

## Research Article

# Does the Experience of Being Phubbed by Friends Affect Psychological Well-Being? The Mediating Roles of Loneliness, Relationship Satisfaction, and Self-Esteem

Yeslam Al-Saggaf <sup>1,2</sup>

<sup>1</sup>School of Computing, Mathematics and Engineering, Charles Sturt University, Australia

<sup>2</sup>Instituto Cultura y Sociedad, Universidad de Navarra, Spain

Correspondence should be addressed to Yeslam Al-Saggaf; [yalsaggaf@csu.edu.au](mailto:yalsaggaf@csu.edu.au)

Received 23 February 2023; Revised 15 April 2023; Accepted 27 June 2023; Published 18 July 2023

Academic Editor: Zheng Yan

Copyright © 2023 Yeslam Al-Saggaf. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Phubbing is so common that many probably think it is harmless. Past research found that phubbing partners indirectly affected their well-being. The current study was aimed at investigating whether phubbing friends is also indirectly related to their well-being. A total of 457 smartphone users attempted an online survey from which 202 complete responses were included in the final analysis. The questionnaire contained measures of the experience of being phubbed by friends, psychological well-being, loneliness, friendship satisfaction, and self-esteem. A mediation analysis revealed a significant indirect effect of being phubbed by friends on psychological well-being, through the mediating roles of loneliness and relationship satisfaction and the sequential mediating roles of loneliness and self-esteem, and relationship satisfaction and self-esteem. Being phubbed by friends was associated with an increase in the phubbed friends' levels of loneliness and a decrease in their levels of friendship satisfaction and, as a result, in a worsening of their psychological well-being. An increase in levels of loneliness or a decrease in levels of friendship satisfaction was also negatively associated with self-esteem and, in turn, with psychological well-being. These findings extend past research on partner phubbing by establishing new pathways between the experience of being phubbed by friends and psychological well-being. Overall, this study contributes important insights into friends' use of smartphones in face-to-face settings by highlighting the psychological mechanism that explains the relationship between being phubbed by friends and the phubbed individuals' psychological well-being.

## 1. Introduction

Inappropriate use of smartphones in social settings has complicated the relationships among youth and affected their well-being [1]. Dependency on smartphones [2, 3] has created a new problem, namely, phubbing [4]. Every time you enter a coffee shop, there is a good chance that the group of young people sitting with each other around you are not talking to each other [5]. Instead, you will see them sitting quietly with their heads leaning forward and with both of their hands holding their smartphones [5]. Phubbing is the momentary shifting of one's attention from a face-to-face conversation to the smartphone [6]. The individual who engages in phubbing behaviour is labelled a "phubber" [7]. The phubbed, often called phubbee, is the individual being

ignored by the phubber, during a copresent social interaction, in favour of the smartphone [7].

Phubbing has been found to be associated with a long list of detrimental effects [8] including ostracism [9], loneliness [10], anxiety [11], depression [12], smartphone addiction [13], cyberbullying perpetration [14], withdrawal [15], aggression [16], lower self-evaluation [17], academic procrastination [18], and poor academic performance [19]. Phubbing can also increase smartphone-related conflicts [20], lowers evaluations of relationship quality [21], and heightens feelings of jealousy [22]. Phubbing is associated with loss of face [13], annoyance [23], and confrontations [24]. Phubbing can lower levels of happiness, family connectedness, friendship satisfaction, job performance, and motivation [25]. Phubbing can negatively affect satisfaction

with life [26], the quality of friendship, communication skills, and the perception regarding one's importance to those closest to them [27].

The literature indicates that friendship is important for one's psychological well-being [28]. What is not clear from the literature is how young people's phubbing affects the phubbed friends' psychological well-being. This study will investigate this effect on the phubbed friends. The aim of this study is to investigate the effect of friends' phubbing on the phubbed individuals' psychological well-being.

The study makes five contributions. (1) It highlights the underresearched area of phubbing among friends, particularly among youth, which has received less attention compared to phubbing children, partners, and employees [8]. (2) It uses the Being Phubbed scale to measure the effect of phubbing from the phubbee's perspective, which is a different approach from previous studies that mainly relied on the phubber's perspective; see, for example, [25]. (3) It focuses on the impact of phubbing on psychological well-being, an aspect that has been largely overlooked in existing research that has mainly focused on emotional, subjective, or mental well-being [29]. (4) It takes into consideration the mediating roles of friendship satisfaction, loneliness, and self-esteem, in the relationship between being phubbed and psychological well-being, which have not been included together in a mediation analysis model before. (5) It explores the moderating role of self-esteem in the relationship between being phubbed and psychological well-being, given that self-esteem has played a dual role in the complex relationship between phubbing and psychological well-being.

It should be noted that while emotional well-being, subjective well-being, mental well-being, and psychological well-being are all related to an individual's overall well-being, each has a slightly different meaning and focus. Emotional well-being refers to an individual's ability to manage and regulate their emotions effectively. It involves having a sense of control over one's emotions and being able to experience a range of positive emotions such as joy, love, and contentment [30]. Subjective well-being refers to an individual's overall evaluation of their life and experiences, including their emotional state, satisfaction with their relationships, sense of purpose, and meaning in life. It encompasses both cognitive and affective components of well-being [31]. Mental well-being refers to an individual's state of mind and the extent to which they are able to function effectively in their daily life. It involves factors such as stress management, coping strategies, and resilience [32]. Psychological well-being refers to an individual's overall sense of happiness and fulfillment in life and is often associated with positive psychological traits such as self-esteem, optimism, sense of purpose, and meaning in life [33].

## **2. Being Phubbed, Psychological Well-Being, Loneliness, Friendship Satisfaction, and Self-Esteem**

Phubbing and being phubbed are not the same thing. Phubbing is looking at the behaviour from a phubber's perspec-

tive. Being phubbed is looking at the experience from a phubbee's perspective [1]. The effect of phubbing and being phubbed should be measured using measuring instruments that take into account the two mentioned perspectives. Often the same scale is used to measure either phubbing or being phubbed or both [1]. This study adopted Chotpitayasunondh and Douglas's [34] Generic Scale of Being Phubbed to measure the effect of being phubbed by friends. This scale is different from Chotpitayasunondh and Douglas's [34] Generic Scale of Phubbing.

Psychological well-being is a complex psychological concept. For some, it is happiness as understood in terms of the balance between negative affect and positive affect. For others, it is satisfaction with life [35]. Psychological well-being encompasses six dimensions: self-acceptance, environmental mastery, purpose in life, positive relations with others, personal growth, and autonomy [35]. Psychological well-being and phubbing are related [36]. A study by Caner [37] revealed that partner phubbing indirectly negatively affected life satisfaction through the mediating roles of relationship satisfaction and romantic relationship quality. Life satisfaction is a measure of well-being [38]. Partner-phubbing literature indicates that phubbing partners indirectly affected their well-being. In David and Roberts' [39] study, this indirect effect was through worsening levels of anxiety and depression. The existence of an indirect effect of partner phubbing on psychological well-being suggests friend phubbing is likely to have an indirect effect on the phubbed friends' psychological well-being. A study by Sun & Samp [25] found a negative association between friend phubbing and friendship satisfaction, a finding that is consistent with the above finding of Keyes [32], so the indirect effect of being phubbed by friends on psychological well-being is not unlikely.

Loneliness is experienced when social relationships are judged to be deficient [29]. Loneliness was not found to be a strong predictor of phubbing [10]. But peer phubbing among adolescents has been found to be a predictor of loneliness [40]. Being phubbed by a peer triggered adolescents' feelings of rejection, and this increased their loneliness [40]. At the same time, loneliness was seldom treated as a mediator capable of carrying the effect of phubbing to the outcome variable under investigation. But there is evidence in the literature that suggests that loneliness can act as a mediator. Wang et al. [41], for example, found that loneliness mediated the association between father phubbing and children's social networking sites addiction. Given that friend phubbing predicts loneliness and that loneliness is linked to well-being [42], loneliness is predicted to mediate the relationship between being phubbed by friends and psychological well-being.

Phubbing significantly negatively affects relationship satisfaction [8]. However, the effect of friends' phubbing on friendship satisfaction is not yet fully understood. A study by Sun & Samp [25] revealed that individuals who phubbed their friends did so because they were not satisfied with their friendships. If individuals phubbed their friends because they were not satisfied with their friendships, it makes more sense that the phubbed individuals will be less satisfied with

their friendships if their friends regularly phubbed them. Indeed, one study found peer phubbing to have a negative effect on the quality of friendship among students [43]. Since being phubbed by friends negatively affected the phubbed individuals' relationship satisfaction with their friends, and given that a decline in relationship satisfaction is associated with a decline in psychological well-being [44], friendship satisfaction is predicted to mediate the relationship between being phubbed by friends and psychological well-being.

Phubbing is negatively correlated with self-esteem [45]. A study by Hao et al. [46] found that phubbing significantly threatened self-esteem. In the phubbing literature, self-esteem is often treated as a mediator [45]; see, for example, Hong et al. [47] and Xie et al. [48]. But a study by Wang et al. [49] treated self-esteem as a moderator and found that self-esteem significantly moderated the relationship between phubbing and depressive symptoms in children. Since it is not clear what role self-esteem will play in the relationship between being phubbed by friends and psychological well-being, this study will test the role of self-esteem as a mediator and as a moderator. As a mediator, self-esteem will be entered into the hypothesised mediation models, to see if it plays a role in mediating the effect of being phubbed on the phubbed friends' psychological well-being. As a moderator, self-esteem will be entered into a moderation model, to see if the effect of phubbing on the phubbed friends' psychological well-being is stronger for youth with lower self-esteem.

This study will assess the mediating roles of loneliness, friendship satisfaction, and self-esteem in the relationship between being phubbed and psychological well-being. The moderating role of self-esteem in the relationship between being phubbed and psychological well-being will also be investigated. The study will test the following hypotheses:

Hypothesis 1 (H1): being phubbed by friends would predict loneliness.

Hypothesis 2 (H2): being phubbed by friends would predict friendship satisfaction.

Hypothesis 3 (H3): loneliness would predict psychological well-being.

Hypothesis 4 (H4): friendship satisfaction would predict psychological well-being.

Hypothesis 5 (H5): loneliness will mediate the relationship between being phubbed by friends and psychological well-being.

Hypothesis 6 (H6): friendship satisfaction will mediate the relationship between being phubbed by friends and psychological well-being.

### 3. Method

This section covers recruitment, sampling, ethical considerations, and measurements, as well as the reliability and the validity of the scales and the techniques used in analysing the data.

**3.1. Procedure.** The present study used an anonymous online survey questionnaire administered via Qualtrics. The survey was made available for participants to take after ethics approval from the author's University Human Research

Ethics Committee was obtained. Data collection took place during the last three months of 2022. A total of 457 responses to the survey were submitted, but only 202 responses were used. One individual selected the "Under 14" age group and 120 participants selected the "25 or above" age group and were all immediately removed from the survey because they were not eligible to participate. The criterion for participation was that all participants needed to be between 14 and 24. The other 134 participants were excluded because they submitted incomplete responses. This study was aimed at collecting data from two age groups: adolescents (14-17) and youth (18-24). Both groups have been shown to be among the heaviest users of smartphones [50]. Indeed, these two groups are more likely than others to experience significant life changes, which may impact smartphone use and its potential effects. By studying these age groups, we can gain a better understanding of how smartphone use affects young people as they navigate through these life changes.

The method of sampling was convenience sampling. The study was advertised on several sites including the author's university daily newsletter, Survey Circle, Survey Swap, Reddit (Sample Size), and the StudentRoom.UK. The author's media engagements and an article in the Australian Conversation also contributed to the efforts of recruiting participants for this study. Participants were warned in the information consent statement that it is possible that the survey questions may evoke negative emotions, especially if they triggered memories of negative experiences, and were asked to exercise caution. If they felt uncomfortable, they were encouraged to discontinue participation, and if they felt the need to talk to someone, they were asked to contact their health care professional, a counsellor, or a close friend and could visit Beyond Blue at <https://www.beyondblue.org.au>, which has useful resources for support. Data collection was anonymous, and the dataset is stored securely in accordance with the author's University Human Research Ethics Committee-approved project's Data Management Plan.

**3.2. Participants.** Participants were aged between 16 and 24 with the majority's age (~46%) falling between 20 and 24. This is excluding ~10% who did not respond to the specific age question, "Please indicate your age," which is different from the eligibility question, i.e., of being between 14 and 24. Approximately 38% of the participants, excluding ~10% who did not respond to this question, were female (coded as 2), and 18.1% were male (coded as 1). Participants were not asked about their country of residence, but as Qualtrics captured their geolocation data (excluding those missing), their latitude and longitude data were mapped in RStudio. As can be seen from Figure 1, participants mostly resided in the UK, US, and Europe.

#### 3.3. Measures

**3.3.1. Being Phubbed.** To measure the effect of friends' phubbing, the Generic Scale of Being Phubbed (GSBP) [34] was used after replacing the word "others" with "my friend(s)." The GSBP scale consists of 22 items. The questionnaire rates

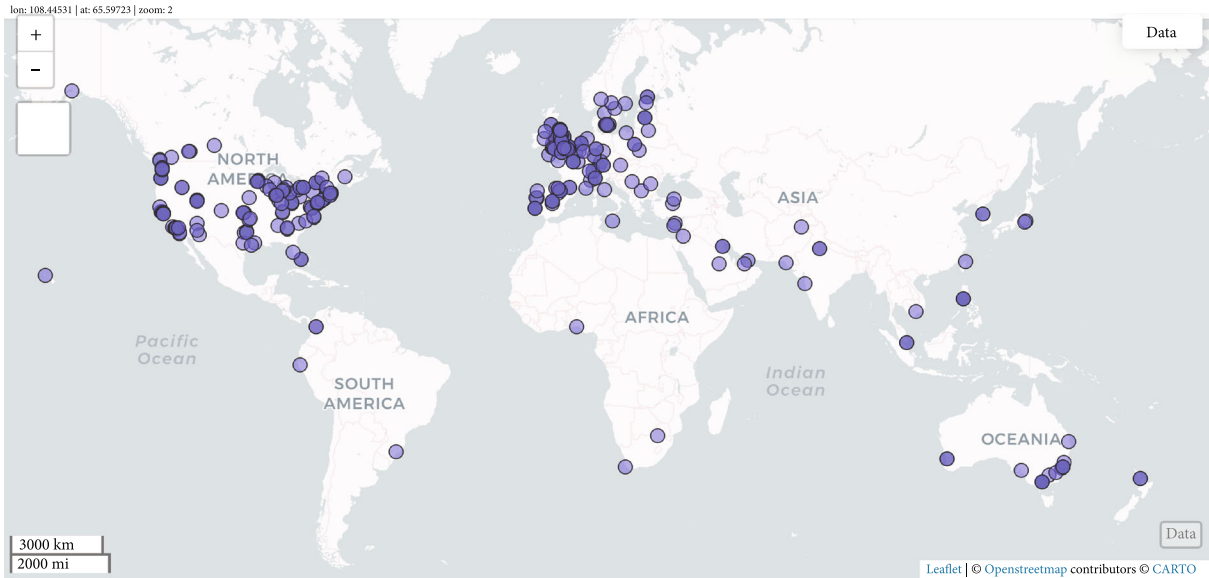


FIGURE 1: Location of participants.

the experience of being phubbed in social interactions on a seven-point Likert scale from one (*never*) to seven (*always*). The GSBP consists of three factors: perceived norms (PN), feeling ignored (FI), and interpersonal conflict (IC). The scale includes items such as “My friend(s) seems to be using their phone to go online,” “My friend(s) seems anxious if their phone is not nearby,” and “My friend(s) places their phone where they can see it.” The Cronbach  $\alpha$  for the scale in this study was .967, which is within the .92-.97 range of the Cronbach  $\alpha$  for the original scale. The scale’s validity was assessed using an Exploratory Factor Analysis in SPSS. The Kaiser-Meyer-Olkin (KMO = .957) measure and Bartlett’s Test of Sphericity ( $p < .001$ ) indicated that the three factors were correctly extracted using the Principal Components with Varimax rotation. The three factors, all with an eigenvalue above 1.319, explained 74.1% of the variance. The scale’s validity was also cross checked using a Confirmatory Factor Analysis in Amos. The confirmatory factor analysis ( $\chi^2 = 544.563$ , DF = 206, CFI = .926, TLI = .909, and RMSEA 0.060) confirmed that the items loaded well on their factors (see Figure 2). Table 1 shows the mean and the standard deviation for the scale. Looking at the mean, it would appear overall that the survey respondents experienced being phubbed by their friends only occasionally. Thus, participants did not perceive high levels of phubbing by their friends.

**3.3.2. Loneliness.** Loneliness was measured using the three-item loneliness scale [51]. The scale consists of the following questions: “How often do you feel that you lack companionship?,” “How often do you feel left out?,” and “How often do you feel isolated from others?” The scale rates the experience of being lonely on a three-point scale ranging from “hardly ever” (coded as 1) to “often” (coded as 3). The Cronbach  $\alpha$  for the scale in this study was .816. According to the scale instructions, a score between 3 and 5 indicates that the respondent is not lonely, whereas a scale of 6 to 9 indicates that the respondent is lonely. Considering the mean in this

study is 6 (see Table 1), this would indicate that, overall, the sample is high on loneliness.

**3.3.3. Friendship Satisfaction.** To measure friendship satisfaction, the relationship satisfaction scale [52] was used after replacing the word “partner” with “friend(s).” The relationship satisfaction questionnaire consists of four items and includes statements such as “I am extremely satisfied with my relationship with my friend(s),” and “My relationship with my friend(s) is very rewarding.” The scale rates relationship satisfaction on a nine-point Likert scale ranging from 1 (not at all) to 9 (completely true). The Cronbach  $\alpha$  for the scale in this study was .876. The scale’s validity was assessed using an Exploratory Factor Analysis in SPSS. Kaiser-Meyer-Olkin (KMO = .823) measure and Bartlett’s Test of Sphericity ( $p < .001$ ) indicated that the factor was correctly extracted using the Principal Components with Varimax rotation. The extracted factor had an eigenvalue of 2.945 and explained 73.618% of the variance. The scale’s validity was also validated using a Confirmatory Factor Analysis in Amos. The confirmatory factor analysis ( $\chi^2 = .651$ , DF = 2, CFI = 1, TLI = 1.014, and RMSEA 0.00) confirmed that the items loaded well on the single factor (see Figure 3).

**3.3.4. Psychological Well-Being.** Psychological well-being was measured using Ryff’s psychological well-being scales [35]. The 18-item scale rates different aspects of well-being on a six-point scale from one (strongly disagree) to six (strongly agree). The questionnaire consists of six factors: autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. Each factor is associated with three of the 18 items. The Cronbach  $\alpha$  for the scale in this study was .803.

**3.3.5. Self-Esteem.** Self-esteem was measured using the Rosenberg Self-Esteem Scale [53]. The 10-item questionnaire rates

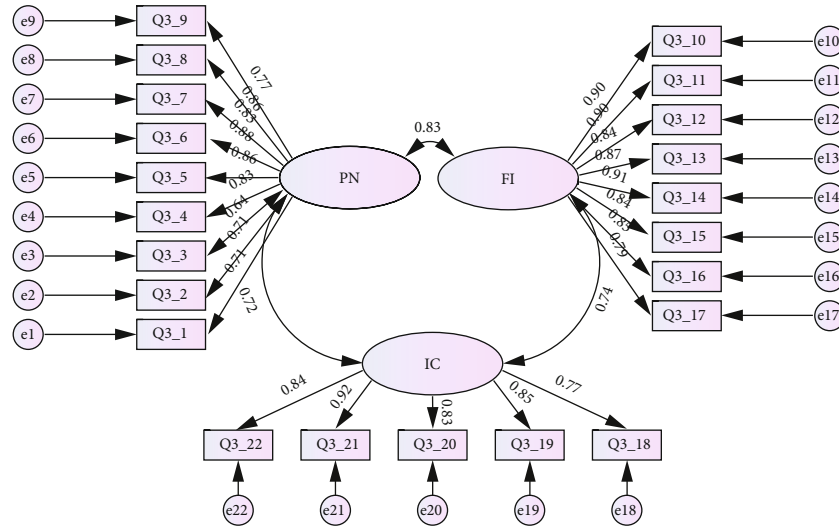


FIGURE 2: Confirmatory factor analysis for being phubbed.

TABLE 1: Mean scores and standard deviations of variables.

| Variable                 | Minimum | Maximum | M     | Median | SD    | Skewness | Kurtosis |
|--------------------------|---------|---------|-------|--------|-------|----------|----------|
| Being phubbed            | 23      | 154     | 69.40 | 65.5   | 27.71 | .54      | -.27     |
| Loneliness               | 3       | 9       | 6     | 6      | 1.79  | .08      | -.78     |
| Friendship satisfaction  | 5       | 36      | 26.2  | 27     | 6.3   | -.63     | .33      |
| Psychological well-being | 51      | 101     | 74.99 | 76     | 11.34 | .01      | -.72     |
| Self-esteem              | 10      | 40      | 27.5  | 28     | 5.93  | -.26     | .19      |

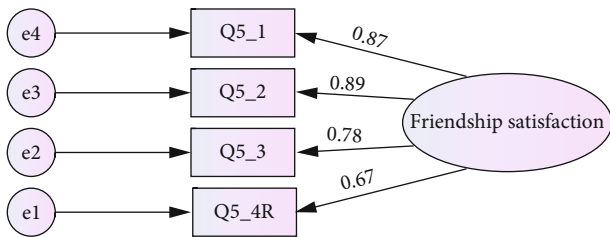


FIGURE 3: Confirmatory factor analysis for friendship satisfaction.

self-esteem on a four-point scale from one (strongly disagree) to four (strongly agree). The Cronbach  $\alpha$  for the scale in this study was .895.

**3.4. Data Analysis.** The required sample size for the serial mediation was calculated using the Monte Carlo Power Analysis for Indirect Effects simulation web app [54]. The Monte Carlo Power Analysis web app determined that for an 80% power to detect an indirect effect, given a standardised coefficient of 0.3 for each model path, except for the direct effect of  $c'$ , ( $\alpha = 0.05$ , 5000 replications), 145 responses were sufficient.

Data analysis was performed using IBM SPSS Version 29 and IBM SPSS Amos Version 29. Scales were scored after the reversed items were recoded. The scales are scored by summing the values of each participant’s response to the scale items. Descriptive statistics, plots, correlation, and regression analyses involving all variables were carried out on the dataset to gain an understanding of the data. The main anal-

ysis technique used in this study was sequential mediation (Model 6) using PROCESS Macro 4.2 in SPSS [55]. The role of self-esteem as a moderator was also tested via Hayes’ PROCESS Macro version 4.2 for SPSS using Model 92 to see if the effect of phubbing on the phubbed friends’ psychological well-being is stronger for youth with lower self-esteem. Self-esteem did not moderate any interaction effect, so no results relating to moderation will be reported. All analyses were conducted with bootstrapping selected to take advantage of this technique’s robustness against violations of normality assumptions [56]. The bootstrapping technique used confidence intervals (CIs) of 95% from 10,000 random samples.

Being phubbed was treated as the independent variable (predictor) and psychological well-being as the dependent variable (outcome). Loneliness, friendship satisfaction, and self-esteem were included in the analysis models as mediators to find out if friends’ phubbing affects psychological well-being through its effect on loneliness and friendship satisfaction or these two together with self-esteem. This will allow the opportunity to see how the effect of friends’ phubbing takes place, in other words, the psychological mechanism. Age and gender, of the final sample ( $N = 202$ ), were included in the preliminary correlation, regression, and sequential mediation analyses as covariates but were not found to be associated with any statistically significant results; therefore, they were not included in the final correlation, regression, and sequential mediation analyses.

## 4. Results

**4.1. Correlations.** Pearson's correlation analysis revealed that being phubbed was positively correlated with loneliness ( $r = .29, p < 0.001$ ) and negatively correlated with friendship satisfaction ( $r = -.28, p < 0.001$ ). Loneliness was negatively correlated with friendship satisfaction ( $r = -.50, p < 0.001$ ), psychological well-being ( $r = -.46, p < 0.001$ ), and self-esteem ( $r = -.41, p < 0.001$ ). Friendship satisfaction was positively correlated with psychological well-being ( $r = .40, p < 0.001$ ) and self-esteem ( $r = .25, p < 0.001$ ). Lastly, psychological well-being was positively correlated with self-esteem ( $r = .71, p < 0.001$ ). Table 2 shows the results of Pearson's correlation analysis among the variables.

**4.2. Regression.** The regression model, which was significant ( $F(4) = 62.8, p < .001$ ) accounting for 56% of the variance, showed that being phubbed did not predict psychological well-being, so as expected, there is no direct association between the two variables. However, loneliness ( $b = -0.71, 95\% \text{ CI: } [-1.38, -0.01]$ ), friendship satisfaction ( $b = 0.35, 95\% \text{ CI: } [0.15, 0.53]$ ), and self-esteem ( $b = 1.17, 95\% \text{ CI: } [1.00, 1.35]$ ) all predicted psychological well-being. Table 3 shows the results of the bootstrapped regression analysis.

**4.3. Mediation.** Three mediation models were tested in which each included two of the three mediating variables. The effect of being phubbed by friends on youth's psychological well-being was expected to be fully sequentially mediated by loneliness, friendship satisfaction, and self-esteem. Sequential mediation was tested via Hayes' PROCESS Macro version 4.2 for SPSS using Model 6 and 10,000 random bootstrap samples. The sequential mediation analysis revealed four significant indirect effects. Table 4 shows the results of the bootstrapped sequential mediation.

For the being phubbed -> loneliness -> psychological well-being path (see Figure 4), being phubbed significantly positively predicted loneliness ( $b = 0.02, 95\% \text{ CI: } [0.01, 0.03]$ ), supporting H1, and loneliness significantly negatively predicted psychological well-being ( $b = -1.23, 95\% \text{ CI: } [-1.91, -0.55]$ ), confirming H3. Loneliness mediated the relationship between being phubbed by friends and psychological well-being, thereby supporting H5. It appears an increase in levels of being phubbed was associated with an increase in levels of loneliness, and this increase in levels of loneliness was associated with a decrease in levels of psychological well-being.

For the being phubbed -> loneliness -> self-esteem -> psychological well-being path (see Figure 4), loneliness significantly negatively predicted self-esteem ( $b = -1.43, 95\% \text{ CI: } [-1.87, -0.99]$ ), and self-esteem significantly positively predicted psychological well-being ( $b = 1.19, 95\% \text{ CI: } [1.01, 1.37]$ ). It appears an increase in levels of being phubbed was associated with an increase in levels of loneliness, and this increase in levels of loneliness was associated with a decrease in levels of self-esteem. The drop in levels of self-esteem was associated with a drop in levels of psychological well-being.

TABLE 2: Pearson's correlations among variables using 10,000 bootstrap samples ( $N = 202$ ).

| Variable                 | 1 | 2     | 3      | 4      | 5      |
|--------------------------|---|-------|--------|--------|--------|
| Being phubbed            | — | .29** | -.28** | -.115  | -.060  |
| Loneliness               |   | —     | -.50** | -.46** | -.41** |
| Friendship satisfaction  |   |       | —      | .40**  | .25**  |
| Psychological well-being |   |       |        | —      | .71**  |
| Self-esteem              |   |       |        |        | —      |

\*\*Correlation is significant at the 0.000 level (2-tailed).

For the being phubbed -> friendship satisfaction -> psychological well-being path (see Figure 5), as hypothesised (H2), being phubbed significantly negatively predicted friendship satisfaction ( $b = -0.06, 95\% \text{ CI: } [-0.09, -0.03]$ ), and in accordance with H4, friendship satisfaction significantly positively predicted psychological well-being ( $b = 0.43, 95\% \text{ CI: } [0.24, 0.61]$ ). Friendship satisfaction mediated the relationship between being phubbed by friends and psychological well-being, thus confirming H6. It appears that an increase in levels of being phubbed was associated with a decrease in levels of friendship satisfaction, and this decrease in levels of friendship satisfaction was associated with a decrease in levels of psychological well-being.

For the being phubbed -> friendship satisfaction -> self-esteem -> psychological well-being path (see Figure 5), friendship satisfaction significantly positively predicted self-esteem ( $b = 0.24, 95\% \text{ CI: } [0.10, 0.37]$ ), and self-esteem significantly positively predicted psychological well-being ( $b = 1.24, 95\% \text{ CI: } [1.07, 1.40]$ ). It appears that an increase in levels of being phubbed was associated with a decrease in levels of friendship satisfaction, and this decrease in levels of friendship satisfaction was associated with a decrease in levels of self-esteem. The drop in levels of self-esteem was associated with a drop in psychological well-being.

## 5. Discussion and Conclusion

Past research found that phubbing partners indirectly affected their well-being [57]. The current study was aimed at investigating whether phubbing friends is also indirectly related to well-being. The above results of the mediation analysis show that being phubbed by friends did not have a direct relationship with youth's psychological well-being in any mediation model tested during analysis. The relationship of being phubbed by friends with youth's psychological well-being was fully operated through mediating variables. The literature reviewed above, e.g., [24, 32, 36, 38, 42, 43, 45], suggested that being phubbed can affect psychological well-being indirectly through several mediating variables, such as loneliness, relationship satisfaction, and self-esteem. This highlighted the need to test multiple mediating paths, including sequential mediation, between being phubbed by friends and psychological well-being. Given psychological well-being is a broad concept that encompasses multiple dimensions, including self-acceptance, environmental mastery, purpose in life, positive relations with others, personal

TABLE 3: Regression analysis using 10,000 bootstrap samples ( $N = 202$ ).

|                         | B     | Bootstrap coefficients |                 | 95% confidence interval |       |
|-------------------------|-------|------------------------|-----------------|-------------------------|-------|
|                         |       | Std. error             | Sig. (2-tailed) | Lower                   | Upper |
| Constant                | 37.92 | 5.10                   | <.001           | 27.53                   | 47.51 |
| Being phubbed           | 0.00  | .02                    | .97             | -.04                    | .04   |
| Loneliness              | -.71  | .35                    | .04             | -1.38                   | -.01  |
| Friendship satisfaction | .35   | .10                    | <.001           | .15                     | .53   |
| Self-esteem             | 1.17  | .09                    | <.001           | 1.00                    | 1.35  |

Dependent variable: psychological well-being.  $R^2 = .56$ .

TABLE 4: Paths of significant indirect effects using 10,000 bootstrap samples ( $N = 202$ ).

| Paths of indirect effects   | Effect | Bootstrap coefficients 95% confidence interval |         |          |
|---|--------|--|---------|----------|
|   |        | BootSE   | BootLLC | BootULCI |
| Being phubbed -> loneliness -> psychological well-being                             | -.04   | .01  | -.07    | -.02     |
| Being phubbed -> loneliness -> self-esteem -> psychological well-being              | -.03   | .01  | -.05    | -.01     |
| Being phubbed -> friendship satisfaction -> psychological well-being                | -.03   | .01  | -.04    | -.01     |
| Being phubbed -> friendship satisfaction -> self-esteem -> psychological well-being | -.02   | .01  | -.03    | -.01     |

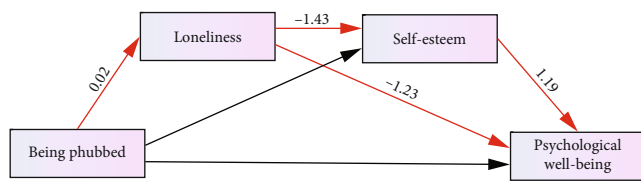


FIGURE 4: Paths of significant indirect effects of sequential mediation (loneliness and self-esteem).

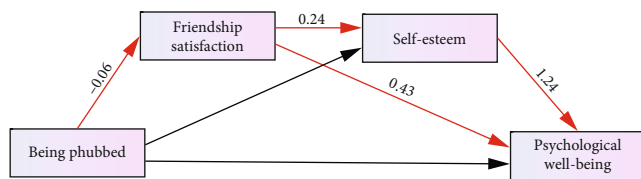


FIGURE 5: Paths of significant indirect effects of sequential mediation (friendship satisfaction and self-esteem).

growth, and autonomy, testing multiple mediating paths, including sequential mediation, is necessary to better understand the complex relationship between being phubbed by friends and psychological well-being and to identify potential intervention points to mitigate the negative impact of being phubbed by friends on youth’s psychological well-being.

Being phubbed by friends was associated with youth’s psychological well-being either through the mediating role of loneliness or through the mediating roles of loneliness and self-esteem in sequence (chain effect). Being phubbed by friends was associated with an increase in feelings of lone-

liness. The increase in feelings of loneliness was associated with a worsening of psychological well-being. Youth’s psychological well-being was also related to friends’ phubbing through the association with loneliness (intensifying feelings of loneliness) and subsequently through the association with self-esteem (worsening feelings of self-esteem). Similarly, being phubbed by friends was associated with youth’s psychological well-being either through the mediating role of friendship satisfaction or through the mediating role of friendship satisfaction and self-esteem in sequence (chain effect). Being phubbed by friends was associated with a decrease in feelings of friendship satisfaction. The decrease in feelings of friendship satisfaction was, in turn, associated with a worsening of psychological well-being. Youth’s psychological well-being was also indirectly related to friends’ phubbing through the association with friendship satisfaction (lowering feelings of friendship satisfaction) and subsequently through the association with self-esteem (aggravating feelings of self-esteem). Thus, while being phubbed by friends did not have a direct relationship with youth’s psychological well-being, youth’s psychological well-being was associated with their friends’ phubbing through the mediating roles of loneliness and friendship satisfaction, as mediators, and through the sequential mediation of loneliness and self-esteem and friendship satisfaction and self-esteem.

This study is significant because there are numerous studies on phubbing children, partners, and employees. Yet, there is a dearth of research on phubbing friends, especially among the youth [8]. In addition, existing research on phubbing and friendship measured the effects of phubbing using the phubbing scale, which measures phubbing from

the perspective of the phubber; see, for example, [25]. This study used the being phubbed scale which measures the effect of being phubbed from the phubbee's perspective. Moreover, the literature is rich with accounts on the effect of phubbing on depression, but there is a paucity of research on the effect of phubbing on the phubbed individuals' overall well-being. In research studies in which well-being was investigated, researchers focused more on emotional well-being, subjective well-being, or mental well-being [29]. Psychological well-being is seldom considered in friend-phubbing research. This study focused on the effect of phubbing on the phubbed friends' psychological well-being. This study also took into consideration the mediating role of loneliness, friendship satisfaction, and self-esteem, which have not been included together in a mediation analysis model before.

A limitation needs to be outlined. Even though 457 participants took part in the study survey, only 202 responses met the eligibility and completeness criteria and were subsequently used in the analysis. No doubt a larger sample could have resulted in larger effect sizes, so this issue should be taken into consideration when making inferences from the results of this research study. However, this research study adopted the Monte Carlo Power Analysis for Indirect Effects to determine the adequate sample size for the serial mediation which the simulation web app calculated as 145 responses. In addition, this study used bootstrapping in all the analyses. In this study, bootstrapping used confidence intervals (CIs) of 95% from 10,000 random samples. Bootstrapping is known for its robustness against violations of normality assumptions [56]. Another limitation is that this study relied on a cross-sectional survey. While it is difficult to establish causation with a cross-sectional survey, a cross-sectional survey can still provide valuable insights into the current characteristics, attitudes, and behaviours of a sample at a specific point in time, allowing researchers to explore relationships between variables and identify potential areas for further research or intervention.

Another issue is that this study did not investigate the phubbed friends' reaction when phubbed by their friends. Did the phubbed individuals also engage with their phones in response? A study by Tulane et al. [58] revealed that the reason their study participants pretended to send text messages in social settings was to avoid feeling lonely or appearing lonely. This is similar, in some way, to Tandon's et al. [59] and Al-Saggaf's [60] findings relating to why smartphone users phubbed. They phubbed, in the case of these two studies, to escape the negative feeling of fear of missing out, so phubbing, for them, was a coping mechanism. What was the phubbed individuals' coping strategy when their friends phubbed them? Are there cultural differences that can explain the phubbing process? These questions are for future research to address.

To sum up, partner phubbing had an indirect effect on partners' psychological well-being through worsening their levels of anxiety and depression. In the current study, phubbing friends was indirectly associated with the phubbed friends' psychological well-being through the association with loneliness (increasing their levels of loneliness) and friendship satisfaction (worsening their feelings of friendship satisfaction)

and through these two factors in combination with self-esteem. Thus, while being phubbed by friends did not have a direct relationship with psychological well-being, there is a significant negative association between being phubbed by friends and psychological well-being, as phubbing is associated with increased levels of loneliness and decreased levels of friendship satisfaction. Furthermore, an increase in levels of loneliness or a decrease in levels of friendship satisfaction were also associated with a decrease in self-esteem, which in turn was associated with a decrease in psychological well-being. Friends are not likely to stop phubbing each other in the future. For this reason, it is important to understand its effects on them. The literature on phubbing is growing exponentially, but friends' phubbing is still a neglected area of research. This study is one of few that looked at the effect of friend's phubbing on youths' psychological well-being.

### Data Availability

Access to data is restricted. The study involved 14+ participants. When applying for ethics approval from the author's University Human Research Ethics Committee, a commitment was made in the approved Data Management Plan not to share the dataset with anyone.

### Disclosure

This research was performed as part of the employment of the author at Charles Sturt University and as a Visiting Research Fellow at the Universidad de Navarra. Open access publishing was facilitated by Charles Sturt University, as part of the Wiley-Charles Sturt University agreement via the Council of Australian University Librarians.

### Conflicts of Interest

The author wishes to state that there is no actual or perceived conflict of interest to declare (directly or indirectly related to the work submitted for publication).

### Acknowledgments

The author wishes to thank Dr Rachel Hogg from the School of Psychology at Charles Sturt University for her assistance with the recruitment of participants and her advice and for sharing with him useful resources on moderation and mediation. The author also wishes to thank the Instituto Cultura y Sociedad, Universidad de Navarra, where he collected the data for this study, analysed the data, and prepared the first draft of the manuscript, as a Visiting Research Fellow during the months of October and December 2022.

### References

- [1] Y. Al-Saggaf, "The Psychology of Phubbing," Springer, 2022.
- [2] K. E. Lee, S. H. Kim, T. Y. Ha et al., "Dependency on smartphone use and its association with anxiety in Korea," *Public Health Reports*, vol. 131, no. 3, pp. 411–419, 2016.
- [3] Z. Bitar, S. Hallit, W. Khansa, and S. Obeid, "Phubbing and temperaments among young Lebanese adults: the mediating



- effect of self-esteem and emotional intelligence,” *BMC Psychology*, vol. 9, no. 1, pp. 1–9, 2021.
- [4] Y. Al-Saggaf, R. MacCulloch, and K. Wiener, “Trait boredom is a predictor of phubbing frequency,” *Journal of Technology in Behavioral Science*, vol. 4, no. 3, pp. 245–252, 2019.
  - [5] S. Utz, “POPC and social relationships,” in *Permanently Online, Permanently Connected*, P. Vorderer, D. Hefner, L. Reinecke, and C. Klimmt, Eds., pp. 140–148, Taylor & Francis Group, 2017.
  - [6] Y. Al-Saggaf, “Phubbing, fear of missing out and boredom,” *Journal of Technology in Behavioral Science*, vol. 6, no. 2, pp. 352–357, 2021.
  - [7] Y. Al-Saggaf and R. MacCulloch, “Phubbing and social relationships: results from an Australian sample,” *Journal of Relationships Research*, vol. 10, 2019.
  - [8] Y. Al-Saggaf and S. B. O’Donnell, “Phubbing: perceptions, reasons behind, predictors, and impacts,” *Human Behavior and Emerging Technologies*, vol. 1, no. 2, pp. 132–140, 2019.
  - [9] L. J. Ning, *Exploring an Everyday Phenomenon: is Phubbing Analogous to Ostracism?*, In Bachelor thesis. National University of Singapore, 2019, <https://scholarbank.nus.edu.sg/handle/10635/157682>.
  - [10] Y. Al-Saggaf and S. B. O’Donnell, “The role of state boredom, state of fear of missing out and state loneliness in state phubbing,” in *The 30th Australasian Conference on Information Systems: ACIS 2019 - Esplanade Hotel*, pp. 214–221, Perth, Australia, 2019.
  - [11] S. Chatterjee, “Antecedents of phubbing: from technological and psychological perspectives,” *Journal of Systems and Information Technology*, vol. 22, no. 2, pp. 161–178, 2020.
  - [12] S. Verma, R. K. Kumar, and S. K. Yadav, “The determinants of phubbing behaviour: a millennials perspective,” *International Journal of Innovative Technology and Exploring Engineering*, vol. 8, no. 12S, pp. 2278–3075, 2019.
  - [13] B. T. McDaniel and E. Wesselmann, “‘You phubbed me for that?’ Reason given for phubbing and perceptions of interactional quality and exclusion,” *Human Behavior and Emerging Technologies*, vol. 3, no. 3, pp. 413–422, 2021.
  - [14] X. Wang, W. Wang, Y. Qiao, L. Gao, J. Yang, and P. Wang, “Parental phubbing and adolescents’ cyberbullying perpetration: a moderated mediation model of moral disengagement and online disinhibition,” *Journal of Interpersonal Violence*, vol. 37, no. 7–8, pp. NP5344–NP5366, 2022.
  - [15] R. Latifa, E. F. Mumtaz, and I. Subchi, “Psychological explanation of phubbing behavior: Smartphone addiction, empathy and self control,” in *2019 7th International Conference on Cyber and IT Service Management (CITSM)*, Jakarta, Indonesia, November 2019.
  - [16] X. Wang, Y. Qiao, W. Li, and L. Lei, “Parental phubbing and children’s social withdrawal and aggression: a moderated mediation model of parenting behaviors and parents’ gender,” *Journal of Interpersonal Violence*, vol. 37, pp. 1–25, 2022.
  - [17] Y. Zhang, Q. Ding, and Z. Wang, “Why parental phubbing is at risk for adolescent mobile phone addiction: a serial mediating model,” *Children and Youth Services Review*, vol. 121, article 105873, 2021.
  - [18] A. Rachman, “Effect of phubbing behavior on student academic procrastination,” *Jurnal Bimbingan dan Konseling*, vol. 8, no. 1, pp. 1–5, 2020.
  - [19] P. Uceda, L. Bazán, and R. López, “Current situation of COVID-19 and its impact on phubbing and student performance,” in *Brazilian Technology Symposium*, vol. 233, pp. 130–136, Cham: Springer International Publishing, 2021.
  - [20] H. Krasnova, O. Abramova, I. Notter, and A. Baumann, *Why Phubbing Is Toxic for Your Relationship: Understanding the Role of Smartphone Jealousy Among ‘Generation Y’ Users*, Association for Information Systems, 2016.
  - [21] V. Chotpitayasunondh and K. M. Douglas, “The effects of ‘phubbing’ on social interaction,” *Journal of Applied Social Psychology*, vol. 48, no. 6, pp. 304–316, 2018.
  - [22] C. J. Beukeboom and M. Pollmann, “Partner phubbing: why using your phone during interactions with your partner can be detrimental for your relationship,” *Computers in Human Behavior*, vol. 124, article 106932, 2021.
  - [23] E. Mantere, N. Savela, and A. Oksanen, “Phubbing and social intelligence: role-playing experiment on bystander inaccessibility,” *International Journal of Environmental Research and Public Health*, vol. 18, no. 19, p. 10035, 2021.
  - [24] M. Fellesson and N. Salomonson, “It takes two to interact - service orientation, negative emotions and customer phubbing in retail service work,” *Journal of Retailing and Consumer Services*, vol. 54, article 102050, 2020.
  - [25] J. Sun and J. A. Samp, “‘Phubbing is happening to you’: examining predictors and effects of phubbing behaviour in friendships,” *Behaviour & Information Technology*, vol. 41, no. 12, pp. 1–14, 2022.
  - [26] F. Zamani, S. Talepasand, and A. Taghinezhad, “Psychometric properties of the phubbing scale among Iranian students,” *Health Education and Health Promotion*, vol. 8, no. 1, pp. 25–30, 2020, January 2022, <http://hehp.modares.ac.ir/article-5-35782-en.html>.
  - [27] T. Kadylak, “An investigation of perceived family phubbing expectancy violations and well-being among U.S. older adults,” *Mobile Media & Communication*, vol. 8, no. 2, pp. 247–267, 2020.
  - [28] J. L. Wang, L. A. Jackson, J. Gaskin, and H. Z. Wang, “The effects of social networking site (SNS) use on college students’ friendship and well-being,” *Computers in Human Behavior*, vol. 37, pp. 229–236, 2014.
  - [29] J. Maclean, Y. Al-Saggaf, and R. Hogg, “Instagram photo sharing and its relationships with social connectedness, loneliness, and well-being,” *Social Media + Society*, vol. 8, no. 2, 2022.
  - [30] B. L. Fredrickson, “The role of positive emotions in positive psychology: the broaden-and-build theory of positive emotions,” *The American Psychologist*, vol. 56, no. 3, pp. 218–226, 2001.
  - [31] E. Diener, R. Lucas, and S. Oishi, “Subjective well-being: the science of happiness and life satisfaction,” in *Handbook of Positive Psychology*, C. R. S. Shane and J. Lopez, Eds., pp. 63–73, Oxford University Press, 2002.
  - [32] C. L. M. Keyes, “Mental illness and/or mental health? Investigating axioms of the complete state model of health,” *Journal of Consulting and Clinical Psychology*, vol. 73, no. 3, pp. 539–548, 2005.
  - [33] C. D. Ryff and B. H. Singer, “Know thyself and become what you are: a eudaimonic approach to psychological well-being,” *Journal of Happiness Studies*, vol. 9, no. 1, pp. 13–39, 2008.
  - [34] V. Chotpitayasunondh and K. M. Douglas, “Measuring phone snubbing behavior: development and validation of the generic scale of phubbing (GSP) and the generic scale of being phubbed (GSBP),” *Computers in Human Behavior*, vol. 88, pp. 5–17, 2018.

- [35] C. D. Ryff and C. L. M. Keyes, "The structure of psychological well-being revisited," *Journal of Personality and Social Psychology*, vol. 69, no. 4, pp. 719–727, 1995.
- [36] İ. Parmaksız, "Predictive effect of phubbing and life satisfaction on depression symptoms in adults," *Journal of Dependence*, vol. 22, no. 3, pp. 236–247, 2021.
- [37] F. Caner, "The relationship between partner phubbing and life satisfaction: the mediating role of relationship satisfaction and perceived romantic relationship quality," *Psychological Reports*, vol. 126, no. 1, pp. 303–331, 2023.
- [38] B. M. Trifiro and K. Prena, "Active Instagram use and its association with self-esteem and well-being," *Technology, Mind, and Behavior*, vol. 2, no. 3, pp. 1–5, 2021.
- [39] M. E. David and J. A. Roberts, "Developing and testing a scale designed to measure perceived phubbing," *International Journal of Environmental Research and Public Health*, vol. 17, no. 21, p. 8152, 2020.
- [40] X.-P. Xu, Q.-Q. Liu, Z.-H. Li, and W.-X. Yang, "The mediating role of loneliness and the moderating role of gender between peer phubbing and adolescent mobile social media addiction," *International Journal of Environmental Research and Public Health*, vol. 19, no. 16, article 10176, 2022.
- [41] P. Wang, H. Hu, P. K. H. Mo et al., "How is father phubbing associated with adolescents' social networking sites addiction? Roles of narcissism, need to belong, and loneliness," *The Journal of Psychology*, vol. 156, no. 5, pp. 331–348, 2022.
- [42] Y. Al-Saggaf, "Information sharing on facebook by alone, single and lonely female users," *Search (Malaysia)*, vol. 9, no. 1, 2017.
- [43] M. S. Parus, A. A. Adu, and A. Keraf, "Phubbing behavior and quality of friendship in Faculty of Public Health, Nusa Cendana University," *Journal of Health and Behavioral Science*, vol. 3, no. 1, pp. 13–23, 2021.
- [44] M. E. David and J. A. Roberts, "Investigating the impact of partner phubbing on romantic jealousy and relationship satisfaction: the moderating role of attachment anxiety," *Journal of Social and Personal Relationships*, vol. 38, no. 12, pp. 3590–3609, 2021.
- [45] M. M. Chmielik and A. Błachnio, "Till phone do us part: the role of phubbing in relationship satisfaction and self-esteem," *Journal for Perspectives of Economic Political and Social Integration*, vol. 27, no. 2, pp. 91–112, 2022.
- [46] L. Hao, D. Liu, J. Yin, B. Lin, X. Zhang, and Q. Jiang, "Peer phubbing and selfie liking: the roles of attention seeking and gender," *Social Behavior and Personality*, vol. 49, no. 7, pp. 1–13, 2021.
- [47] W. Hong, R. De Liu, Y. Ding, T. P. Oei, R. Zhen, and S. Jiang, "Parents' phubbing and problematic mobile phone use: the roles of the parent-child relationship and children's self-esteem," *Cyberpsychology, Behavior, and Social Networking*, vol. 22, no. 12, pp. 779–786, 2019.
- [48] X. Xie, X. Tang, H. Rapp, D. Tong, and P. Wang, "Does forgiveness alleviate depression after being phubbed for emerging adults? The mediating role of self-esteem," *Computers in Human Behavior*, vol. 109, article 106362, 2020.
- [49] X. Wang, L. Gao, J. Yang, F. Zhao, and P. Wang, "Parental phubbing and adolescents' depressive symptoms: self-esteem and perceived social support as moderators," *Journal of Youth and Adolescence*, vol. 49, no. 2, pp. 427–437, 2020.
- [50] T. Fibaek Bertel and T. F. Bertel, "It's like I trust it so much that I don't really check where it is I'm going before I leave': informational uses of smartphones among Danish youth," *Mobile Media & Communication*, vol. 1, no. 3, pp. 299–313, 2013.
- [51] M. E. Hughes, L. J. Waite, L. C. Hawkey, and J. T. Cacioppo, "A short scale for measuring loneliness in large surveys results from two population-based studies," *Research on Aging*, vol. 26, no. 6, pp. 655–672, 2004.
- [52] S. L. Murray, J. G. Holmes, D. W. Griffin, and J. L. Derrick, "The equilibrium model of relationship maintenance," *Journal of Personality and Social Psychology*, vol. 108, no. 1, pp. 93–113, 2015.
- [53] M. Rosenberg, *Conceiving the Self*, Basic Books, New York, 1979, April 2022, <https://pesquisa.bvsalud.org/portal/resource/pt/psa-123867>.
- [54] A. M. Schoemann, A. J. Boulton, and S. D. Short, "Determining power and sample size for simple and complex mediation models," *Social Psychological and Personality Science*, vol. 8, no. 4, pp. 379–386, 2017.
- [55] A. F. Hayes, *Introduction to Mediation, Moderation, and Conditional Process Analysis*, Guilford Press, New York, 2nd edition, 2018, November 2022, [https://books.google.es/books?hl=en&lr=&id=6uk7DwAAQBAJ&oi=fnd&pg=PP1&ots=Y\\_ScqRPrkD&sig=OLJuHJUvYzXGA-T-RDAfcm8CYkw&redir\\_esc=y#v=onepage&q&f=false](https://books.google.es/books?hl=en&lr=&id=6uk7DwAAQBAJ&oi=fnd&pg=PP1&ots=Y_ScqRPrkD&sig=OLJuHJUvYzXGA-T-RDAfcm8CYkw&redir_esc=y#v=onepage&q&f=false).
- [56] K. J. Preacher and A. F. Hayes, "SPSS and SAS procedures for estimating indirect effects in simple mediation models," *Behavior Research Methods, Instruments, & Computers*, vol. 36, no. 4, pp. 717–731, 2004.
- [57] J. A. Roberts and M. E. David, "My life has become a major distraction from my cell phone: partner phubbing and relationship satisfaction among romantic partners," *Computers in Human Behavior*, vol. 54, pp. 134–141, 2016.
- [58] S. Tulane, J. Vaterlaus, and T. Beckert, "A mixed methods examination of adolescents' reasons for pretending to text," *Journal of Adolescence*, vol. 69, no. 1, pp. 175–179, 2018.
- [59] A. Tandon, A. Dhir, S. Talwar, P. Kaur, and M. Mäntymäki, "Social media induced fear of missing out (FoMO) and phubbing: behavioural, relational and psychological outcomes," *Technological Forecasting and Social Change*, vol. 174, article 121149, 2022.
- [60] Y. Al-Saggaf, "State phubbing fully mediates the relationship between state fear of missing out and time spent on social media," in *Moving technology ethics at the forefront of society, organisations and governments*, A. Pelegrín Borondo, J. A. Oliva, M. Murata, and K. M. L. Palma, Eds., pp. 253–261, Universidad de La Rioja, 2021.