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ORIGINAL ARTICLE

Short-Video Flow and Problematic Social Media Use: A Cross-Sectional Serial Mediation Model Involving Decision Fatigue, Mistake Rumination, and Smombie Behavior

Ali Berke Körün[1] · **Çağrı Aksu**[2] · **Seydi Ahmet Satıcı**[1,3,4]

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Abstract
The widespread use of short video-based social media platforms has fundamentally altered digital content consumption habits. However, the cross-sectional associations linking short-video flow to problematic social media use remain underexplored. The present study examined the serial mediating roles of decision fatigue, mistake rumination, and smombie behavior in this relationship. Utilizing a cross-sectional design, data from 1111 participants were analyzed via structural equation modeling (SEM) and bootstrapping procedures. Correlation analyses revealed significant positive associations among all study variables. The structural model yielded significant associations among short-video flow, decision fatigue, mistake rumination, smombie behavior, and problematic social media use. Bootstrapping analyses indicated that the indirect effects were statistically significant and consistent with the hypothesized ordering of the variables. However, the cross-sectional design does not establish temporal ordering or causal mediation. Overall, the findings suggest that short-video flow is associated with decision fatigue, mistake rumination, and smombie behavior. These cross-sectional associations may inform future longitudinal and experimental research on problematic digital use.

Keywords Short video flow · Decision fatigue · Mistake rumination · Smombie behavior · Problematic social media use

Rapid advancements in communication technologies have brought about a significant shift in individuals' digital content consumption habits. The most prominent manifestation of this development has been observed in social media usage and content creation processes (Park et al., 2025). Social media content, which was traditionally static and text-based, has

✉ Ali Berke Körün
berke.korun@yildiz.edu.tr

[1] Department of Psychological Counseling, Faculty of Education, Yıldız Technical University, Istanbul 34350, Türkiye

[2] Faculty of Engineering, Artvin Çoruh University, Artvin, Türkiye

[3] Faculty of Education, Biruni University, Istanbul, Türkiye

[4] Near East University, Nicosia, Türkiye

been replaced by short videos. The new digital ecosystem emerging through platforms such as TikTok, Instagram Reels, and YouTube Shorts possesses certain distinctive characteristics (Kütük, 2025; Lin et al., 2023). Key features include short durations of 15–60 s, rapid and unlimited content transitions, algorithmic personalization, and the presence of numerous stimulating elements (Liao, 2024). This design, where users encounter a new short piece of content instantly with every swipe, aims to keep users engaged for as long as possible (Şanlıer & Yılmaz, 2025). However, this constantly updated stream of content may place demands on individuals' cognitive resources and self-regulation processes. As noted by Nong et al. (2023), exposure to short video streams is associated with behavioral addictions and low motivation for achievement in the long term. Zhang and Li (2025), on the other hand, note that short videos are associated with a tendency toward high-risk behavior and shorter reaction times. Short-video flow refers to the subjective experience of focused attention, absorption, and deep engagement while viewing short-video content. It concerns the quality and intensity of the viewing experience rather than the frequency, duration, or problematic nature of short-video use. Therefore, short-video flow should be distinguished from short-video consumption, excessive use, and problematic use (Yang et al., 2023). Importantly, the studies discussed above primarily concern short-video exposure, consumption, or problematic use rather than the subjective experience of short-video flow. Therefore, this literature provides contextual information about the characteristics of short-video environments but should not be regarded as direct evidence concerning short-video flow. In the present study, the construct of interest was the quality and intensity of individuals' subjective absorption during short-video viewing, not how frequently or how long they viewed such content.

Short-video flow may be associated with perceived cognitive strain and decision fatigue. Decision fatigue is one potentially relevant cognitive correlate. Decision fatigue is fundamentally defined as the exhaustion individuals experience in their ability to make new decisions as their cognitive resources diminish following repeated selection and evaluation processes (Hickman et al., 2018). Although users on short-form video platforms may appear to be passive content consumers, in reality, they are constantly faced with micro-level decision-making processes. Users make successive choices within very short time intervals, such as continuing to watch the video, skipping quickly, rewatching, or interacting with the content (Ye et al., 2025). These repeated choices may be theoretically relevant to perceived cognitive demands. Indeed, research indicates that decision fatigue is associated with numerous negative psychological processes, such as low self-control, burnout, poor communication skills, information overload, and FoMO (Maier et al., 2025; Zaremohzzabieh et al., 2024). Additionally, it is noted that decision fatigue is negatively associated with protective psychological resources such as perseverance, compassion, spiritual well-being, and psychological resilience (Fernández-Miranda et al., 2023; Jamahneh et al., 2026). These findings suggest that decision fatigue may be associated with difficulties in cognitive and emotional regulation and various problematic behaviors.

Decision fatigue may be associated with dysfunctional cognitive processes and reduced psychological resources. Individuals experiencing decision fatigue may also report a greater tendency to dwell on their previous mistakes (Cai et al., 2025). Accordingly, decision fatigue and mistake rumination may be positively associated, although the direction of this relationship cannot be determined from cross-sectional evidence. Mistake rumination is defined as a recurring, difficult-to-control, and negative tendency to dwell on past failures, mistakes, and poor decisions (Flett et al., 2020). Difficulties in cognitive flexibility may be associated with a greater tendency to remain engaged in repetitive negative thoughts (Yazıcı Çelebi et al., 2025). This pattern of ruminative thinking has been

associated with several indicators of psychological difficulty. Research shows that rumination about mistakes is associated with psychological distress, depressive symptoms, anxiety, excessive perfectionism, and maladaptive coping strategies (Philpot & Donachie, 2025). Additionally, it is noted that mistake rumination is positively associated with cognitive rigidity, low self-control, and a general tendency toward ruminative thinking (Kabadayi & Mercan, 2023). Similarly, Barabadi et al. (2024) examined mistake rumination in relation to socially prescribed perfectionism, foreign language anxiety, and willingness to communicate. Furthermore, mistake rumination may also be associated with perceived mental fatigue and difficulties in attentional control (Flett et al., 2026).

Increased dysfunctional thinking patterns, reduced self-control, and heightened psychological distress associated with mistake rumination may be related to lower environmental awareness and more automatic digital behavior patterns. Engagement with technological devices may theoretically serve as a means of distraction from repetitive negative thoughts (Han et al., 2022). Such a tendency may also be associated with dysfunctional digital behavior patterns. One such behavior pattern is smombie behavior. Smombie behavior refers to a state in which individuals become disconnected from their physical surroundings, experience divided attention, and exhibit reduced environmental awareness due to their intense focus on smartphone use (Park & Kim, 2021). Therefore, smombie behavior is not merely about intensive phone use but also manifests as individuals becoming mentally immersed in digital content to an extreme degree and becoming desensitized (Park & Oh, 2024). Smombie behavior may be interpreted as a possible form of maladaptive coping, although this interpretation does not establish its function or development over time. Previous research has examined smombie behavior in relation to psychological well-being and phubbing (Inci et al., 2026), as well as daytime sleepiness and injury-related health beliefs (Temuçin & Alemdar, 2026). Such digital behavior may also be associated with habitual digital engagement and reduced attention to the social environment (Zhou et al., 2026). Thus, smombie behavior may be considered a pattern of smartphone absorption and reduced environmental awareness that is potentially associated with poorly controlled digital engagement.

Automatic and unconscious patterns associated with smombie behavior may coexist with more uncontrolled, compulsive, and problematic social media use (PSMU). Accordingly, smombie behavior may be positively associated with problematic social media use. However, the reverse direction is also plausible, as individuals with higher levels of problematic social media use may become more absorbed in their smartphones and less aware of their physical surroundings. PSMU generally refers to excessive or poorly controlled patterns of social media engagement that are associated with difficulties in daily functioning (Pellegrino et al., 2022). Although such patterns have frequently been examined within behavioral addiction frameworks, their classification as a clinical addiction remains debated. Therefore, the term PSMU is used in the present study without implying a formal addiction diagnosis. Behavioral addiction frameworks nevertheless offer a potentially useful theoretical perspective for understanding features such as impaired control, salience, and continued engagement despite negative consequences (Grant et al., 2010; Griffiths, 2017). In particular, the salience component of Griffiths' model may provide a conceptual basis for examining the intense smartphone absorption and reduced environmental awareness associated with smombie behavior. Previous studies have found that PSMU is associated with anxiety, depressive symptoms, impaired sleep quality, low self-esteem, loneliness, and lower psychological well-being (Ergün et al., 2025; Kalınkara & Talan, 2025; Liu et al., 2025a). It has also been associated with difficulties in academic, occupational, and interpersonal functioning (Landa-Blanco et al., 2024; Zheng & Peng, 2025). These

findings suggest that PSMU may be relevant to multiple aspects of cognitive, emotional, and behavioral functioning. However, these associations should not be interpreted as evidence that PSMU constitutes a formally established behavioral addiction or directly causes these adverse outcomes.

The Present Study

Behavioral addictions are considered one of the significant psychosocial problems that have become increasingly visible as digital technologies have taken center stage in daily life. In particular, the fast-paced, accessible, and continuous nature of social media platforms may be associated with more time spent in digital environments and uncontrolled usage patterns. In this context, examining the correlates of problematic social media use and the contemporary factors associated with it from a multidimensional perspective has become a priority in the research literature. With the rapid rise in popularity of short-video-based platforms, individuals' digital content consumption habits have also changed significantly. The effects of this change on individuals' cognitive, emotional, and behavioral functioning have begun to attract increasing attention. Although previous studies have examined the relationships between short-video use, problematic social media use, and various psychological variables, few studies have examined the cognitive and behavioral factors potentially associated with the relationship between short-video flow and problematic social media use. Indeed, there is a need for studies that examine various cognitive and behavioral processes, such as decision fatigue, mistake rumination, and smombie behavior, in conjunction. Cognitive Load Theory proposes that working-memory capacity is limited and that processing rapidly changing and stimulus-rich information may place demands on available cognitive resources (Sweller, 1988). Applied to the present context, the repeated attentional shifts and micro-decisions involved in short-video engagement may be associated with cognitive strain and decision fatigue. Ego-depletion and self-regulatory resource perspectives similarly propose that sustained decision-making and regulatory demands may be associated with a reduced capacity or willingness to exert subsequent cognitive control (Baumeister et al., 1998; Inzlicht & Schmeichel, 2012). These frameworks provide a theoretical rationale for positioning decision fatigue after short-video flow in the proposed model, without establishing a temporal or causal relationship. Against this theoretical background, the proposed sequence reflects a conceptual progression across experiential, cognitive, and behavioral domains rather than an empirically established temporal process. First, short-video flow represents the subjective experience of attention and absorption during short-video viewing. The rapid attentional shifts and repeated micro-decisions associated with this experience may be related to cognitive strain and decision fatigue (Huang et al., 2025; Schampheleer et al., 2025; Ye et al., 2025). Second, reduced cognitive and self-regulatory resources may be associated with greater difficulty disengaging from repetitive negative thoughts, providing a theoretical rationale for positioning mistake rumination after decision fatigue (Cai et al., 2025; Liu et al., 2025b). Third, Compensatory Internet Use Theory suggests that repetitive negative thoughts may be associated with greater absorption in digital content as a means of distraction or emotional escape, providing a rationale for positioning smombie behavior after mistake rumination (Han et al., 2022; Kardefelt-Winther, 2014). Finally, smombie behavior and PSMU represent conceptually distinct levels of problematic digital engagement. Smombie behavior refers more specifically to smartphone absorption and reduced awareness of the immediate physical environment,

whereas PSMU represents a broader pattern of poorly controlled social media engagement and functional difficulties. Smombie behavior was therefore modeled as a relatively proximal behavioral correlate and PSMU as the broader outcome construct, consistent with the concept of behavioral salience (Griffiths, 2017; Moretta & Wegmann, 2025). Nevertheless, the reverse pathway, in which higher levels of PSMU are associated with greater smartphone absorption and smombie behavior, is also theoretically plausible. Thus, the proposed sequence represents one plausible conceptual configuration, and the present cross-sectional data cannot establish its temporal direction. Based on these theoretical arguments and previous findings, the following directional hypotheses were proposed:

H1. Positive associations are expected between each pair of adjacent variables in the proposed sequence: short-video flow and decision fatigue, decision fatigue and mistake rumination, mistake rumination and smombie behavior, and smombie behavior and problematic social media use.
H2. Short-video flow is expected to have a positive serial indirect association with problematic social media use through decision fatigue, mistake rumination, and smombie behavior, in that proposed order. These hypotheses summarize the theoretically proposed associations examined in the study. However, because the study and its analytic plan were not preregistered, they should not be interpreted as prospectively registered confirmatory predictions. The proposed model is presented in Fig. 1.

Method

Participant and Procedure

The study sample consisted of 1111 Turkish participants recruited through convenience sampling from Türkiye. The questionnaires were administered face-to-face in university settings. Because postgraduate students were more accessible at the data-collection sites,

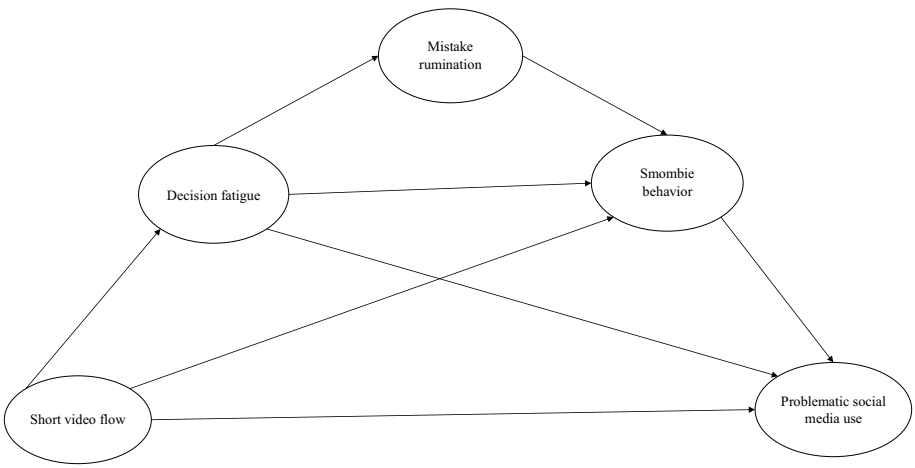

Fig. 1 The figure presents all hypothesized structural paths tested in the serial mediation model, regardless of their statistical significance. Measurement indicators and residual terms are omitted for clarity

they were disproportionately represented and constituted 48.8% of the sample. Participants ranged in age from 18 to 77 years ($M = 33.70$, SD = 11.39). The sample included 582 females (52.4%) and 529 males (47.6%). Regarding marital status, 530 participants (47.7%) were single and 581 (52.3%) were married. Most participants reported spending 4–6 h per day using screens and indicated that they usually or sometimes followed technological developments. Data were collected over a four-month period from January to April in university settings. Although the questionnaire was hosted online, it was administered face-to-face rather than distributed as a remote online survey. Potential participants were approached in person in university classrooms and common campus areas and completed the questionnaire electronically using tablets at the data-collection sites. Participation was open to adults aged 18 years or older, with no additional eligibility criteria. Before accessing the questionnaire, participants were informed about the purpose of the study, the voluntary nature of participation, and their right to withdraw at any time. Informed consent was obtained electronically. Responses were completely anonymous, and no directly identifying information, including names, student numbers, or email addresses, was collected. Participants received no financial compensation. Detailed demographic characteristics are presented in Table 1.

Measures

Short Video Flow Scale

This scale was originally developed by Ye et al. (2022) to measure individuals' short video viewing experiences. The scale was adapted into Turkish by Türk and Yıldırım (2024). It is a 5-point Likert-type scale consisting of 8 items and a single dimension. Higher scores indicate a stronger subjective flow experience during short-video viewing. They do not, by themselves, indicate more frequent, excessive, or problematic short-video use. The Turkish adaptation demonstrated good internal consistency ($\alpha = .87$). In the current study, the scale demonstrated excellent internal consistency ($\alpha = .91$).

Decision Fatigue Scale

This scale was originally developed by Hickman et al. (2018) to measure individuals' levels of decision fatigue. The scale was adapted into Turkish by Sarıakçalı and Kırpık (2022). It is a 5-point Likert-type scale consisting of 9 items and a single dimension. Higher scores on the scale indicate that individuals experience greater decision fatigue. The Turkish adaptation demonstrated good internal consistency ($\alpha = .86$). In the current study, the scale demonstrated good internal consistency ($\alpha = .89$).

Mistake Rumination Scale

This scale was originally developed by Flett et al. (2020) to measure levels of mistake rumination. The scale was adapted into Turkish by Kabadayi and Mercan (2023). It is a 4-point Likert-type scale consisting of 7 items and a single dimension. Higher scores on the scale indicate that individuals engage in more mistake rumination. The Turkish adaptation demonstrated good internal consistency ($\alpha = .82$). In the current study, the scale demonstrated good internal consistency ($\alpha = .87$).

Table 1 Demographic information of participants

Variable	Frequency	%
Gender		
Female	582	52.4
Male	529	47.6
Marital status		
Single	530	47.7
Married	581	52.3
Education status		
High school	28	2.5
University student	291	26.2
Postgraduate student	542	48.8
Graduated from a university	250	22.5
What is your average daily screen time?		
Less than 1 h	31	2.8
1–3 h	330	29.7
4–6 h	479	43.1
7–9 h	191	17.2
More than 10 h	80	7.2
How often do you follow technological innovations?		
Never	15	1.4
Rarely	121	10.9
Sometimes	373	33.6
Usually	462	41.6
Always	140	12.6
How much time do you spend on social media on average each day?		
Less than 1 h	94	8.5
1–3 h	761	68.5
4–7 h	222	20.0
More than 8 h	34	3.0
How much time do you use artificial intelligence devices average each day?		
Less than 1 h	208	18.8
1–3 h	798	71.8
4–7 h	85	7.7
More than 8 h	20	1.8

Smombie Scale

This scale was originally developed by Park and Kim (2021) to measure individuals' levels of "smombie" behavior. The scale was adapted into Turkish by Sönmez Sari et al. (2024). It is a 5-point Likert-type scale consisting of 15 items and 4 dimensions. Higher scores on the scale indicate that individuals exhibit more smombie behavior. The Turkish adaptation demonstrated good internal consistency (α=.86). In the current study, the scale demonstrated good internal consistency (α=.90).

Bergen Social Media Addiction Scale

This scale was originally developed by Schou Andreassen et al. (2016) to measure individuals' levels of problematic social media use. The scale was adapted into Turkish by Demirci (2019). It is a 5-point Likert-type scale consisting of 6 items and a single dimension. Higher scores indicate higher levels of problematic social media use. Although the official name of the instrument includes the term "addiction," scores were interpreted as indicating the severity of problematic social media use rather than as evidence of a clinical addiction diagnosis. The Turkish adaptation demonstrated good internal consistency ($\alpha = .83$). In the current study, the scale demonstrated good internal consistency ($\alpha = .85$).

Ethics

Ethical approval was obtained from the Yıldız Technical University Scientific Research Ethics Committee (Approval No. E-20250505422). Electronic informed consent was obtained from all participants. Participation was voluntary, and participants were informed of their right to withdraw from the study at any time without penalty.

Data Analysis

In this study, correlation analysis and structural equation modeling (SEM) were employed to examine the relationships among short-video flow, decision fatigue, mistake rumination, smombie behavior, and problematic social media use. IBM SPSS Statistics 27.0 and AMOS Graphics 24.0 were used for data analysis. First, the dataset was screened for missing values and univariate normality. No missing values were identified; therefore, no imputation or case deletion was required. Skewness and kurtosis values fell within the acceptable range of ± 2. Multivariate outliers were examined using Mahalanobis distance across the 12 observed indicators included in the SEM, using $p < .001$ as the criterion. No cases exceeded this criterion. Descriptive statistics, internal consistency coefficients, and Pearson correlation coefficients were subsequently calculated. Because all constructs were assessed using self-report measures administered during the same data collection, potential common-method variance was examined using Harman's single-factor test. All item-level indicators from the five measures were entered simultaneously into an unrotated exploratory factor analysis using principal axis factoring, with the extraction constrained to a single factor (Podsakoff et al., 2003). Before parcel construction, separate item-level confirmatory factor analyses were conducted to evaluate the unidimensionality of the Short-Video Flow, Decision Fatigue, Mistake Rumination, and Bergen Social Media Addiction scales. The results generally supported the proposed unidimensional structures, as indicated by the comparative fit indices and standardized factor loadings. Although the RMSEA value for the Decision Fatigue Scale was slightly above the conventional.08 threshold, its CFI, TLI, SRMR, and standardized factor loadings provided additional support for an essentially unidimensional structure. Based on these results, two parcels were retained for each of the four unidimensional constructs. Although three or more indicators per latent construct are generally preferred, two parcels were used because the relevant scales were relatively short, ranging from six to nine items, and the complete

five-factor measurement model was overidentified. This specification reduced the number of observed indicators while retaining a parsimonious representation of each construct. Nevertheless, we recognize that two indicators provide less information for evaluating construct-specific measurement misspecification than three or more indicators. The odd–even allocation procedure was selected a priori because it provided a simple, transparent, reproducible, and non-data-driven method for constructing comparably sized parcels. A loading-based factorial algorithm was not selected because the purpose was not to optimize parcel composition using sample-specific factor loadings. Instead, item-level CFAs were conducted before parceling to evaluate the dimensionality and potential misspecification of each scale. Thus, parceling was used to obtain a parsimonious measurement model and more stable parameter estimates rather than to address multidimensionality or conceal item-level misspecification (Little et al., 2002; Matsunaga, 2008). Smombie behavior was not parceled because the scale comprises four theoretically distinct subdimensions, which were retained as separate observed indicators. SEM was performed following the two-step approach proposed by Anderson and Gerbing (1988), and model parameters were estimated using maximum likelihood estimation. First, a measurement model comprising five latent constructs and 12 observed indicators was tested. These indicators included two item parcels each for short-video flow, decision fatigue, mistake rumination, and problematic social media use, together with four theoretically distinct subdimensions representing smombie behavior. Subsequently, the structural model was tested as a serial multiple-mediation model. Short-video flow was specified as the independent variable, decision fatigue, mistake rumination, and smombie behavior were specified as sequential mediators in this order, and problematic social media use was specified as the dependent variable. The principal serial indirect pathway was short-video flow → decision fatigue → mistake rumination → smombie behavior → problematic social media use. The model also estimated the additional theoretically specified direct and shorter indirect associations presented in Fig. 1. Accordingly, the model was specified as an ordered serial mediation model rather than a parallel mediation model. Model fit was evaluated using multiple indices. CFI and TLI values of ≥.90 and RMSEA and SRMR values of ≤.08 were interpreted as indicating acceptable model fit. More stringent values of CFI and TLI ≥.95, RMSEA ≤.06, and SRMR ≤.08 were considered indicative of good model fit. Because cutoff values should not be treated as rigid decision rules, the indices were evaluated collectively (Hu & Bentler, 1999). Given the broad age range of the sample, variability in screen-use characteristics, and previous evidence of gender differences in problematic social media use (Su et al., 2020), age, gender, education level, daily screen time, and daily social-media use were evaluated as potential covariates. Each variable was included in adjusted structural models as part of sensitivity analyses to examine its association with problematic social media use and determine whether its inclusion altered the principal structural associations. The statistical significance of the indirect associations was examined using 5,000 bootstrap resamples and 95% confidence intervals (Preacher & Hayes, 2008). All statistical tests were two-tailed, with the significance level set at $p < .05$. In the present study, serial mediation refers to the statistical estimation of direct and indirect associations. Because all variables were measured concurrently, significant indirect effects were not interpreted as evidence of temporal ordering or causal mediation.

Results

Preliminary Analysis and Correlation Results

Descriptive statistics, internal consistency coefficients, and correlations among the study variables are presented in Table 2. Harman's single-factor test indicated that the first unrotated factor accounted for 31.59% of the total variance, below the commonly used 50% threshold. Although this result does not completely rule out common-method bias, it suggests that the observed covariance was not dominated by a single common-method factor (Podsakoff et al., 2003). All study variables were positively and significantly correlated, with coefficients ranging from.381 to.643 (all ps < .01). The strongest association was observed between smombie behavior and problematic social media use, whereas the weakest association was between short-video flow and mistake rumination. Detailed information is presented in Table 2.

Measurement Model

Before testing the parceled measurement model, item-level CFAs were conducted for the four scales represented by item parcels. The results generally supported their unidimensional structures, with CFI values ranging from.967 to.989 and TLI values ranging from.939 to.979. RMSEA values ranged from.057 to.084, while the standardized factor loadings were generally moderate to strong. The measurement model consisted of five latent variables: short video flow, decision fatigue, mistake rumination, smombie behavior and problematic social media use. These constructs were represented by a total of 12 observed variables: two for short video flow, two for decision fatigue, two for mistake rumination, four for smombie behavior and two for problematic social media use. The goodness-of-fit indices indicated that the measurement model provided a good fit to the data (χ^2/df = 4.528, CFI = .978, TLI = .968, RMSEA = .056, SRMR = .028). These findings indicated that the observed variables meaningfully represent their respective underlying latent variables.

Serial Mediation Model

Model Fit and Direct Associations

The structural model was tested using structural equation modeling (SEM), and the results indicated an acceptable fit to the data (χ^2/df = 5.534, CFI = .959, TLI = .945, RMSEA = .074, SRMR = .037). Examination of the path coefficients revealed that short-video flow was positively associated with decision fatigue (β = .665, p < .001) and smombie behavior (β = .596, p < .001). Decision fatigue was positively associated with mistake rumination (β = .595, p < .001), smombie behavior (β = .146, p < .001), and problematic social media use (β = .166, p < .001). Mistake rumination was positively associated with smombie behavior (β = .169, p < .001), and smombie behavior was positively associated with problematic social media use (β = .676, p < .001). The direct association between short-video flow and problematic social media use was not statistically significant (β = .081, p = .070). Sensitivity analyses were conducted by including age, gender,

Table 2 Descriptive statistics, reliability, and correlation findings

Variable	Descriptive statistics					Correlations				
	Mean	SD	Skewness	Kurtosis	α	1	2	3	4	5
1. Short video flow	20.831	7.846	.241	−.959	.906	–				
2. Decision fatigue	22.164	7.966	.394	−.270	.889	.592**	–			
3. Mistake rumination	17.471	5.161	.323	−.387	.873	.381**	.518**	–		
4. Smombie behavior	34.624	10.883	.636	.513	.895	.634**	.558**	.399**	–	
5. Problematic social media use	15.446	5.968	.275	−.622	.846	.601**	.531 **	.449**	.643**	–

*$p < .05$, **$p < .01$, and α = Cronbach alpha

education level, daily screen time, and daily social-media use as potential covariates in the structural model. None of these variables showed a statistically significant association with problematic social media use in the adjusted models, and their inclusion did not materially alter the magnitude or statistical significance of the principal structural associations. Therefore, the final structural model was presented without these covariates to preserve parsimony. All standardized path coefficients are presented in Fig. 2 and Table 3.

Indirect Associations

Bootstrap analyses showed that short-video flow had a statistically significant total association with problematic social media use (B=.360, 95% BC CI [.332,.389], p<.001). After the mediators were included in the model, the direct association was not statistically significant (B=.043, 95% BC CI [−.021,.100], p=.177), whereas the total indirect association was significant (B=.317, 95% BC CI [.268,.379], p<.001). All four specific indirect associations ending in problematic social media use were statistically significant. The largest specific indirect association occurred through smombie behavior (B=.197, 95% BC CI [.152,.258], p<.001). Significant indirect associations were also observed through decision fatigue (B=.063, 95% BC CI [.034,.097], p<.001), through decision fatigue and smombie behavior (B=.039, 95% BC CI [.017,.062], p=.001), and through the full serial pathway involving decision fatigue, mistake rumination, and smombie behavior (B=.019, 95% BC CI [.009,.032], p<.001). This pattern was consistent with an association operating primarily through the specified indirect pathways rather than through a statistically significant

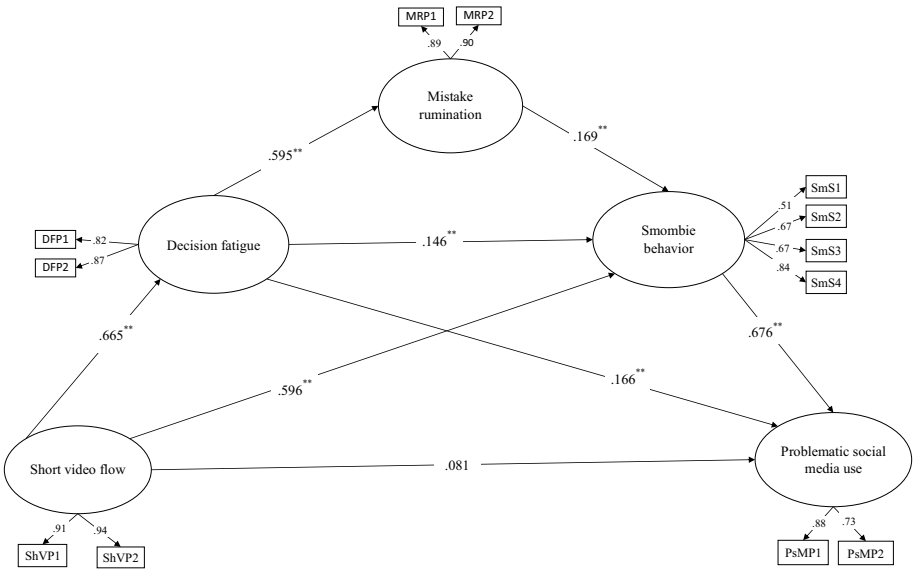

Fig. 2 Standardized path coefficients are presented. Solid lines indicate statistically significant associations, whereas the dashed line indicates the nonsignificant direct association between short-video flow and problematic social media use. Measurement indicators are shown; residual terms are omitted for clarity. Note. $^{*}p$<.05 and $^{**}p$<.01. ShVP: parcel of short video flow, DFP: parcel of decision fatigue, MRP: parcel of mistake rumination, SmS: sub dimension of smombie, PsMP: parcel of problematic social media use

Table 3 Direct associations in the serial mediation model

Direct pathway	β	p
Short-video flow → decision fatigue	.665	<.001
Short-video flow → smombie behavior	.596	<.001
Short-video flow → problematic social media use	.081	.070
Decision fatigue → mistake rumination	.595	<.001
Decision fatigue → smombie behavior	.146	<.001
Decision fatigue → problematic social media use	.166	<.001
Mistake rumination → smombie behavior	.169	<.001
Smombie behavior → problematic social media use	.676	<.001

β = standardized maximum likelihood path coefficient. The arrows indicate the directional paths specified in the statistical model and should not be interpreted as evidence of causal direction

direct association. All indirect associations specified in the model were statistically significant; therefore, H2 was supported. Detailed estimates are presented in Table 4.

Discussion

As digital technologies have become central to everyday life, short-video-based social media platforms have significantly transformed individuals' content consumption habits. The primary objective of this study is to examine the mediating roles of decision fatigue, mistake rumination, and smombie behavior in the relationship between short-video flow and problematic social media use. According to the correlation findings, there are significant relationships among all variables. Structural equation modeling indicated significant indirect associations between short-video flow and problematic social media use through the proposed mediators. Although the direct association was not statistically significant after the mediators were included, the total indirect association and all specific indirect

Table 4 Direct, indirect, and total associations between short-video flow and problematic social media use

Association type and pathway	Estimate (B)	95% BC bootstrap CI	p
Overall associations			
Total association: short-video flow → PSMU	.360	[.332,.389]	<.001
Direct association: short-video flow → PSMU	.043	[−.021,.100]	.177
Total indirect association: short-video flow → mediators → PSMU	.317	[.268,.379]	<.001
Specific indirect associations			
Short-video flow → decision fatigue → PSMU	.063	[.034,.097]	<.001
Short-video flow → smombie behavior → PSMU	.197	[.152,.258]	<.001
Short-video flow → decision fatigue → smombie behavior → PSMU	.039	[.017,.062]	.001
Short-video flow → decision fatigue → mistake rumination → smombie behavior → PSMU	.019	[.009,.032]	<.001

PSMU problematic social media use, *BC CI* bias-corrected bootstrap confidence interval. Confidence intervals were calculated using 5000 bootstrap resamples., B = unstandardized coefficient

associations ending in problematic social media use were statistically significant. These findings are discussed within the framework of the relevant literature.

According to the first finding of the structural model, short-video flow was positively associated with decision fatigue. This finding is consistent with Cognitive Load Theory and ego-depletion and self-regulatory resource perspectives (Baumeister et al., 1998; Huang et al., 2025; Inzlicht & Schmeichel, 2012; Schampheleer et al., 2025; Sweller, 1988). Unlike traditional long-form and text-based content, short-form video platforms differentiate themselves through continuous scrolling options and personalized algorithms. Thanks to this system, users can access a large number of pieces of content in a very short time. However, users are constantly faced with micro-level decision-making processes while in front of the screen. Individuals make sequential choices regarding the short videos they watch, such as continuing to watch, liking, saving, sharing, or swiping to move on (Ye et al., 2025). Exposure to rapidly changing contexts, visual stimuli, and reward-related cues may be associated with greater cognitive demands. In particular, this digital experience, which requires constant shifts in attention, may be associated with greater perceived cognitive strain. Such cognitive demands may be associated with greater difficulty in everyday decision-making and higher levels of decision fatigue. Importantly, the construct measured in the present study was the subjective experience of short-video flow rather than the frequency, duration, or problematic nature of short-video consumption. Therefore, explanations involving repeated exposure and consumption intensity should be regarded as possible theoretical interpretations rather than directly measured aspects of short-video flow.

The structural model also indicated that decision fatigue was positively associated with mistake rumination. This finding is consistent with theoretical approaches suggesting that the depletion of cognitive resources can weaken individuals' ability to regulate negative thought processes (Liu et al., 2025b). Individuals experiencing decision fatigue may feel mentally more exhausted due to repeated choices and heavy cognitive load throughout the day. Decision fatigue may be associated with greater difficulty in flexibly regulating attention and disengaging from negative thoughts. Difficulties in self-regulation may coexist with a greater tendency to dwell on past mistakes, failures, and poor decisions. According to another finding of the structural model, mistake rumination was positively associated with smombie behavior. This finding can be interpreted within the framework of the Compensatory Internet Use Theory (Kardefelt-Winther, 2014). Individuals who ruminate on their mistakes may feel a need to escape this pressure and find relief because they are constantly exposed to recurring thoughts about their past failures and poor decisions. In such circumstances, individuals may engage with digital content and short videos as a possible means of distraction or temporary emotional escape. Individuals who turn to digital screens to escape their repetitive thoughts may see their connection to their physical surroundings weaken due to excessive use, and their environmental awareness may decrease. This theoretical account offers one possible interpretation of the positive association between mistake rumination and smombie behavior. However, distraction motives and changes in environmental awareness over time were not directly assessed, and the present findings do not establish this proposed process.

According to the final finding of the structural model, smombie behavior was positively associated with problematic social media use. This finding aligns with theoretical approaches in the behavioral addiction literature that suggest automated and unconscious digital behaviors may be associated with patterns of problematic use (Moretta & Wegmann, 2025). When considered within Griffiths' Behavioral Addiction Model, the tendency to remain focused on a screen in situations requiring attention to the physical environment may be conceptually related to behavioral salience. Individuals with a high tendency toward smombie behavior may struggle to notice stimuli from the external environment in settings

that require physical attention and may be unable to direct their attention toward the outside world. Ultimately, this may be associated with tendencies toward problematic social media use. Beyond the adjacent associations constituting the proposed serial sequence, the structural model revealed several additional significant direct associations. Short-video flow showed a relatively strong direct association with smombie behavior, indicating that stronger subjective absorption in short-video content was associated with reduced awareness of the physical environment, even after the other modeled associations were considered. This interpretation is consistent with research conceptualizing short-video flow as an immersive form of digital engagement and smombie behavior as smartphone-focused absorption accompanied by reduced environmental awareness (Park & Kim, 2021; Yang et al., 2023). Decision fatigue also showed smaller direct associations with smombie behavior and problematic social media use. This pattern suggests that decision fatigue may be related to both immediate smartphone absorption and broader problematic social media use through shorter pathways that do not necessarily include mistake rumination. These associations are broadly consistent with self-regulatory resource perspectives, according to which sustained cognitive demands may be associated with reduced capacity or willingness to exert behavioral control (Baumeister et al., 1998; Inzlicht & Schmeichel, 2012). Therefore, the overall findings appear to reflect multiple overlapping associations rather than a single, exclusive serial sequence. Given the cross-sectional design, these direct associations should not be interpreted as evidence of temporal or causal relationships.

After the proposed mediators were included in the model, short-video flow was not significantly directly associated with problematic social media use, whereas the total indirect association was statistically significant. Nevertheless, the four specific indirect pathways ending in problematic social media use differed in their composition and magnitude. The largest indirect association operated through smombie behavior, suggesting that smartphone absorption and reduced awareness of the physical environment may constitute a relatively prominent behavioral pathway linking short-video flow with problematic social media use. This interpretation is consistent with perspectives emphasizing behavioral salience and poorly controlled digital engagement (Griffiths, 2017; Moretta & Wegmann, 2025). A second indirect association operated through decision fatigue alone. This shorter pathway suggests that the cognitive strain associated with short-video flow may be related to problematic social media use without necessarily involving mistake rumination or reduced environmental awareness. This interpretation is broadly consistent with self-regulatory resource perspectives, according to which sustained cognitive demands may be associated with a reduced capacity or willingness to exert behavioral control (Baumeister et al., 1998; Inzlicht & Schmeichel, 2012). The indirect pathway through decision fatigue and smombie behavior further indicates that cognitive strain may be associated with problematic social media use through greater smartphone absorption, even when mistake rumination is not included in the pathway. Finally, the complete serial pathway through decision fatigue, mistake rumination, and smombie behavior was statistically significant but had the smallest magnitude. This indirect association is consistent with the hypothesized pattern linking decision fatigue, mistake rumination, smombie behavior, and problematic social media use. However, its comparatively modest magnitude suggests that the complete serial sequence should not be considered the dominant explanatory pathway. Overall, the findings indicate several overlapping cognitive and behavioral indirect associations rather than a single exclusive serial process. This distinction is particularly important given the large sample size, which provided sufficient statistical power to detect relatively small associations. Taken together, these findings suggest that short-video flow, decision fatigue, mistake rumination, smombie behavior, and problematic social media use are interrelated.

However, the temporal and causal directions of these associations cannot be determined from the present data. Problematic social media use may not be adequately understood solely in terms of the intensity or duration of digital-device use. It is a multidimensional pattern of problematic digital behavior that may be associated with individuals' cognitive resources, repetitive thought patterns, and digital behavior tendencies.

Several reverse and alternative pathways should also be considered. Individuals with higher levels of problematic social media use may be more likely to become intensely absorbed in short-video content and display greater smombie behavior. Similarly, individuals experiencing decision fatigue or mistake rumination may deliberately or automatically engage with short-video content as a means of distraction, avoidance, or emotional regulation. Reciprocal relationships are also possible; for example, short-video flow and decision fatigue may reinforce each other over time, as may problematic social media use and smombie behavior. Therefore, although the observed indirect effects were consistent with the hypothesized ordering, the present data cannot determine whether the proposed, reversed, or reciprocal model best represents the temporal relationships among the variables.

Limitations and Future Research

First, all study variables were measured at the same time. Therefore, the temporal ordering and causal relationships among the variables cannot be established. Although the significant indirect effects were statistically consistent with the proposed serial mediation model, they do not demonstrate that short-video flow leads to decision fatigue, which subsequently leads to mistake rumination, smombie behavior, and problematic social media use. Reverse and reciprocal relationships remain possible. For example, problematic social media use may be associated with greater short-video flow and smombie behavior, while decision fatigue or mistake rumination may encourage individuals to engage more strongly with short-video content as a means of distraction or emotional escape. Longitudinal, intensive longitudinal, and experimental studies are needed to examine the temporal and causal directions of these associations. Second, because all constructs were assessed using self-report questionnaires administered within the same cross-sectional data collection, some of the observed associations may have been influenced or inflated by common-method variance. Although Harman's single-factor test showed that a single factor accounted for only 31.59% of the total variance, this diagnostic procedure cannot completely rule out common-method bias. Future studies should use temporally separated assessments, multiple informants, behavioral records, or objective measures such as screen-time data. Third, the use of convenience sampling and face-to-face data collection in university settings resulted in an educationally unbalanced sample, with postgraduate students constituting 48.8% of the participants. Although the sample covered a broad age range, the overrepresentation of postgraduate students may limit the generalizability of the findings to individuals with lower levels of education and to non-university populations. Postgraduate students may differ from the general population in terms of digital literacy, academic demands, and technology-use patterns. Therefore, the findings should be generalized cautiously, and future studies should employ more educationally and socioeconomically diverse community samples and, where possible, probability-based sampling procedures. Fourth, the study and its analytic plan were not preregistered. Although the proposed ordering of the variables was informed by relevant theoretical frameworks, it was not prospectively registered, and the analyses should therefore not be regarded as strictly confirmatory. Given the complexity of the model, the relatively high correlations

among the constructs, and the presence of multiple plausible pathways, some degree of analytical flexibility cannot be ruled out. Accordingly, the findings should be regarded as exploratory and hypothesis-generating and should be replicated in future studies using preregistered hypotheses and analytic plans. Fifth, although the complete measurement model was identified and the item-level CFA results generally supported the unidimensionality of the parceled scales, four latent constructs were represented by only two parcels. This specification provides fewer degrees of freedom for evaluating construct-specific measurement misspecification than models using three or more indicators. Future studies should therefore examine the robustness of the present findings using item-level models or at least three parcels constructed through alternative allocation methods, such as a factorial algorithm. Finally, the current study is limited to specific variables. Given the multidimensional nature of problematic social media use, incorporating additional psychological variables such as impulsivity and FoMO into the model in future research could contribute to a more comprehensive understanding of the cognitive and behavioral processes associated with problematic social media use.

Implications

The findings suggest several tentative theoretical and practical implications. From a theoretical perspective, the positive associations among short-video flow, decision fatigue, and mistake rumination indicate that cognitive load perspectives may provide a useful framework for examining subjective engagement with short-video content. These cross-sectional findings may contribute to the literature by connecting short-video flow with cognitive strain and repetitive negative thinking. However, they do not establish that short-video flow produces cognitive load, decision fatigue, or rumination. The findings also suggest that smombie behavior may have a potentially relevant role in patterns associated with problematic social media use. Within the framework of Griffiths' Behavioral Addiction Model, reduced awareness of the physical environment while using a smartphone may be conceptually related to behavioral salience. Nevertheless, the present findings provide only cross-sectional support for this interpretation and do not demonstrate that smombie behavior constitutes a manifestation or consequence of addiction. Further longitudinal and experimental research is required to examine these theoretical possibilities. The findings also suggest several tentative considerations for mental health professionals, educators, and families. In clinical settings, professionals may consider assessing cognitive strain, decision fatigue, and repetitive negative thinking alongside patterns of problematic technology use. However, whether directly targeting these factors improves intervention outcomes remains to be tested. Similarly, the findings may inform the future development and evaluation of psychoeducational programs addressing digital self-regulation and awareness of online decision-making processes. For families, smombie behavior may be considered as a possible correlate of mental fatigue or repetitive negative thinking rather than being interpreted solely as disinterest or rule-breaking. These suggestions should be regarded as hypothesis-generating directions rather than evidence-based intervention recommendations. Longitudinal and intervention studies are needed before specific clinical, educational, or parental guidance can be established.

Conclusion

In conclusion, the findings were consistent with a hypothesized cross-sectional pattern involving several direct and indirect associations linking short-video flow with problematic social media use through different combinations of decision fatigue, mistake rumination, and smombie behavior. The significant indirect effects suggest that cognitive strain, repetitive negative thinking, and absorption in smartphone use may be relevant correlates of this relationship. However, the findings do not demonstrate that short-video flow initiates a sequential cognitive-behavioral mechanism or that problematic social media use is causally driven by these factors. Longitudinal, intensive longitudinal, and experimental research is needed to determine the temporal direction and causal nature of these associations.

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Data availability Data will be available on request.

Declarations

Ethics Approval This research was ethically approved by Yıldız Technical University Scientific Research Ethics Committee (Approval No. E – 20250505422). All procedures performed in this study were conducted in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. No animals or humans were harmed in the research.

Consent to Participate Electronic informed consent was obtained from all participants. Participation was voluntary, and participants were informed of their right to withdraw from the study at any time without penalty.

Consent for Publication The authors confirm that written informed consent was obtained from all participants for the publication of this manuscript and any accompanying images.

Pre-registration Statement This study was not pre-registered.

Competing Interests The authors declare no competing interests.

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