Data Availability Statement: The data presented in this study are available on request from the corresponding author. The data are not publicly available due to privacy restrictions.

Acknowledgments: The authors wish to thank the Josiah Charles Trent Memorial Foundation Endowment Fund at Duke University for their support of this work.

Conflicts of Interest: The authors declare no conflict of interest.

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