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Intra- and interpersonal factors and adolescent wellbeing during COVID-19 in three countries

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Abstract

COVID-19 has altered adolescents' opportunities for developing and strengthening interpersonal skills and proficiencies. Using data from adolescents in Italy, the United States, and the United Kingdom, we examined the relation between internalizing symptoms assessed pre-pandemic or when pandemic-related restrictions were lifted (Time 1) and associated internalizing symptoms during a subsequent restrictive pandemic period (Time 2). Across all 3 countries, we found significant and consistent effect sizes in the relation between Time 1 and Time 2 internalizing symptoms. We further examined the direct and moderating impact of self-efficacy and contextual supports for adolescents' internalizing symptoms. Higher self-efficacy was associated with lower levels of internalizing symptoms at Time 2 in all 3 countries. Additionally, the relation between Time 1 and 2 internalizing symptoms was buffered by regulatory self-efficacy and peer support in Italy, but in the U.S., higher levels of general self-efficacy instead had an exacerbating effect on the relation between Times 1 and 2 internalizing symptoms. Results are discussed in the context of utilizing cross-national datasets to examine similarities in adolescent well-being over time and in the face of varying government responses to the pandemic.

Keywords: COVID-19, internalizing, adolescence, support, self-efficacy

Intra- and interpersonal factors and adolescent wellbeing during COVID-19 in three countries

COVID-19 has caused pervasive psychosocial disruptions for all ages, but adolescents have been particularly vulnerable to indirect impacts of the pandemic (Panchal et al., 2021) despite being less likely to experience symptomatic illness relative to adults (Viner et al., 2020). Disruptions to the predictability, structure, and perceived safety of daily life have raised questions about the social, emotional, and mental health consequences of the pandemic for adolescents (Hsieh et al., 2021). Although extant literature on COVID-19 and adolescents includes findings about maladjustment (e.g., Mastrotheodoros, 2020), few cross-national studies have explored the association among COVID-19 experiences and emotional symptoms influencing mental health, considering individual, family, and peer-level predictors, while also accounting for contagion and political response in respective countries (Lansford et al., 2021; Skinner et al., 2021). This study attempts to fill that gap using longitudinal data from three countries.

Adolescent Mental Health

During the COVID-19 pandemic, adolescents experienced increases in depressive symptoms, which have either worsened or emerged during the sudden worldwide crisis (Campos et al., 2021). Anxiety has also become a main indicator of poorer mental health during lockdown (Tamarit et al., 2020). Together, symptoms of depression and anxiety can be broadly characterized as internalizing symptoms. Cross-sectional studies on COVID-19 (Wang et al., 2020; Hussong et al., 2021) document increases in adolescents' internalizing symptoms following confinement (Orgiles et al., 2021; Saurabh & Ranjan, 2020; Zhou et al., 2020). Prior research also shows that social isolation during outbreaks of Ebola, SARS, and MERS was associated with a range of distress indicators (Brooks et al., 2020; Desclaux et al., 2017).

Intra- and Interpersonal (Moderating) Factors

Self-efficacy refers to one's confidence in the ability to plan and perform actions to achieve desirable goals or to manage positive and negative events effectively. According to Bandura (1991), self-efficacy, an intraindividual asset, aids individuals in reacting positively to challenges. As a result, people with higher levels of self-efficacy can cope with adversities and avoid potential negative impacts on their mental health (Hua & Ma, 2022). At the interpersonal level, adolescence is a critical period for establishing attachment bonds, seeking validation from peers, and building social connections, yet opportunities for such growth have been negatively impacted by pandemic-related social distancing and home isolation (Okabe-Miyamoto et al., 2021). Social support can be a protective factor against internalizing symptoms (Fredrick et al., 2018), and perceived social support may be more influential than received social support for individuals' mental health, buffering the impact of adversities and strengthening individuals' confidence to deal with life's challenges (Liu et al., 2022).

Global Context and Current Study

Although research on the psychological impact of COVID-19 has developed significantly in a short time, much research has been conducted in non-adolescent populations (e.g. Chen et al., 2021, Fish et al., 2020; Şimşir et al., 2021). While some studies have investigated risk and protective factors for adolescents' well-being during the pandemic (Tamarit et al., 2020), few are cross-national. Disease spread has differed by country, and restrictions varied substantially (World Health Organization, 2020). Governmental responses developed according to economic, sociopolitical, and demographic characteristics; these, in turn, shaped the stringency level of the restriction measures as well as security protocols and residents' mobility (Kavanagh & Singh, 2020).

Our study utilizes data from three countries to examine three research questions. First, what is the relation between adolescents' internalizing symptoms during pre-pandemic or low-restricted pandemic (Time 1) to heightened levels of COVID-19 community transmission and/or restrictions (Time 2)? We hypothesized that, consistent with prior literature, higher levels of internalizing symptoms at T1 would be associated with higher levels of internalizing symptoms at T2. Second, are promotive resources such as self-efficacy and social support related to internalizing symptoms during the pandemic? We expected that higher levels of self-efficacy and social support would be associated with lower levels of T2 internalizing symptoms, consistent with prior research. Finally, do self-efficacy, family support, or peer support buffer the relation between Time 1 and 2 internalizing symptoms? Given the mixed literature on social support and uncertainty about how self-efficacy functioned during the pandemic, we had no directional hypotheses for these potential moderating effects.

Regarding country-specific context for the current study, in Italy (Study 1) in Time 2, in December 2020, there were 40 COVID cases per 100,000 people (Dong, Du & Gardner, 2020), and cases generally continued to decline for the next few months. Face coverings were required in public spaces, and there were school and workplace closures (Mathieu, et al. 2020). In the United States (Study 2), COVID-19 response was characterized by significant state variability, and [blinded] experienced fewer restrictions compared to the rest of the U.S. During Time 2 in Fall 2020, COVID-19 cases were rising, with 61 cases per 100,000 individuals reported on December 18, 2020 (Dong, Du & Gardner, 2020). In the U.K. (Study 3), cases reached 263 per 100,000 during the T2 study period of January 2022. COVID-19 measures were re-introduced requiring no stay-at-home restrictions but face coverings in public spaces (Mathieu, et al. 2020). Using a stringency index, comprised of nine metrics (e.g., school and work closures,

restrictions on public gatherings, closures of public transport), with 0 being no restrictions and 100 being the strictest response, T2 index scores were 80.56 for Italy, 71.76 for the U.S. and 42.10 for the U.K. (Mathieu et al., 2020).

This study uses existing data from these three countries, previously unrelated, for secondary analyses. The aim is to illuminate if and how pre-existing datasets can be leveraged to examine the focal research questions more comprehensively compared to single-country studies and to potentially offer insights on cultural and contextual similarities and/or differences in each country during the COVID-19 pandemic.

Method

Overview of Analyses for All Three Studies

Analyses for all studies were conducted with Mplus 8.0 (Muthèn & Muthèn, 2018), and the full information maximum likelihood (FIML) estimation was used to account for missing data. Model fit was evaluated with the Maximum Likelihood Ratio Test Statistic (χ^2), the Root Mean Square Error of Approximation (RMSEA), and the Comparative Fit Index (CFI). We utilized recommended cut-off points of 0.06 for RMSEA and 0.08 for SRMR (Hu & Bentler, 1998), and 0.90 for CFI (Bollen, 1989). Regions of significance for significant interaction results were calculated (Preacher et al., 2006). Codebooks (*Table S5*) and sample Mplus code (*Figure S4*) are provided.

Study I

Participants

Data were collected from adolescents aged 15-19 years in Italy from an ongoing longitudinal study of non-suicidal self-injury. At T1, 625 students participated (*M*age = 14.48 years, 48% female, 10.6% non-Italian), and 504 students participated at T2, 402 of whom had also provided internalizing symptom data at T1.

Procedure

T1 data were collected in person with a research assistant in January/February 2020, prior to the official outbreak of COVID-19. T2 data were collected during the pandemic in December 2020. Most T2 surveys were completed with a research assistant using video chat. In a few instances, students completed the surveys independently due to difficulties scheduling the interview. Ethics board approval was obtained from the participating university in Italy.

Measures

Internalizing symptoms. Internalizing symptoms at both time points were measured with the Internalizing Scale from the Youth Self-Report (YSR; Achenbach et al., 1991). The 26-item scale evaluated somatic complaints from the last 6 months (e.g., "I have nausea with no known medical cause"), anxiety (e.g., "I am too fearful or anxious"), and withdrawal/depression (e.g., "I prefer to be alone rather than with others"). A 3-point Likert scale ranging from 0 ('*not true'*) to 2 ('*very or often true'*) was used. Higher mean scores indicated higher levels of internalizing symptoms. The internal consistency at T1 was $\alpha = .89$ and .91 for T2.

Regulatory self-efficacy. Regulatory self-efficacy was assessed at T2 using four items from the Perceived Emotional Self-Efficacy Scale (Caprara & Gerbino, 2001). The management of negative emotions scale (e.g., "overcome the frustration if others don't appreciate you as you would like") was used, and ratings were on a 5-point Likert scale ranging from 1 ('*not at all*

capable') to 5 ('*entirely capable'*). Higher means scores indicated higher levels of regulatory self-efficacy. The internal consistency for the mean composite was α = .75.

Perceived social support. Peer (four items, e.g., "I can count on my friends when things go wrong") and family support (four items, e.g., "my family tries to help me") were measured at T2 using the Multidimensional Scale of Perceived Social Support (Zimet et al., 1988). Items were rated on a 7-point Likert scale ranging from 1 *('very strongly disagree'*) to 7 ('*very strongly agree*'). High mean scores indicated higher levels of perceived social support. The internal consistencies for peer and family support were α = .91 and α = .78 respectively.

COVID experience. Responses were coded as 1 if the participant had tested positive for COVID, were presumed positive based on symptoms, or knew anyone close to them diagnosed with COVID-19.

Results

Correlations between all variables for Italy are presented in *Table S1*. As shown in *Table 1*, a 1 *SD* increase in T1 internalizing problems was associated with a 0.51 *SD* increase in T2 internalizing problems ($p < .001$). In addition, expressed in standard deviations, fewer internalizing problems were associated with higher levels of regulatory self-efficacy ($\beta = -.16$, $p < .001$), higher levels of peer support ($\beta = -.09$, $p < .05$), and higher levels of family support ($\beta = -.18$, $p < .001$). Male gender identity was associated with lower levels of T2 internalizing symptoms ($\beta = -.14$, $p < .05$), and direct experience with COVID was related to higher levels of T2 internalizing symptoms ($\beta = .17$, $p < .01$).

The interaction between T1 internalizing symptoms and regulatory self-efficacy for T2 internalizing symptoms was significant ($p < .01$); at higher levels of regulatory self-efficacy, the

relation between T1 and T2 internalizing symptoms was weaker compared to those with lower levels of regulatory self-efficacy (*Figure 1*). Regions of significance testing showed that at all levels of self-efficacy in the sample, the relation between T1 and T2 internalizing was statistically significant and positive (*Figure S1*). Additionally, higher levels of peer support buffered the relation between T1 and T2 internalizing symptoms (*Figure 2*) compared to low levels of peer support ($p < .01$). The relation between T1 and T2 internalizing was statistically different from zero at all values of peer support in the sample (*Figure S2)*. Family support was not a significant moderator (see *Table S4*).

Study 2

Participants

Project LIBRA is an ongoing, longitudinal study conducted in the Southwestern U.S. examining adolescents' everyday experiences and their well-being. At T1, 715 racially/ethnically diverse students approximately aged 16 participated in the data collection, which was pre-pandemic (46.1% female; 40.4% member of an immigrant family); at T2, during a COVID-19 lockdown, 354 students completed surveys), all of whom had also provided T1 data on internalizing symptoms.

Procedure

Following ethics approval from the project lead's home institution, parent consent and student assent were obtained during a school-based recruitment process. T1 occurred pre-pandemic in Spring 2018-2019 when participants were in 10th grade, and T2 occurred during a COVID-19 lockdown in Fall 2020, when participants were in either 11^{th} or 12^{th} grade. Most participants completed surveys online at T1 and T2, with a small number completing paper-and-

pencil or phone-based surveys with trained research assistants. The surveys were available in English and Spanish.

Measures

Internalizing symptoms. Internalizing symptoms at both time points were assessed by combining measures of depressive symptoms and anxiety. The 10-item Center for Epidemiologic Studies Depression scale (CES-D) assessed depressive symptoms (Andresen et al., 1994). Participants rated the extent they experienced each item (e.g., "I could not get going") in the past week on a 3-point Likert scale from 0 ("*rarely or none of the time/less than 1 day"*) to 3 ("*most or all the time/5–7 days"*). The 9-item generalized anxiety disorder subscale of the revised Screen for Child Anxiety Related Emotional Disorders measured anxiety (Muris et al., 1998). Items (e.g., "I worry about the future") were rated on a 3-point Likert scale from 0 (*"almost never"*) to 2 *("often"*). In both the anxiety and depression scales, items were averaged with higher scores indicating greater depression or anxiety. The correlations between the depressive and anxiety scales were $r = .54$ at T1 and T2. To create an internalizing scale, the depressive and anxiety scales were each standardized, and a mean of the Z-scores was created, then standardized for analyses. The internal consistency of the internalizing scale at T1 was $\alpha = .88$ and $\alpha = .90$ at T2.

General self-efficacy. General self-efficacy was assessed at T2 using the 5-item Pearlin's Mastery Subscale (Pearlin & Schooler,1978). Items (e.g., "I can do just about anything I set my mind to") were rated on a 5-point Likert scale from 0 ("*not true at all"*) to 4 ("*true all of the time*"). Higher mean scores denoted greater general efficacy. The internal consistency was $\alpha = .80$.

Perceived social support. Social support was assessed at T2 with friend support and parental trust subscales of the Inventory of Parent and Peer Attachment (Armsden & Greenberg, 1987). Five items in the friend support scale (e.g., "My friends listen to what I have to say") and five parental trust items (e.g., "My parents accept me as I am") were rated on a 5-point Likert scale ranging from 0 ("*never"*) to 4 ("*always"*). For both scales, average scores were computed with higher scores indicating higher levels of support or trust. The internal consistency was α = .93 for both friend and parent support.

COVID experience. Direct COVID-19 experience was assessed at T2 by creating a dichotomous score from three items. If the participant became physically ill, hospitalized, or put into self-quarantine due to COVID-19, or had a family member who had done so, a score of "1" was entered.

Results

Correlations are provided in *Table S2*. In the US, a 1 *SD* increase in T1 internalizing was related to a .4 *SD* increase in T2 internalizing ($p < .001$) (see *Table 1*). Expressed in standard deviations, higher levels of self-efficacy were related to lower levels of T2 internalizing symptoms (β = -.38, $p < .001$) and male gender identity was related to a fewer T2 internalizing symptoms (β = -.33, $p < .001$). The interaction between T1 internalizing symptoms and T2 self-efficacy was significant ($p < .05$). Among those with higher self-efficacy, the relation between T1 and T2 internalizing symptoms was stronger (the slope is steeper) relative to those with lower efficacy (*Figure 3*); at all levels of self-efficacy in the sample, the slope of the relation between T1 and T2 internalizing symptoms was statistically significant and positive, and rates of

internalizing were consistently higher for those with lower self-efficacy. (*Figure S3*). The interactions by peer (*Table 1*) and family (*Table S4*) support were not significant.

Study 3

Participants

The U.K. data were drawn from the nationally representative sample of 16–25-year-old U.K. residents who participated in the Youth Economic Activity and Health (YEAH) Monitor, which explores COVID-19 influence on youth employment, learning, wellbeing, and social inequality. The present analysis was age restricted to 16-19 year olds (T1 M_{age} = 18.06, 52% female; 27% non-white). Analyses were based on the third (T1, July 2021) and fifth (T2, January/February 2022) waves of data collection. Data were provided by 336 subjects at T1 and 298 subjects at T2, with 67 subjects at T2 also having provided data on internalizing symptoms at T1.

Procedure

Participants were recruited from web access panels and completed surveys online at all time points. For the initial sample, quotas were set according to age within gender, working status, and region. Follow-up quarterly samples were recruited from previous participants when possible and refreshed according to the quotas to account for attrition when necessary. Each sample was designed to be nationally representative, and the study received full ethical approval.

Measures

Internalizing symptoms. Internalizing symptoms at both time points were assessed using the Brief Hopkins Symptom Checklist (HSCL-5), a five-item scale assessing worry,

anxiety, and dysphoria (European Social Survey, 2001; Schmalbach et al., 2021). Participants rated how much they were bothered by feelings of fearfulness, nervousness, hopelessness, sadness, and worries in the past week with responses ranging from 1= *Not at all* to 4 = *Extremely*. Higher mean scores indicated higher levels of internalizing symptoms. The internal consistency was $\alpha = .89$ for T1 and $\alpha = .93$ for T2 for the mean composite scales.

General self-efficacy. General self-efficacy was assessed at T2 using the 6-item short form of the General Self-Efficacy Scale (GSE-6), a valid and reliable assessment (Brünger & Spyra, 2018; Schwarzer & Jerusalem, 1995). Respondents rated the degree to which they agreed with each state statement, e.g. "I can solve most problems if I put in the necessary effort," on a 5-point Likert-type scale. The internal consistency of the mean composite was $\alpha = .96$.

Social support. At T2, participants rated whether they had sought help or advice when experiencing a personal or emotional problem (including in person, via phone call, chat, and telephone). One binary item was used to report support-seeking from family (parents, siblings or other relatives) and another item for support-seeking from friends.

COVID-19 experience. COVID-19 experience was assessed at T2 with three items: Serious illness of a close family member or friend, death of a close family member or friend, each due to COVID-19, or their own positive COVID-19 diagnosis. A score of "1" was entered if the participant reported any of the three items.

Results

Correlations and sample sizes are provided in *Table S3*. As shown in *Table 1*, a 1 *SD* change in T1 internalizing symptoms was associated with a .65 *SD* increase in T2 internalizing symptoms ($p < .001$). Expressed in standard deviations, self-efficacy was related to fewer T2

internalizing symptoms (β = -.23, p < .01). The interactions between T1 internalizing symptoms and both self-efficacy (*Table 1*) and social support (*Table 1 and Table S4*) in predicting T2 internalizing were not significant in the U.K.

General Discussion

This study capitalizes on data from three countries (Italy, U.S., U.K.) to reveal patterns of intra- and interpersonal processes linked to adolescent well-being during the pandemic. Our first hypothesis (H1) was supported; in all countries, internalizing symptoms measured either prior to pandemic onset (Italy and U.S.) or during a "re-opening" period (U.K.) were significantly associated with later internalizing symptoms, with moderate and similar effect sizes (0.4 to 0.6 *SD*). Even when controlling for external, interpersonal factors like social support, knowing someone with COVID-19, and intra-individual processes (i.e., regulatory and general self-efficacy), the changes in internalizing symptoms among adolescents over time were significant. Although anxiety and depression were measured using different but widely-used and validated instruments and different modes of assessment, analyses yielded strikingly similar results, even across differing ages during adolescence (mean age 14 in Italy, 16 in the U.S., and 18 in the U.K.). Given that in the U.K., the time between T1 and T2 was only six months, these changes are unlikely due to typical developmental changes during adolescence. Further, adolescent anxiety and depression typically peak roughly around age 15 (Petersen et al., 2018), so we would expect a relatively stable or decreasing trajectory across these ages and time points rather than the moderate increases we observed in all three countries.

We observed interesting patterns of findings that highlighted the unique role of self-efficacy for adolescents as a protective and promotive factor. Using cross-sectional data, our second hypothesis was supported; higher levels of self-efficacy were associated with lower levels

of anxiety and depression at T2 for both the Italian measure of regulatory self-efficacy and for the U.S. and U.K. measures of general self-efficacy. Although the association between self-efficacy and internalizing symptoms was significant and in the same direction (negative) across countries, the moderating role of these two distinct measures of efficacy operated differently, highlighting a novel intra-individual process in the COVID-19 literature. Regarding our third research question, higher levels of regulatory self-efficacy had a buffering effect on the relation between T1 and T2 internalizing symptoms in Italy, whereas general self-efficacy in the U.S. had an exacerbating effect on the relation between T1 and T2 internalizing symptoms These two types of self-efficacies operated differently – exacerbating versus buffering – likely because they measured two different nuances in the self-efficacy measurement. In Italy, regulatory self-efficacy measured the degree to which adolescents who were presented with negative experiences felt they could manage strong, negative emotions effectively; in adolescents for whom regulatory self-efficacy was high, the relation between T1 and T2 internalizing was weaker. This is not surprising considering the number of opportunities the pandemic presented for adolescents to manage negative emotions like uncertainty, disappointment, fear, anger, and sadness. In other words, those adolescents who were confident they could manage difficult emotions effectively showed a weaker relation between pre-pandemic and pandemic levels of internalizing symptoms. In the U.S., general self-efficacy measured the extent to which an individual feels control over events in their life, rather than events being fatalistically determined. This differs from the measure in Italy because the self-efficacy measure in the U.S. is more about perception of ability to control events rather than manage negative emotions. In prior research about parental control, the relation between pandemic disruption and internalizing symptoms was weaker for young adults with higher prior levels parental psychological control

(Skinner et al., 2022). In other words, adolescents who report higher levels of efficacy and control about events in their lives may be more negatively impacted by the pandemic because so many aspects of their lives were simply uncontrollable, which may have then triggered anxiety and sadness. Conversely, adolescents who feel competent at managing negative pandemic changes were less adversely impacted as the pandemic wore on compared to those with lower levels of regulatory self-efficacy. Had we been able to measure self-efficacy and support at both time points, we would be positioned to examine latent change scores in these constructs, but these measures were not available longitudinally.

As a final note, some of the differences observed between countries examined in this paper may be due to political or cultural differences in pandemic response, but at the individual level, personal exposure to the virus may be more strongly associated with psychological outcomes than state-wide restrictions (Thompson et al., 2022). Although generalizability is limited because of non-nationally representative samples in some sites, differences in online versus in-person administration, and different sample sizes across study sites, this study on adolescents across three countries highlights the need to support all youth globally despite varied pandemic response and disease transmission cycles, diverse social welfare policies, and different cultural contexts.

The authors report no conflicts of interest.

Data for individual studies may be made available upon request.

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Table 1

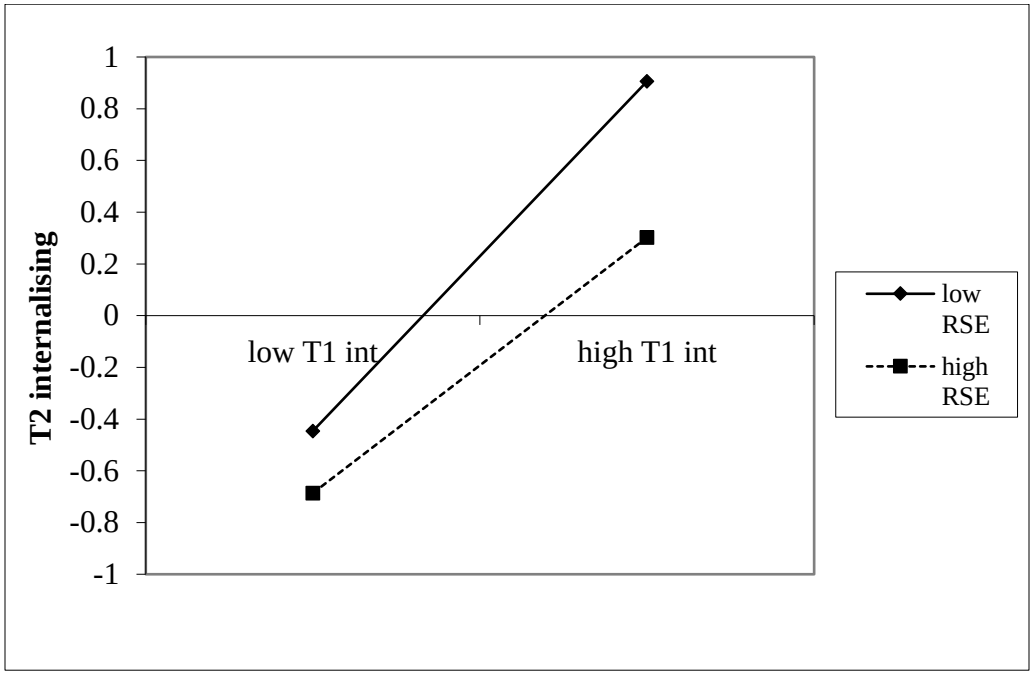
FIML model results estimating main and interaction effects on T2 internalizing symptoms

	Italy *a*	U.S. *b*	U.K. *c*
Models 1a, b and c: Main effects	T2 Internalizing symptoms		
	β(SE)	*β*(SE)	*β*(SE)
T1 internalizing symptoms	0.511***(.045)	0.405***(.041)	0.651***(.106)
T2 self-efficacy[a]	-0.162***(.037)	-0.378***(.041)	-0.229**(.071)
T2 peer support	-0.090*(.037)	-0.041(.035)	-0.013(.070)
T2 family support[b]	-0.179***(.042)	-0.093(.049)	-0.008(.067)
COVID experience	0.169** (.060)	0.003(.072)	0.097(.118)
Gender identity (1=male)	-0.144*(.062)	-0.329***(.074)	-0.003(.122)
Minority status[c]	-0.105(.108)	-0.099(.071)	0.028(.121)
Models 2a, b and c: Self-efficacy interaction effects	T2 Internalizing symptoms		
	β(SE)	*β*(SE)	*β*(SE)
T1 internalizing x self-efficacy	-0.091*(.040)	0.058*(.027)	-0.095(.108)
Models 3a, b and c: Peer support interaction effects	T2 Internalizing symptoms		
	β(SE)	*β*(SE)	*β*(SE)
T1 internalizing x peer support	-0.077**(.028)	0.007(.040)	-0.128/(.115)

[a]*Regulatory self-efficacy in Italy, general self-efficacy in U.S. and U.K.*
[b]*Parent support in Italy and U.K, parental trust in U.S.*
[c]*Non-Italian in Italy, self-reported immigrant in U.S., non-white in U.K*
**p < .05, **p < .01, ***p<.001*

Figure 1

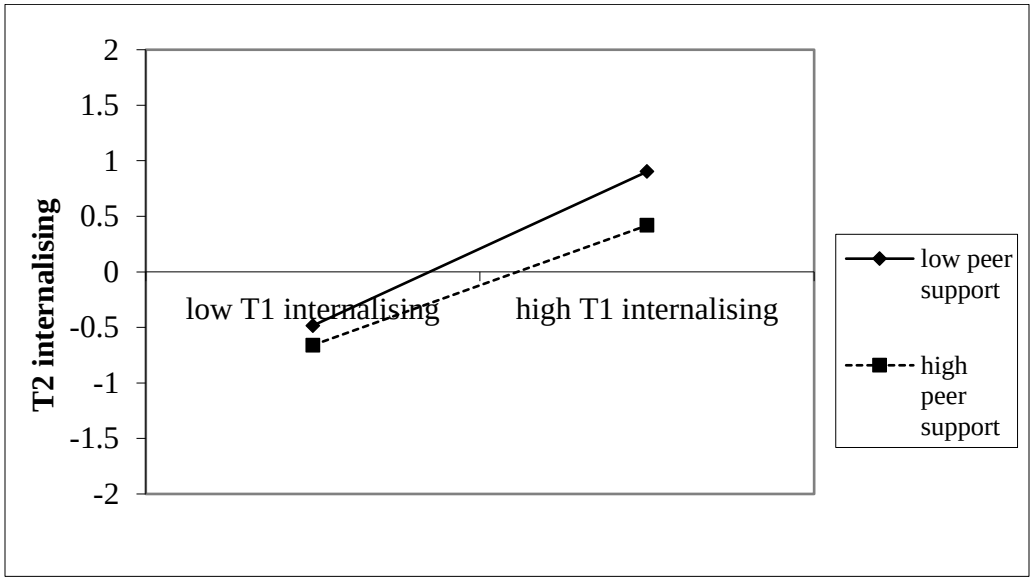
Italy: Moderating role of regulatory self-efficacy



T1 = Time 1; T2 = Time 2; RSE = regulatory self-efficacy

Figure 2

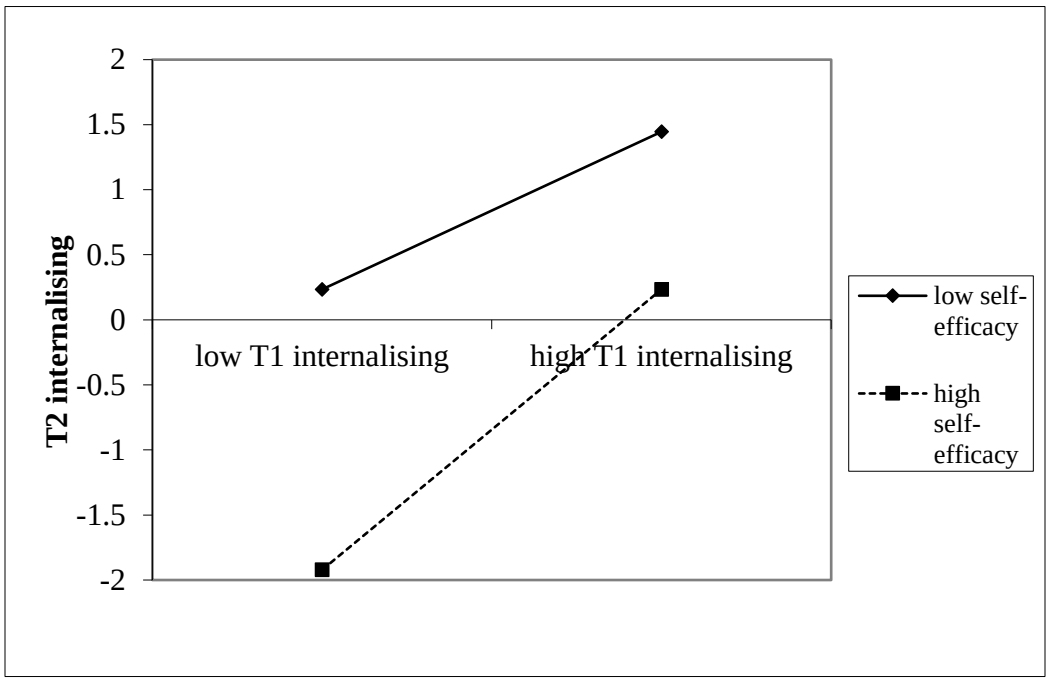
Italy: Moderating role of peer support



T1 = Time 1; T2 = Time 2

Figure 3

U.S.: *Moderating role of self-efficacy*



T1 = Time 1; T2 = Time 2

Table S1

Italy: Bivariate correlations of standardized variables[a] and sample sizes

	n	1	2	3	4	5	6	7
1. T1 internalizing	625							
2. T2 internalizing	503	.72***						
3. T2 regulatory self-efficacy	402	-.46***	-.51***					
4. T2 peer support	504	-.33***	-.38***	.21***				
5. T2 family support	504	-.45***	-.51***	.27***	.53***			
6. COVID experience	504	.01	.09*	-.03	.02	-.05		
7. Gender identity (1 = male)	624	-.32***	-.29***	.35***	.05	.05	-.01	
8. Nationality (1=non-Italian)	625	-.02	-.02	.04	-.04	-.07	-.07	.00

*$p < .05$. ** $p < .01$. *** $p < .001$.

[a]COVID experience, gender identity, and nationality are dichotomous and unstandardized

Table S2

U.S.: Bivariate correlations of standardized variables[a] and sample sizes

	n	1	2	3	4	5	6	7
1. T1 internalizing	715							
2. T2 internalizing	354	.67***						
3. T2 general self-efficacy	353	-.48***	-.64***					
4. T2 friend support	345	-.10	-.12*	.12*				
5. T2 parental trust	345	-.37***	-.45***	.48***	.18**			
6. COVID experience	353	.01	.02	.00	.07	-.05		
7. Gender identity (1 = male)	365	-.26***	-.31***	.07	-.11	.13*	-.11	
8. Immigrant status (1 = immigrant)	725	.01	-.02	-.02	-.00	-.13*	.09	-.02

* $p < .05$. ** $p < .01$. *** $p < .001$.

[a]COVID experience, gender identity, and immigrant status are dichotomous and unstandardized

Table S3

U.K.: Bivariate correlations of standardized variables[a] and sample sizes

	n	1	2	3	4	5	6	7
1. T1 internalizing	336							
2. T2 internalizing	287	.75***						
3. T2 general self-efficacy	285	-.20	-.42***					
4. T2 peer support-seeking	298	.15	.05	-.06				
5. T2 family support-seeking	298	.02	.00	-.01	.29***			
6. COVID experience	356	-.04	.05	.00	.07	.09		
7. Gender identity (1 = male)	610	-.35***	-.19**	.07	-.01	-.08	-.10	
8. Minority status (1 = non-White)	562	.05	.02	-.10	-.16**	-.24***	.08	.02

** $p < .01$. *** $p < .001$.

[a]COVID experience, gender identity, and minority status are dichotomous and unstandardized

Table S4

FIML model results estimating T2 internalizing symptoms

	Italy *a*	U.S. *b*	U.K. *c*
Models 4a, b, and c: Family support interaction effect models	b (SE)	b (SE)	b (SE)
T1 internalizing x family support	-0.045 (.03)	0.039 (.04)	-0.053 (.11)

Table S5

Codebook

Field name	Construct
	Italy
Gen	Gender identity (1=male)
Nationality	Italian vs. non-Italian (1=non-Italian)
ZCOVID_Exp	COVID experience (1=experience)
ZT2_Peer	Time 2 Peer support (standardized)
ZT2_Family	Time 2 Family support (standardized)
ZT2_NegEm	Time 2 regulatory self-efficacy for managing negative emotions (standardized)
ZmT1_Intern	Time 1 internalizing symptoms (standardized)
ZmT2_Intern	Time 2 internalizing symptoms (standardized)
T1IntxNegEm	Interaction: time 1 internalizing x regulatory self efficacy
T1IntxPeer	Interaction: Time 1 internalizing x peer support
T1IntxFamily	Interaction: Time 1 internalizing x family support
T1IntxGender	Interaction: Time 1 internalizing x gender
T1IntxCOVID	Interaction: Time 1 internalizing x COVID experience
	US
Gen	Gender identity (1=male)
imgrntfX	Immigrant status (1 = immigrant)
ZCOVIDExp	COVID experience (1= experience)
Zfrsupp4	Time 2 peer support (standardized)
Zprtrst	Time 2 parental trust (standardized)
Zgeneff4	Time 2 self-efficacy(standardized)
ZW3Int	Time 1 internalizing symptoms (standardized)
ZW4Int	Time 2 internalizing symptoms (standardized)
T1IntxEff	Interaction: Time 1 internalizing x self-efficacy
T1IntXGender	Interaction: Time 1 internalizing x gender
T1IntxFrSupp	Interaction: Time 1 internalizing x peer support
T1IntxPar	Interaction: Time 1 internalizing x parental support
T1IntXCOVID	Interaction: Time 1 internalizing x COVID experience
	UK
Gen	Gender identity (1 = male)
Minority	Minority status (1 = non-white)
ZT5COVIDExp	COVID experience (1= experience)
ZW5_FrSupp	Time 2 peer support (standardized)
ZW5_FamSupp	Time 2 family support (standardized)
ZW5Efficacy	Time 2 self-efficacy (standardized)
ZT3Int	Time 1 internalizing symptoms (standardized)
ZT5Int	Time 2 internalizing symptoms (standardized)

T3IntxEff	Interaction: Time 1 internalizing x self-efficacy
T3IntxGender	Interaction: Time 1 internalizing x gender
T3IntxFriend	Interaction: Time 1 internalizing x peer support
T3IntxFamily	Interaction: Time 1 internalizing x parental support
T3IntxCOVID	Interaction: Time 1 internalizing x COVID experience

Figure S1

Italy: Moderation by regulatory self-efficacy – regions of significance

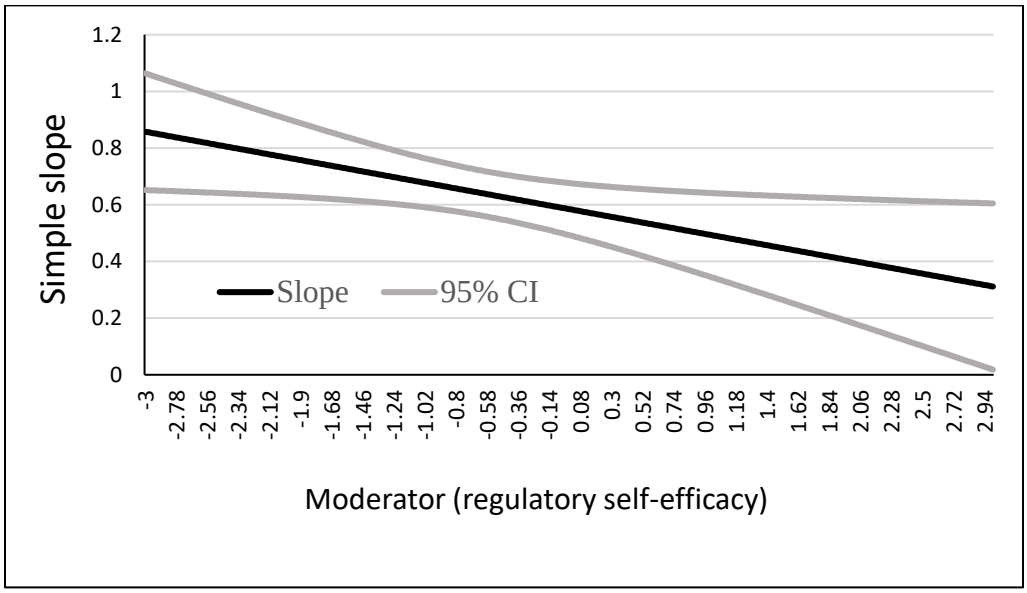


Figure S2

Italy: Moderation by peer support – regions of significance

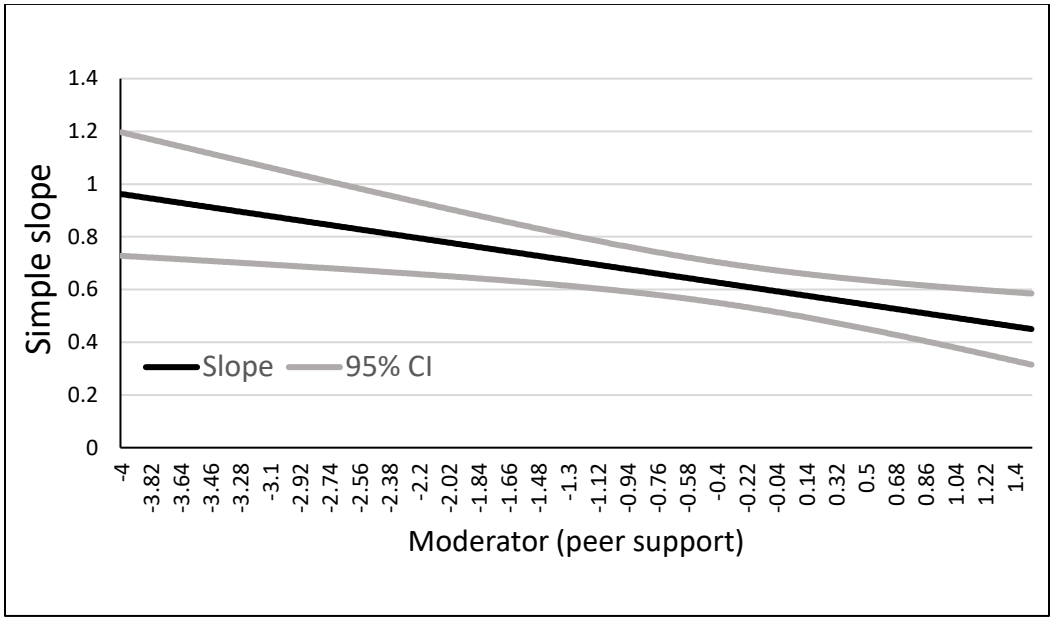


Figure S3

U.S.: Moderation by self-efficacy – regions of significance

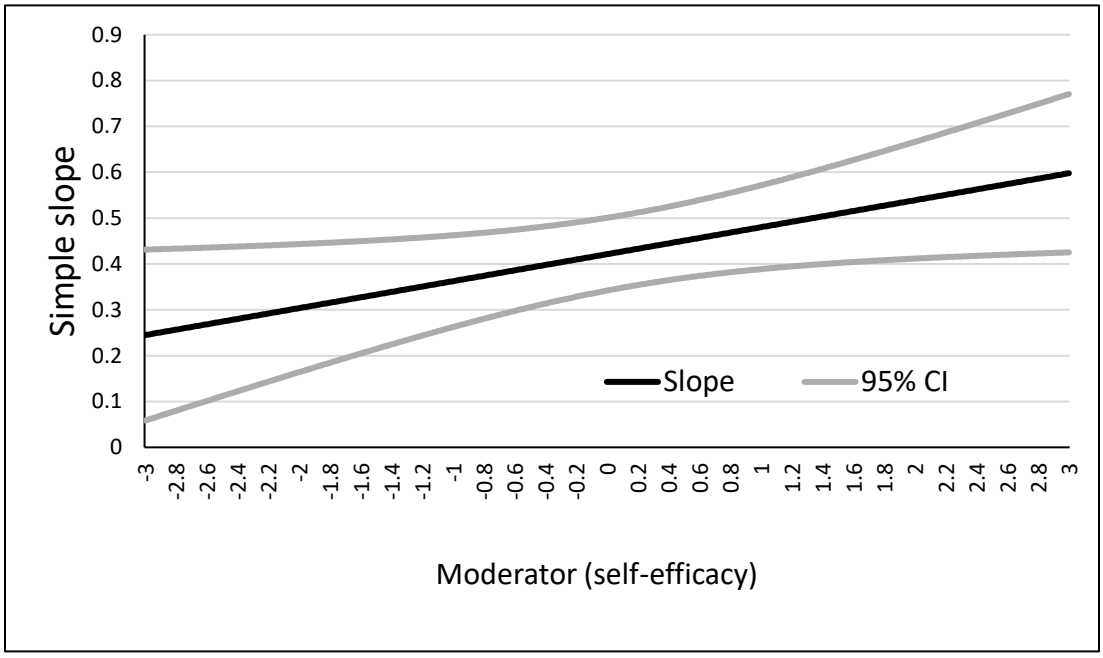


Figure S4

Example of MPlus code

Italy: Interaction example

Note: This code models Time 2 internalizing on the interaction between Time 1 internalizing and Time 2 regulatory self-efficacy. The remaining models (Time 1 internalizing x peer support, x family support, x child gender, and x COVID experience), were modelled identically and separately. Similarly, the main effects model eliminated the interaction terms but otherwise follows the coding below. The models for the U.S. and the U.K. were run in identical fashion using the variable names provided in *Table S5*.

```
VARIABLE:
NAMES ARE
ID
Nationality
Gen
COVID_Exp
ZCOVID_Exp
ZT2_Peer
ZT2_Family
ZT2_Teacher
ZT2_NegEm
ZmT1_intern
ZmT2_intern
T1IntxNegEm
T1IntxPeer
T1IntxFamily
T1IntxGender
T1IntxCOVID
;

USEVARIABLES ARE
Nationality
GEN
!ZCOVID_Exp
!ZT2_Peer
!ZT2_Family
ZT2_NegEm
ZmT1_intern
ZmT2_intern
T1IntxNegEm
!T1IntxPeer
!T1IntxFamily
!T1IntxGender
!T1IntxCOVID
```

```
;

MISSING is .;

ANALYSIS:
estimator is mlr;

MODEL:
ZmT2_intern ON
GEN
NATIONALITY
!ZCOVID_Exp
!ZT2_Peer
!ZT2_Family
ZT2_NegEm
ZmT1_intern
T1IntxNegEm
!T1IntxPeer
!T1IntxFamily
!T1IntxGender
!T1IntxCOVID
;


!freely estimating the covariances
GEN
nATIONALITY
!ZCOVID_Exp
!ZT2_Peer
!ZT2_Family
ZT2_NegEm
ZmT1_intern
T1IntxNegEm
!T1IntxPeer
!T1IntxFamily
!T1IntxGender
!T1IntxCOVID


OUTPUT:
MODINDICES (3.84);
!tech3;
!standardized;
```