

The Pathways from Cyberostracism, Dispositional Hope, and Self-Efficacy to Psychological Well-Being Among University Students: A Serial Mediation Study

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Abstract

The phenomenon of cyberostracism, characterized by exclusion and being ignored in virtual environments, can negatively impact mental health. Previous research has not adequately explored the impact of cyberostracism on well-being or the role of potential mediating variables in this relationship. Examining these mediating pathways can enhance our understanding of how cyberostracism affects individuals' psychological well-being and may inform intervention strategies to mitigate its negative effects. This study aimed to investigate the links between cyberostracism, dispositional hope, self-efficacy, and psychological well-being. The participants consisted of 322 college students aged 18 to 40 ($M = 21.14$, $SD = 2.56$), selected using a convenience sampling method. Structural Equation Modeling (SEM) and bootstrap analysis were employed to explore how hope and self-efficacy might mediate the link between cyberostracism and psychological well-being. The results indicated that cyberostracism, dispositional hope, self-efficacy, and psychological well-being were significantly associated with one another. Furthermore, SEM and bootstrap analyses showed that dispositional hope and self-efficacy significantly mediated the link between cyberostracism and psychological well-being. In conclusion, the findings suggest that dispositional hope and self-efficacy may mitigate the adverse impact of cyberostracism on psychological well-being. These results may contribute significantly to counseling practices and educational research aimed at supporting college students' psychological well-being and preventing the negative effects of cyberostracism.

Keywords: Cyberostracism, hope, self-efficacy, psychological well-being

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Introduction

People have fundamental needs, such as forming meaningful, lasting, and high-quality relationships with others and feeling a sense of belonging to a group (Baumeister & Leary, 1995). To meet these needs, individuals must feel genuinely valued by others and experience positive emotions towards them (Li et al., 2019). Developing healthy social relationships is especially important for school-aged adolescents and young adults (Parameswari, 2015; Wong et al., 2022). Studies suggest that well-being is closely related to the fulfillment of these fundamental needs (Lataster et al., 2022; Martela et al., 2023). Ryan and Deci (2000) argue that meeting fundamental needs is crucial for continuous psychological development and well-being. In face-to-face interactions with peers or others, young people may encounter social ostracism but can also gain benefits such as feeling valued and secure, fulfilling their needs for acceptance and approval, building healthy social relationships, and understanding social norms. Ostracism refers to the experience of being ignored and excluded by one or more individuals (Williams et al., 2000). Those subjected to social ostracism may be deprived of basic needs, including self-esteem, a sense of control, belonging, and a sense of meaningful existence (Hartgerink et al., 2015; Williams & Nida 2011).

In today's digital age, the ways in which college students and young adults seek to fulfill their fundamental needs have evolved dramatically (Webster et al., 2020; Wong et al., 2022). Over the past twenty years, the digital era has significantly altered how young adults engage and communicate. Social media platforms (such as Twitter, Instagram, Facebook, etc.) have transformed human relationships, providing opportunities for connectivity, information sharing, and social involvement (Zakharova et al., 2020). However, alongside these advancements, the digital world has also introduced new challenges and concerns, one of which is cyberostracism—being excluded and ignored on virtual social platforms (Vorderer & Schneider, 2017; Williams et al., 2000). Being ostracized by peers or others on real or virtual social networks can threaten the fulfillment of students' basic social needs (Williams, 2007; Schneider et al., 2017) and negatively impact well-being (Webster et al., 2020). Students with lower levels of psychological well-being (PWB) may face the risk of low academic performance and school dropout (Limone & Toto, 2022). Therefore, this study examines the relationships among cyberostracism, dispositional hope, self-efficacy, and PWB among university students. Additionally, the study tests whether hope and self-efficacy mediate the relationship between cyberostracism and PWB. The results of this study may have significant implications for educational psychology, preventive counseling practices, and educational research.

Literature Review

Cyberostracism refers to the intentional exclusion or rejection of an individual within online platforms and has become a pervasive and distressing form of social interaction (Lutz & Schneider, 2020; Nezelek et al., 2012; Vorderer & Schneider, 2017). This phenomenon has become a growing concern, particularly among college students who are heavily engaged in online interactions (Niu et al., 2018; Smith et al., 2017; Tang & Duan, 2021; Wang et al., 2022). The experience of being ignored or excluded in virtual environments may lead to feelings of isolation, decreased self-worth, and other negative psychological outcomes, adversely affecting students' mental health (Tang & Duan, 2021; Yuju et al., 2018), psychological adjustment (Pamuk & Cırcır, 2023), and academic performance.

Experiencing cyberostracism has been highlighted as potentially causing harm comparable to the ostracism encountered in face-to-face social interactions (Smith et al., 2017). Like ostracism, cyberostracism significantly threatens the quality of social relationships and undermines the need to belong (Hayes et al., 2018; Schneider et al., 2017). Cyberostracism can negatively impact psychological needs such as self-esteem, social connection, meaningful existence, and control, while also triggering a wide array of physiological, emotional, cognitive, and behavioral responses (Williams & Nida, 2011). Moreover, cyberostracism has been linked to reduced PWB, including higher levels of depression and anxiety (Donate et al., 2017; Smith et al., 2017). Previous studies have suggested that cyberostracism can be as harmful as real-life ostracism, posing a similar threat to PWB by jeopardizing individuals' basic needs (Niu et al., 2018; Tang & Duan, 2021).

PWB is a complex construct that includes various cognitive and emotional components. PWB encompasses six key dimensions (Ryff & Keyes, 1995): autonomy, which involves feeling in control of

one's life and decisions; positive relationships with others, which entail fulfilling and supportive connections; environmental mastery, which relates to effectively managing and adapting to one's surroundings; personal growth, which involves a sense of continuous development; purpose in life, which includes having goals and a sense of purpose; and self-acceptance, which refers to embracing oneself, including both strengths and weaknesses. Together, these dimensions contribute to an individual's PWB. Similarly, the PERMA model (Seligman, 2011) defines PWB through five elements: Positive emotions, Engagement, Relationships, Meaning, and Accomplishments.

As people increasingly turn to digital platforms for socializing, work, and entertainment, the impact of cyberostracism on PWB has become a significant focus for researchers and clinicians. This phenomenon poses unique challenges because it occurs in an environment lacking physical cues, making it difficult to interpret and address (Wesselmann et al., 2012). The psychological effects of cyberostracism are complex, involving a range of emotional and cognitive responses, such as heightened feelings of sadness, anger, and reduced self-esteem (Wesselmann et al., 2012; Zwolinski, 2014). Moreover, the anonymity and detachment inherent in online interactions can amplify the negative effects of ostracism, underscoring the need to investigate the underlying mechanisms through which it impacts individuals' PWB (Covert & Stefanone, 2018; Hartgerink et al., 2015).

While cyberostracism may detrimentally impact students' PWB, the degree of this impact may be influenced by factors such as hope and self-efficacy. Hope is described as a constructive mindset characterized by setting goals, devising strategies to achieve them, and possessing the determination to follow through (Snyder, 2002). This optimistic state is identified as a key psychological asset during challenging circumstances, embodying both proactive behavior and flexible thinking (Snyder et al., 1991). As an important protective factor, hope may reduce the adverse effects of cyberostracism on PWB (Niu et al., 2018). Self-efficacy refers to the belief in one's ability to execute specific behaviors successfully to attain desired outcomes (Williams, 2010). It can play a crucial role in how individuals respond to challenging situations. Higher self-efficacy is often associated with greater resilience when confronted with stress and adversity. This belief in one's capabilities can positively impact PWB, as it helps individuals navigate difficult circumstances with confidence and determination. Additionally, self-efficacy can mediate the relationship between optimism and PWB (Roslan et al., 2021).

Both hope (Rubin, 2001; Rustoen et al., 2010) and self-efficacy (Schönfeld et al., 2015) are considered crucial protective factors against stressors and adverse life events. In the context of cyberostracism, individuals with higher levels of hope and self-efficacy are likely to exhibit greater resilience against its negative effects. While cyberostracism can harm an individual's PWB (Williams, 2007), those with higher levels of hope may view it as a temporary setback rather than a permanent condition, maintaining a sense of optimism and a positive outlook (Snyder, 2002). Similarly, individuals with higher self-efficacy are more likely to perceive cyberostracism as a challenge they can effectively manage and overcome, thereby mitigating its negative impact on their PWB (Bandura, 1997). Thus, both hope and self-efficacy can serve as buffers against the adverse effects of cyberostracism, contributing to the maintenance of PWB in online social interactions.

The Current Study

College students and young adults actively participate in various online platforms and engage in diverse relationships and interactions, making them a suitable group for studying cyberostracism. Furthermore, university students are often in a stage of forming new friendships, joining social groups, and developing their social identities, which makes experiences of online exclusion significant for their social relationships and well-being during young adulthood (Li et al., 2022; Niu et al., 2018; Smith et al., 2017; Tang & Duan, 2021). Research on college students provides a valuable opportunity to understand the psychological and emotional effects of cyberostracism. Studies, such as the one by Smith et al. (2017), on college students' perceptions of the effects of cyberostracism on well-being, shed light on the impact of cyberostracism on individuals' PWB.

This study seeks to deepen our understanding of how cyberostracism relates to PWB among college students by investigating how hope and self-efficacy mediate this relationship. Furthermore, this study stands out as the first to investigate the connections between cyberostracism, dispositional hope, self-efficacy, and PWB. While researchers' attention to cyberostracism has grown over the past twenty years,

there has been a scarcity of studies focusing on this issue within Turkey (Akçay & Kayış, 2023; Oktar et al., 2022; Pamuk & Cırcır, 2023). Examining the mediating pathways can shed light on how cyberostracism affects college students' PWB and provide insights into potential counseling intervention strategies in educational settings to mitigate its negative effects. In line with the main purpose, the following hypotheses were proposed: Cyberostracism will be negatively associated with PWB (H1), hope (H2), and self-efficacy (H3). Finally, dispositional hope (H4) and self-efficacy (H5) will mediate the link between cyberostracism and PWB.

Students' PWB may be closely linked to their academic performance and overall educational experience (Bukhari & Khanam, 2017; Kaya & Erdem, 2021; Rand et al., 2020). Cyberostracism can lead to increased anxiety and depression (Niu et al., 2018; Yuju et al., 2018), which can adversely affect students' ability to concentrate, engage in class, and perform academically. Understanding how to mitigate these effects is crucial for fostering a supportive learning environment that promotes both mental health and academic success. By identifying dispositional hope and self-efficacy as key mediating factors, the present study can provide valuable insights for developing targeted interventions. Educational institutions can implement programs that enhance these attributes, such as hope, self-efficacy, and resilience workshops, to help students cope with the negative impacts of cyberostracism. Such interventions can be integrated into existing student support services and mental health resources, offering practical solutions for educators and administrators. While previous research has highlighted the adverse effects of cyberostracism on mental health, there is a lack of comprehensive understanding regarding the mechanisms through which these effects occur, particularly in the context of educational settings.

Method

Participants and Procedure

The study involved university students at both undergraduate and graduate levels from various provinces across Turkey, with ages ranging from 18 to 40 ($M = 21.14$, $SD = 2.56$). Of the participants, 221 (68.63%) were female, and 101 (31.37%) were male. Among the participants, 275 (85.40%) were undergraduate students, and 47 (14.60%) were graduate students. Among the undergraduate students, 92 (28.6%) were freshmen, 89 (27.6%) were sophomores, 50 (15.5%) were juniors, and 44 (13.7%) were seniors. Participants' average daily social media usage ranged from 2 hours to 8 hours ($M = 4.07$, $SD = 1.31$). Additionally, 99 (30.75%) of the participants reported having low socioeconomic status, 138 (42.86%) reported medium socioeconomic status, and 85 (26.40%) reported high socioeconomic status.

This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki and was approved by the Human Research Ethics Committee of Sinop University (Approval No: 2024/84; Date: 2024/05/02). Participants were reached through online platforms, and data were collected using Google Forms. The link to the data collection form was shared on the researchers' social media accounts and student WhatsApp groups. Participants were provided with informed consent that outlined the study's purpose, assured the confidentiality of personal information, specified that data would be used only for research purposes, informed participants of their right to withdraw from the study, and emphasized the voluntary nature of participation.

Measures

Cyberostracism

The Cyberostracism Scale (CS) was used to assess levels of virtual social ostracism (Hatun & Demirci, 2022). The scale comprises 14 items, loading onto three factors (direct exclusion, indirect exclusion, and ignored). The scale is scored on a 5-point Likert-type scale (1 = never, 5 = always). The CS includes items such as "They do not respond to my personal messages on social media." Total scores on the scale range from 14 to 70. The CS demonstrates good internal reliability ($\alpha = .85$) and acceptable goodness of fit values (Hatun & Demirci, 2022). In this study, the scale exhibited high reliability, with Cronbach's alpha (α) = .92 and McDonald's omega (ω) = .92.

Hope

The Dispositional Hope Scale (DHS) was used to assess participants' levels of hope (Tarhan & Bacanlı, 2015; originally developed by Snyder et al., 1991). The scale comprises 12 items (including 4 filler items) and is organized into two factors: alternative ways thinking and actuating thinking. Participants provided responses on an 8-point Likert-type scale (1 = definitely false, 8 = definitely true). The scale includes items such as "I energetically pursue my goals." Total scores obtained from the scale range from 8 to 88. The fit indices of the scale were deemed acceptable, and the internal consistency reliability coefficient ($\alpha = .84$) was considered good (Tarhan & Bacanlı, 2015). In the current study, the DHS showed high reliability ($\alpha = .88$ and $\omega = .88$).

Self-efficacy

The Self-Efficacy Scale (SES) was used to assess the level of self-efficacy (Sherer et al., 1982). The Turkish version of the SES (Yıldırım & İlhan, 2010) consists of 17 items, categorized into three factors: initiative, persistence, and effort. Participants evaluate each item using a 5-point Likert scale (1 = never, 5 = very good). The SES includes items such as "Failure just makes me try harder." Total scores on the scale range from 17 to 85. The SES demonstrates a high reliability coefficient ($\alpha = .80$) and strong construct validity (Yıldırım & İlhan, 2010). In the present study, the SES showed good reliability ($\alpha = .83$ and $\omega = .83$).

Psychological Well-being

The Psychological Well-being Scale (PWBS; Diener et al., 2010) was used to evaluate levels of PWB. The Turkish version of the PWBS (Telef, 2013) comprises 8 items, each rated on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree). The PWBS includes items such as "I am competent and capable in the activities that are important to me." Total scores on the scale range from 8 to 56, with higher scores reflecting greater levels of PWB. The PWBS demonstrated good internal reliability ($\alpha = .80$) and acceptable goodness of fit values (Telef, 2013). In this study, the PWBS exhibited satisfactory reliability ($\alpha = .82$ and $\omega = .82$).

Data Analysis

Before testing the hypothesized model, several preliminary analyses were conducted. Descriptive analyses were performed to examine the characteristics of the variables. Normality assumptions were assessed by examining skewness and kurtosis values (Tabachnick & Fidell, 2013). The reliability of the variables was assessed using Cronbach's alpha and McDonald's omega coefficients. Pearson correlation analysis was employed to explore the relationships between the variables.

Structural Equation Modeling (SEM) was used to investigate whether hope and self-efficacy could serially mediate the relationship between cyberostracism and PWB (Kline, 2015). Serial mediation, also known as chain mediation, occurs when the effect of the independent variable is transmitted through multiple mediators before affecting the dependent variable (Hayes, 2018). Various fit indices were used to evaluate both the measurement and hypothesized models. According to accepted criteria (Hu & Bentler, 1999; Kline, 2015), a model is considered to fit the data well if the root-mean-square residual (SRMR) and root-mean-square error of approximation (RMSEA) values are below 0.08, while the comparative fit index (CFI), normed fit index (NFI), and goodness of fit index (GFI) are above 0.90. Additionally, to reduce measurement errors in single-factor measures, a parcellation technique was employed, dividing the unidimensional PWBS into two parcels (Little et al., 2002). To enhance the significance of the direct and indirect relationships in the models, bootstrap analyses were conducted with 5000 resampling iterations, using 95% confidence intervals (Preacher & Hayes, 2008).

Findings

Preliminary Analysis

Table 1 presents the findings from the preliminary analyses. The skewness values for the study variables ranged from -1.27 to 1.16, and the kurtosis values ranged from -0.12 to 1.29, indicating acceptable normality of the data. Additionally, the reliability coefficients for the variables were satisfactory, with both Cronbach's alpha (α) and McDonald's omega (ω) ≥ 0.82 . The composite reliability (CR) values exceeded 0.70, and the average variance extracted (AVE) values were above 0.50 (Bagozzi & Yi, 1988; Fornell & Larcker, 1981).

The correlation analysis revealed that PWB was negatively associated with cyberostracism ($r = -.518, p < .001$) and positively associated with both dispositional hope ($r = .593, p < .001$) and self-efficacy ($r = .549, p < .001$). Cyberostracism was negatively associated with both dispositional hope ($r = -.351, p < .001$) and self-efficacy ($r = -.381, p < .001$). Furthermore, dispositional hope was positively associated with self-efficacy ($r = .514, p < .001$).

Table 1.
Descriptive Statistics

Variables	Mean	SD	Skewness	Kurtosis	CR	AVE	α	ω	1	2	3
(1) CO	26.17	9.03	1.16	.91	.840	.637	.911	.911	1		
(2) DH	47.92	9.00	-.57	.05	.809	.683	.878	.878	-.351**	1	
(3) SE	58.24	9.04	-.46	-.12	.754	.510	.829	.831	-.381**	.514**	1
(4) PWB	38.29	7.21	-1.27	1.29	.798	.664	.823	.824	-.518**	.593**	.549**

Note. CO= cyberostracism, DH = dispositional hope, SE = self-efficacy, PWB = psychological well-being, AVE = average variance extract, CR = composite reliability, ** $p < .001$

When examining the scale scores in terms of students' demographic characteristics (see Table 2), there were no significant differences based on gender in cyberostracism ($t = -1.07, p > .05$), self-efficacy ($t = -1.20, p > .05$), and PWB scores ($t = -0.94, p > .05$). However, for dispositional hope ($t = 2.30, p < .05$), male students ($M = 49.81, SD = 7.76$) had higher levels of hope compared to female students ($M = 47.06, SD = 9.41$). There were no significant differences in cyberostracism scores based on education level ($t = -0.26, p > .05$). However, dispositional hope ($t = -2.15, p < .05$), self-efficacy ($t = -3.11, p < .01$), and PWB scores ($t = 2.69, p < .01$) differed significantly based on education level. Graduate students had significantly higher scores compared to undergraduate students in dispositional hope ($M = 50.51, SD = 8.54$ vs. $M = 47.48, SD = 9.02$), self-efficacy ($M = 61.98, SD = 8.37$ vs. $M = 57.61, SD = 9.01$), and PWB ($M = 40.87, SD = 7.27$ vs. $M = 37.84, SD = 7.12$). Additionally, there were no significant differences in cyberostracism ($F = 0.39, p > .05$), dispositional hope ($F = 0.94, p > .05$), and self-efficacy scores ($F = 0.26, p > .05$) based on socioeconomic status. However, PWB scores ($F = 2.69, p < .01$) differed significantly based on perceived income level. Students with higher income levels ($M = 40.20, SD = 6.73$) reported higher PWB scores compared to students with lower income levels ($M = 36.57, SD = 7.99$).

Table 2.
Analysis of Differences in Cyberostracism, Hope, Self-efficacy, and PWB Scores Based on Gender, Educational Status, and Socioeconomic Status

Measures	Demographics	Group	n	Mean	SD	t/F	p	d/η^2
CO	Gender	Female	221	25.80	9.11	-1.07	.284	-.129
		Male	101	26.97	8.86			
	Educational status	Undergraduate	275	26.12	9.19	-0.26	.794	-.041
		Graduate	47	26.49	8.15			
	Socioeconomic status	Low ¹	99	26.84	9.55	0.39	.678	.002
		Middle ²	138	25.89	8.66			
High ³		85	25.85	8.93				
DH	Gender	Female	221	47.06	9.41	-2.57	.011	-.309
		Male	101	49.81	7.76			
	Educational status	Undergraduate	275	47.48	9.02	-2.15	.033	-.339
		Graduate	47	50.51	8.54			
	Socioeconomic status	Low ¹	99	47.39	10.16	0.94	.393	.006
		Middle ²	138	47.60	8.44			
High ³		85	49.06	8.43				

Table 2 continuing

Measures	Demographics	Group	n	Mean	SD	t/F	p	d/ η^2
SE	Gender	Female	221	57.84	9.11	-1.20	.231	-.144
		Male	101	59.14	8.85			
	Educational status	Undergraduate	275	57.61	9.01	-3.11	.002	-.490
		Graduate	47	61.98	8.37			
	Socioeconomic status	Low ¹	99	57.92	8.86	0.26	.772	.002
		Middle ²	138	58.12	9.06			
High ³		85	58.83	9.28				
PWB	Gender	Female	221	38.03	7.49	-0.94	.351	.120
		Male	101	38.84	6.57			
	Educational status	Undergraduate	275	37.84	7.12	-2.69	.008	-.424
		Graduate	47	40.87	7.27			
	Socioeconomic status	Low ¹	99	36.57	7.99	5.99	.003	.036
		Middle ²	138	38.34	6.63			
High ³		85	40.20	6.73				

Note. CO= cyberostracism, DH = dispositional hope, SE = self-efficacy, PWB = psychological well-being, SD= standard deviation, df = degrees of freedom, t= independent samples t-test, F= one-way ANOVA, p = level of significance, *d* = Cohen's *d*, η^2 = Eta-square, *= Tukey test, 1,2,3= groups with different numbers for each variable in the same column.

Measurement Model

Before testing the hypothesis model, the measurement model was evaluated to ensure its adequacy. The model comprised four latent variables (cyberostracism, dispositional hope, self-efficacy, and PWB) and eight observed variables (cyber-direct excluded, cyber-indirect excluded, cyber-ignored, alternative ways thinking, actuating thinking, initiative, persistence, effort, well-being parcel 1, and well-being parcel 2). The results of the measurement model assessment indicated acceptable fit indices: $\chi^2 = 77.85$, $df = 29$, $p < .001$; $SRMR = .054$, $RMSEA = .072$, [90% CI: .053 - .092], $GFI = .95$, $CFI = .97$, $NFI = .95$, $IFI = .97$. These indices suggest that the measurement model fits the data well. Additionally, the results (Table 1) indicate that the measurement model's variables had satisfactory internal reliability, as well as discriminant and convergent validity (Bagozzi & Yi, 1988; Fornell & Larcker, 1981).

Structural Equation Modeling

In this study, four structural models were evaluated to understand the mediating roles of dispositional hope and self-efficacy in the relationship between cyberostracism and PWB. First, the full mediation of dispositional hope and self-efficacy in the link between cyberostracism and PWB was investigated (Model 1). The Model 1 did not provide an acceptable fit ($\chi^2 (31, N = 322) = 175.73$, $\chi^2/df = 5.67$, $SRMR = .09$, $RMSEA = .12$, $GFI = .89$, $CFI = .90$, $NFI = .88$, $AIC = 223.73$, $ECVI = .697$). Then, the role of hope and self-efficacy was examined by drawing a path from hope to self-efficacy (Model 2). The Model 2 had acceptable fit values ($\chi^2 (30, N = 322) = 111.21$, $\chi^2/df = 3.71$, $SRMR = .07$, $RMSEA = .09$, $GFI = .94$, $CFI = .94$, $NFI = .93$, $AIC = 161.41$, $ECVI = .503$). Then, the mediating model was examined by drawing a path from cyberostracism to PWB and from hope to self-efficacy (Model 3). The Model 3 had acceptable fit values ($\chi^2 (29, N = 322) = 77.85$, $\chi^2/df = 2.68$, $SRMR = .05$, $RMSEA = .07$, $GFI = .95$, $CFI = .97$, $NFI = .95$, $AIC = 129.85$, $ECVI = .405$). All relationships between the variables were significant. Lastly, the mediating model was examined by drawing a path from cyberostracism to PWB and from self-efficacy to hope (Model 4). The Model 4 had acceptable fit values ($\chi^2 (29, N = 322) = 77.85$, $\chi^2/df = 2.69$, $SRMR = .05$, $RMSEA = .07$, $GFI = .95$, $CFI = .96$, $NFI = .94$, $AIC = 130.85$, $ECVI = .405$). However the path from cyberostracism to hope was not significant for he Model 4. Among the tested models, Model 3 provided the best fit to the data, as evidenced by better fit indices and lower AIC and ECVI values. This model, which includes serial mediation with hope and self-efficacy in the relationship between cyberostracism and PWB, was considered to most accurately represent the relationships among the variables (see Figure 1).

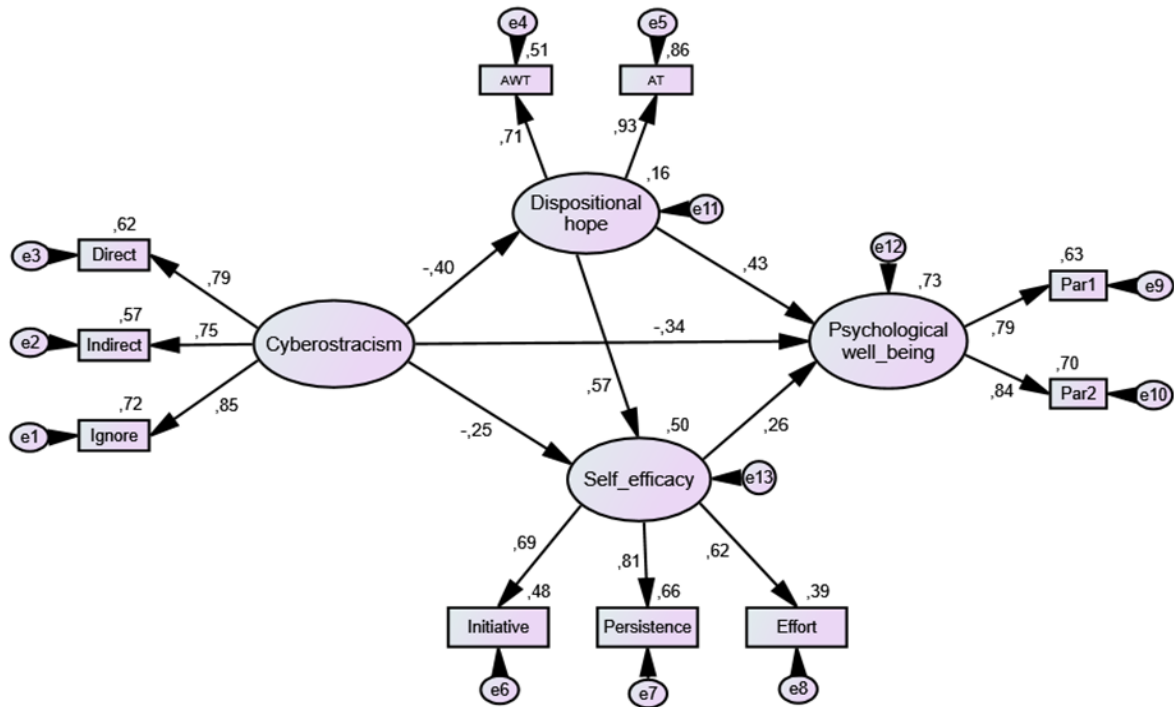


Figure 1. The Hypothesized Model Demonstrates the Links between the Variables

Bootstrap analysis results (Table 3) showed that cyberostracism significantly predicted hope ($\beta = -.404$, bootstrapping CI = $-.542$ to $-.238$), self-efficacy ($\beta = -.246$, bootstrapping CI = $-.381$ to $-.111$), and PWB ($\beta = -.343$, bootstrapping CI = $-.450$ to $-.229$). Hope ($\beta = .434$, bootstrapping CI = $.278$ to $.593$) and self-efficacy ($\beta = .257$, bootstrapping CI = $.069$ to $.448$) significantly predicted PWB. Additionally, hope positively predicted self-efficacy ($\beta = .574$, bootstrapping CI = $.442$ to $.700$). Cyberostracism explained 16% of the variance in hope, and when combined with hope, it accounted for 50% of the variance in self-efficacy. Independent and mediating variables together explained 73% of the variance in PWB. Analysis of the indirect effects showed that cyberostracism indirectly predicted PWB through hope and self-efficacy ($\beta = -.299$, bootstrapping CI = $-.400$ to $-.195$). Moreover, hope mediated the link between cyberostracism and self-efficacy ($\beta = -.232$, bootstrapping CI = $-.342$ to $-.128$). Finally, self-efficacy mediated the link between hope and PWB ($\beta = .148$, bootstrapping CI = $.041$ to $.269$). These findings suggest that hope and self-efficacy may serve as mediators in the relationship between cyberostracism and PWB (Table 3).

Table 3.

The Bootstrap Results for Standardized Coefficients

Paths	Coefficients	95% CI	
		LB	UB
Total effect			
CO → PWB	-.641***	-.749	-.508
Direct effects			
CO → DH	-.404***	-.542	-.238
CO → SE	-.246***	-.381	-.111
CO → PWB	-.343***	-.450	-.229
DH → SE	.574***	.442	.700
DH → PWB	.434***	.278	.593
SE → PWB	.257**	.069	.448

Table 3 continuing

Paths	Coefficients	95% CI	
		LB	UB
Indirect effects			
CO → DH → SE	-.232***	-.342	-.128
DH → SE → PW	.148*	.041	.269
CO → DH and SE → PWB	-.299**	-.400	-.195

Note. Bootstrap bias-corrected confidence intervals with 5,000 resamples. CI = confidence interval, LB = lower bound, UB = upper bound, CO = cyberostracism, DH = dispositional hope, SE = self-efficacy, PWB = psychological well-being. * $p < .05$, ** $p < .01$, *** $p < .001$.

Discussion

The main goal of this study was to enhance our understanding of the relationship between cyberostracism and PWB by examining the influence of hope and self-efficacy among university students. The results have significant implications for educational psychology, research, and school counseling. By highlighting the harmful effects of cyberostracism on PWB, the study underscores the need to address this issue within educational environments. In this section, before discussing the findings related to the study's hypotheses, we examined the scale scores for cyberostracism, dispositional hope, self-efficacy, and PWB in relation to students' demographic characteristics. The results indicated that male students had higher levels of hope compared to female students, but there were no differences in cyberostracism, self-efficacy, and PWB scores based on gender. When examined by education level, graduate students exhibited higher levels of dispositional hope, self-efficacy, and PWB compared to undergraduate students. Additionally, students with a higher perception of socioeconomic status reported higher PWB compared to those with a lower income level. However, cyberostracism, dispositional hope, and self-efficacy scores did not differ based on socioeconomic status. Previous studies have yielded both overlapping and differing results compared to the findings of this study. For instance, Ganji et al. (2023) found that male university students reported higher hope scores, while Yin et al. (2019) found that female high school students reported higher hope scores. These differing levels of hope may be attributed to cultural and developmental differences between male and female students. Furthermore, Wyatt and Oswalt (2013) found that undergraduate students reported higher levels of mental health issues compared to graduate students. Similarly, Dial et al. (2021) found that during the COVID-19 pandemic, undergraduate students experienced higher stress and less positive mood compared to graduate students. These results may be explained by the fact that graduate students generally show higher well-being than undergraduates, possibly due to greater likelihood of seeking help and support (Dial et al., 2021; Wyatt & Oswalt, 2013). Lastly, previous studies support the findings of this study by demonstrating that income level and socioeconomic status can significantly affect well-being (Kaplan et al., 2008; Navarro-Carrillo et al., 2020).

Research on cyberostracism and its effects on mental health outcomes has been the focus of several studies. Williams et al. (2000) examined the effects of cyberostracism, emphasizing its significance even in online settings. Cyberostracism, a form of social exclusion in online environments, has emerged as a significant concern in the digital age due to its potential adverse effects on mental well-being (Nezlek et al., 2012; Williams & Nida, 2011). The present study revealed that cyberostracism was significantly and negatively associated with PWB (H1). This finding aligns with previous research suggesting that cyberostracism can have detrimental effects on mental health (Li et al., 2022; Mattila et al., 2013). For instance, Tang and Duan (2021) found that cyberostracism predicted emotional well-being in an experimental study. Lutz (2022) demonstrated that cyberostracism was negatively associated with basic psychological needs, adversely affecting individuals' well-being. Additionally, Wang et al. (2022) reported that cyberostracism was negatively associated with both emotional well-being and PWB among college students. Although previous studies have shown that cyberostracism is negatively associated with well-being, the relationship between cyberostracism and PWB can be complex and multifaceted. This suggests that the impact of cyberostracism on well-being and mental health may vary among university students and young adults. Therefore, it is important to consider mediating variables, such as

risk and protective factors, that can explain the relationships between cyberostracism and PWB among university students. For instance, factors such as fulfilling basic needs (Wang et al., 2022), self-esteem and mindfulness (Yuju et al., 2018), and optimism (Niu et al., 2018) have been found to mediate the link between cyberostracism and well-being. Additionally, exposure to cyberostracism can negatively impact students' self-efficacy by reducing their hopes about their relationships, themselves, and their futures, which can, in turn, adversely affect their overall well-being. However, the roles of hope and self-efficacy in the association between cyberostracism and PWB have not yet been examined. Thus, investigating the relationships and mediating roles of hope and self-efficacy in the context of cyberostracism and PWB is crucial.

This study indicated that cyberostracism is significantly and negatively associated with hope (H2) and self-efficacy among university students (H3). Cyberostracism may have a detrimental impact on students' hope and self-efficacy. Exposure to cyberostracism can weaken behavioral regulation, lead to negative emotions and outcomes, and erode students' belief in their capabilities. Research has shown that cyberostracism can impair individuals' ability to regulate behavior, which is crucial for maintaining hope and self-efficacy (Shi et al., 2022). Additionally, cyberostracism is associated with negative emotions, lower satisfaction, and adverse behavioral outcomes, all of which can contribute to a decline in hope and self-efficacy among university students (Mattila et al., 2013). Hope plays a significant role in the association between negative life events and mental well-being (Huen et al., 2015; Visser et al., 2012), underscoring its importance in mitigating the adverse effects of cyberostracism on mental well-being. Individuals with higher levels of hope might be more effective at managing challenges like cyberostracism. Similarly, self-efficacy is also influenced by cyberostracism. Low levels of self-efficacy are linked to behavioral avoidance, while high levels can encourage the initiation and persistence of behavior (Ren et al., 2021). Cyberostracism may undermine individuals' self-efficacy by creating feelings of exclusion and inadequacy, which can further diminish their hope and confidence in their abilities.

The results revealed that hope (H4) and self-efficacy (H5) mediated the association between cyberostracism and PWB among university students. Additionally, hope mediated the link between cyberostracism and self-efficacy. This suggests that individuals who experience cyberostracism might have lower levels of hope, which, in turn, impacts their belief in their ability to handle challenges. Similarly, self-efficacy serves as a mediator in the relationship between hope and PWB, indicating that individuals with higher levels of hope are more likely to exhibit greater self-efficacy, leading to enhanced PWB. In a study investigating the links among hope, self-efficacy, and overall well-being, researchers found that hope and self-efficacy accounted for general well-being (Magaletta & Oliver, 1999). Duggleby et al. (2009) emphasized that hope is associated with feelings of empowerment, highlighting an individual's perception of control over their life. These results suggest that hope and self-efficacy are significant factors in promoting PWB and mental health (Gallagher et al., 2019). Previous studies have not explored the mediating roles of hope and self-efficacy in the association between cyberostracism and PWB. However, the mediating roles of other variables have been examined. For example, Wang et al. (2022) conducted a cross-sectional study with university students, revealing that the satisfaction of basic psychological needs mediated the connection between cyberostracism and emotional well-being as well as PWB. Additionally, other studies involving adolescents and university students have found that self-esteem (Yuju et al., 2018) and optimism (Niu et al., 2018) mediate the association between cyberostracism and depression. In a study with Turkish college students, Pamuk and Cırcır (2023) found that emotional stability serves as a significant factor in the association between cyberostracism and adjustment problems, indicating that emotional stability mitigates the adverse effects of cyberostracism on psychological adjustment.

The current study reinforces the notion that hope and self-efficacy play crucial roles in fostering students' well-being. Both hope and self-efficacy were significantly associated with PWB, highlighting their substantial contributions to enhancing PWB and mental health (Heinitz et al., 2018; Gallagher et al., 2019). In conclusion, the study underscores the importance of hope and self-efficacy in mitigating the negative effects of cyberostracism on PWB. These factors serve as protective mechanisms, emphasizing the need to nurture hope and self-efficacy to improve mental well-being in the context of cyberostracism.

The findings from this study may have significant implications for educational settings. By highlighting the detrimental effects of cyberostracism on students' PWB, this study underscores the need for educational institutions to address this issue proactively. Educators should be aware of the potential harm caused by cyberostracism and develop strategies to foster inclusive online environments. Educational institutions can incorporate modules and workshops focused on building hope and self-efficacy. For example, integrating positive psychology practices into the curriculum can help students develop a more hopeful outlook and greater confidence in their abilities, which can buffer against the negative effects of cyberostracism. Additionally, universities can establish support programs that specifically address the issue of cyberostracism. These programs might include peer support groups, counseling services, and online resources that provide strategies for coping with exclusion and building resilience. By focusing on these educational implications, institutions can not only improve students' PWB but also create a more supportive and inclusive learning environment. This research provides a foundation for future studies to explore additional strategies and interventions that can further enhance students' resilience against the negative impacts of cyberostracism.

Conclusion and Limitations

This study highlights the complex interplay between cyberostracism, hope, self-efficacy, and PWB among university students, offering significant insights for educational psychology, educational research, and school counseling. The findings underscore the importance of addressing cyberostracism and enhancing hope and self-efficacy as strategies to improve PWB in this population. Recognizing the critical role of these factors enables the development of effective interventions to address the challenges posed by cyberostracism in digital communication environments. This research not only advances our understanding of how online social dynamics affect well-being but also provides valuable insights for developing strategies to enhance mental and academic performance in the digital age. Future research could further explore these relationships and examine potential interventions to increase hope, self-efficacy, and social relationship skills among college students exposed to cyberostracism.

This study has certain limitations. The participants were exclusively Turkish undergraduate and postgraduate students, which may limit the generalizability of the results to other age groups. Future studies could enhance external validity by including high school students, middle-aged adults, and older adults. The study employed a cross-sectional design, which prevents establishing causal associations between cyberostracism, hope, self-efficacy, and PWB. Longitudinal and experimental designs could provide more robust evidence of causality. The data were collected using self-report measures, which are susceptible to response biases and social desirability effects. Future studies could incorporate triangulation in data collection techniques, such as observation and qualitative interviews, to support the validity of the results. Additionally, examining teachers' perspectives on how students are affected by cyberostracism could be valuable. While this study investigated the mediating roles of hope and self-efficacy, other potential mediators and moderators were not explored. Future research could enhance our understanding of the mechanisms underlying the relationship between cyberostracism and PWB by including additional variables such as resilience, psychological flexibility, social support, mindfulness, and self-compassion. The study was conducted within a specific cultural context, which may limit the generalizability of the findings to other cultural settings. Replication studies in different cultural contexts could help determine the cross-cultural applicability of the results.

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Ethics statement: In this study, I declare that the rules stated in the "Higher Education Institutions Scientific Research and Publication Ethics Directive" are complied with and that I do not take any of the actions based on "Actions Against Scientific Research and Publication Ethics". At the same time, I declare that there is no conflict of interest, and that all the responsibility belongs to the article author in case of all ethical violations.

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