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Cybervictimization and well-being among adolescents during the COVID-19 pandemic: The mediating roles of emotional self-efficacy and emotion regulation

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A B S T R A C T

Cybervictimization has been linked to adverse psychological consequences but little is known about the mechanisms linking cybervictimization to lower well-being. We conducted two studies to examine emotional self-efficacy and distinct emotion regulation strategies as potential mediators in the relationship between cybervictimization and lower well-being among German adolescents during the school closures due to the COVID-19 pandemic in early 2020. In Study 1, 107 adolescents (M_{age} = 15.76) reported their cybervictimization frequency, emotional self-efficacy beliefs, and aspects of well-being (i.e., self-esteem, perceived social support, and subjective well-being during the COVID-19 related school closures). Emotional self-efficacy mediated the link between cybervictimization and all well-being measures. Specifically, cybervictimization was related to lower well-being through lower self-efficacy for managing negative emotions. For further examination, in Study 2, 205 adolescents (M_{age} = 15.45) were asked to report their cybervictimization experiences, use of specific emotion regulation strategies (rumination, reappraisal, and suppression), and well-being (i.e., self-esteem and life satisfaction). Cybervictimization was related to lower well-being through more rumination, but not through reappraisal or suppression. Taken together, our findings suggest that cybervictims may have lower emotional self-efficacy beliefs and engage in more rumination, a maladaptive emotion regulation strategy. These deficits in adolescents' beliefs and capabilities for effectively managing negative emotions may be accountable for the adverse psychological consequences of cybervictimization. Notably, exploratory analyses suggest that cybervictimization frequency did not increase among adolescents during the lockdown (e.g., homeschooling, social distancing) due to the COVID-19 pandemic.

1. Introduction

Most adolescents regularly use information and communication technologies (ICT) to communicate with others and to access information online (e.g., for education or entertainment; see Kowalski, Limber, & McCord, 2019, for a review). Despite many advantages of ICT, digital technologies provide new platforms and opportunities for aggressive behavior in the form of cyberbullying (i.e., cyberaggression, cybervictimization). Extending the definition of traditional bullying, cyberbullying can be defined as "willful and repeated harm inflicted through the use of computers, cell phones, and other electronic devices" (Hinduja & Patchin, 2014, p. 11). Cyberaggression describes the act of perpetrating cyberbullying, while cybervictimization refers to the exposure to cyberbullying (Turliuc, Măirean, & Boca-Zamfir, 2020).

Reports on prevalence rates of cybervictimization are mixed due to different conceptualizations and measurements used. Approximately 7%–18% of adolescents report cybervictimization within the last months, with some studies reporting rates of up to 50% (Kowalski et al., 2019). In 2020, a survey among 4 418 German students found a cybervictimization rate of 17.3%, marking a remarkable increase compared to a rate of 12.7% in a similar survey three years earlier (Bündnis gegen Cybermobbing, 2020). The COVID-19 pandemic might be responsible for a recent increase in cybervictimization as many people had to move their communication and workplace to the digital world. With school lessons being taught online, adolescents in particular might spend comparatively more time on the internet, facing a higher risk of cybervictimization.

Cybervictimization has frequently been shown to be related to

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negative psychological consequences. Yet, little is known about the coping mechanisms used by cybervictims to respond to the experience of being bullied in cyberspace (Raskauskas & Huynh, 2015). Specifically, cybervictimization was found to be associated with lower well-being, such as lower life satisfaction, less social support, lower self-esteem, more depressive and somatic symptoms, loneliness, and suicide ideation (Bai, Huang, Hsueh, & Zhang, 2021; Pabian & Vandebosch, 2021; Urano, Takizawa, Ohka, Yamasaki, & Shimoyama, 2020; see also Kowalski, Giumetti, Schroeder, & Lattanner, 2014, for a meta-analysis). Victimization from cyberbullying might induce even worse health consequences compared to traditional bullying due to unique characteristics like anonymity and publicity (Wang, Nansel, & Iannotti, 2011). For instance, individuals may feel comparatively more hopeless when targeted by a perpetrator in front of a possibly large online community. Research does indeed show that victims perceive cyberbullying as worse than traditional bullying, especially if the attacks occur publicly and anonymously (Sticca & Perren, 2013). Furthermore, in contrast to traditional bullying, a single cyberbullying event may develop a repetitive effect as insulting posts stay online and can torment victims for a long time.

Considering the high prevalence of cybervictimization among adolescents and little research examining how cybervictims select strategies for coping with such a stressful event, it seems crucial to gain a better understanding of the coping mechanisms linking cybervictimization to lower well-being. Recent studies emphasize the role of emotional self-efficacy (e.g., Heiman, Olenik-Shemesh, & Eden, 2015) and emotion regulation (e.g., Erreygers, Vandebosch, Vranjes, Baillien, & De Witte, 2018; Turliuc et al., 2020) for cybervictimization. In the present research, we conducted two studies to examine emotional self-efficacy and specific emotion regulation strategies as potential mediators in the association between cybervictimization and well-being.

1.1. Emotional self-efficacy and cybervictimization

Self-efficacy beliefs refer to people's perceived capabilities to control their lives and accomplish their goals (Bandura, 1997). Self-efficacy beliefs influence people's motivation to face difficult challenges, their adjustment to situational demands, and their engagement in successful self-regulation (Bandura, 1997; Caprara, Di Giunta, Pastorelli, & Eisenberg, 2013; Gunzenhauser et al., 2013). Emotional self-efficacy, in particular, can be described as people's perceived capability to successfully manage their emotions (Caprara et al., 2013). Among adolescents and young adults, self-efficacy in managing negative emotions was shown to be related to higher self-esteem, less depressive symptoms, higher life satisfaction, more optimism, and less delinquent conduct (Bandura, Caprara, Barbaranelli, Gerbino, & Pastorelli, 2003; Caprara & Steca, 2005; Gunzenhauser et al., 2013).

Emotional self-efficacy was found to be associated with less traditional bullying victimization and aggression among adolescents (Özer, Totan, & Atik, 2011; Samper-García, Malonda-Vidal, Llorca-Mestre, Muñoz-Navarro, & Mestre-Escrivá, 2021; Wang et al., 2018). Similarly, even though research on self-efficacy in cybervictimization is still scarce, cybervictims were shown to have lower general (Wong, Chan, & Cheng, 2014) and emotional self-efficacy (Heiman et al., 2015) in adolescent samples. Individuals who experience frequent victimization may lose confidence in their ability to control events in their lives and tend to develop lower self-efficacy beliefs. As a result, they might be less likely to use coping strategies if they do not believe in their capability to do so effectively. Consequently, individuals may suffer more negative psychological consequences after experiencing victimization. In line with this assumption, low self-efficacy for using coping strategies has been shown to partially mediate the relationship between traditional bullying victimization and psychological maladjustment in a study among adolescents (Singh & Bussey, 2011). Emotional self-efficacy might be crucial for coping with victimization and may constitute a valuable protective factor against negative psychological consequences

after experiencing victimization. However, to the best of our knowledge, no study has yet examined whether emotional self-efficacy mediates the relationship between *cyber*victimization and well-being (see also Raskauskas & Huynh, 2015, for a review).

1.2. Emotion regulation and cybervictimization

Emotion regulation describes "processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions" (Gross, 1998b, p. 275). Gross's process model of emotion regulation distinguishes among distinct emotion regulation strategies which he categorized according to their temporal position during emotion generation. We will focus on three frequently examined emotion regulation strategies, each affecting one of the last three stages (attentional deployment, cognitive change, and response modulation) indicated in the process model (Gross, 1998b): *Rumination* (i.e., recurrently directing attention to negative emotional stimuli), *reappraisal* (i.e., cognitively reevaluating an emotional situation), and *suppression* (i.e., masking the outward expression of emotions; McRae & Gross, 2020).

Emotion regulation is crucial for the development of social competence (Eisenberg, Spinrad, & Eggum, 2010; Trommsdorff & Cole, 2011). Previous research demonstrated different associations with well-being and social functioning for specific emotion regulation strategies (see Joormann & Stanton, 2016, for a review). Rumination and suppression are frequently described as maladaptive emotion regulation strategies as their use is related to lower well-being, more depressive symptoms, and less perceived social support among Western participants (Gross & John, 2003; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008; Schunk, Trommsdorff, & König-Teshnizi, 2021; Schunk, Trommsdorff, Wong, & Nakao, 2021). Reappraisal, on the other hand, is often referred to as an adaptive strategy due to its relationship with higher well-being, less depressive symptoms, and more perceived social support (Gross & John, 2003; Schunk, Trommsdorff, & König-Teshnizi, 2021; Schunk et al., 2021).

Limited research on emotion regulation in cybervictimization among adolescents and young adults demonstrated that cybervictims are more likely to use maladaptive emotion regulation strategies, such as suppression, self-blame, and rumination (Ak, Özdemir, & Kuzucu, 2015; Arató, Zsido, Lénárd, & Lábadi, 2020; Erreygers et al., 2018; Vranjes, Erreygers, Vandebosch, Baillien, & De Witte, 2018). On the other hand, adolescents who experienced no cybervictimization reported more reappraisal (Vranjes et al., 2018). Research on traditional bullying suggests that victimization during adolescence may affect future emotion regulation as the use of suppression among university students has been linked to greater retrospective reports of victimization during high school (Chervonsky & Hunt, 2018). Children who experience victimization may develop emotion regulation difficulties that negatively affect their social functioning and well-being. In line with this assumption, in a study among children, victimization was shown to be related to social maladjustment (e.g., peer rejection) through the mediation of maladaptive emotion regulation (Schwartz & Proctor, 2000). Similarly, Gardner, Betts, Stiller, and Coates (2017) found that children who experienced traditional bullying victimization used less reappraisal. Lower reappraisal, in turn, predicted more maladaptive coping which in turn predicted more school loneliness.

The few studies that examined emotion regulation strategies as mediators for the relationship between cybervictimization and well-being measures focused primarily on rumination. Specifically, rumination was found to mediate the positive link between cybervictimization and depressive symptoms among US-American female college students (Feinstein, Bhatia, & Davila, 2014) and Chinese adolescents (Chu, Fan, Liu, & Zhou, 2019). Rumination was also shown to partially mediate the positive relationship between cybervictimization and somatic symptoms four months later in a study among adolescents (Rey, Neto, & Extremera, 2020). These findings support the assumption that rumination functions

as a mediator between cybervictimization and aspects of well-being. The function of other emotion regulation strategies (e.g., reappraisal, suppression) remains to be examined.

1.3. The present research

In sum, previous research demonstrated associations of emotional self-efficacy and emotion regulation with victimization. However, only a few studies investigated self-efficacy and emotion regulation in cybervictimization. Deficits in emotional self-efficacy and emotion regulation may explain the negative effects of cybervictimization on well-being. We conducted two complementing studies among adolescent samples aiming to clarify the mediating functions of emotional self-efficacy and emotion regulation in associations between cybervictimization and well-being. We assessed specific aspects of well-being, namely life satisfaction, self-esteem, and perceived social support (Diener et al., 2010). We also examined subjective well-being during the COVID-19 pandemic (SWB–COV). In Study 1 we tested whether emotional self-efficacy mediates the relationship between cybervictimization and lower well-being (i.e., less self-esteem, less perceived social support, lower SWB-COV). Further, we examined in Study 2 whether specific emotion regulation strategies (i.e., rumination, reappraisal, suppression) mediate the link between cybervictimization and lower well-being (i.e., lower self-esteem, lower life satisfaction). The following hypotheses were formulated (see Fig. 1.):

H1. Cybervictimization predicts lower well-being (i.e., lower self-esteem, less perceived social support, lower SWB-COV) via lower emotional self-efficacy.

H2. Cybervictimization predicts lower well-being (i.e., lower self-esteem, lower life satisfaction) via more rumination.

H3. Cybervictimization predicts lower well-being (i.e., lower self-esteem, lower life satisfaction) via less reappraisal.

H4. Cybervictimization predicts lower well-being (i.e., lower self-esteem, lower life satisfaction) via more suppression.

We conducted exploratory analyses to address additional questions of interest. Specifically, our data collection coincided with the beginning of the COVID-19 pandemic, providing us with the unexpected opportunity to assess how cybervictimization frequency may have changed during this situation (e.g., because of more ICT use due to homeschooling and social distancing).

2. Study 1

The purpose of Study 1 was to examine whether emotional self-efficacy functions as a mediator for associations between cybervictimization and various aspects of well-being (i.e., self-esteem, perceived social support, SWB-COV). We also conducted additional analyses to examine the unique effects of emotional self-efficacy for the management of specific emotions (e.g., anger, fear). Furthermore, we explored the possible influence of the COVID-19 pandemic (e.g., homeschooling, social distancing) on cybervictimization frequency.

2.1. Method

2.1.1. Participants and procedure

The initial sample included 120 participants. We excluded thirteen participants as they were outside our previously defined age range of 13–18 years ($n = 9$), did answer less than 50% of the items ($n = 1$), or did not provide demographic information ($n = 3$). The final sample consisted of 107 adolescents ($M_{age} = 15.76$, $SD = 1.38$, age range between 13 and 18 years; 64.5% female). Participants were recruited between May and June 2020 from two secondary schools (*Gymnasien*) in Germany and invited to complete an online survey through the platform SoSci Survey (https://www.soscisurvey.de/). Students attended online classes from home during the survey period due to the COVID-19 pandemic and received the survey invitation via email from their school. Participation was voluntary and parents and students gave informed consent.

2.1.2. Measures

2.1.2.1. Cyberbullying.
We applied the Mobbing Questionnaire for Students (Jäger, Fischer, & Riebel, 2007) to measure cybervictimization and cyberaggression with four items each. The items cover central areas of bullying (harassment, denigration, outing, and exclusion) according to Willard (2007). To capture cyberbullying during COVID-19 (i.e., after the German government-enforced school closures), students were asked to rate their experiences with cybervictimization and their own involvement in cyberaggression "during school closure" (1 = *never*, 2 = *once or twice*, 3 = *two to three times in a month*, 4 = *once a week*, 5 = *few times a week*). At the time of data collection, schools had been closed for approximately two months. We slightly adjusted the original items by Jäger et al. (2007) to include the intention to harm which is significant in the definition of cyberbullying (e.g., "How many times did someone
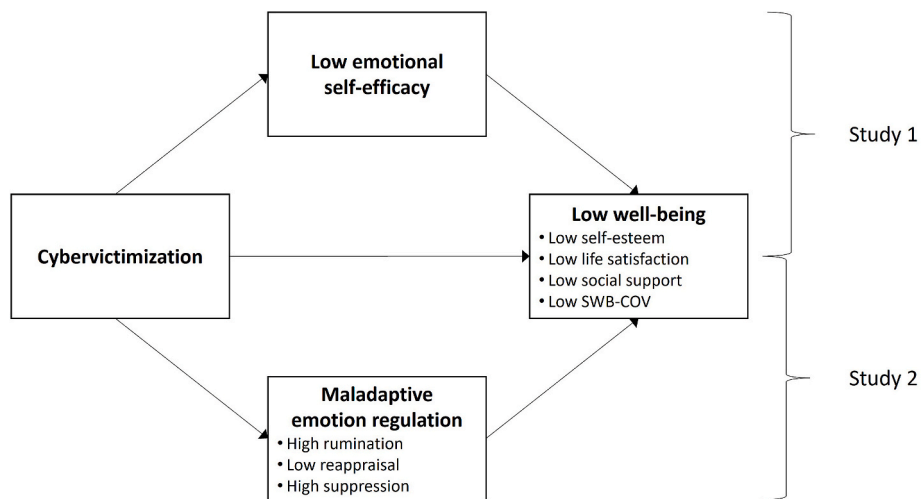

Fig. 1. Conceptual model of our predictions for Study 1 and Study 2. Emotional self-efficacy and emotion regulation were assessed only in Study 1 and Study 2, respectively. Some outcomes were assessed in only one study. SWB-COV = subjective well-being during the COVID-19 pandemic, assessed by using school closure as a time reference.

[did you] spread rumors or defamations about you [others] via the internet/cell phone *to hurt you* [*them*]"). Moreover, we asked participants after each item whether they had experienced a certain cyberbullying event less frequently, equally frequently, or more frequently compared to the time before COVID-19 ("before school closure"). This follow-up question was not asked if participants answered an item with "never". We abstained from calculating a score for cyberaggression, which was originally intended to serve exploratory purposes, due to a low Cronbach's alpha of only .05.

2.1.2.2. Emotional self-efficacy. The Multidimensional Negative Emotions Self-Regulatory Efficacy Scale (Caprara et al., 2013) was used to assess participants' self-efficacy beliefs in their ability to manage negative emotions (15 items; 1 = *not well at all*, 7 = *very well*). The scale consists of five subscales measuring self-efficacy for the management of anger/irritation, despondency/sadness, fear, shame/embarrassment, and guilt. Two fluent English speakers translated the scale into German via backtranslation.

2.1.2.3. Well-being measures. To assess participants' well-being we applied the following measures: We used the revised German version of the Rosenberg Scale (Rosenberg, 1965; German version by von Collani & Herzberg, 2003) to assess participants' self-esteem (10 items; 1 = *strongly disagree*, 4 = *strongly agree*). Participants completed the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988; German version by Greimel et al., 2016) to measure perceived social support by family and friends (8 items; 1 = *strongly disagree*, 7 = *strongly agree*). Furthermore, we applied the World Health Organization Five-Item Well-Being Index (WHO-5; World Health Organization, 1998; available at http://www.who-5.org/) to explicitly measure subjective well-being during the COVID-19 pandemic (SWB–COV) by adding "during school closure" as a reference to the instruction (5 items; 1 = *at no time*, 6 = *all of the time*).

2.1.3. Data processing and analytic strategy

IBM SPSS Statistics was used for data analyses. We estimated missing values with expectation maximization if at least 80% of the items of a scale had been answered. All mediation analyses were conducted using PROCESS version 3.5 (Hayes, 2017; model 4) with 5 000 bootstraps.

2.2. Results and discussion

2.2.1. Testing for common method bias

We tested for common method bias which may exist in our study since we only used self-reported data (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Harman's single-factor test was applied by running an unrotated principal component analysis including all items of major constructs assessed in Study 1. We obtained 12 components with eigenvalues above 1. The largest component explained only 29.68% of the total variance which is far below the traditional threshold of 50%. We can therefore conclude that common method bias is unlikely as no single component accounted for most of the variance.

2.2.2. Reliability and validity of constructs and descriptive analyses

Indicators for the reliability and validity of constructs are presented in Table 1 together with descriptive statistics, including skewness and kurtosis, and partial correlations among study variables. Partial correlations were computed to account for age and gender effects. Specifically, girls reported lower emotional self-efficacy ($M = 2.85$, $SE = 0.07$ versus $M = 3.18$, $SE = 0.09$; $t(102) = -2.69$, $p = .008$) and perceived more social support ($M = 6.00$, $SE = 0.14$ versus $M = 5.52$, $SE = 0.19$; $t(105) = 2.05$, $p = .043$) compared to boys. Age was negatively correlated with SWB-COV ($r = -0.19$, $p = .046$). Descriptive statistics showed that cybervictimization was non-normally distributed with a skewness of 3.70 and a kurtosis of 14.73. Skewed data is common in research on aggressive behavior because the highest categories on the scale ("once a week", "few times a week") are less often selected (Einarsen, Hoel, & Notelaers, 2009; see also; Antoniadou, Kokkinos, & Markos, 2016; Del Rey et al., 2015; Forssell, 2016; Wang, Yang, Wang, & Lei, 2019). Our planned mediation analyses apply a bootstrapping method that is robust against violations of normality and thus suitable for analyzing the data (Hayes, 2017; Preacher & Hayes, 2008).

We calculated Cronbach's alpha and composite reliability to examine internal consistency. Composite reliability was at least 0.79 for all constructs, suggesting adequate internal consistency (Hair, Hult, Ringle, & Sarstedt, 2017). Cronbach's alpha was slightly below the common threshold of 0.70 for cybervictimization ($\alpha = 0.66$), self-efficacy in managing anger ($\alpha = 0.64$), and self-efficacy in managing guilt ($\alpha = 0.69$). The respective items consist of only three or four items which may partly explain the low alpha values. For each of these scales, deleting one item would have only slightly improved alpha values, thus we

Table 1
Descriptive statistics and partial correlations (controlled for age and gender) for Study 1.

Variable	1	2	3	4	5	6	7	8	9	10
1. CBV	(0.71)									
2. Self-esteem	−.50**	(0.74)								
3. Social support	−.46**	.55**	(0.79)							
4. SWB-COV	−.29**	.57**	.41**	(0.77)						
5. SE (overall)	−.35**	.60**	.38**	.51**	(0.54)					
6. SE-anger	−.24*	.27**	.21*	.24*	.56**	(0.76)				
7. SE-sadness	−.32**	.59**	.42**	.48**	.80**	.32**	(0.84)			
8. SE-fear	−.22*	.37**	.15	.38**	.63**	.18	.42**	(0.85)		
9. SE-shame	−.31**	.53**	.42**	.40**	.75**	.21*	.61**	.33**	(0.85)	
10. SE-guilt	.03	.08	−.05	.09	.42**	.09	.12	.09	.11	(0.79)
M	1.11	3.05	5.83	3.59	2.97	3.09	3.16	3.45	2.88	2.27
SD	0.30	0.62	1.18	1.09	0.61	0.88	1.00	0.87	1.03	0.88
Skewness	3.70	−0.93	−1.50	−0.20	0.17	−0.02	−0.11	−0.40	0.07	0.26
Kurtosis	14.73	0.58	2.53	−0.69	−0.37	−0.49	−0.67	0.15	−0.84	−0.62
α	.66	.78	.95	.82	.82	.64	.80	.81	.80	.69
CR	.79	.92	.93	.88	.84	.80	.88	.89	.88	.83
N	107	107	107	107	105	107	106	107	107	104

CBV = Cybervictimization, SWB-COV = subjective well-being during the COVID-19 pandemic, SE = emotional self-efficacy, α = Cronbach's alpha, CR = composite reliability. The square rooted averaged variance extracted (AVE) is given in parentheses on the diagonal (Fornell & Larcker, 1981).
*$p < .05$. **$p < .01$.

decided against this step to avoid losing valuable information since alphas were marginally below .70 and composite reliabilities were satisfactory.

Discriminant validity was examined by computing the square rooted averaged variance extracted (AVE) and by its comparison with the respective correlations of each construct (Fornell & Larcker, 1981). Please note that high correlations among overall self-efficacy and its subscales have to be expected since the overall score was calculated through the sub-scores. Table 1 illustrates that the square roots of the AVE are larger than the inter-construct correlations for each major construct, except for a high correlation between the overall self-efficacy score and self-esteem ($r_{\mathrm{partial}} = .60$). We calculated the variance inflation factor (VIF) to follow up on some of the high correlations by testing for multicollinearity. All VIF values were lower than 2.00 and thus below the threshold of 5.00 (Hair et al., 2017), indicating that multicollinearity was no concern.

2.2.3. Testing the mediating role of emotional self-efficacy

Mediation analyses were conducted to examine whether emotional self-efficacy mediates the link between cybervictimization and well-being (i.e., self-esteem, social support, SWB-COV). We ran a mediation analysis for each of the three outcomes and included age and gender as covariates (see Fig. 2). Results revealed a significant indirect effect of cybervictimization on self-esteem through emotional self-efficacy, $b = -0.34$, 95% CI [−0.49, −0.18], indicating that lower self-efficacy partially mediated the relationship between cybervictimization and lower self-esteem. Specifically, more cybervictimization was related to lower emotional self-efficacy, and lower self-efficacy was related to lower self-esteem. Similarly, emotional self-efficacy partially mediated the negative relationship between cybervictimization and perceived social support, $b = -0.33$, 95% CI [−0.59, −0.10]. Emotional self-efficacy also mediated the negative link between cybervictimization and lower SWB-COV, $b = -0.57$, 95% CI [−0.88, −0.29]. The direct effect of cybervictimization on SWB-COV became nonsignificant ($p = .164$), indicating that emotional self-efficacy completely mediated the relationship between cybervictimization and lower SWB-COV. These

findings demonstrate the mediating role of emotional self-efficacy beliefs in the relationship between cybervictimization and various aspects of well-being. Hypothesis 1 was thus supported.

We followed up on these findings by conducting post-hoc analyses to examine the possibility of gender or age moderating the mediating effect of self-efficacy on the three well-being measures. The moderated mediation models were calculated using PROCESS model 7 and included the same variables as the respective mediation models (e.g., age was included as a covariate in the analysis testing gender as a moderator and vice versa). Neither age nor gender moderated the link between cybervictimization and emotional self-efficacy nor did we observe any moderated mediation.

2.2.4. Exploratory analyses

2.2.4.1. Subscales of emotional self-efficacy.
We conducted additional analyses to explore the unique effects of emotional self-efficacy beliefs regarding the management of specific emotions (i.e., subscales of the self-efficacy scale). As can be seen in Table 1, cybervictimization was negatively related to almost every subscale of emotional self-efficacy (anger/irritation, despondency/sadness, fear, and shame/embarrassment), but unrelated to self-efficacy in managing guilt ($p = .804$). Fischer's z-tests showed no significant differences in the strengths of the correlations of cybervictimization with self-efficacy in managing anger/ irritation, despondency/sadness, fear, or shame/embarrassment, respectively.

We included every subscale of emotional self-efficacy in a single mediation model to examine the unique mediating effects of each subscale in the relationship between cybervictimization and well-being measures (i.e., self-esteem, social support, SWB-COV). The analyses revealed that only self-efficacy in managing sadness, $b = -0.21$, 95% CI [−0.44, −0.05], and in managing shame, $b = -0.12$, 95% CI [−0.25, −0.01], mediated the negative relationship between cybervictimization and self-esteem (direct effect: $b = -0.64$, $p < .001$; total effect: $b = -1.03$, $p < .001$). Moreover, only self-efficacy in managing sadness completely mediated the negative link between cybervictimization and
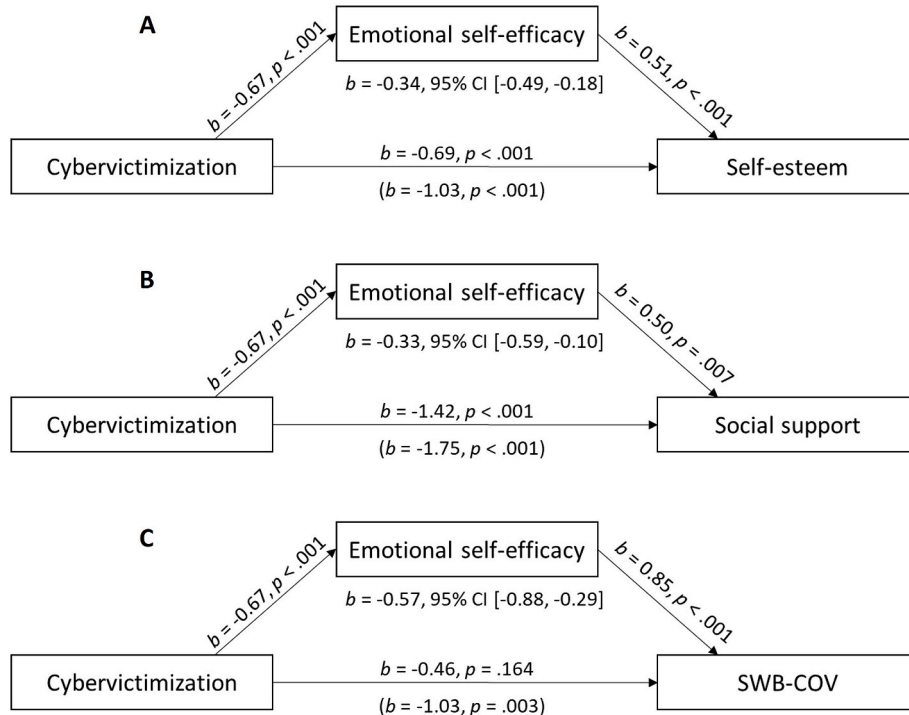

Fig. 2. Mediation models for the effect of cybervictimization through emotional self-efficacy on self-esteem (A), perceived social support (B), and subjective well-being during COVID-19 (SWB–COV; C). Age and gender were included as covariates.

SWB-COV, $b = -0.30$, 95% CI $[-0.65, -0.04]$ (direct effect: $b = -0.38$, $p = .254$; total effect: $b = -1.03$, $p = .003$). For social support as dependent variable, the total indirect effect through all subscales was significant, $b = -0.50$, 95% CI$[-0.83, -0.16]$, but no indirect effect of a single subscale significantly mediated the link between cybervictimization and less social support (direct effect: $b = -1.26$, $p = .001$; total effect: $b = -1.75$, $p < .001$). These findings highlight the importance of distinguishing between distinct emotions when examining self-efficacy beliefs. Self-efficacy in managing sadness appears to be especially crucial for mediating relationships between cybervictimization and well-being measures. On the other hand, self-efficacy in managing guilt seems negligible as this subscale was unrelated to cybervictimization.

2.2.4.2. Perceived change in the frequency of cybervictimization during COVID-19. Cybervictimization frequency might have changed during the COVID-19 pandemic in light of increased ICT use due to home-schooling and social distancing regulations. We asked participants who reported having experienced cybervictimization whether they had experienced the respective cyberbullying event less frequently, equally frequently, or more frequently compared to the time "before school closure". We obtained 35 answers indicating cybervictimization (counting each of the four items of cybervictimization separately). Of those replies 25.7% indicated experiencing cybervictimization less frequently, 54.3% indicated equally frequent, and 20.0% indicated more frequent cybervictimization during the pandemic/school closure as compared to before. It should be noted that we only asked current cybervictims (during COVID-19/school closure) about their perceived changes in cybervictimization frequency; we do not have data from participants who were victimized *before* COVID-19 but not *during* COVID-19. Thus, the percentage indicating fewer cybervictimization might be an underrepresentation of the true decrease of cybervictimization. Despite this limitation and our rather small sample, these exploratory findings suggest that cybervictimization did not occur more frequently during the first few months of the COVID-19 pandemic.

3. Study 2

Study 1 examined the role of subjective emotional self-efficacy beliefs in cybervictimization. We aimed to add to these findings in Study 2 by examining whether the relationship between cybervictimization and well-being is mediated by specific emotion regulation strategies (i.e., rumination, reappraisal, suppression). Furthermore, we explored whether similar findings will be obtained for traditional bullying victimization as for cybervictimization.

3.1. Method

3.1.1. Participants and procedure

The initial sample included 208 participants. We excluded three participants who were older than 18 years. The final sample included 205 high school students ($M_{age} = 15.45$, $SD = 1.10$, age range between 14 and 18 years; 63.9% female, 1.5% diverse) from Germany ($n = 182$) and Switzerland ($n = 23$). The small amount of participants with Swiss nationality is explained by the fact that we distributed our survey primarily near the German city Konstanz which is located at the border to Switzerland. We collected data from March to April 2020 by sending out email invitations that directed participants to an online survey on the platform SoSci Survey (https://www.soscisurvey.de/). Students gave informed consent and voluntarily completed the survey.

3.1.2. Measures

3.1.2.1. Cyberbullying. We applied the scales by Wong and McBride (2018) to measure the frequency of cybervictimization and cyberaggression during the last three months with 15 items each (1 = *never*, 2 =

once or twice, 3 = *two to three times in a month*, 4 = *about once a week*, 5 = *few times a week*). The items measure whether a person has experienced or carried out cyberaggressive behavior based on several distinguishable cyberbullying types (i.e., relational, pictorial, verbal, and extortion).

3.1.2.2. Traditional bullying. Traditional bullying victimization and aggression during the last three months were measured with nine items each (1 = *never*, 2 = *once or twice*, 3 = *two to three times in a month*, 4 = *about once a week*, 5 = *few times a week*; adapted from Wong, Cheng, Ngan, & Ma, 2011). Items measured relational, pictorial, verbal, and extortion bullying behavior. Cyberbullying and traditional bullying scales were translated to German from the English version and double-checked by a bilingual speaker. In addition, the creator of the original Chinese cyberbullying scales was involved in the translation process and all items were carefully discussed to preserve their meaning (e.g., sometimes the Chinese version used a single word to describe a concept, whereas in German several words were needed).

3.1.2.3. Emotion regulation strategies. We applied five items from the Perseverative Thinking Questionnaire (Ehring et al., 2011) to measure rumination (0 = *never*, 4 = *almost always*). Reappraisal and suppression were measured with the Emotion Regulation Questionnaire (10 items; 1 = *strongly disagree*, 7 = *strongly agree*; Gross & John, 2003; German version by Abler & Kessler, 2009).

3.1.2.4. Well-being measures. We assessed self-esteem with the same measure used in Study 1. Moreover, the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985; German version by Glaesmer, Grande, Braehler, & Roth, 2011) was used to assess life satisfaction (five items; 1 = *strongly disagree*, 7 = *strongly agree*).

3.1.3. Data processing and analytic strategy

The analytic strategy was the same as in Study 1.

3.2. Results and discussion

3.2.1. Testing for common method bias

Analogous to Study 1, Harman's single-factor test was used to check for common method bias. The principal component analysis resulted in 17 components with eigenvalues above 1, with the largest component explaining only 28.02% of the total variance. Since no single component accounted for most of the variance, common method bias is unlikely.

3.2.2. Reliability and validity of constructs and descriptive analyses

Descriptive statistics and partial correlations (controlled for age and gender) for Study 2 as well as indicators for the reliability and validity of constructs are given in Table 2. Compared to boys, girls reported more rumination ($M = 3.31$, $SE = 0.07$ versus $M = 2.87$, $SE = 0.10$; $t(198) = 3.78$, $p < .001$), lower self-esteem ($M = 2.82$, $SE = 0.05$ versus $M = 3.19$, $SE = 0.07$; $t(200) = -4.56$, $p < .001$), and lower levels of cybervictimization ($M = 1.14$, $SE = 0.04$ versus $M = 1.33$, $SE = 0.08$; $t(97.31) = -2.21$, $p = .029$) and cyberaggression ($M = 1.09$, $SE = 0.02$ versus $M = 1.35$, $SE = 0.08$; $t(81.41) = -3.36$, $p = .001$). Even though age was only marginally related to rumination ($r = 0.12$, $p = .078$), we again computed partial correlations controlling for both age and gender to remain consistent with Study 1. Similar to Study 1 and previous studies on aggressive behavior (Einarsen et al., 2009), (cyber)bullying scales were non-normally distributed with a skewness between 2.01 and 3.62.

Internal consistencies were satisfactory as Cronbach's alphas and composite reliability scores were above 0.70 (Hair et al., 2017), except for suppression with a Cronbach's alpha of .69 which we judged as marginally acceptable. Discriminant validity, as examined by the square rooted AVE, was adequate for most constructs (see Table 2). However, we obtained high intercorrelations of cybervictimization with cyberaggression and traditional bullying victimization, respectively. This is in

Table 2
Descriptive statistics and partial correlations (controlled for age and gender) for Study 2.

Variable	1	2	3	4	5	6	7	8	9
1. CBV	(0.81)								
2. CBA	.84**	(0.74)							
3. TBV	.72**	.63**	(0.69)						
4. TBA	.58**	.70**	.60**	(0.68)					
5. Self-esteem	−.14*	−.04	−.23**	−.09	(0.70)				
6. LS	−.18*	−.11	−.19**	−.03	.54**	(0.82)			
7. Rumination	.12	.04	.23**	.09	−.46**	−.39**	(0.76)		
8. Reappraisal	.07	.06	.03	−.02	.14	.29**	.03	(0.68)	
9. Suppression	.12	.13	.14	.07	−.24**	−.27**	.19**	.18**	(0.72)
M	1.20	1.18	1.45	1.45	2.94	4.73	3.16	4.08	3.82
SD	0.51	0.44	0.57	0.55	0.59	1.34	0.81	1.01	1.22
Skewness	3.62	3.51	2.01	2.29	−0.39	−0.52	−0.05	−0.20	0.07
Kurtosis	12.92	12.39	4.14	6.18	−0.27	−0.20	−0.32	0.37	−0.26
α	.96	.94	.85	.84	.88	.88	.80	.76	.69
CR	.97	.95	.89	.89	.90	.91	.87	.84	.81
N	203	205	205	205	205	204	203	204	203

CBV = Cybervictimization, CBA = cyberaggression, TBV = Traditional bullying victimization, TBA = Traditional bullying aggression, LS = Life Satisfaction, α = Cronbach's alpha, CR = composite reliability. The square rooted averaged variance extracted (AVE) is given in parentheses on the diagonal (Fornell & Larcker, 1981). *p < .05. **p < .01.

line with previous research which suggests that victims of cyberbullying are often also perpetrators of cyberbullying and victims of traditional bullying (Kowalski et al., 2014). An examination of VIF values indicated no multicollinearity issues (VIFs <3.89).

3.2.3. Testing the mediating role of emotion regulation strategies

We ran mediation analyses to examine whether emotion regulation strategies mediate the negative relationship between cybervictimization and well-being (i.e., self-esteem, life satisfaction). We simultaneously
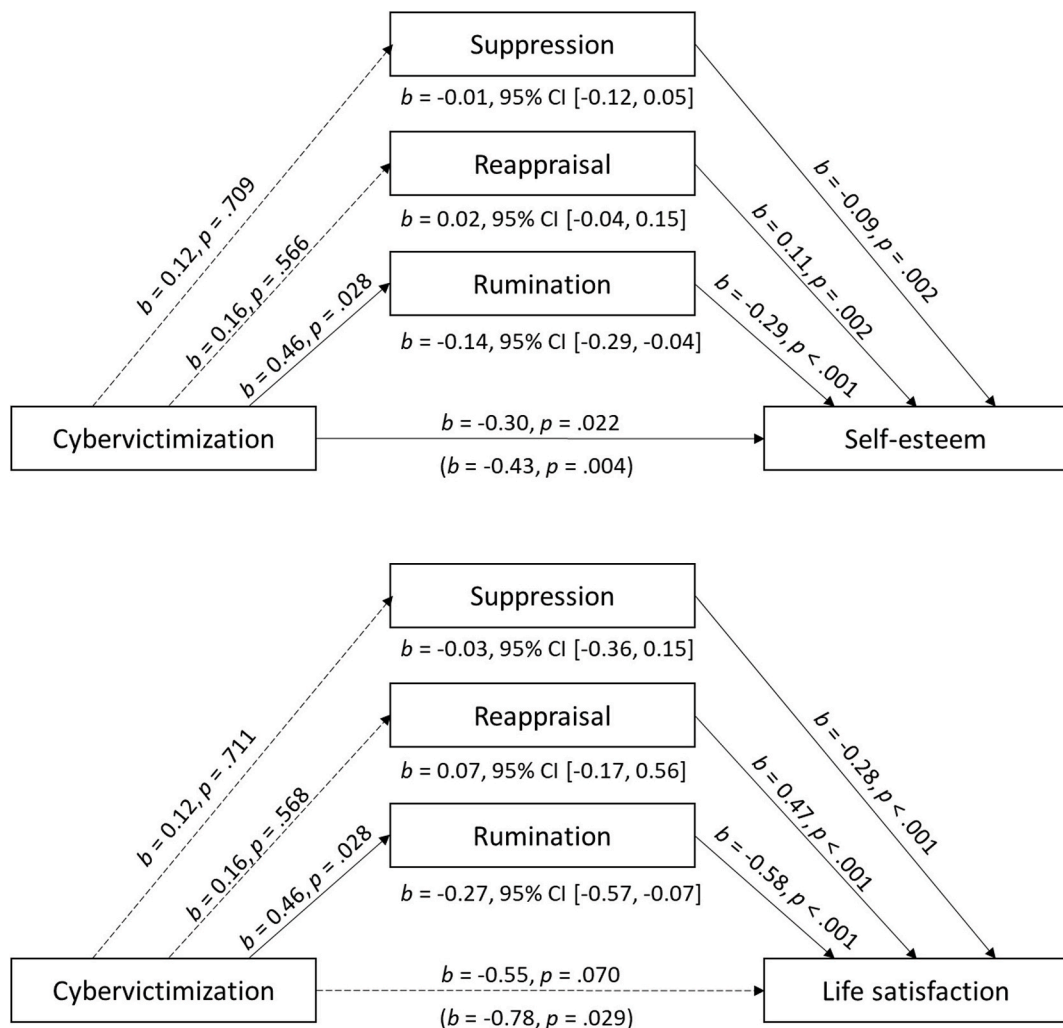

Fig. 3. Mediation models for the effect of cybervictimization through emotion regulation strategies on self-esteem (A) and life satisfaction (B). Dashed lines indicate nonsignificant effects. Age, gender, and cyberaggression were included as covariates.

tested rumination, reappraisal, and suppression as mediators (see Fig. 3). Age, gender, and cyberaggression were included as covariates. Due to the high correlation between cybervictimization and cyberaggression ($r_{partial}$ = .84), we included cyberaggression as a covariate since individuals who are only cybervictims may differ from individuals who are both victims and perpetrators.

Results yielded a significant indirect effect of cybervictimization on self-esteem through rumination, b = −0.14, 95% CI [−0.29, −0.04], but not through reappraisal, b = 0.02, 95% CI [−0.04, 0.15], or suppression, b = −0.01, 95% CI [−0.12, 0.05]. Similarly, we obtained an indirect effect of cybervictimization on life satisfaction through rumination, b = −0.27, 95% CI [−0.57, −0.07], but not through reappraisal, b = 0.07, 95% CI [−0.17, 0.56], or suppression, b = −0.03, 95% CI [−0.36, 0.15]. The direct effect of cybervictimization became nonsignificant (p = .070), indicating that rumination completely mediated the negative link between cybervictimization and life satisfaction. Hypothesis 2 was thus supported regarding the mediating role of rumination. Hypotheses 3 and 4, however, were rejected as reappraisal and suppression did not function as mediators in any of the relationships. Rumination may play a comparatively more crucial role as rumination affects attentional processes early in the emotion regulation process (Gross, 1998b).

Post-hoc analyses were conducted to examine whether age or gender moderate the mediating effect of rumination. Similar to the post-hoc analyses in Study 1, we computed the respective analyses using PROCESS model 7. Age significantly moderated the negative link between cybervictimization and rumination, indicating a weaker effect among older participants (interaction effects: $F(1, 194)$ = 3.96, p = .048, ΔR^2 = 0.018, and $F(1, 193)$ = 4.05, p = .046, ΔR^2 = 0.019, for the analyses predicting self-esteem and life satisfaction, respectively). With increasing age, adolescents might be less likely to ruminate in response to cybervictimization as they may develop more effective coping strategies. Importantly, the index of moderated mediation was nonsignificant in both models, thus no moderated mediation can be inferred (self-esteem: 95% CI [−0.01, 0.15]; life satisfaction: 95% CI [−0.02, 0.30]). Gender neither moderated the link between cybervictimization and rumination nor moderated the mediating effect of rumination on self-esteem and life satisfaction, respectively.

3.2.4. Exploratory analyses

We tested whether our findings also apply to traditional bullying by repeating the mediation analyses for traditional bullying victimization (see Fig. 4). Analogous to the previous analyses we included age, gender, and traditional bullying aggression as covariates. Results revealed an indirect effect of traditional bullying victimization on self-esteem through rumination, b = −0.11, 95% CI [−0.20, −0.03], and again no significant indirect effects through reappraisal, b = 0.01, 95% CI [−0.02, 0.05], or suppression, b = −0.03, 95% CI [−0.08, 0.01]. A comparable pattern emerged for life satisfaction, with rumination partially mediating the negative relationship between traditional bullying victimization and life satisfaction, b = −0.22, 95% CI [−0.40, −0.06], and no
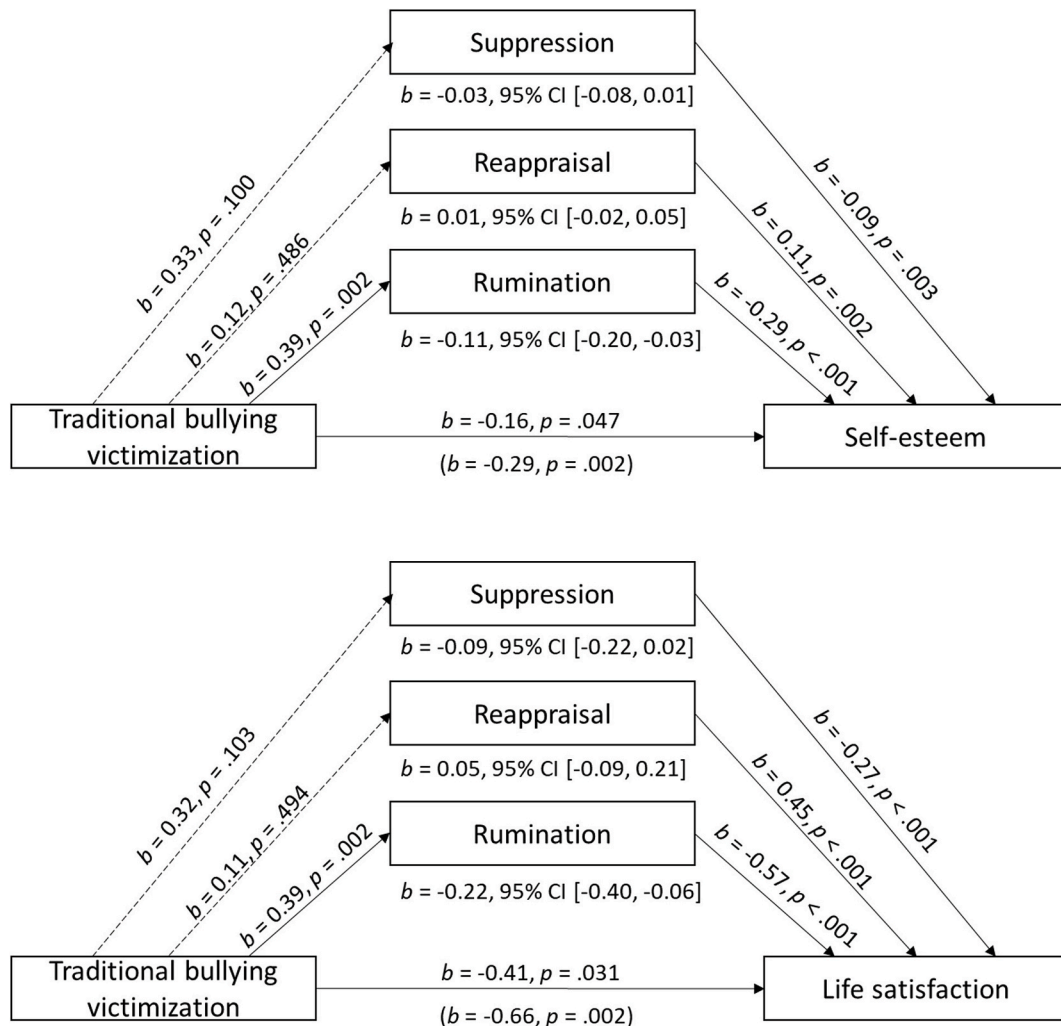

Fig. 4. Mediation models for the effect of traditional bullying victimization through emotion regulation strategies on self-esteem (A) and life satisfaction (B). Dashed lines indicate nonsignificant effects. Age, gender, and traditional bullying aggression were included as covariates.

indirect effects through reappraisal, $b = 0.05$, 95% CI $[-0.09, 0.21]$, or suppression, $b = -0.09$, 95% CI $[-0.22, 0.02]$. The similar findings for cybervictimization and victimization in traditional bullying suggest that rumination has a comparable function in both types of victimization.

4. General discussion

The objectives of this research were to examine the potential mediating functions of emotional self-efficacy and specific emotion regulation strategies (i.e., rumination, reappraisal, suppression) in the relationship between cybervictimization and well-being among adolescents. In support of hypothesis 1, the findings of Study 1 showed that lower emotional self-efficacy in managing negative emotions mediated the link between cybervictimization and lower well-being (i.e., lower self-esteem, less perceived social support, and lower SWB-COV, respectively). Furthermore, results of Study 2 revealed that more rumination (hypothesis 2), but not reappraisal or suppression (hypotheses 3–4), mediated the relationship between cybervictimization and lower well-being (i.e., lower self-esteem, lower life satisfaction).

Previous studies emphasized the role of emotional processes in cybervictimization by examining whether emotional self-efficacy or adaptive emotion regulation moderate (buffer) the negative association between cybervictimization and impaired well-being (e.g., Turliuc et al., 2020). Recently, researchers suggested that social-cognitive factors (e. g., self-efficacy) and coping strategies (e.g., emotion regulation) may not only moderate but mediate the link between cybervictimization and psychological consequences (Raskauskas & Huynh, 2015, p. 123). Moderator and mediator variables are conceptually distinct as "moderator variables specify when certain effects will hold, [whereas] mediators speak to how or why such effects occur" (Baron & Kenny, 1986, p. 1176). Testing mediation thus allows examining whether a specific variable accounts for the relationship between a predictor and an outcome (Baron & Kenny, 1986; MacKinnon, Fairchild, & Fritz, 2007). In our case, the mediators emotional self-efficacy and emotion regulation were examined to better understand the processes or mechanisms linking cybervictimization to lower well-being.

In support of our assumptions and consistent with past findings on traditional bullying victimization (Singh & Bussey, 2011), we found that self-efficacy in managing negative emotions mediated the link between cybervictimization and lower self-esteem, less perceived social support, and lower SWB-COV, respectively. Specifically, cybervictimization was related to lower emotional self-efficacy which in turn was related to lower well-being. Notably, cybervictimization was related to lower self-efficacy beliefs in managing several specific emotions, such as anger, sadness, fear, and shame. Only the subscale for self-efficacy in managing guilt was unrelated to cybervictimization. Self-efficacy in managing sadness and shame, in particular, were unique mediators in the link between cybervictimization and lower self-esteem. These findings are in line with focus group analyses suggesting that the negative emotions of adolescent cybervictims play a crucial role in cybervictimization (Dennehy, Meaney, Cronin, & Arensman, 2020). Specifically, cybervictims were found to experience extensive shame that discouraged them from reporting cybervictimization or seeking social support. Self-efficacy in managing such negative emotions might be crucial for coping with cybervictimization as self-efficacy beliefs affect the vulnerability to psychological distress (Bandura, 1997; Singh & Bussey, 2011). Individuals who have high self-efficacy beliefs are more likely to take adequate actions to cope with negative life events (Bandura, 1997). People may be unlikely to even initiate emotion regulation if they do not believe in their ability to manage their emotions in a stressful situation. Thus, people's subjective belief in successfully managing negative emotions should be a crucial first step for coping with cybervictimization by initiating effective emotion regulation (Caprara et al., 2013).

The role of emotion regulation in cybervictimization is underlined by our second study which demonstrated that cybervictimization is related to lower well-being through more rumination. This finding is consistent with previous research showing rumination to mediate the relationship between cybervictimization and more depressive symptoms (Chu et al., 2019; Feinstein et al., 2014). We found, however, no indirect effects of cybervictimization through reappraisal or suppression on well-being. In contrast to reappraisal and suppression, rumination is used early in the emotion regulation process, at the stage of attentional deployment (Gross, 1998a). Therefore, rumination might be more crucial for the link between cybervictimization and lower well-being than reappraisal or suppression.

Previous research found that rumination both mediated and moderated the relationship between cybervictimization and depressive symptoms among Chinese adolescents (Chu et al., 2019). It should be mentioned that we attempted to replicate this finding by additionally testing rumination as a moderator. However, we obtained no significant moderation, even though the tendency was the same, suggesting that rumination increased the negative effect of cybervictimization on well-being (see supplementary material for details). This absence of the previously reported moderation effect is intriguing. Since Chu et al. (2019) conducted their study in China, the contrasting findings might be explained by the different cultural contexts in which the research took place. For instance, a recent study suggests that cyberbullying is less prevalent among Germans as compared to Hong Kong Chinese and functions differently in these cultures (Wong, Schunk, Trommsdorff, & McBride, 2021). The moderating role of rumination might be more important in cultures where cyberbullying is more frequent by increasing the negative effect of cybervictimization on well-being. Going back to the distinction by Baron and Kenny (1986), the moderation analysis by Chu et al. (2019) illustrated for *whom* cybervictimization is linked to lower well-being, namely for Chinese adolescents with high levels of rumination. While we obtained no moderation, rumination functioned as a mediator in our study, hinting at the *why* and the mechanism linking cybervictimization to lower well-being. This mediation suggests that rumination might be critical for a decrease in well-being among cybervictims. By definition, rumination is a response to distressing situations (Nolen-Hoeksema et al., 2008). The pervasive nature and omnipresence of cyberbullying seem almost predetermined to promote rumination (Dennehy et al., 2020). Specifically, this may take the form of victims repeatedly reading the same tormenting messages or posts. Focusing on the causes and consequences of a cyberbullying event may then induce adverse psychological consequences for the victim. Notably, traditional bullying victimization was also related to lower well-being through more rumination, suggesting that the mediating function of rumination might be similar for traditional and cybervictimization.

Our findings should be interpreted within the context of the COVID-19 pandemic during which we conducted this research. Among others, the German government enforced regulations, like social distancing rules and school closures, thereby restricting adolescents in their real-life contacts and transferring social communication and education to the digital world (see Steinmetz, Batzdorfer, & Bosnjak, 2020, for an overview of measures implemented in Germany). For instance, Cauberghe, Van Wesenbeeck, De Jans, Hudders, and Ponnet (2021) found that adolescents used more social media to cope with loneliness during the pandemic. In 2020, a large study in Germany showed an increase in cybervictimization compared to 2017 and attributed this change to the extensive online communication during the COVID-19 pandemic—without explicitly assessing COVID-19-related cyberbullying experiences (Bündnis gegen Cybermobbing, 2020). In the exploratory analyses of Study 1, we directly assessed whether adolescents perceived a change in cybervictimization frequency due to the COVID-19 lockdown (school closures). Interestingly, most responses indicated no change in the frequency of cybervictimization (54.3%), whereas 25.7% indicated less and 20.0% indicated more frequent cybervictimization during school closures. Even though our sample size is relatively small and at least some participants perceived an increase in cybervictimization, our findings suggest that claims of an excessive cyberbullying

increase in response to the COVID-19 lockdown might be exaggerated. Future studies should use larger sample sizes and explicitly measure cyberbullying changes in response to the COVID-19 pandemic to empirically answer this question without simply attributing a higher prevalence of cyberbullying to the pandemic (e.g., cyberbullying might have increased anyway in recent years due to more engagement in social media).

4.1. Limitations and implications

It should be noted that the causation of the calculated mediation models is questionable as we conducted mediation analyses with cross-sectional data and other untested variables might be responsible for the obtained associations (Fiedler, Harris, & Schott, 2018). Future studies may test our findings using a longitudinal or experimental design. For instance, Rey et al. (2020) showed that rumination mediated the link between cybervictimization and somatic symptoms four months later which supports a causal interpretation of the mediating effect of rumination. An experimental design, such as a double randomization design, is to be preferred. Researchers could conduct two experiments by randomly assigning participants to a cybervictimization manipulation in the first experiment (measuring mediator and outcome) and assigning participants to a mediator manipulation in the second experiment. This method allows differentiating the effect of the predictor on the mediator and the effect of the mediator on the outcome (see Pirlott & MacKinnon, 2016, for further details). Ethical considerations forbid any "real" cybervictimization from being inflected, but other options are available (e.g., vignettes or asking participants to remember past cybervictimization experiences). Using cyberbullying vignettes (e.g., Machmutow, Perren, Sticca, & Alsaker, 2012) for assessing self-efficacy and emotion regulation strategies after cybervictimization may also avoid potential biases and misunderstandings related to self-report scales (Brewer & Kerslake, 2015). For instance, participants might fail to report cybervictimization because they do not remember its occurrence or do not appraise an event as cyberbullying.

Since we examined emotional self-efficacy and emotion regulations in two separate studies, we were unable to discuss their associations with each other and their relative importance. An obvious next step for future studies is the examination of both factors in a single process model. A serial mediation model might be tested, with cybervictimization being related to lower emotional self-efficacy, which might be related to more maladaptive emotion regulation, which might then be related to lower well-being. The Transactional Model of Stress and Coping (TMSC; Lazarus & Folkman, 1984, 1987) may serve as a theoretical framework for this purpose as the model describes how individuals' cognitive appraisals (e.g., self-efficacy beliefs) are linked to the selection of coping strategies (e.g., emotion regulation) after experiencing stressful events (e.g., cybervictimization; as suggested by Raskauskas & Huynh, 2015). However, no study seems to have tested the TMSC in the context of cybervictimization yet, even though the model has been used as a theoretical guideline for coping with cybervictimization by some researchers (e.g., Dennehy et al., 2020; Völlink, Bolman, Dehue, & Jacobs, 2013).

Our research has practical implications for cyberbullying interventions as cybervictims may benefit from programs focusing on building self-efficacy beliefs and emotion regulation skills. A review across 19 studies (including randomized controlled trials) shows that mindfulness-based and cognitive-behavioral interventions are effective for reducing rumination (Querstret & Cropley, 2013). Notably, the review also revealed that both internet-based and face-to-face delivered interventions are equally effective. Adolescents might be particularly vulnerable for dysfunctional coping with cybervictimization as past research found that adolescents possess a comparatively small repertoire of adaptive emotion regulation strategies (Zimmermann & Iwanski, 2014). Since adolescents face a high risk of experiencing cybervictimization (Kowalski et al., 2019), they should be empowered with the

confidence and knowledge to effectively regulate their emotions. Emotion regulation might be especially crucial for cybervictimization as cybervictims might have more difficulties in escaping cyberbullying compared to traditional bullying (Vranjes, Baillien, Vandebosch, Erreygers, & De Witte, 2017). Furthermore, Völlink et al. (2013) suggest that cybervictims are more likely to use emotion-focused (versus problem-focused) coping due to their belief that cyberbullying is unchangeable. The possibly higher engagement in emotion-focused coping highlights the need to teach adolescents effective emotion regulation strategies to cope with cybervictimization by counteracting dysfunctional emotion regulation (e.g., rumination).

4.2. Conclusion

Our research provides support for the mediating functions of emotional self-efficacy and emotion regulation (i.e., rumination) in the relationship between cybervictimization and lower well-being among adolescents. Future studies may test self-efficacy and emotion regulation in a single model and apply an experimental or longitudinal design to examine the effects of cybervictimization on well-being while considering the mediating roles of emotional self-efficacy and emotion regulation.

Author note

Credit author statement

Fabian Schunk: Writing – original draft, Conceptualization and methodology of Study 2, Investigation, Data curation, Formal analysis. **Franziska Zeh:** Conceptualization and methodology of Study 1, Investigation, Formal analysis, Writing – review & editing. **Gisela Trommsdorff:** Supervision, Conceptualization, Writing – review & editing.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.chb.2021.107035.

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