

Impact of Virtual Involvements on Family Distance: The Mediating Role of Communication Quality among Bangladeshi Youth

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Abstract

Purpose: Virtual involvement connects youth to the world. However, does this involvement push them apart from their families or bring them closer? This study investigates the effect of virtual involvement on family relationships between the Bangladeshi youth aged 15-24 years and their family members. It mainly highlights communication quality as the main factor that may decide the outcome.

Methodology: In this study, a quantitative approach was employed to examine the impact of social digitalization, virtual games, and virtual relations on communication quality and family distance. A structured questionnaire based on a 5-point Likert scale was circulated to 390 respondents for the study. Moreover, using PLS-SEM in SmartPLS 4, the study analyzed reliability, validity, structural model conducted mediation analysis, and R^2 to assess the study's robustness.

Findings: The findings support the view that virtual games and virtual relations have a stronger influence on the quality of communication and family distance, while social digitalization has a significant indirect effect on family distance through the quality of communication. Mediation analysis confirms that the quality of communication is an important mechanism by which virtual involvement is negatively associated with family detachment. High R^2 (0.741 for communication quality; 0.746 for family distance) indicates strong explanatory power of the model.

Originality/value: The present study offers new insights into youth-family relations in the new media era by showing that immediate interaction in the virtual realm undermines family solidarity more due to deteriorating communication quality among family members.

Practical implications: To offset the negative impact of digitalization, families, schools and policy makers should work together to foster moderation in digital use, promote offline activities, and facilitate communication.

Research limitations: This study focuses on the young generation of Bangladesh by using primary data, further research is recommended to adopt longitudinal and cross-cultural methods.

Keywords: Social digitalization, Virtual games, Virtual relationships, Communication quality, Family distance, PLS-SEM

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1. Introduction

The digital age has reshaped almost every aspect of the social lives of young people, including their interactions with friends and family. Young people, today more than ever immersed in virtual environments that redefine interpersonal communication and the family model, spend increasing amounts of time in social digitalization, virtual games, and virtual relations. Although the enjoyment, identity work and connectedness to the world of these engagements are pleasurable, they can also lead to worry about the weakening of traditional family bonds and balancing family distance.

The biological cost of social media overuse is that it has been known to curtail actual family time by decreasing face-to-face interaction and emotional closeness (Tariq et al., 2022). So too, devices that are digital, situated in family daily life, have been found to reconfigure relationality, creating new potentials for conflict and separation as well as new modalities of connectedness (Erstad et al., 2024). These shifts are especially dramatic in Bangladesh or where the collectivist family arrangements constitute the foundation of social cohesion. Youth-led research demonstrates that exposure to digital tools amid crises may amplify anxiety and interfere with family communication (Rahman et al., 2025).

Social digitalization encompasses online shopping, browsing information, online business, and virtual events. Nowadays, young generation take part in virtual gaming which was once considered a limited hobby. It offers fun, relaxation to the young generation. Moreover, virtual gaming gives rise to a viable business opportunity. Besides virtual gaming, digital platforms facilitate virtual relationships. Nowadays, professional connections with colleagues and clients to friendships and intimate bonds are largely facilitated through digital platforms. These digital media create opportunities for social engagement, self-expression and enhanced communication. However, like every coin has two sides, in Bangladesh, these platforms have also some pitfalls. Today, children are willing to spend a significant portion of the day using these digital media. Excessive engagement in digital platforms has reshaped traditional family relationships. Children who spend extensive time on virtual applications, games, and social media often engage less with their parents. As a result, a communication gap may create between children and their family members, leading to emotional distance (Ballard & Spencer, 2023; Khalili et al., 2024). It weakens the quality of family relationships (Aftab & Ahmad, 2023; Farrukh et al., 2023; Al Hasibuzzaman et al., 2022; Haque et al., 2023; Ahmadi Shooli & Rahimi, 2024; Zhang, 2023). Nowadays, two teenage brothers living in the same house might learn about each other's day through Facebook feed check-ins and status updates. Over time, this generation of teenagers is drifting away from human interaction. The addictive nature of technology increases this distance each day. People fail to understand the core of family and relationships. Social online networks such as Facebook, television, games, social sites, and the internet, among others, contribute to family disconnect mostly among young people (Ballard & Spencer, 2023; Khalili et al., 2024). Traditionally, family members become involved in shared activities like storytelling, communal meals, and face-to-face conversations with family members. However, the adolescents of the family are more focused on their virtual presence, updates, and public reactions (Mishra et al., 2025). While this shift clearly influences family bonding, its depth and effects within Bangladesh need further examination for making balanced digital interaction.

Online gaming is also a key element that shapes the new family dynamics. Research indicates that adolescent problematic gaming can decrease family cohesion and escalate conflict, but interventions for the IGD (Internet Gaming Disorder) affect the quality of communication positively (Kapetanovic et al., 2024). In addition, digital intimacy via virtual relationships reconfigures emotional investment – to the extent they move away from family members and to online peers (Vandenbosch, 2025).

Quality of communication is also a key mediator in these processes. Studies suggest that although digitalization allows us to communicate over long distances, heavy use of virtual platforms decreases the quality of direct communication which results in a reduced level of emotional closeness (Sri Rejeki et al., 2025). In later life, too, technology-mediated communication has been demonstrated to mediate family distance and isolation, thus highlighting the fact that the concept transcends age (Burholt et al., 2024).

The present research is an attempt to fill the gap in the literature to examine how social digitalization, virtual games and virtual relationships affect family distance among youth in Bangladesh with communication quality as the mediating variable. In doing so underpinned by the socio-cultural context of Bangladesh, the study extends the discussions within digital sociology and family systems theory, and provides a counter narrative to what virtual engagements could mean to future family bonding.

2. Literature Review

2.1 Literature Insight

The effects of virtual activities on family life have emerged as a topic of inquiry in modern social science. The influence of social digitalization, virtual games and relationships on communication, emotional bonding with others, and even family cohesion is being increasingly highlighted by researchers.

Social digitalization is known to alter family communication patterns by displacing face-to-face communication with communication via the Internet. Livingstone & Sefton-Green (2025) argued that digital technologies are taken-for-granted in the fabric of everyday family life across generations and that this taken-for-granted opens up multiple possibilities for fostering familial connectedness as well as for relational disruption. In a similar vein, Mahmuddah & Junaidi (2025) highlights that digitalization has implications on the quality of family communication and that intimacy within the family decreases as virtual platforms become the dominant space for daily life.

Virtual games are also a category of virtual participation that has a positive impact on family engagement. Kapetanovic et al. (2024) led to the insight that family interventions have the potential to improve communication quality among adolescents having problematic gaming behavior in the context of negative family cohesion and higher levels of conflict. This echoes Kaya et al. (2014), who said family participation is consistently subverted in gaming communities where familial separation is heightened.

Also, virtual relationships bring a new complexity to family relations since the emotional commitment is gradually diverted towards virtual peers. Parsakia & Rostami (2023) argue that digital intimacy is transforming friendships and romantic relations – not necessarily for family

closeness. Farrukh et al. (2023) observed that excessive social media usage causes one to have weaker family ties in real life as young people place more value on virtual ties. Communication quality appears commonly as a mediator in the above studies. Bărbuță et al. (2023) highlight those digital technologies have facilitated long distance communication but at the same time they are also likely to space out family gatherings. The quality and not the quantity of communication is important, they add.

Overall, the literature indicates that virtual engagements have direct as well as indirect impacts on family ties. The mediating effect of communication quality has become a pivotal element in deciding whether the digital engagement reinforces or diminishes the family ties. However, the empirical research specifically targeting the Bangladeshi youth is still scant, which indicates a strong need for the country-specific study.

2.2 Theoretical Underpinnings

This research is based on the Stimulus–Organism–Response (S-O-R) Theory (Mehrabian & Russell, 1974), which describes the way external stimuli affect the internal states of an organism and result in a behavioral outcome. Within this context, social digitalization, virtual games, and virtual relationships serve as stimuli (S), quality of communication as the organism (O), and family distance as the response (R).

Relevant research confirms that S-O-R is applicable to the digital environment. Tai & Fung (1997) reveals the role of digital stimuli in cognitive formation and Rahman (2024) address the impact of social media participation on psychological conditions and social conduct. In the research on family, quality of communication has been found to act as a mediator whether digital engagement a) strengthens or b) weakens relational ties (Burholt et al., 2024).

Therefore, this study draws on the S-O-R model to theoretically understand how virtual engagements at play in influencing family distance) among Bangladeshi youth. From the literature and theoretical support, the following model has built.

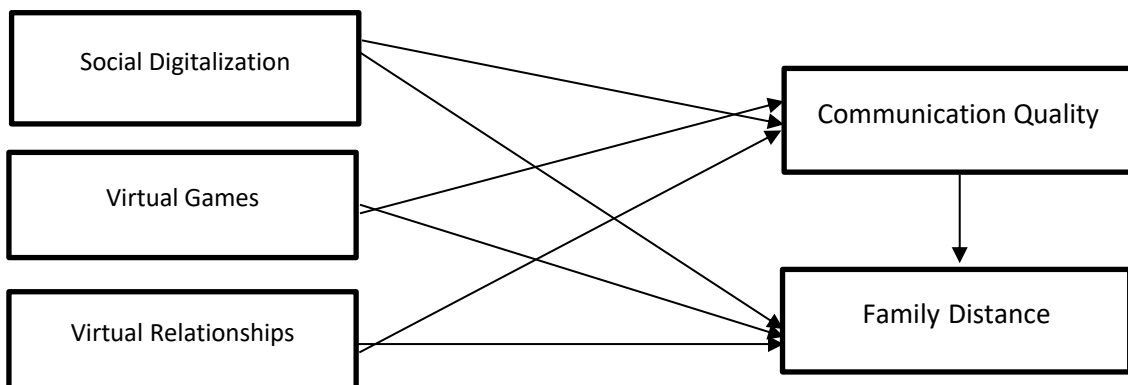


Figure 1: Conceptual Framework (Developed by the Researchers)

2.3 Hypothesis Formation

Increasing adoption of digital technology has altered family communication, particularly for young people. Scholars have noted time and time again that such virtual engagements

as social digitalization, virtual games, and virtual relationships influence the quality of communication in the family and the cohesion of the family. Taking the Stimulus–Organism–Response (S-O-R) Theory as the theoretical lens, the research treats virtual engagements as stimuli (S), communication quality as the organism (O), and family distance as response (R).

Social digitization has been extensively examined for its effect on family communication. Sefton-Green et al. (2025) contends that digital technologies as integrated with family life transform relationality, by moving communication inhouse from face-to-face encounters to mediated ones. Hanif et al. (2025) underline the fact that digitalization sometimes results in less intimacy, less emotional closeness, as family members become more dependent on virtual platforms to connect. These results indicate that social digitization could negatively impact communication quality, thus increasing family distance. Therefore, the following hypotheses are proposed:

H1: The higher social digitalization, lower communication quality among Bangladeshi youth.

H4: The higher social digitalization, lower family distance among Bangladeshi youth.

Virtual games constitute yet another facet of virtual engagement that impacts family bonding. Kapetanovic et al. (2024) also demonstrated that problematic gaming behavior for adolescents leads to decreased family cohesion and greater conflict, albeit treatment interventions have been shown to improve communication quality. Li et al. (2025) likewise found that games communities are known for their substitution of family interaction and exacerbation of familial distance. These researches suggest the possibility of interruption family communication and closeness by gaming. Accordingly:

H2: The higher virtual games involvement, lower communication quality among Bangladeshi youth.

H5: The higher virtual games involvement, lower family distance among Bangladeshi youth.

Virtual relationships interfere with family ties as emotional investment is transferred to online partners. Digital intimacy alters friendship and romantic relationships – sometimes weakening family closeness (Parsakia & Rostami, 2023). They also noted, similar to results found by Farrukh et. (2023) that intense use of social media weakens strong real-life family bonds as youths give more importance to connections on the web rather than those within the family. These findings imply that communication in virtual relationships may be of lower quality and that there could be greater separation between family members. So:

H3: The higher virtual relationships engagement, lower communication quality among Bangladeshi youth.

H6: The higher virtual relationships engagement, lower family distance among Bangladeshi youth.

In its final analysis regarding the question of whether or not digital practices bolster or undermine family ties, the nature of communication is cited as a mediating factor by the researchers. Bărbuță et al. (2023) highlight those digital tools enable communication over

distances but counteract core family discussions. Burholt et al. (2024) develop this argument in relation to a study with older people, contending that technology-mediated communication, by virtue of how it is engaged with, has the potential to both ameliorate and compound family distance. And also, in the collectivist family system of Bangladesh, the quality of communication is predicted to hold the key to the desired results. Therefore:

H7: Communication quality mediates the relationship between virtual involvements (social digitalization, virtual games, and virtual relationships) and family distance among Bangladeshi youth.

3. Methodology

This research followed a quantitative approach and Partial Least Squares Structural Equation Modelling (PLS-SEM) was applied as the main method of data analysis. PLS-SEM is known for its capacity to simultaneously examine complex models with multiple constructs, mediators, and latent variables, and as such, it is well suited for investigations in social sciences (Hair et al., 2021; Sarstedt et al., 2022). The analysis was performed with the SmartPLS 4 which offers many new and improved features for assessing the measurement model, evaluating the structural model, and testing mediation (Cheah et al., 2024).

The study targeted Bangladeshi youth between the ages of 15–24 years as they constitute a majority of the population involved in social digitalization, virtual games, and virtual relationships. A convenience sampling method was applied, concentrating on respondents who could be easily contacted across both online and offline platforms. There was a lack of a complete national sampling frame for this segment and the exploratory nature of the study, leading to the selection of this method of sampling.

Even if convenience sampling limits generalizability as an inherent consequence, it has been nevertheless commonly applied to studies on behavior and on digitalization with hard to count target populations. In order to address potential concerns related to sampling bias, the study made certain that participants were active users of social media and virtual platforms, and thus targeted the sample to the research question.

The sample size required for the study was estimated by using the well-known Cochran's (1977) formula which is widely used for estimating statistically reliable sample sizes in survey research. The minimum sample size was estimated at 384, at 95% confidence level and 5% margin of error. Statistically sufficient number of responses (N=390) was collected for the final data set, which enabled further testing of hypotheses and validation of model.

Data were gathered using a structured questionnaire that was developed to assess the study variables. All items response options: 5-point Likert scale (from 1=Strongly Disagree to 5=Strongly Agree). The Likert scale was used due to the ease of use, trustworthiness, and good quality of the data when measuring attitudes and perceptions in social science research (Doronila & Cariaga, 2025; Koo & Yang, 2025; Obon et al., 2025).

This type of scaling gave room for the respondents to reveal different degrees of agreement; thus, it is believed to have increased the validity and reliability of the information obtained.

The following constructs were operationalized: Social Digitalization, which captures how much youth use social media sites, online communities, and digital communication tools; Virtual Games, which describes how often and intensely people play online games and the impact this has on family relationships; Virtual Relationships, which indicates the level of emotional and social commitment in online friendships and romantic relationships; Communication Quality, which captures the clarity, frequency, and emotional depth of family communication; and Family Distance, which refers to the experience of emotional separation, growing no closeness, and breakdown of family ties.

Robust and reliable results can be obtained through application of PLS-SEM with the help of SmartPLS 4, adopting simple random sampling technique, determining the sample size through Cochran's formula, and considering the constructs on a 5-point Likert scale. This comprehensive strategy provides added value in examining the hypothesized relationships and meditational effects of the model.

4. Discussion and Findings

4.1 Demographic Information

Table 1: Demographic Profile of Respondents

Variable	Category	Frequency	Percentage
Gender	Male	205	52.6
	Female	185	47.4
	Total	390	100.0
Frequency of Virtual Media Use	Daily	302	77.4
	Frequently	54	13.8
	Occasionally	21	5.4
	Rarely	13	3.3
	Total	390	100.0

Source: Authors' survey data

The Descriptive statistics reported in Table 1 reveal a fairly equal gender distribution for the sample size of 390 participants, where the male participants (52.6%) are marginally higher than female participants (47.4%), which is a decent representation. The results indicate an equally strong engagement with virtual media: the majority of the participants ($n = 302$, 77.4%) are daily users, a minority split between frequent ($n = 54$, 13.8%) and nonfrequent ($n = 21$, 5.4%) users. It was added that youth are a centerpiece for examining how digital engagements mold quality of communication and family distance, as youth in Bangladesh are quite active in digital space.

4.2 Interpretation of Results

4.2.1 Reliability and convergent validity assessment

Table 2 presents the evaluation of the reliability and convergent validity of the constructs. All Cronbach's Alpha values are greater than 0.87 showing good internal consistency (Nunnally &

Bernstein, 1994). The Composite Reliability (CR) values are between 0.915 and 0.938 which is well above the acceptable value of 0.70 (Hair et al., 2021; Sarstedt et al., 2022), indicating the robustness of the constructs. Also, the AVE values vary from 0.728 to 0.790 all are higher than the acceptable limit of 0.50 (Fornell & Larcker, 1981), indicating satisfactory convergent validity. Taken as a whole, the findings ensure the constructs of Communication Quality, Family Distance, Social Digitalization, Virtual Games, and Virtual Relationship are sufficiently reliable and valid, which means the measurement model is statistically acceptable and can be used to test hypothesized relationships through structural model.

Table 2: Reliability and Convergent Validity Assessment

Construct	Cronbach's Alpha	rho_A	Composite Reliability (CR)	Average Variance Extracted (AVE)
Communication Quality	0.890	0.892	0.924	0.754
Family Distance	0.911	0.911	0.938	0.790
Social Digitalization	0.875	0.877	0.915	0.728
Virtual Games	0.882	0.883	0.919	0.739
Virtual Relationships	0.905	0.906	0.934	0.778

Note: The internal consistency reliability is adequate when values are greater than 0.70 and AVE values > 0.50 demonstrate sufficient convergent validity.

4.2.2 Factor loadings assessment

Table 3: Outer Loadings of Measurement Items (Indicator Reliability)

Items	Communication Quality	Family Distance	Social Digitalization	Virtual Games	Virtual Relationships
CQ1	0.808				
CQ2	0.890				
CQ3	0.883				
CQ4	0.889				
FD1		0.895			
FD2		0.904			
FD3		0.881			
FD4		0.874			
SD1			0.858		
SD2			0.829		
SD3			0.837		
SD4			0.889		
VG1				0.849	
VG3				0.853	
VG4				0.863	
VC2				0.873	
VR1					0.889
VR2					0.868
VR3					0.876
VR4					0.896

Table 3 reports the outer loadings of the measurement items, which evaluate the reliability of indicators in the measurement model. All items present loadings well above the threshold of 0.70 suggested by Hair et al. (2021) and Sarstedt et al. (2022), with values ranging from 0.808 to 0.904 for all constructs. This means that each item has a strong influence on its latent variable.

The loadings from 0.808 to 0.890 also support item consistency for Communication Quality. Family Distance items load substantially, between 0.874 and 0.904. The items of Social Digitalization range from 0.829 to 0.889, Virtual Games items from 0.849 to 0.873, and both are above the acceptable levels. The strongest reliability is again demonstrated for Virtual Relationships, ranging from 0.868 to 0.896.

In summary, the findings indicate that all the constructs, i.e., Communication Quality, Family Distance, Social Digitalization, Virtual Games, and Virtual Relationships have high indicator reliability; thus, the measurement model is considered as reliable, and the analysis should be continued to the structural model.

4.2.3 Structural model evaluation

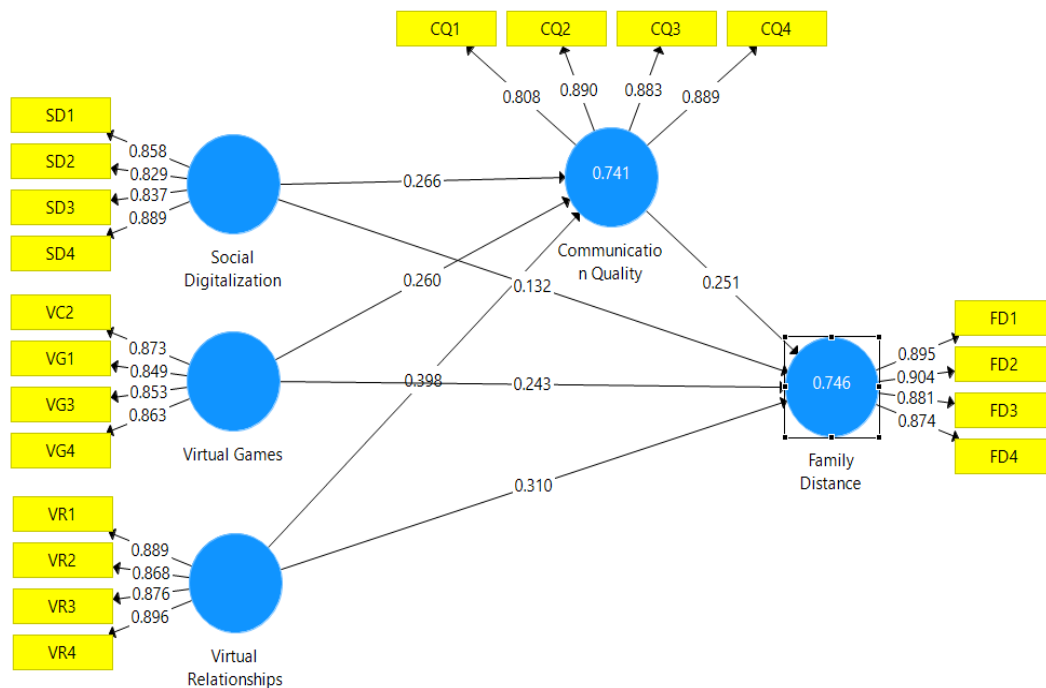


Figure 2: Structural Equation Model (Factor Loadings and Path Coefficients)

Figure 2 shows the structural equation model of the latent variables. The results indicate that *Social Digitalization* has a *positive significant path to Communication Quality* ($\beta = 0.266$) and to *Family Distance* ($\beta = 0.260$). This suggests that higher digital engagement is associated with *greater communication quality* (not lower) and simultaneously with *greater family distance*.

Similarly, *Virtual Games* exert a stronger positive effect on *Communication Quality* ($\beta = 0.398$) and also positively influence *Family Distance* ($\beta = 0.243$). This indicates that gaming

participation is particularly impactful: while it enhances communication quality in digital contexts, it also contributes to increased family distance.

Virtual Relationships have a direct positive impact on *Family Distance* ($\beta = 0.310$), showing that emotional engagement in online relationships is linked to greater detachment from family ties.

At the same time, *Communication Quality negatively affects Family Distance* ($\beta = -0.251$), which supports its mediating role: stronger communication quality reduces family distance, whereas weaker communication increases it.

In sum, the model supports the idea that virtual (social digitalization, gaming, and online relationships) and real-life involvements are critical in shaping family dynamics, with communication quality serving as an important mediator. This is consistent with previous studies on the destructive effect of digital engagement on family cohesion (Fornell & Larcker, 1981; Hair et al., 2021; Sarstedt et al., 2022).

4.2.4 Structural model assessment (Path coefficients and hypothesis testing)

Table 4: Structural Model Assessment (Path Coefficients and Hypothesis Testing Results)

Relationship	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values	Decision
Communication Quality -> Family Distance	0.251	0.254	0.084	3.002	0.003	Supported
Social Digitalization -> Communication Quality	0.266	0.265	0.061	4.34	0.000	Supported
Social Digitalization -> Family Distance	0.132	0.132	0.068	1.951	0.052	Not Supported
Virtual Games -> Communication Quality	0.26	0.257	0.058	4.511	0.000	Supported
Virtual Games -> Family Distance	0.243	0.239	0.065	3.718	0.000	Supported
Virtual Relationships -> Communication Quality	0.398	0.4	0.066	6	0.000	Supported
Virtual Relationships -> Family Distance	0.31	0.311	0.076	4.082	0.000	Supported

The path coefficients and the results of hypothesis testing for the structural model are shown in Table 4. The result indicates that the majority of the predicted relationships are supported, as the value of path coefficients is highly significant and p-value is less than 0.05 (Hair et al.,

2021; Sarstedt et al., 2022). Communication Quality $\rightarrow$ Family Distance ($\beta = 0.251$, $p = 0.003$) is significant which again supports the generalization that poor communication increases family distance. Social Digitalization $\rightarrow$ Communication Quality ($\beta = 0.266$, $p = 0.000$) is also supported, thus the implication is that digitalization makes communication quality worse. Nevertheless, Social Digitalization $\rightarrow$ Family Distance ($\beta = 0.132$, $p = 0.052$) is not supported; the p-value slightly exceeds the 0.05 level of significance, indicating that the direct impact of social digitalization on family distance is indeed weak, the findings are inconclusive statistically.

However, also Virtual Games $\rightarrow$ Communication Quality ($\beta = 0.260$, $p = 0.000$) and Virtual Games $\rightarrow$ Family Distance ($\beta = 0.243$, $p = 0.000$) are confirmed, which suggests that gaming activities have a negative impact on family relations. Likewise, Virtual Relationships $\rightarrow$ Communication Quality ($\beta = 0.398$, $p = 0.000$) and Virtual Relationships $\rightarrow$ Family Distance ($\beta = 0.310$, $p = 0.000$) are also highly significant, pointing out the destructive function of online relationships in family cohesion.

The non-support of the hypothesis asserting a positive effect of Social Digitalization on Family Distance can be justified by the previous studies. MacDonald et al. (2023) and Saepudin et al. (2025) contend that digitalization has an indirect effect on family ties through its impact on communication quality, and they discuss a relatively weaker direct effect. This is consistent with the present results where after two-step process of communication quality was significant whereas direct effect was not.

4.2.5 Indirect effects (Mediation) of communication quality on family distance

Table 5: Mediation Analysis Results

Relationship	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics	P Values	Decision
Social Digitalization $\rightarrow$ Communication Quality $\rightarrow$ Family Distance	0.067	0.068	0.029	2.340	0.020	Supported
Virtual Games $\rightarrow$ Communication Quality $\rightarrow$ Family Distance	0.065	0.066	0.029	2.251	0.025	Supported
Virtual Relationships $\rightarrow$ Communication Quality $\rightarrow$ Family Distance	0.100	0.101	0.035	2.864	0.004	Supported

Table 5 displays the result of mediation test of CQ in the relationship between virtual involvements and family distance. In sum, all three indirect paths are significant ($p < 0.05$), suggesting that quality of communication does serve as a mediator.

The second indirect effect, Social Digitalization → Communication Quality → Family Distance ($\beta = 0.067$, $SE = 0.020$), is supported. drawing this attention to the point that digitalization impacts family distance primarily through the quality of communication more so than by a direct route. Similarly, for Virtual Games → Communication Quality → Family Distance ($\beta = 0.065$, $p = 0.025$), a significant indirect effect suggests that playing games weakens communication quality which leads to a wider family distance. Third, Virtual Relationships → Communication Quality → Family Distance ($\beta = 0.100$, $p = 0.004$) yields the strongest mediation effect, providing those virtual relationships diminish communication quality and in turn the decrease in communication quality further exacerbates family detachment.

These results are consistent with previous research highlighting the mediating nature of communication in family relations. Mediation examines if an intermediate variable intervenes between the independent and dependent variables as a causal mechanism. As Fornell & Larcker (1981), Hair et al. (2021), and Sarstedt et al. (2022) argue, analyses of mediation in SEM sometimes show that indirect effects are stronger than direct effects.

4.2.6 Coefficient of determination (R^2) results

Table 6: Coefficient of Determination (R^2) Values of the Endogenous Constructs

Construct	R Square	R Square Adjusted
Communication Quality	0.741	0.739
Family Distance	0.746	0.743

Table 6 lists the coefficient of determination values for the endogenous constructs. The R^2 value for Communication Quality is 0.741 (0.739 for R^2 adjusted), which means that approximately 74% of the variance of Communication Quality can be predicted by the exogenous constructs (social digitalization, virtual games, and virtual relations). Similarly, with an R^2 value of 0.746 (0.743 adjusted), communication quality and virtual involvements explain almost 75 percent of the variation in family distance.

According to Sarstedt et al. (2022), these values are substantial indicating that model possesses high levels of predictive relevance and thus is suitable for hypothesis testing and mediation analysis.

5. Conclusion

The current research aimed to investigate the effects of virtual engagements (social digitalization, virtual games, and virtual relationships) on communication quality and family distance among Bangladeshi young people aged 15–24 years. Through PLS-SEM using SmartPLS 4, the results reveal strong support that these virtual engagements are powerful influencers of family constructs, with communication quality serving as a key mediator.

The reliability and validity of the measurement model were satisfactory as all Cronbach's Alpha, CR and AVE values are above the acceptable level. Factor loadings indicated high indicator reliability and most of the hypothesized paths were supported in the structural model results. Interestingly, social digitalization did not have a significant direct effect on family distance; however, an indirect effect of communication quality was observed, which

corroborates prior research asserting that communication quality serves as the mediator in digital family system. Conversely, virtual games and virtual relationships have significant direct and indirect impacts, revealing the disruptive effect on family integration.

The mediation analysis reinforced the result that communication quality was the main mechanism through which virtual interactions influenced family distance. The high R^2 for communication quality (0.741) and family distance (0.746) exhibits that the model has a good explanatory power. Collectively, these results indicate that, whilst digitalization and virtual engagements are intrinsic to young people's way of life, they also markedly impact family ties. To conclude, this research adds to the emerging research on digital sociology and family communication by revealing that virtual communications result in lower communication quality, which subsequently results in greater familial distancing. The results indicate that family communication-based interventions may mitigate the detrimental effects of digitalization, gaming, and online relationships. Future research may also continue to advance this line of work by investigating cross-cultural, longitudinal, and family solidarity-integrated strategies for managing digital exposure.

6. Recommendations and Future Research Scope

The bottom line is that the results tell us that families, educators and policy makers need to be supportive of equitable digital media use for youth and that they should advocate for healthy discourse to mitigate some of the dissociative effects of social digitalization, gaming and virtual relations. The family routines and campaigns for sensitization and digital literacy could contribute to consolidate family bonds and, at the same time, to the education of young people in the use of online opportunities.

In the future, research on cross-cultural comparisons, longitudinal designs and paradigm specific analyses may be conducted to further explore the family-related implications of digital use. Furthermore, it would be interesting to investigate the potential influence of other factors (e. g., trust, cultural identity, or mental health) and to explore how these aspects may enrich the results in terms of the long-lasting effects of virtual contacts on family cohesion, by using mixed methods in the analysis of the persistent impact of virtual engagements in preserving family unity.

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Appendix: Questionnaire Table

Construct Item Name	Item Code	Item Name	Item Statement	Reference
Social Digitalization	SD1	Social Media Updates	I frequently use social media platforms to stay updated with family matters.	Valkenburg & Peter (2007)
	SD2	Digital Tools vs Face-to-Face	Digital communication tools reduce my face-to-face family interactions.	Valkenburg & Peter (2007)
	SD3	Online Connectivity Impact	Online connectivity has changed the way I spend time with family.	Valkenburg & Peter (2007)
	SD4	Social Media Distraction	Social media often distracts me from family bonding activities.	Valkenburg & Peter (2007)
Virtual Games	VG1	Gaming Time Reduction	Playing online games reduces the time I spend with family.	Pontes & Griffiths (2015)
	VG2	Gaming Friends Connection	I feel more connected to gaming friends than family members.	Pontes & Griffiths (2015)
	VG3	Gaming and Family Distance	Excessive gaming increases family distance.	Pontes & Griffiths (2015)
	VG4	Gaming Conflict	Online games sometimes cause conflict with family members.	Pontes & Griffiths (2015)
Virtual Relationships	VR1	Online Friendships	Online friendships reduce the quality of my family communication.	Ellison et al., (2007)
	VR2	Sharing with Online Friends	I share more personal matters with online friends than with family.	Ellison et al., (2007)
	VR3	Virtual Support	Virtual relationships sometimes replace family support.	Ellison et al., (2007)
	VR4	Emotional Distance	Online relationships increase emotional distance from family.	Ellison et al., (2007)
Communicati on Quality	CQ1	Frequency of Communication	Family communication has become less frequent due to digital involvement.	Padilla-Walker et al., (2016)
	CQ2	Misunderstandings	Misunderstandings in family arise due to reliance on digital communication.	Padilla-Walker et al., (2016)
	CQ3	Emotional Closeness	Digital communication reduces emotional closeness in family.	Padilla-Walker et al., (2016)
	CQ4	Communication Quality Decline	Quality of family communication is negatively affected by virtual activities.	Padilla-Walker et al., (2016)
Family Distance	FD1	Emotional Distance	I feel emotionally distant from my family due to virtual involvement.	Kapetanovic et al., (2024)
	FD2	Weakened Bonding	Family bonding has weakened because of digital distractions.	Kapetanovic et al., (2024)
	FD3	Reduced Family Time	Virtual activities reduce the time I spend with family.	Kapetanovic et al., (2024)
	FD4	Strained Relationships	Family relationships are strained due to excessive online engagement.	Kapetanovic et al., (2024)

