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Phubbing: Age and Online Presence as Necessary Conditions

Phubbing: edad y presencia en línea como condiciones necesarias

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ABSTRACT

Phubbing, the act of ignoring someone in favor of a mobile phone, has become a prevalent social issue in today's digital era. This study aimed to identify necessary conditions for phubbing behavior, focusing on correlates established by Schneider and Hitsfeld (2021). Utilizing data from their survey, the study analyzed a sample of 278 participants, mainly female (74%), with an average age of 26.78 years. The methodology employed Necessary Condition Analysis (NCA). The results revealed that younger age is a significant factor in higher levels of self-phubbing. Specifically, the study found that in contexts with high levels of self-phubbing, youth was a critical determinant. Furthermore, being Permanently Online and Connected emerged as a critical factor in self-phubbing, especially at higher levels, suggesting an increasing dependency on being constantly connected. The study concludes that other variables such as Fear of Missing Out and Mobile Phone Use Norms do not appear to be necessary conditions for phubbing. These findings highlight the multifaceted nature of phubbing and underscore the importance of NCA in revealing the essential conditions contributing to this behavior.

RESUMEN

El phubbing, el acto de ignorar a alguien en favor del teléfono móvil, se ha convertido en un problema social prevalente en la era digital actual. Este estudio tiene como objetivo identificar las condiciones necesarias para el comportamiento de phubbing, centrándose en los factores asociados establecidos por Schneider y Hitsfeld (2021). Utilizando datos de su encuesta, se analizó una muestra de 278 participantes, en su mayoría mujeres (74%), con una edad promedio de 26.78 años. La metodología empleada fue el Análisis de Condición Necesaria (NCA). Los resultados revelaron que una edad menor es un factor significativo en los niveles más altos de auto-phubbing. En concreto, el estudio encontró que en contextos de elevado auto-phubbing, la juventud era un determinante crítico. Además, estar Permanentemente Conectado en Línea surgió como un factor clave en el auto-phubbing, especialmente en niveles altos, lo que sugiere una dependencia creciente de estar constantemente conectado. El estudio concluye que otras variables, como el Miedo a Perderse Algo y las Normas de Uso del Teléfono Móvil, no parecen ser condiciones necesarias para el phubbing. Estos hallazgos subrayan la naturaleza multifacética del phubbing y destacan la importancia del NCA en la identificación de las condiciones esenciales que contribuyen a este comportamiento.

PALABRAS CLAVES · KEYWORDS

Phubbing; Age; Necesary Condition Analysis (NCA); Social behavior; Digital Dependency; Fear of Missing Out (FoMO); Smartphone Addiction
Phubbing; Edad; Análisis de Condiciones Necesarias (NCA); Comportamiento social; Dependencia digital; Miedo a Perderse Algo (FoMO); Adicción a los Teléfonos Inteligentes

1. Introduction

The term "phubbing" was first coined in 2012 by Chotpitayasunondh and Douglas, describing it as the act of slighting someone in a social setting by focusing their attention on the phone rather than the other person (Garrido et al., 2021). This behavior, characterized by Koc and Caliskan (2023) as an interruption of the face-to-face communication through the use of or directing the gaze at a smartphone, essentially involves ignoring people present in favor of interaction with the phone. However, before the emergence of the term "phubbing," research had already addressed concepts and sociocultural trends that helped lay the foundation for understanding this phenomenon. In its early stages, studies on mobile phones use primarily focused on addiction and problematic usage patterns (Karadağ et al., 2015). These studies examined the addictive potential associated with activities such as texting, Internet access, and playing games on mobile devices (e.g., Warden et al., 2004; Sánchez-Carbonell & Beranuy, 2007). The findings of these studies concluded that excessive technology use could have significant negative consequences, such as deteriorating social relationships or the onset of anxiety.

In general, the study of phubbing encompasses both contextual factors and personal characteristics. Authors such as Yuzhanin (2022) interpret it as a contemporary social and communicative issue, which could lead to gradual social detachment. In contrast, Karadağ et al. (2015), and later Chi et al. (2022), suggest that phubbing could stem from the constant need to stay online, indicating a potential underlying addiction to technology. This perspective views phubbing as an inability to focus on in-person interactions due to the constant allure of digital connectivity.

The reviewed literature indicates that phubbing behavior is influenced by a wide range of factors, including the fear of missing out (FoMO), social exclusion, anxiety, depression, negative self-perception, somatiszation, hostility, loneliness, life satisfaction, and Internet and smartphone-related addictions (Chotpitayasunondh & Douglas, 2016; Do & Nguyen, 2022) which will be discussed in more detail below. Other factors contributing to phubbing include attentional skills, the habit of multitasking with media, and the way people perceive understanding and validation from their partners (Han et al., 2022), along with tendencies toward withdrawal, compulsion, and euphoria, which significantly influence phubbing behaviors (Sansevere & Ward, 2021; Frackowiak et al., 2023).

Latifa, Mumtaz, and Subchi (2019) concluded that factors such as smartphone addiction, empathy, and self-control are key elements in shaping phubbing behavior, noting that withdrawal and tolerance tendencies positively affect phubbing, while self-control has a negative impact. Additionally, it has been recorded that higher rates of phubbing toward friends are associated with higher levels of depression, social anxiety, and neuroticism, while a tendency toward amiability seems to correlate negatively with this behavior (Sun & Samp, 2021). Overall, these studies demonstrate the complex interaction of individual, psychological, and environmental factors in the development of phubbing behavior.

As Li et al. (2023) point out, phubbing may be perceived by those who experience it (usually the companions of the person engaging in phubbing) as an insult and a lack of respect toward others in social settings as they prioritize phone use over direct engagement. This implies phubbing can have negative effects on social relationships, affecting the communication dynamics, the formation of impressions, the quality of relationships, and, ultimately, mental health. In particular, it has been linked to an increase in depressive symptoms and conflicts in relationships due to smartphone use (Capilla Garrido et al., 2024).

Research on phubbing has revealed its relationship with various psychological, social, and technological factors. In the psychological realm, it has been found that individuals with higher levels of boredom tend to use their phones as an escape, suggesting that boredom may act as a trigger for phubbing (Lv et al., 2023). On the other hand, the fear of missing out (FoMO) is an anxiety caused by the feeling that one is missing important experiences or events by not being connected (Przybylski & Weinstein, 2013), and has been widely identified as a significant correlate of phubbing (Chi et al., 2022; Gao et al., 2023; Joshi, 2023).

Another important psychological factor is online vigilance (OV), understood as the tendency to constantly monitor activity and notifications on social media (Maftei & Măirean, 2023). Other psychological factors have also been highlighted, such as mental health (Parmaksiz, 2021), internet addiction, the anxiety trait, loneliness, and self-esteem (Barbed-Castrejón et al., 2024).

In the social realm, problematic social media use appears as a factor closely related to phubbing (Chu et al., 2021). At the same time, it has been observed that individuals with symptoms of smartphone addiction (e.g., compulsive use, withdrawal symptoms or neglecting responsibilities) are more likely to engage in phubbing behavior (Safdar et al., 2023).

The study by Schneider and Hitzfeld (2021) aimed to identify the dynamics between mobile phone usage norms and phubbing behavior. A critical aspect of their study was trying to explain the boundary conditions of the relationship between normative or social norms regarding phone use (Mobile Phone Norms or MPN) and phubbing, particularly investigating the moderating effects of FoMO and online vigilance (OV).

The main conclusion of the study, derived from moderation-mediation regression models, is that mobile phone usage norms (MPN) have a negative association with phubbing behavior. Additionally, they concluded that individuals with strong mobile phone usage norms are less likely to engage in phubbing, which highlights the influential role of social norms in phubbing practices. In the same study, these authors found a significant positive correlation between factors such as FoMO and the concept of being permanently online and connected (POPC) with phubbing.

Regarding the methodological approach to phubbing research, descriptive studies or explanatory ones based on linear regression have predominated to date. However, these approaches have not fully captured the complexity of the phenomenon. Nowadays, there is a notable gap in research specifically addressing the essential conditions leading to phubbing, as well as the factors that could prevent this behavior. Addressing these specific aspects will provide a deeper understanding of phubbing compared to more general approaches.

In this regard, the Necessary Condition Analysis (NCA) is a widely used method in organizational sciences and it is crucial for identifying essential conditions in datasets. This approach, initiated by Dul (2016), focuses on determining the necessary factors for specific outcomes, contrasting with traditional logic based on sufficiency. Unlike regression analysis or qualitative comparative analysis of fuzzy sets (QCA), which emphasize sufficiency, NCA focuses on the necessity of conditions for the occurrence of an outcome. While QCA, as described by Bingham et al. (2019), is a case-oriented method which identifies causal relationships by using qualitative data, NCA uses variable scores and linear algebra to formulate statements of necessity. Thiem (2017) emphasizes the importance of best

practices in QCA, and Dul's comparison between NCA and QCA reveals NCA's ability to identify more necessary conditions.

Based on the knowledge gathered from previous research, the aim of this study is to determine which correlates of phubbing can be identified as necessary conditions for the development of phubbing behavior. This research seeks to deepen the understanding of the essential factors contributing to phubbing, using Necessary Condition Analysis to discern these critical elements.

2. Methodology

This study reexamined the data from Schneider and Hitzfeld (2021), whose methodological approach included an online survey. The target population of the study conducted by these authors consisted of young adults active on social media, specifically involving university students. To this end, they used a convenience sample of 278 participants, predominantly women (74%). The participants had an average age of 26.78 years (SD = 10), and more than half had higher education qualifications (51%) or university degrees (28%). The sample was recruited through social media platforms such as Facebook, in line with the study's requirements.

Schneider and Hitzfeld (2021) collected data through a 54-item ad-hoc online questionnaire. To avoid missing data, they requested that all questions be answered. The data collection process began by asking participants to recall their last meal with friends and estimate both the frequency and duration of phubbing during that interaction. This allowed for the calculation of two distinct indices: the Self-Phubbing Index (PIS) and the Phubbing Toward Others Index (PIO), which measure phubbing directed at oneself and toward others, respectively. The frequency of phubbing was rated on a scale from 1 (never) to 7 (very frequent), while the duration was rated from 1 (extremely short) to 7 (extremely long). A multiplicative approach was used to calculate these indices, combining frequency and duration to ensure that a high value in one variable would not compensate for a low value in another, in contrast to the additive approach used by Chotpitayasunondh and Douglas (2016).

In addition to phubbing, questions about other variables were included: Mobile Phone Usage Norms (MPN), Fear of Missing Out (FoMO), and the tendency to be Permanently Online and Connected (POPC).

- Mobile Phone Usage Norms (MPN). This dimension gathers the participants' perception of the appropriateness of phone use in private conversation contexts through seven items. The scale used was Hall et al‘s (2014).
- Fear of Missing Out (FoMO). Evaluated with the FoMO Scale by Przybylski et al. (2013), this instrument measures the extent to which participants experience the fear of being excluded from rewarding social experiences. Participants responded to statements such as "I worry my friends have more rewarding experiences than I do" on an appreciation scale ranging from 1 (not applicable at all) to 7 (fully applicable).
- Permanently Online and Connected (POPC). To measure this dimension, the German Online Vigilance Scale (OVS) by Reinecke et al. (2018) was used,

consisting of 12 items divided into three subscales: Salience (e.g., "I often find myself thinking about online content"), Monitoring (e.g., "I constantly keep track of what is happening online"), and Reactivity (e.g., "When I receive an online message, I immediately pay all my attention to it").

For the present study, a comprehensive review of the data from Schneider and Hitzfeld was conducted, accessible through the Open Science Framework repository (https://osf.io/dgm7). Subsequently, preprocessing was implemented to focus exclusively on the MPN, FoMO, and Permanently Online and Connected (POPC) scores, as these were the dimensions identified by the authors as being involved in their explanatory models.

An analytical approach was then developed by using Necessary but Not Sufficient Condition Analysis (NCA) by Dul (2016), which complemented the regression analysis. Within NCA, and to enhance its reliability, a statistical significance test was developed to assess whether the observed effect was a genuine necessary condition or a spurious result (Dul et al., 2020). The analysis was carried out in three stages:

- Formulation of hypotheses based on specific types of necessary variables. It should be noted that NCA requires formalizing its own specific hypotheses. These should not be confused with the research hypotheses or the statistical testing hypotheses. To avoid any confusion, these hypotheses were written in the results section and not beforehand.
- Evaluation of the effect size using CE-FDH (Conditional Effect Fishbone Diagram) for dichotomous and discrete conditions, and CR-FDH (Contribution Ratio Fishbone Diagram) for discrete conditions with many values and continuous conditions. Statistical significance was calculated using bootstrapping (10,000 cases).
- Dul's criteria were used to interpret effect sizes, categorizing them as insignificant, medium, large, or very large. The analysis was carried out with a statistical significance level set at 0.01 or lower (99% confidence level).

For data analysis, the statistical software R from the Comprehensive R Archive Network (CRAN) project (R Core Team, 2023) was used. The NCA package developed by Dul (2023) was employed for the analysis.

3. Analysis and results

To establish the hypotheses for the Necessary Condition Analysis (NCA), it is essential to have prior causal hypotheses, whether theoretical or evidence-based. In this context, the regression model by Schneider and Hitzfeld (2021) serves as a reference point, particularly because their data and measurements provide empirical evidence. They concluded that a higher adherence to Mobile Phone Usage Norms (MPN) is associated with less phubbing, while the FoMO and being permanently online and connected (POPC) were positively related to phubbing. Additionally, they observed a significant negative link between age and phubbing. A classical correlation matrix, which includes descriptive statistics for the Self-

Phubbing Index (PIS) and the Phubbing Toward Others Index (PIO), is presented in Table 1.

Table 1

Correlation and descriptive statistics

Variable / statistic	Average	SD	Range	MPN	FOMO	POPC	PIS	PIO	SD02_01 (age)
MPN	5.49	0.81	3.22-7.00	1.00					
FOMO	3.27	0.98	1.10-6.00	-0.14**	1.00				
POPC	3.46	1.05	1.00-6.50	-0.13**	0.54***	1.00			
PIS	4.27	4.69	0.00-20.00	-0.19**	0.31***	0.28***	1.00		
PIO	5.79	8.29	0.00-49.00	-0.04	0.08	0.00	0.36***	1.00	
SD02_01 (age)	26.78	10.00	16.00- 66.0	0.19**	-0.41***	-0.26***	-0.26***	-0.01	1.00

Note: Significancy: *(p<.1); **(p<.05); ***(p<.001)

Table 1 shows the correlation between each pair of variables in each cell, with asterisks indicating the strength of the statistical evidence supporting each correlation. As seen in Table 1, MPN presents a negative, moderately significant correlation with PIS, suggesting that a higher adherence to mobile phone usage norms is associated with a reduction in self-phubbing (PIS). However, its correlation with PIO is weak and not statistically significant, indicating a less relevant relationship. On the other hand, FoMO shows a positive and moderately significant correlation with PIS, indicating that higher levels of FoMO correspond to an increase in self-phubbing. The correlation with PIO is positive but weak and non-significant, pointing to a less defined relationship with the perception of phubbing in others. POPC also shows a positive, moderate, and statistically significant correlation with PIS, aligning higher POPC scores with greater self-phubbing. However, its correlation with PIO is again imeaningless and non-significant.

Overall, the lack of significant correlations with PIO for most of the variables indicates that the perception of phubbing in others may be influenced by different factors not represented in this dataset. It is worth noting that no significant differences were found based on sex, so sex was not included in the NCA (Necessary Condition Analysis) study.

The correlation matrix also shows patterns that are worth noting, particularly in how FoMO and POPC relate to PIS. The results indicate that both variables play a significant role in the stress related to phubbing. On the other hand, the lack of statistically significant relationships stands out, especially regarding the variable of phubbing perception in others (PIO).

Based on all these results, the specific hypotheses for the NCA analysis are as follows:

- NCA Hypothesis 1: It is hypothesized that the adherence to mobile phone usage norms (MPN) is a necessary condition for reducing the Self-Phubbing Index (PIS).
- NCA Hypothesis 2: It is proposed that the fear of missing out (FoMO) is a necessary condition for increasing PIS.
- NCA Hypothesis 3: It is postulated that being permanently online and connected (POPC) is a necessary condition for higher levels of PIS.
- NCA Hypothesis 4: It is considered that belonging to a younger demographic group is a necessary condition for higher levels of PIS.

These hypotheses aim solely to explore the essential factors that contribute to the onset and the intensity of self-phubbing, as indicated by the PIS index. Table 2 presents the results of the Necessary Condition Analysis (NCA), including the accuracy levels and effect sizes for each variable as a predictor of the Self-Phubbing Index (PIS).

Table 2

Effect sizes of the necessary conditions and significance tests for the independent variables as predictor of the Phubing Index Self

	CR-FDH		p			CE-FDH		p		
Variable	ES	A	value	CI	OI	ES	A	value	CI	OI
MPN	0.10	98.9%	.016	57.51	49.32	0.11	100%	.089	58.82	30.00
FOMO	0.13	99.3%	.039	60.46	30.27	0.18	100%	.007	59.18	10.00
POPC	0.24	98.6%	.000	48.78	4.63	0.27	100%	.000	48.48	0.00
SD02_01 (age)	0.504	97.8%	.000	4.57	0.00	0.60	100%	.000	18.00	0.000

Note: ES: Effect Size, A= Accuracy, CI= Condition Inefficiency, OI= Outcome Inefficiency, CE-FDH= Ceiling Envelopment-Free Disposal Hull, CR-FDH= Ceiling Regresssion-Free Disposal Hull, p value were estimates with 10000 permutations and are treated as significant if p<.05. Accuracy refers to the percentate of values that are below the ceiling line.

NCA provides revealing interpretations for the variables in the study. Both the CR-FDH and CE-FDH approaches yield similar results, although a slightly lower precision is observed in all cases when using CR-FDH, which is more suitable for continuous variables or those with a large number of values. Notably, both MPN and FoMO show significant effects as necessary conditions, with an effect size of 0.11 for MPN and 0.18 for FoMO, both achieving a C-Precision of 100%. On the other hand, the high inefficiency of the condition for MPN (CI: 58.82) and the lower inefficiency of the outcome (OI: 30.00 for MPN and 10.00 for FoMO) suggest a significant potential for improvement in these areas.

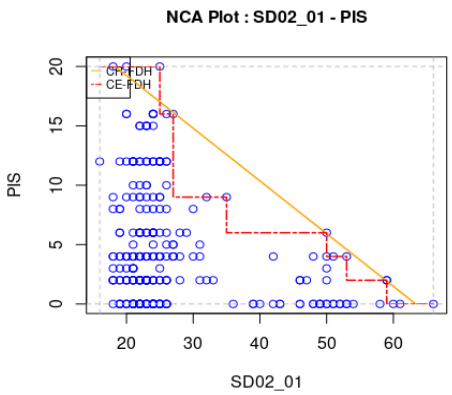
In contrast, age (SD02_01) shows a relevant effect as a necessary condition with an effect size (ES) of 0.60 and a C-Precision of 100%. Therefore, age can be considered a key factor, characterized by low condition inefficiency (CI: 18) and no outcome inefficiency, emphasizing its constant and significant role. Meanwhile, POPC also shows solid results under the CE-FDH approach (ES: 0.27, A: 100%), indicating its significant influence in this context.

Finally, Table 3 shows the graphs and bottlenecks for the predictors that demonstrated significant effects. The table describes the thresholds required for SD02_01 (age) and POPC in relation to the Self-Phubbing Index (PIS).

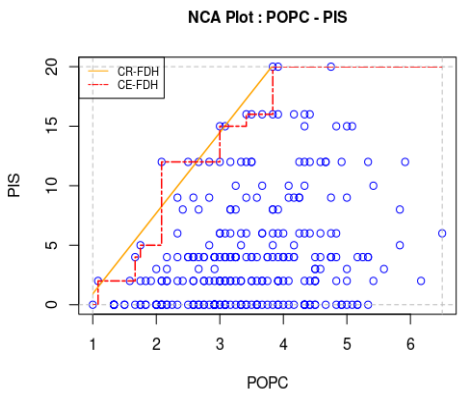
Table 3

Bottlenecks for SD02_01 (age) and POPC

NCA plot SD02_01 x PIS



NCA plot POPC x PIS



PIS	SD02_01 (age)	POPC
0	66.000	NN
10	59.000	1.083
20	53.000	1.667
30	50.000	2.083
40	35.000	2.083
50	27.000	2.083
60	27.000	2.083
70	27.000	3.000
80	27.000	3.417
90	25.000	3.833
100	25.000	3.833

Note: Bottleneck CE-FDH (cut-off point = 0); Conditioned variable=PIS (percentage.range); Condition variables (actual score)= SD02_01, POPC

Regarding the Self-Phubbing Index (PIS), the results show an inverse relationship between PIS and the age required to avoid being a bottleneck. For low PIS scores (0-10), a

significantly higher age is needed, specifically 66 and 59 years, to avoid being a limiting factor. As PIS increases, this age requirement gradually decreases, dropping to 25 years at the highest levels of PIS. This highlights a greater tendency for self-phubbing among younger individuals.

In contrast, the findings regarding POPC indicate that at low levels of PIS, the tendency to be permanently online and connected is not a significant factor, as shown by the 'NN' (not necessary) value for a PIS of 0. However, this changes when PIS reaches 10, at which point being constantly online reappears as a critical element. It is observed that the required POPC score increases progressively with PIS, starting at 1.083 and rising to 3.833 at the highest levels of PIS (90 and 100). This pattern implies that, for higher degrees of self-phubbing, the condition of being permanently online and connected becomes increasingly essential.

4. Discussion

The main objective of this study was to assess which correlates of phubbing, identified in Schneider and Hitzfeld's (2021) research, constitute necessary conditions for the development of phubbing behavior. Before analyzing this aspect in detail, the article initially proposed an expansion and refinement of the concept of phubbing. Specifically, it is suggested that the concept of phubbing should not only apply to a lack of attention to others in in-person meetings where the same physical space is shared, but should also extend to virtual spaces. In this sense, phubbing would also refer to behavior that involves a lack of attention to social interaction, whether mediated by technological elements or not and regardless of whether the same physical space is shared (e.g., in video calls or group chats). In other words, the distinguishing factor to identify phubbing would be the lack of attention to the social interaction of direct participants in favor of "consuming network stimuli." This would likely require a nuanced interpretation of the results of this and other studies.

Regarding the analyzed variables, age has shown to be a necessary, indispensable condition (although not sufficient) for the occurrence of phubbing. This is consistent with the studies reviewed, which indicate that age plays a significant role in phubbing behavior, particularly among adolescents (Hong et al., 2019; Xie & Xie, 2020) and during puberty (Michaud et al., 2006).

However, this issue needs further study, as some studies have found that phubbing seems to increase among teenagers aged 14 to 16 in comparison with their younger peers aged 12 to 13 (Cebollero-Salinas et al., 2022).

Leist (2019) emphasizes the importance of viewing age not just as a sociodemographic variable, but as a dynamic factor that interacts with other variables. This perspective aligns with traditional proposals (Wohlwill, 1969; Freund & Isaacowitz, 2013), where age is managed as a dimension of behavioral change rather than as a causal variable. However, authors such as Ratnasari & Oktaviani (2020) and Winkelmann & Geber (2022) assert that age is a causal factor in phubbing. In this interaction, both the developmental growth of self-esteem and emotional independence are prominently involved, so older adolescents would be more vulnerable to being affected by online social recognition (Valkenburg et al., 2017; Błachnio et al., 2019).

From a sociocultural perspective, this study also acknowledges phubbing is not only a social phenomenon but is deeply embedded in the reality of a Western culture. Social norms, connectivity expectations, and mass access to mobile devices in these cultural contexts shape the conditions under which phubbing emerges and becomes normalized. It is important to consider how this behavior may vary in cultures with different levels of access to technology or in those that prioritize more traditional social dynamics over constant connectivity. Therefore, phubbing must be understood within a cultural framework that allows us to interpret how technology and cultural values interact to shape this phenomenon.

In this discussion, it is important to note that most of the research on phubbing, including the studies we consulted, is cross-sectional rather than longitudinal. This is partly because phubbing is a relatively new concept. Therefore, the differences observed based on age could reflect generational gaps rather than individual evolution over a lifetime.

Schneider's (2019) study found a significant positive relationship between the tendency to be permanently online and connected (POPC) and phubbing behavior. The findings of our study extend this conclusion by suggesting that POPC is not only positively related to phubbing but also a necessary condition for its occurrence. However, it is important to consider that the connection between POPC and phubbing, as highlighted in the literature, is mediated by factors such as FoMO (Grieve et al., 2021) and emotional expression (Cebollero-Salina et al., 2022; Guazzini et al., 2021), among others. Although Schneider and Hitzfeld (2021) did not find moderating effects between these variables, they pointed out that "a possible reason could be that participants reported only moderate levels of POPC and FoMO. Therefore, a sample with higher levels and greater variability in POPC and FoMO might have yielded different results" (p. 1083).

Regarding POPC, the bottleneck analysis indicates that a slight decrease of one point on the POPC scale could significantly reduce a person's level of phubbing (e.g., from selecting "very often" to "often"). This result suggests that phubbing is more closely related to technology addiction issues than to mere social disinterest.

These results are in line with the findings of Arenz and Schnauber-Stockmann (2023), who identified a set of correlates including norms and experiences related to technology, technical equipment, the use of phones (smartphones) and the Internet , and problematic usage patterns. According to these authors, the strongest predictors of phubbing behavior were problematic usage patterns such as smartphone addiction, Internet addiction, and addiction to social networking services.

Regarding sex and gender, the reviewed articles suggest that men, women, and transgender individuals are equally at risk of the negative influences of social media (Rajesh & Draper, 2022). This conclusion, consistent with the results of the present study, suggests that dysfunctional behaviors linked to technology, including phubbing, do not seem to develop differentially between genders.

Finally, it is important to note the absence of certain findings in this study. Specifically, aspects related to the assessment of the presence of phubbing in others (PIO) did not emerge as significant. This absence requires further investigation to explore why individuals may focus more on their own phubbing behavior than on that of others. Additionally, the lack of sufficient evidence to consider other variables as indispensable raises questions about the suitability of the current methodology and the validity of the construct of the measures used. Therefore, further exploration of this phenomenon is needed, employing diverse

methodological approaches and working toward an operational consensus on the concept of phubbing itself.

5. Conclusions

In conclusion, the results obtained, when contrasted with the existing research on the subject, lead to certain conclusions of interest, among which the following stand out:

1. Differences in phubbing levels in relation to age highlight intergenerational differences. However, given the relatively recent emergence of the phubbing phenomenon, it is difficult to state that phubbing evolves with age or how it will manifest in current generations as they age.
2. The tendency to be constantly connected and online (POPC) is a fundamental factor in self-phubbing (PIS), especially at high levels. It also emerges as an increasingly essential condition as PIS increases.
3. However, it is noteworthy that the FoMO and mobile phone usage norms (MPN) do not manifest as indispensable conditions for the occurrence of phubbing, although it is clear that these factors influence phubbing.

On the other hand, the study has shown that Necessary Condition Analysis (NCA) is a complement to traditional correlational and regression analyses, allowing the exploration of the indispensable conditions for the occurrence of a psychosocial phenomenon such as phubbing.

It should also be noted that this study has certain limitations that condition its conclusions. Among others, it is important to consider that the sample is predominantly female. Although throughout the study the results show that there are no differences between sexes, and there are evidences in the same direction in the consulted literature (Rajesh & Draper, 2022), it should not be overlooked that future studies should examine the potential existence of differential patterns based on sex and gender.

Other areas to investigate in future studies include exploring the causal relationships between phubbing and its correlates as individuals age, through longitudinal studies. Similarly, the impact of social norms in different cultures over time should be assessed. Another area is the study of neurobiological mechanisms and how changes across age may influence behaviors such as phubbing. In general, future studies should be longitudinal in nature to analyze the evolution of phubbing as well as the impact of its direct correlates.

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