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Designing a Model of Fear of Missing Out (FoMO) Based on Parenting Styles with the Mediating Role of Brain Behavioral Systems in Female University Students Using Virtual Space

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A B S T R A C T

Objective: The aim of this study was to design a model of Fear of Missing Out (FoMO) based on parenting styles with the mediating role of brain behavioral systems among female university students who are users of virtual space.

Methods and Materials: The research method was descriptive–correlational and was conducted within the framework of structural equation modeling (SEM). The statistical population consisted of undergraduate female students at the Islamic Azad University, Arak branch, from which 224 participants were selected using convenience sampling. Data were collected using the Baumrind Parenting Styles Questionnaire, the Behavioral Inhibition System and Behavioral Activation System Scales, and the FoMO Scale. Data analysis was performed using SPSS version 27 and AMOS version 24.

Findings: Model fit indices indicated an acceptable fit to the data ($\chi^2/df > 3$, RMSEA = 0.08, AGFI < 0.90, CFI < 0.90). Direct path coefficients showed that the authoritative parenting style had significant relationships with behavioral inhibition, behavioral activation, and FoMO ($p \leq 0.01$). Direct effects between the authoritarian parenting style and behavioral inhibition, behavioral activation, and FoMO were also significant ($p \leq 0.01$). Additionally, direct relationships between the permissive parenting style and both behavioral inhibition and behavioral activation were significant ($p \leq 0.01$), but its relationship with FoMO was not significant ($p \geq 0.05$). Indirect effects were significant in all cases.

Conclusion: The findings indicate a significant mediating role of brain behavioral systems in the relationship between parenting styles and FoMO. Overall, the results highlight the importance of parenting styles and brain behavioral systems in explaining the phenomenon of FoMO.

Keywords: *Parenting styles, Brain behavioral systems, Fear of Missing Out (FoMO)*

1. Introduction

The rapid expansion of digital technologies and the pervasive use of social media platforms have fundamentally transformed patterns of human interaction, communication, and psychological functioning, particularly among young adults and university students. Within this evolving digital ecology, the phenomenon of Fear of Missing Out (FoMO) has emerged as a salient psychological construct, reflecting individuals' pervasive apprehension that others might be having rewarding experiences from which they are absent (Przybylski et al., 2013). FoMO is conceptualized not merely as a transient emotional response but as a stable dispositional tendency associated with deficits in basic psychological need satisfaction, particularly relatedness and autonomy (Przybylski et al., 2013). The increasing integration of social media into daily life has intensified exposure to curated representations of others' lives, thereby amplifying social comparison processes and contributing to heightened levels of FoMO among users (Moghaddas & Ghasemipour, 2021; Thomas, 2025). Empirical evidence indicates that FoMO is strongly associated with problematic social media use, emotional distress, and diminished well-being, positioning it as a critical variable in contemporary psychological research (Tandon, 2021; Wolniewicz et al., 2020).

A growing body of literature has demonstrated that FoMO is intricately linked to various adverse psychological outcomes, including anxiety, depression, and reduced subjective well-being. Systematic reviews have highlighted that excessive engagement with social media platforms is associated with increased psychological distress, particularly among adolescents and young adults who are more susceptible to social evaluation and peer influence (Keles et al., 2020). Studies have further shown that FoMO mediates the relationship between social media use and negative psychological outcomes, suggesting that individuals who experience higher levels of FoMO are more likely to engage in compulsive checking behaviors and exhibit symptoms of psychological maladjustment (Oberst et al., 2017). Additionally, FoMO has been found to be positively associated with depressive symptoms and emotional dysregulation, underscoring its role as a maladaptive cognitive-emotional process in the digital age (Barry et al., 2017; Stead & Bibby, 2017).

Beyond its association with emotional outcomes, FoMO has been examined in relation to personality traits and individual differences. Research indicates that traits such as neuroticism and extraversion, as well as insecure attachment styles, are significant predictors of FoMO, highlighting the role of underlying psychological dispositions in shaping individuals' susceptibility to this phenomenon (Blackwell et al., 2017). Furthermore, FoMO has been linked to deficits in self-control and increased vulnerability to behavioral addictions, including problematic smartphone and internet use (Jiang & Zhao, 2017). These findings suggest that FoMO operates within a broader network of psychological constructs, encompassing cognitive, emotional, and behavioral dimensions that interact dynamically within individuals.

In parallel with individual-level determinants, family-related factors—particularly parenting styles—have been identified as critical contextual influences on the development of FoMO and related behavioral patterns. Parenting styles, conceptualized within Baumrind's framework as authoritative, authoritarian, and permissive, represent distinct patterns of parental attitudes and behaviors that shape children's emotional regulation, social competence, and psychological well-being (Pinquart, 2016). Empirical studies have demonstrated that authoritative parenting, characterized by warmth and responsiveness combined with appropriate control, is associated with positive developmental outcomes, whereas authoritarian and permissive styles are linked to various forms of maladjustment (Aref & Jalali Garmroud, 2024). In the context of digital behavior, parenting styles have been shown to influence adolescents' and young adults' engagement with social media and their susceptibility to problematic use patterns (Tamannaifar & Khanshan, 2022).

Recent research has increasingly focused on the role of parenting styles in shaping FoMO. For instance, studies have indicated that lower-quality parent–child relationships and inadequate parental support are associated with higher levels of FoMO, suggesting that unmet emotional needs within the family context may drive individuals to seek validation and connection through digital platforms (Koca & Saatçı, 2022). Similarly, family characteristics, including parental monitoring and communication patterns, have been found to play a significant role in moderating the relationship between social media use and FoMO (Bloemen & De Coninck, 2020). These findings highlight the importance of considering family dynamics as a foundational context in understanding the emergence and maintenance of FoMO.

In addition to environmental and relational factors, neurobiological mechanisms—particularly brain behavioral systems—provide a critical framework for understanding

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individual differences in susceptibility to FoMO. The Behavioral Inhibition System (BIS) and Behavioral Activation System (BAS), as proposed in Gray's reinforcement sensitivity theory, represent fundamental neuropsychological systems underlying responses to punishment and reward, respectively. The BIS is associated with sensitivity to threat and the experience of anxiety, whereas the BAS is linked to approach behavior and reward responsiveness (Anderson & Perone, 2023). Empirical studies have demonstrated that these systems play a central role in shaping emotional and behavioral responses, including tendencies toward risk-taking, reward-seeking, and avoidance behaviors (Gomez et al., 2020).

Research has shown that the BIS and BAS are significantly associated with problematic digital behaviors, including excessive smartphone use and internet addiction. Individuals with heightened BAS sensitivity are more likely to engage in reward-driven behaviors, such as frequent checking of social media, whereas those with elevated BIS sensitivity may experience increased anxiety and social comparison, contributing to higher levels of FoMO (Jiang & Zhao, 2017). Moreover, neurobiological evidence suggests that these systems are embedded within cortico-striatal-thalamic circuits, which are implicated in reward processing and emotional regulation, further emphasizing their relevance in understanding digital behavior patterns (Fettes et al., 2017).

The integration of psychological and neurobiological perspectives provides a more comprehensive understanding of FoMO as a multidimensional construct influenced by both environmental and internal factors. Recent studies have begun to explore the mediating role of brain behavioral systems in the relationship between parenting styles and FoMO, suggesting that these systems may serve as underlying mechanisms through which family influences are translated into behavioral outcomes (Heydari & Izadi, 2024). For example, maladaptive parenting practices may contribute to heightened sensitivity in the BIS or dysregulation in the BAS, thereby increasing individuals' vulnerability to FoMO and related behaviors. This integrative approach aligns with contemporary models of psychological functioning that emphasize the interplay between environmental inputs and neurobiological processes (Ansari & Nouhi, 2024).

Furthermore, social connectedness has been identified as a key factor in the development of FoMO, with studies indicating that individuals who experience lower levels of perceived social support are more likely to report higher levels of FoMO (Wang et al., 2022). The role of social connectedness is particularly salient in the context of social media, where individuals may seek to compensate for offline relational deficits through online interactions. This dynamic underscores the complex interplay between individual needs, family context, and digital environments in shaping FoMO. Additionally, longitudinal and cross-sectional studies have consistently demonstrated that FoMO is associated with increased dependency on social networks and heightened engagement in online activities, further reinforcing its significance as a predictor of problematic digital behavior (Salehi, 2025).

Despite the growing body of research on FoMO, several gaps remain in the literature. In particular, there is a need for integrative models that simultaneously examine the roles of parenting styles and neurobiological systems in predicting FoMO, especially among university students who represent a high-risk population due to their extensive use of digital technologies. While previous studies have explored these factors independently, few have investigated their combined effects within a structural modeling framework. Addressing this gap is essential for developing a more nuanced understanding of the mechanisms underlying FoMO and for informing the design of targeted interventions aimed at reducing its negative consequences.

Accordingly, the present study aims to design and test a structural model of Fear of Missing Out based on parenting styles with the mediating role of brain behavioral systems among female university students who are users of virtual space.

2. Methods and Materials

2.1. Study Design and Participants

The present study employed a non-experimental, correlational design and was conducted using structural equation modeling (SEM). The statistical population consisted of female undergraduate students who were users of virtual space at the Islamic Azad University, Arak branch, during the first semester of the 2025–2026 academic year. To determine the sample size, the guideline proposed by Klein (2023), which recommends a minimum of 200 participants for SEM analysis, was used. Accordingly, and considering inclusion criteria as well as potential sample attrition due to incomplete questionnaires, an initial sample of 300 participants was selected using convenience sampling. After data screening, 224 participants were retained as the final sample. Inclusion criteria included

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obtaining a score above 50 on the Internet Addiction Scale and providing informed consent to participate. Exclusion criteria included failure to respond to at least 5% of the questionnaire items and withdrawal from the study during data collection. Ethical considerations included ensuring the confidentiality of participants' information, the right to withdraw from the study at any stage, providing sufficient information about the study objectives and procedures, and avoiding the use of non-scientific sources.

2.2. Measures

The Fear of Missing Out Scale was developed by Przybylski et al. (2013) and consists of 10 items. Responses are rated on a five-point Likert scale ranging from "not at all true of me" (0) to "extremely true of me" (5). Total scores range from 10 to 50, with higher scores indicating greater fear of missing out on experiences and information. Convergent validity was assessed by correlating the total score of this scale with the Basic Psychological Needs Satisfaction Scale developed by La Guardia et al. (2000), yielding a correlation coefficient of 0.83, indicating good validity. Internal consistency reliability, measured using Cronbach's alpha, was reported as 0.86 in a student sample (Przybylski et al., 2013). In Iran, the scale was translated and standardized by Bayrami et al. among students of Urmia University of Medical Sciences. Convergent validity was confirmed through a significant relationship between time spent on social networks and FoMO at the 0.05 level, and reliability was reported as 0.87 using Cronbach's alpha. In the present study, Cronbach's alpha was 0.82.

The Baumrind Parenting Styles Questionnaire was developed by Baumrind (1971) to assess patterns of parental influence and child-rearing practices. The questionnaire consists of 30 items, with 10 items each measuring permissive, authoritarian, and authoritative parenting styles. Items 1, 6, 10, 13, 14, 17, 19, 21, 24, and 28 assess the permissive style; items 2, 3, 7, 9, 12, 16, 18, 25, and 26 assess the authoritarian style; and items 4, 5, 8, 11, 15, 20, 22, 23, 27, and 30 assess the authoritative style. Responses are rated on a five-point Likert scale ranging from "strongly disagree" to "strongly agree," scored from 0 to 4. Separate scores are calculated for each parenting style by summing the relevant items. In Iran, Esfandiari reported test–retest reliability coefficients of 0.69 for the permissive style, 0.77 for the authoritarian style, and 0.73 for the authoritative style. Hosseini Dolatabadi and Saadat (2012) confirmed the construct validity of the questionnaire using exploratory factor analysis, supporting its three-factor structure. Their findings indicated that the permissive, authoritarian, and authoritative styles explained 14.5%, 17.4%, and 14.3% of the total variance, respectively. Factor loadings ranged from 0.58 to 0.74, indicating acceptable validity. They also reported overall reliability of 0.71, with subscale reliabilities of 0.62 (permissive), 0.62 (authoritarian), and 0.75 (authoritative). In the present study, Cronbach's alpha coefficients were 0.79 for authoritative, 0.76 for authoritarian, and 0.70 for permissive styles.

The Behavioral Inhibition System and Behavioral Activation System Scales consists of 24 self-report items developed by Carver and White (1994). Items are rated on a five-point Likert scale from 1 to 5. Four items (1, 6, 11, and 17) are filler items and are not included in scoring. Items 2 and 22 are reverse-scored. The Behavioral Inhibition System (BIS) subscale includes 7 items (2, 8, 13, 16, 19, 22, and 24) and assesses sensitivity to punishment, threat, and anxiety responses. The Behavioral Activation System (BAS) includes three subscales—Drive, Reward Responsiveness, and Fun Seeking—measured by items 3, 4, 5, 7, 9, 10, 12, 14, 15, 18, 20, 21, and 23. Carver and White (1994) reported internal consistency coefficients of 0.74 for BIS and 0.71 for BAS. In Iran, Mohammadi (2008) reported acceptable psychometric properties in a sample of university students in Shiraz, with test–retest reliability coefficients of 0.68 for BAS and 0.71 for BIS. In the present study, Cronbach's alpha coefficients were 0.69 for BIS and 0.71 for BAS.

The Young Internet Addiction Test was developed by Young (1999) and includes 20 items rated on a five-point Likert scale ranging from "rarely" (1) to "always" (5). Total scores range from 20 to 100, with higher scores indicating greater levels of internet addiction. Scores are categorized into three levels: 20–49 (no addiction), 50–79 (at risk of addiction), and 80–100 (internet addiction). Young and Rogers (1998) reported internal consistency above 0.92, and test–retest reliability was also found to be significant (Alavi et al., 2010). Reliability coefficients using test–retest and split-half methods were reported as 0.82 and 0.72, respectively, confirming the instrument's reliability and validity. In the present study, Cronbach's alpha was 0.74.

2.3. Data Analysis

For data analysis, descriptive statistics including mean and standard deviation were calculated. In the inferential section, structural equation modeling (SEM) was used. Data

were analyzed using SPSS version 25 and AMOS version 24.

3. Findings and Results

In the present study, 224 female undergraduate psychology students enrolled during the first semester of the 2025–2026 academic year participated. Among them, 128 participants (57.2%) were aged 20–22 years, 67 participants (29.9%) were aged 23–25 years, and 29 participants (12.9%) were older than 25 years. In terms of marital status, 38 participants (16.9%) were married and 186 participants (83.1%) were single.

Table 1

Descriptive Statistics and Pearson Correlation Coefficients Among Variables

Variable	1	2	3	4	5	6
1. Authoritative Style	—					
2. Authoritarian Style	-0.31**	—				
3. Permissive Style	-0.02	0.14*	—			
4. Behavioral Inhibition	-0.37**	0.34**	0.25**	—		
5. Behavioral Activation	0.31**	-0.24**	-0.37**	—		
6. FoMO	-0.40**	0.42**	0.50**	0.58**	-0.54**	—
Mean	31.32	15.05	21.62	18.81	38.52	26.61
Standard Deviation	7.49	9.08	8.03	3.48	6.31	8.20
Skewness	-1.41	0.85	0.10	-0.25	-0.24	0.02
Kurtosis	1.17	0.29	0.08	-0.21	0.59	0.64

The results in Table 1 indicate that the correlation coefficients between endogenous variables, mediating variables, and exogenous variables are significant at $p < 0.01$. Therefore, the linearity of relationships among variables is confirmed. Based on skewness and kurtosis values, which fall within the range of -2 to +2 for all variables, the normality of data distribution is supported. To assess the assumption of multicollinearity, tolerance and variance inflation factor (VIF) values were calculated for all variables. Since tolerance values were greater than 0.40 and VIF values were less than 3, the absence of multicollinearity was confirmed. The independence of errors was examined using the Durbin–Watson test, with a value of 1.95, which falls within the acceptable range of 1.5 to 2.5, thereby confirming the assumption.

Table 2

Direct Effects of the Research Model

Path	Standardized Coefficient (β)	t-value	p-value
Authoritative → Behavioral Inhibition	-0.23	-2.85	0.001
Authoritative → Behavioral Activation	0.40	5.91	0.001
Authoritarian → Behavioral Inhibition	0.32	3.94	0.001
Authoritarian → Behavioral Activation	-0.28	-3.21	0.001
Permissive → Behavioral Inhibition	0.27	3.12	0.001
Permissive → Behavioral Activation	-0.18	-2.38	0.001
Authoritative → FoMO	-0.19	-2.51	0.013
Authoritarian → FoMO	0.13	1.97	0.046
Permissive → FoMO	0.09	1.42	0.088

The results in Table 2 show that the direct relationship between the authoritative parenting style and behavioral inhibition was negative and significant ($\beta = -0.23$, $p < 0.01$), while its relationship with behavioral activation was positive and significant ($\beta = 0.40$, $p < 0.01$), and with FoMO was negative and significant ($\beta = -0.19$, $p < 0.05$). The authoritarian parenting style had a positive and significant relationship with behavioral inhibition ($\beta = 0.32$, $p < 0.01$), a negative and significant relationship with behavioral activation ($\beta = -0.28$, $p < 0.01$), and a positive and significant relationship with FoMO ($\beta = 0.13$, $p < 0.05$). The permissive parenting style showed a positive and significant relationship with behavioral inhibition ($\beta = 0.27$, $p < 0.01$) and a negative and significant relationship with behavioral

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activation (β = -0.18, p < 0.01), but its relationship with FoMO was not statistically significant (β = 0.09, p > 0.05).

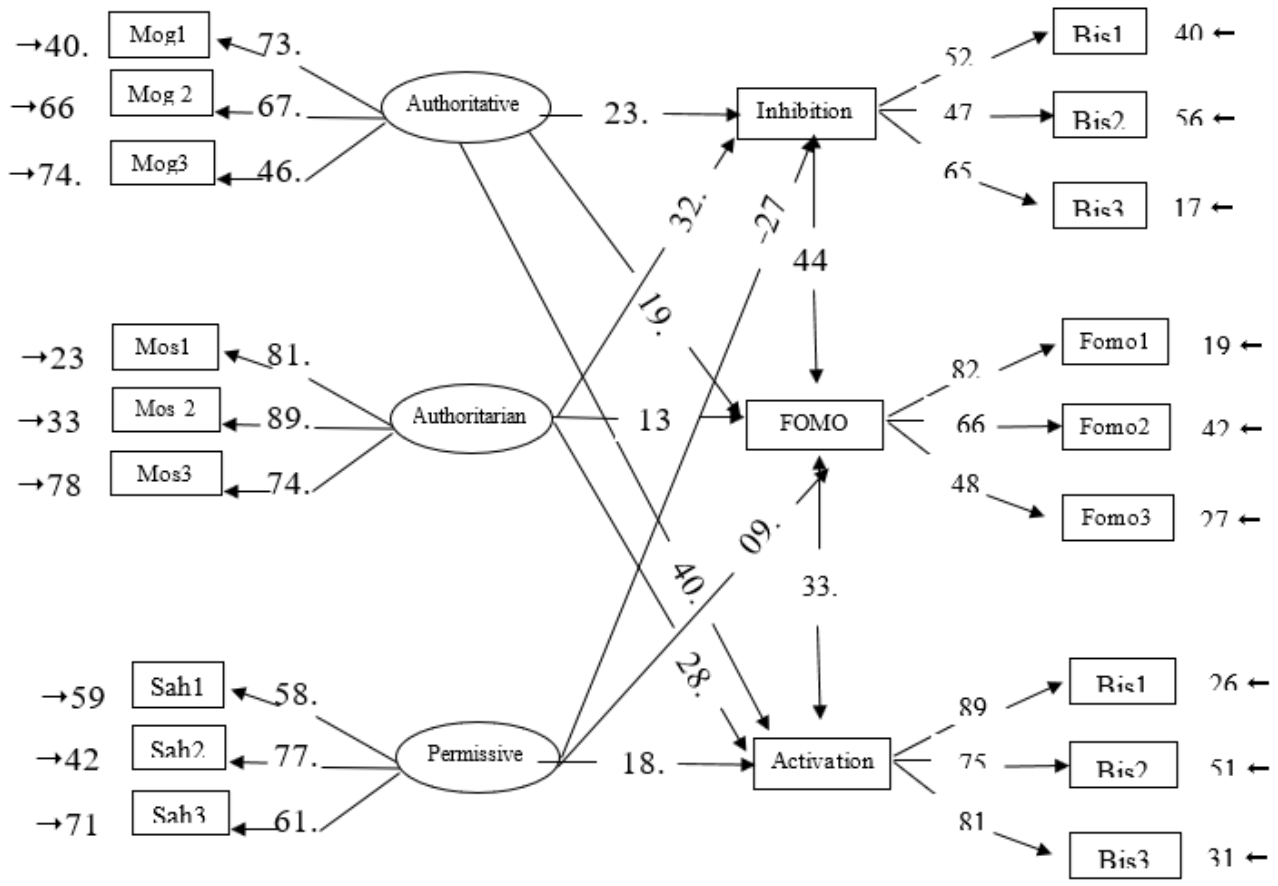
Table 3

Bootstrap Results for Testing the Mediating Role of Brain Behavioral Systems

Path	Standardized Coefficient (β)	Standard Error	Lower Bound (95% CI)	Upper Bound (95% CI)
Authoritative → Inhibition → FoMO	-0.101	0.008	-0.134	-0.076
Authoritative → Activation → FoMO	-0.132	0.025	-0.166	-0.098
Authoritarian → Inhibition → FoMO	0.141	0.034	0.116	0.175
Authoritarian → Activation → FoMO	-0.092	0.019	-0.127	-0.068
Permissive → Inhibition → FoMO	0.118	0.014	0.087	0.144
Permissive → Activation → FoMO	0.059	0.027	-0.021	0.087

Figure 1

Model with Beta Values



Based on the bootstrap results with a 95% confidence interval in Table 3, the indirect effect of the authoritative parenting style on FoMO through behavioral inhibition (β = -0.101, CI [-0.134, -0.076]) and behavioral activation (β = -0.132, CI [-0.166, -0.098]) was significant. Similarly, the indirect effect of the authoritarian parenting style on FoMO through behavioral inhibition (β = 0.141, CI [0.116, 0.175]) and behavioral activation (β = -0.092, CI [-0.127, -0.068]) was significant. The indirect effects of the permissive parenting style on FoMO through behavioral inhibition (β = 0.118, CI [0.087, 0.144]) and behavioral activation (β = 0.059, CI [-0.021, 0.087]) were also significant.

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Table 4

Model Fit Indices

Index	χ^2	df	χ^2/df	GFI	IFI	CFI	RMSEA
Obtained Values	776.73	346	2.21	0.91	0.91	0.92	0.074
Acceptable Range	—	—	< 3	> 0.90	> 0.90	> 0.90	< 0.08

The results in Table 4 indicate that the model fit indices are satisfactory. Specifically, the RMSEA value is less than 0.08, and the GFI, IFI, and CFI indices are all greater than 0.90. Additionally, the χ^2/df ratio is less than 3. Overall, these findings confirm that the proposed model demonstrates an acceptable fit to the data.

4. Discussion

The findings of the present study provide a comprehensive understanding of the structural relationships among parenting styles, brain behavioral systems, and Fear of Missing Out (FoMO) among female university students who are active users of virtual space. The results indicated that the authoritative parenting style had a negative and significant relationship with behavioral inhibition and FoMO, while it was positively associated with behavioral activation. These findings suggest that individuals raised in supportive and structured family environments are less likely to experience anxiety-driven cognitive patterns and maladaptive social comparison processes that characterize FoMO. This interpretation is consistent with prior research emphasizing that authoritative parenting fosters emotional regulation, autonomy, and psychological well-being, thereby reducing vulnerability to maladaptive digital behaviors (Aref & Jalali Garmroud, 2024; Pinquart, 2016). Furthermore, the negative association between authoritative parenting and FoMO aligns with studies indicating that higher-quality parent–child communication and emotional support mitigate the need for external validation through social media engagement (Bloemen & De Coninck, 2020; Schmuck, 2021).

In contrast, the findings revealed that the authoritarian parenting style was positively associated with behavioral inhibition and FoMO, while showing a negative relationship with behavioral activation. This pattern suggests that individuals exposed to rigid and controlling parenting environments may develop heightened sensitivity to threat and social evaluation, which in turn increases their susceptibility to FoMO. The elevated behavioral inhibition observed in this group reflects increased anxiety and vigilance toward potential social exclusion, a core feature of FoMO. These results are in line with previous studies demonstrating that maladaptive parenting practices are linked to higher levels of psychological distress and problematic social media use (Koca & Saatçı, 2022; Tamannaifar & Khanshan, 2022). Additionally, the positive association between authoritarian parenting and FoMO supports earlier findings that individuals with lower perceived autonomy and higher psychological control are more prone to experience feelings of exclusion and inadequacy in digital environments (Ansari & Nouhi, 2024; Salehi, 2025).

The permissive parenting style exhibited a distinct pattern, showing significant positive relationships with behavioral inhibition and negative relationships with behavioral activation, while its direct association with FoMO was not statistically significant. This finding suggests that although permissive parenting may contribute to certain emotional vulnerabilities, it does not directly predict FoMO in the same manner as authoritarian parenting. One possible explanation is that the lack of structure and guidance in permissive parenting may lead to inconsistent behavioral regulation, which indirectly influences FoMO through intermediary mechanisms such as brain behavioral systems. This interpretation is supported by studies indicating that the impact of permissive parenting on behavioral outcomes is often mediated by internal psychological processes rather than direct effects (Pinquart, 2016; Tamannaifar & Khanshan, 2022).

A central contribution of the present study lies in the examination of the mediating role of brain behavioral systems. The results demonstrated that both behavioral inhibition and behavioral activation significantly mediated the relationship between parenting styles and FoMO. Specifically, higher levels of behavioral inhibition were associated with increased FoMO, whereas higher levels of behavioral activation showed a complex pattern depending on the parenting context. These findings are consistent with reinforcement sensitivity theory, which posits that individuals with heightened sensitivity to punishment (BIS) are more prone to anxiety and avoidance behaviors, while

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those with heightened sensitivity to reward (BAS) are more likely to engage in approach-oriented behaviors (Anderson & Perone, 2023).

The positive association between behavioral inhibition and FoMO can be explained by the tendency of individuals with high BIS sensitivity to engage in negative social comparison and fear of exclusion, both of which are central to the FoMO construct. This is in line with previous research demonstrating that BIS is associated with negatively biased social cognitions and increased vulnerability to anxiety-related disorders (Gomez et al., 2020). Moreover, the mediating role of behavioral inhibition supports findings indicating that anxiety and emotional dysregulation are key mechanisms linking environmental stressors to problematic digital behaviors (Keles et al., 2020; Wolniewicz et al., 2020).

Similarly, the role of behavioral activation in mediating the relationship between parenting styles and FoMO highlights the importance of reward sensitivity in digital engagement. Individuals with higher BAS sensitivity are more likely to seek rewarding experiences through social media, such as social approval and positive feedback, which can reinforce FoMO-related behaviors. This finding is consistent with studies showing that reward responsiveness is a significant predictor of excessive social media use and FoMO (Jiang & Zhao, 2017; Stead & Bibby, 2017). Additionally, neurobiological evidence suggests that BAS-related processes are linked to activity in reward-related brain circuits, including cortico-striatal pathways, which play a crucial role in motivation and reinforcement learning (Fettes et al., 2017).

The overall model demonstrated an acceptable fit to the data, indicating that the proposed structural relationships among parenting styles, brain behavioral systems, and FoMO are empirically supported. This finding underscores the importance of adopting an integrative framework that considers both environmental and neurobiological factors in understanding FoMO. The results also align with contemporary perspectives that emphasize the interplay between individual differences and contextual influences in shaping psychological outcomes (Heydari & Izadi, 2024).

Furthermore, the significant correlations observed among the study variables provide additional support for the proposed model. The negative correlation between authoritative parenting and FoMO, as well as the positive correlations between authoritarian parenting, behavioral inhibition, and FoMO, highlight the interconnected nature of these constructs. These findings are consistent with prior research demonstrating that FoMO is associated with lower levels of social connectedness and higher levels of dependency on social networks (Salehi, 2025; Wang et al., 2022). Additionally, the strong associations between FoMO and behavioral inhibition further reinforce the role of anxiety-related processes in driving FoMO experiences (Barry et al., 2017).

Taken together, the findings of the present study contribute to the growing body of literature on FoMO by providing a nuanced understanding of its antecedents and underlying mechanisms. By demonstrating the mediating role of brain behavioral systems, the study highlights the importance of considering both psychological and neurobiological factors in explaining individual differences in FoMO. This integrative approach not only advances theoretical understanding but also has practical implications for the development of interventions aimed at reducing FoMO and its associated negative outcomes.

One of the key implications of these findings is the need to address family dynamics and parenting practices as part of interventions targeting FoMO. Enhancing parental awareness of the impact of their parenting style on children's psychological development may help reduce the risk of maladaptive digital behaviors. Additionally, interventions aimed at improving emotional regulation and reducing anxiety may be particularly effective for individuals with high behavioral inhibition, thereby mitigating their susceptibility to FoMO.

The results also suggest that interventions targeting reward sensitivity and self-control may be beneficial for individuals with high behavioral activation, as these individuals may be more prone to engaging in compulsive social media use. Such interventions could focus on promoting healthier digital habits and fostering intrinsic sources of motivation and satisfaction, thereby reducing reliance on external validation through social media.

5. Conclusion

In conclusion, the present study provides empirical support for a comprehensive model of FoMO that integrates parenting styles and brain behavioral systems. By elucidating the complex interplay between these factors, the study offers valuable insights into the psychological mechanisms underlying FoMO and highlights potential avenues for intervention and prevention.

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6. Limitations & Suggestions

The present study has several limitations that should be considered when interpreting the findings. First, the use of a cross-sectional design limits the ability to draw causal inferences regarding the relationships among variables. Second, the reliance on self-report measures may introduce response biases, such as social desirability and recall bias, which could affect the accuracy of the data. Third, the sample consisted exclusively of female university students, which may limit the generalizability of the findings to other populations, including males and non-student groups. Fourth, the use of convenience sampling may further restrict the representativeness of the sample. Finally, although the study examined key psychological and neurobiological variables, other potentially relevant factors, such as personality traits and cultural influences, were not included in the model.

Future research should address these limitations by employing longitudinal and experimental designs to better establish causal relationships among parenting styles, brain behavioral systems, and FoMO. Additionally, future studies should include more diverse samples in terms of gender, age, and cultural background to enhance the generalizability of the findings. Incorporating objective measures of digital behavior, such as usage data from smartphones or social media platforms, could also improve the validity of the results. Furthermore, future research could explore the role of additional mediators and moderators, such as personality traits, attachment styles, and coping strategies, to provide a more comprehensive understanding of the mechanisms underlying FoMO. Finally, cross-cultural studies could offer valuable insights into how cultural norms and values influence the relationships among the study variables.

From a practical perspective, the findings of the present study highlight the importance of promoting healthy parenting practices and enhancing individuals' emotional regulation skills to reduce the risk of FoMO. Educational programs aimed at increasing awareness of the psychological effects of social media use could help individuals develop more balanced and mindful digital habits. Mental health professionals may also benefit from incorporating strategies that target anxiety, reward sensitivity, and self-control into their interventions for individuals experiencing high levels of FoMO. Additionally, universities and educational institutions could play a key role in providing support services and resources to help students manage their digital engagement and maintain psychological well-being.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors equally contributed to this article.

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