# Feature Extraction of Fear of Missing Out in Adolescent Users within Mobile Social Media Environments: Postprint

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**Date:** 2023-08-27T00:00:00+00:00

## Abstract

[Purpose/Significance] In the mobile social media environment, Fear of Missing Out (FoMO) among adolescent users has become increasingly prevalent and severe. This study identifies the key characteristics of FoMO among this demographic, laying the groundwork for developing a robust and practical FoMO measurement scale. [Method/Process] Two qualitative research methods—critical incident analysis and in-depth interviews—were employed to collect raw data, which were then coded using NVivo 11 software to extract the key characteristics of FoMO among adolescent users in the mobile social media environment. [Results/Conclusion] The key characteristics of FoMO among adolescent users in the mobile social media environment were extracted, comprising 50 nodes across five dimensions: context, purpose, behavior, consequence, and psychology.

## Full Text

## Preamble

**Volume 62, Issue 17, September 2018**

**Feature Extraction of Young Users' Fear of Missing Out (FOMO) in Mobile Social Media Environments**

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## Abstract

[**Purpose/Significance**] The problem of Fear of Missing Out (FOMO) among adolescent users has become increasingly prevalent and serious in mobile social media environments. This study extracts the key characteristics of adolescent users' FOMO in mobile social media contexts to establish a foundation for developing a robust and practical FOMO measurement scale in the future. [**Method/Process**] We employed two qualitative research methods—critical incident analysis and in-depth interviews—to obtain original information, and utilized NVivo 11 software to code the interview data and extract key characteristics of adolescent users' FOMO in mobile social media environments. [**Result/Conclusion**] We extracted 50 nodes comprising the key characteristics of adolescent users' FOMO in mobile social media environments across five dimensions: situation, purpose, behavior, result, and psychology.

**Keywords:** mobile social media; adolescent users; Fear of Missing Out; FOMO; features
**Classification Number:** G209
**DOI:** 10.13266/j.issn.0252-3116.2018.17.012

## Introduction

As media technology and application environments evolve, people's frequency of social media use and degree of dependence have surged dramatically. In emerging media environments that provide real-time access to massive amounts of information, many users have developed a fear of missing relevant information—a phenomenon known as Fear of Missing Out (FOMO). Preliminary research on FOMO in social media environments has begun to emerge. J. Wortham proposed that FOMO is a source of negative emotions and frustration because it makes people doubt whether they are making optimal choices in life [1]. M. Morford suggested that the combination of social media and FOMO may be potentially linked to unfortunate events [2]. M. Vandenabeel et al. proposed that FOMO among adolescents may lead to social media addiction behaviors [3], and FOMO has been proven to be a predictor of smartphone addiction [4]. C. Montag et al.'s research indicates that excessive WeChat use affects brain structure [5]; the Royal Society for Public Health's 2018 report "Social Media and Young People's Mental Health" shows that while 91% of 16-24-year-old users obtain more emotional support through social media, this also leads to anxiety, depression, and sleep deprivation, with young people's addiction to social media surpassing that of tobacco and alcohol [6].

Dependency serves as an important driving force behind user information behavior, leading to repetitive behavioral manifestations such as repeatedly checking mobile phones, frequently logging into social media, and continuously indulging in online games [7]. As dependency intensifies, mobile social media users may transition from mild to heavy dependence, with FOMO problems gradually developing into internet addiction issues. Compared to addiction, FOMO repre-

sents an earlier stage of dependency and is more amenable to early intervention and regulation through environmental variables, thereby preventing the development of serious addiction problems. The 41st "Statistical Report on China's Internet Development" released by CNNIC (China Internet Network Information Center) in January 2018 shows that as of December 2017, China's mobile internet user population reached 753 million, with usage rates of social applications such as WeChat Moments, QQ Space, and Weibo reaching 87.3%, 64.4%, and 40.9% respectively. The "Emergency Notice from the General Office of the Ministry of Education on Doing a Good Job in Preventing Primary and Secondary School Students from Internet Addiction and Educational Guidance" issued in April 2018 emphasizes that local authorities must fully recognize the extreme importance and practical urgency of preventing primary and secondary school students from internet addiction. Recently, emerging mobile social media platforms such as TikTok have become popular among adolescents, attracting social attention while further intensifying and catalyzing FOMO problems. However, current research on FOMO-related issues in mobile social media remains insufficiently deep and systematic.

In this context, accurately measuring the degree of FOMO among adolescent users in mobile social media environments has become an important research topic. Building upon existing FOMO research, this study employs interviews and critical incident analysis to extract the basic characteristics of adolescent users' FOMO in mobile social media environments, establishing a foundation for developing a robust FOMO measurement scale. The specific research approach is as follows: First, using the critical incident method, we design interview outlines from five dimensions—situation, purpose, behavior, result, and psychology—to obtain relevant information about adolescent users' FOMO in mobile social media environments, and conduct preliminary interviews with frequent mobile social media users to obtain pre-interview data. Next, combining FOMO concepts and pre-interview data, we screen adolescent users with specific characteristics as formal interview subjects and adopt a progressive in-depth interview approach to obtain detailed interview data. Then, using online word frequency analysis tools and NVivo 11 software, we analyze and code the interview data to extract key characteristics of adolescent users' FOMO in mobile social media environments across the five dimensions of situation, purpose, behavior, result, and psychology.

This research is supported by the National Social Science Fund Youth Project "Research on User Adoption Behavior and Quality Evaluation of Network Information Services from an Experience Perspective" (Project Number: 14CTQ024).

## 2. FOMO Concept and Related Research

### 2.1 Concept

In 2011, JWT Intelligence, the research department of the renowned marketing communications brand J. Walter Thompson, defined FOMO as "the uneasy and sometimes all-consuming feeling that you're missing out—that your peers are doing, in the know about, or in possession of more or something better than you" [8]. Cognitive psychologist A. K. Przybylski et al. conducted the first academic exploration of FOMO in social media, defining it as "a pervasive apprehension that others might be having rewarding experiences from which one is absent," characterized primarily by a desire to continuously know what others are doing [9]. Zhao Yuxiang et al. defined FOMO as "when people rely on various mobile intelligent terminals to engage in a series of user information behaviors, including browsing, searching, and socializing, to maintain instant connection with the real or virtual world, and when this instant connection cannot be satisfied, they experience varying degrees of anxiety at the subconscious or psychological level, including discomfort, unease, irritability, or panic" [7].

Based on existing FOMO concepts and related research findings, we believe that FOMO consists of people's subconscious or psychological anxiety and the series of specific behaviors, behavioral outcomes, and psychological characteristics caused by this anxiety. Therefore, we define users' FOMO in mobile social media environments as: In mobile internet environments, people become accustomed to maintaining instant connection with the external world through various mobile social media; when this instant connection cannot be satisfied, they experience varying degrees of anxiety at the subconscious or psychological level. To alleviate this anxiety, people engage in various behaviors using mobile social media, which produce actual outcomes and psychological impacts.

### 2.2 Measurement Scales and Related Research

A. K. Przybylski et al. used principal component analysis and latent trait theory analysis to develop the earliest FOMO measurement scale consisting of 10 items [9]. B. Hato developed a C-FOMO scale based on Przybylski's scale to measure the frequency of checking mobile phones across five situations: general circumstances, social activities, family/friend emergencies, important news headlines, and work/school-related issues [10]. D. Alt developed a FOMO measurement scale based on Przybylski's scale, consisting of three parts: social FOMO (6 items), news information FOMO (3 items), and commercial information FOMO (4 items) [11]. J. P. Abel et al. combined and evaluated all previous FOMO scale items to form a preliminary scale (37 items) containing factors such as discomfort, irritability, anxiety, and self-esteem, and used factor analysis of questionnaire samples to develop a 10-item FOMO psychological basis measurement scale [12]. Song Xiaokang et al. used expert consultation and factor analysis methods to construct a mobile social media user FOMO measurement scale containing 16 indicators across four dimensions: psychological motivation,

cognitive motivation, behavioral performance, and emotional dependence [13].

Additionally, some scholars have applied Przybylski's scale in related empirical research. F. S. Yin et al. selected 7 items from Przybylski's scale as measurement items for the FOMO variable when exploring key influencing factors of social networking site users' continuous usage intention, and conducted a survey analysis of Taiwanese Facebook users. The results showed that users' FOMO and enjoyment significantly positively influenced their continuous usage intention of SNS websites [14]. D. Elhai et al. directly used Przybylski's scale as measurement items for the FOMO variable, recruited 308 participants from Amazon's MTurk labor market for survey analysis, and found that FOMO significantly influenced people's smartphone use [15]. I. Beyens et al. selected 9 items from Przybylski's scale as measurement items for the FOMO variable, conducted a survey analysis of adolescent users, and found that adolescents' FOMO and stress significantly influenced their Facebook use, with FOMO playing an important role in adolescents' media use and well-being [16]. C. Lai et al. studied the relationship between FOMO and social inclusion/exclusion experiences using neurobiological brain activity imaging [17]. S. L. Buglass et al. studied the relationship between users' continuous and frequent SNS use and FOMO [18]. F. Gil developed a Spanish FOMO measurement scale consisting of 10 items based on Przybylski's scale [19], and U. Oberst et al. used this Spanish measurement scale as items to measure the FOMO variable in a survey analysis of 1,468 Latin American social media users aged 16-18, showing that FOMO and SNS use intensity have different mechanisms of influence on negative consequences and psychopathology of mobile SNS use [20].

Through this brief review of FOMO-related research, we find that current FOMO scale research has the following characteristics: (1) Przybylski et al.'s FOMO scale, due to its simplicity and ease of use, has been widely applied and tested as an indicator of the FOMO variable in many social media-related empirical studies, generating significant academic impact. However, this FOMO scale was designed for traditional social media users, while mobile social media users exhibit different characteristics from traditional social media users, and its applicability in mobile social media environments needs to be tested. (2) People typically use dependency level and anxiety level as criteria for judging FOMO or addiction. In existing research represented by Przybylski's scale, indicators that can directly reflect users' FOMO levels—such as the context of social media use, specific behaviors, psychological characteristics, and resulting behavioral outcomes—are not reflected in the scales. In other words, existing FOMO scales are not suitable for actually measuring FOMO levels among mobile social media users. Therefore, extracting FOMO characteristics of mobile social media users based on relevant research to establish a foundation for designing a practical measurement scale for FOMO levels in mobile social media environments is undoubtedly a necessary and urgent task.

## 3. Research Design and Data Coding

### 3.1 Research Methods and Tools

**3.1.1 Qualitative Research Methods** Qualitative research methods are based on description and analysis, do not rely on quantitative data, and follow an "interpretivist" approach, offering advantages over other research methods in terms of data collection, theory formation (inductive method), and understanding perspectives [21]. Based on this, we selected critical incident analysis and in-depth interviews as two qualitative research methods to obtain original information, and used NVivo 11 software to analyze and code interview data to extract key characteristics of adolescent users' FOMO in mobile social media environments.

(1) **Critical Incident Analysis**. The critical incident method was proposed by American scholars J. Flanagan and R. Baras in 1954. It is a method that collects respondents' memorable critical incidents through specific procedures, conducts content analysis, and then 归纳 s them into a certain framework system [22]. The STAR method, as a commonly used approach in critical incident analysis, identifies key events from interview recordings and transcripts after obtaining them, and then classifies and 归纳 s this information after analyzing the prerequisites, causes, processes, contexts, and results of key events. The STAR method describes events from four aspects: S is Situation—requiring respondents to describe the specific context when the event occurred; T is Target—requiring respondents to describe the reasons for the event; A is Action—requiring respondents to describe the specific actions taken at the time; R is Result—requiring respondents to describe the outcomes obtained after taking the action. We used the STAR method to design interview outlines, conducted in-depth interviews with mobile social media users to obtain original interview data for designing FOMO scales, and extracted key characteristics of mobile social media users' FOMO from the interview data.

(2) **In-depth Interviews**. In-depth interviews generate in-depth exploration of specific issues or experiences and have always been a useful data collection method in various types of qualitative research [23]. Their essence is to elicit interpretations of experiences from each interviewee [24], thereby conducting in-depth investigation of specific issues. Following the requirements of in-depth interviews and combining open-ended questions designed in the interview outline, we enabled respondents to describe and reflect on their experiences using mobile social media in ways that rarely appear in daily life. During the interview process, the interviewer focused on the interview questions, trying to elicit detailed discussions from respondents about relevant issues. The interviewer's main tasks were to listen, observe keenly, and record carefully, while providing necessary guidance during the interview process.

**3.1.2 NVivo 11 Software** NVivo software is a qualitative and mixed-methods research software developed by QSR International in Australia [25], primarily suitable for analyzing qualitative research data from longitudinal studies, behavioral research, content analysis, dialogue analysis, anthropology, literature review, and mixed uses of the above methods. Many foreign scholars have used it for qualitative research [26]. NVivo 11, compared to previous versions of the software, has more comprehensive functions and more accurate calculations, helping to improve research rigor and scientific validity [27]. Using NVivo 11 software, we coded and statistically analyzed the interview data obtained from in-depth interviews.

### 3.2 Research Process

#### 3.2.1 Data Acquisition

(1) **Interview Outline Design**. Based on relevant literature and the STAR method, we designed guiding questions as a semi-structured interview outline from five aspects according to research objectives: situation, purpose, action, result, and psychology. Specifically: Situations of mobile social media use, including users' states when using mobile social media, time points of use, frequency of use, and duration of use; Purposes of mobile social media use, including psychological motivations and internal intentions when using mobile social media during work/learning/entertainment/communication processes; Specific behaviors in mobile social media use, such as browsing Moments, checking instant messaging information, reading official accounts, posting/sharing/reposting/replying to information; Results of mobile social media use, including actual impacts on life/work/learning/social interaction; Psychological feelings before and after using mobile social media.

After designing the interview outline, we selected 8 frequent mobile social media users with anxiety for a pilot survey. From the pilot survey data, we extracted three key behavioral characteristics for identifying users with FOMO problems: Frequently checking Weibo/WeChat/QQ Space/TikTok, etc., to view all new content of interest on mobile social media to ensure nothing is missed; Taking out their mobile phone to open mobile social media from time to time regardless of whether they have something to do, for fear of missing important information; After posting updates on WeChat and other mobile social media, repeatedly and frequently checking to learn others' opinions immediately. We then selected mobile social media users who met at least one of these three key behavioral characteristics as interview respondents. When preparing for formal interviews, we made appointments with respondents in advance to ensure they had sufficient time for in-depth communication.

(2) **Respondent Selection and Interview Methods**. The "2016 China Social Application User Behavior Research Report" shows that from the

perspective of social users' age structure, users under 30 account for 52.1%, making adolescent users the main body of social media. This study invited 26 adolescent users under 30 who met at least one of the above three key behavioral characteristics as respondents. Interview methods included face-to-face interviews (16 respondents), telephone interviews (5 respondents), and WeChat voice interviews (5 respondents). Formal interviews were conducted from January 1, 2018, to February 10, 2018, with each respondent interviewed for approximately 30 minutes. The interviewer recorded the entire interview process with the respondents' consent.

During the in-depth interview process, the interviewer flexibly handled interview questions based on actual circumstances, not limited to the order in the outline, encouraged respondents to actively participate, recall, think, explain, and describe in detail, and focused on exploring details of relevant issues. After the interview, respondents were sequentially numbered with Arabic numerals. Based on interview records and recordings, the audio data was manually transcribed word-for-word and sentence-by-sentence into Word text documents, with respondents' numbers (1-26) used as file names. After initial coding and analysis of the information data, key events related to the research topic were extracted, and in-depth follow-up interviews were conducted with respondents about these key events. Each respondent was interviewed an average of 2.5 times, and information collected from follow-up interviews was reorganized into the respondents' data.

**3.2.2 Data Coding and Analysis** The organized Word text data was standardized and imported into an online word frequency analysis tool (http://www.cncorpus.org/) and NVivo 11 software. Using grounded theory coding methods, the text data was coded step-by-step in the order of initial coding, focused coding, axial coding, and theoretical coding. When coding the data of the 22nd respondent using NVivo 11, no new free nodes appeared. Continuing to code the data of respondents 23-26 also produced no new free nodes that could be coded, indicating that data saturation [28] had been reached and the number of respondents met requirements.

(1) **Initial Coding (Open Coding)**. We analyzed the interview data word-by-word and sentence-by-sentence, standardized the naming of each content word or sentence in the interview data, and then used the online word frequency analysis tool to conduct word frequency analysis on the initially coded text data, forming an initial code table to provide guidance for further coding.

(2) **Focused Coding**. Based on initial coding and word frequency analysis, combined with research themes and interview data, we screened important or frequently occurring initial codes to find codes that could fully represent the interview data. After screening the initial codes, we found 50 important codes related to FOMO, including 13 codes for situation, 8 codes for purpose, 10 codes for behavior, 12 codes for result, and 7

codes for psychology. These codes were marked as free nodes in NVivo 11 software.

(3) **Axial Coding**. We sought associations among the 50 codes found in focused coding and 归纳 d these codes into fewer, higher-level concepts. In NVivo 11 software, we used situation, purpose, behavior, result, and psychology as first-level tree nodes. After repeated comparison and analysis, combined with research themes and interview data, we established 14 second-level tree nodes and categorized the 50 free nodes marked in focused coding into each second-level tree node according to content (reference points here refer to the number of free nodes contained in tree nodes), as specifically shown in Figure 1 [Figure 1: see original paper].

After axial coding, the logical relationships between tree nodes and free nodes were basically formed. The detailed situation of free nodes contained in each tree node is shown in Tables 1 to 5 below.

(4) **Theoretical Coding**. Users with different FOMO levels generate different usage situations and specific behavioral characteristics for different purposes. After performing specific behaviors, they present different psychological characteristics and results. For example, users with high FOMO levels frequently check mobile social media during busy work/learning processes to maintain social connections or obtain information. Their specific behaviors focus on social interaction and information, and they often feel regret after checking because it reduces work efficiency or affects concentration. However, due to weak FOMO control ability, they still check repeatedly. At the same time, different behavioral purposes generate different usage situations and psychological characteristics.

In summary, based on the key feature structure formed by axial coding, we systematically 梳理 d the internal relationships among the five dimensions of situation, purpose, behavior, result, and psychology to form a key dimension influence model of adolescent users' FOMO in mobile social media environments, as shown in Figure 2 [Figure 2: see original paper].

## 4. Data Analysis and Feature Extraction

To accurately count the frequency of free nodes, we used NVivo 11 software and online word frequency analysis tools to jointly conduct word frequency statistics on free nodes (1-26 are respondent numbers, with frequency statistics counting the number of times free nodes appeared under first-level tree nodes), as specifically shown in Tables 1 to 5.

### 4.1 Situation—Key Background Characteristics of Adolescent Users' FOMO in Mobile Social Media Environments

Users' situational characteristics of mobile social media use mainly include four aspects: usage state, time point of use, frequency of use, and duration of single

use, directly reflecting users' ability to control FOMO. The specific situations of related nodes are shown in Table 1 :

**Table 1. Statistical Results of "Situation" Related Features**

| Secondary Tree Node (Reference Points) | Material Source List |
|---|---|
| **Usage State (4)** | |
| Work/Learning | 23 [1-8, 12, 15, 17, 22, 23, 25] |
| Life Gap | 22 [1-12, 14, 16-23, 26] |
| Rest/Entertainment | 12 [7-12, 15-18, 20, 21] |
| Need to Use | 14 [1-19, 21-26] |
| **Time Point (3)** | |
| Spare Time Use | 18 [1-8, 10-16, 18, 19, 20] |
| Convenient Use | 15 [1-12, 17-24] |
| Need-Based Use | 10 [3-8] |
| **Frequency (3)** | |
| Always Online | 22 [1-12, 14-18, 19, 21] |
| Frequent Use | 20 [1-12, 13-18, 19, 22] |
| Occasional Use | 8 [2-7, 22, 23, 26] |
| **Duration (3)** | |
| Under 10 Minutes | 15 [1-10, 13-16, 25] |
| 10-30 Minutes | 12 [2-7, 22, 23, 26] |
| Over 30 Minutes | 11 [1-12, 15-16, 18-20, 22-23] |

Through analysis of interview data, we found 13 key situational characteristics: (1) Usage state includes 4 key characteristics. Using mobile social media in different states reflects different user FOMO levels. For example, users who frequently check mobile social media during work/learning/life gaps clearly have higher FOMO levels than those who check during rest/entertainment. (2) Time point includes 3 key characteristics. The ranking of FOMO levels is: spare time use > convenient use > need-based use. (3) Frequency includes 3 key characteristics. Users who are always online and frequent users have higher FOMO levels than occasional users. (4) Duration includes 3 key characteristics, which are influenced by usage state and specific behaviors. Its relationship with FOMO level requires further analysis.

### 4.2 Purpose—Key Cause Characteristics of Adolescent Users' FOMO in Mobile Social Media Environments

Users' purposes for using mobile social media mainly include entertainment, social maintenance, and information acquisition, reflecting users' internal reasons for generating FOMO. The specific situations of related nodes are shown in Table 2 :

**Table 2. Statistical Results of "Purpose" Related Features**

| Secondary Tree Node (Reference Points) | Material Source List |
|---|---|
| **Entertainment (2)** | |
| To Fit In | 13 [9-16, 18-24] |
| To Pass Time | 20 [3-10, 12-22, 24] |
| **Social Maintenance (3)** | |
| Showcasing Self | 13 [1-8, 10-12, 15, 18] |
| Understanding Others | 20 [1-12, 13-18, 19, 22] |
| Maintaining Relationships | 22 [1-26] |
| **Information Acquisition (3)** | |
| Understanding Society | 17 [1-20, 22, 24] |
| Learning Knowledge | 9 [3-7, 10-12, 15] |
| Getting News | 17 [2-6, 8-17, 20, 22] |

Through analysis of interview data, we found 8 key purpose characteristics: (1) Entertainment includes 2 key characteristics. Some users use mobile social media for entertainment to fit in, while others do so to pass time. (2) Social maintenance includes 3 key characteristics. Users use mobile social media to maintain social relationships for self-showcasing, understanding others, and maintaining emotional connections. (3) Information acquisition includes 3 key characteristics. Users use mobile social media to obtain information to comprehensively understand society, timely learn knowledge, and acquire news. Different purposes reflect different situational characteristics and behavioral characteristics. The relationship between behavioral purpose and FOMO level needs to be considered in combination with specific situational and behavioral characteristics.

### 4.3 Behavior—Key Behavioral Characteristics of Adolescent Users' FOMO in Mobile Social Media Environments

Users' specific behaviors in mobile social media use correspondingly include entertainment, social interaction, and information, directly reflecting what FOMO users in mobile social media environments fear missing. The specific situations of related nodes are shown in Table 3 :

**Table 3. Statistical Results of "Behavior" Related Features**

| Secondary Tree Node (Reference Points) | Material Source List |
|---|---|
| **Entertainment Behavior (3)** | |
| Playing Games | 8 [2-5, 13-16, 20] |
| Checking Celebrity Updates | 3 [11, 15, 22] |
| Finding Music/Video Resources | 8 [1-10, 13, 16] |
| **Social Behavior (5)** | |
| Posting Personal Updates | 12 [1-8, 10-12, 16] |
| Checking Chat Messages | 19 [2-12, 14-18, 19, 21] |
| Checking Friends' Updates | 22 [1-12, 15-21, 23] |

| Secondary Tree Node (Reference Points) | Material Source List |
|---|---|
| Commenting | 20 [1-12, 13-18, 19, 22] |
| Sharing/Reposting | 22 [1-20, 22-25] |
| **Information Behavior (2)** | |
| Browsing Official Accounts/Weibo | 17 [1-12, 14-16, 18-19, 21] |

Through analysis of interview data, we found 10 key behavioral characteristics: (1) Entertainment behavior includes 3 key characteristics. Users who use mobile social media for entertainment fear missing the latest game information and celebrity updates, resulting in behaviors such as frequently playing games, checking celebrity updates, and finding music/video resources. (2) Social behavior includes 5 key characteristics. Users who use mobile social media to maintain social relationships fear missing others' information, comments, updates, and opportunities for others to know about them, resulting in behaviors such as frequently chatting, posting updates, commenting, checking chat messages, and checking Moments updates. (3) Information behavior includes 2 key characteristics. Users who use mobile social media to obtain information fear missing the latest news and knowledge concepts, resulting in behaviors such as frequently browsing news, official accounts, and Weibo. Different behaviors present different situational characteristics, and the relationship between specific behaviors and FOMO also needs to be considered in combination with specific usage situations and behavioral outcomes.

### 4.4 Result—Key Impact Characteristics of FOMO on Adolescent Users in Mobile Social Media Environments

Results reflect the positive and negative impacts of FOMO from mobile social media on users. The specific situations of related nodes are shown in Table 4 :

**Table 4. Statistical Results of "Result" Related Features**

| Secondary Tree Node (Reference Points) | Material Source List |
|---|---|
| **Negative Impact (4)** | |
| Wasting Time | 23 [1-14, 16-23] |
| Affecting Concentration | 17 [1-15, 17-19, 21, 23] |
| Reducing Work/Learning Efficiency | 15 [1-10, 13-17, 19, 22] |
| Weakening Face-to-Face Communication | 8 [2-5, 8-9, 12, 20] |
| **Positive Impact (8)** | |
| Improved Communication Efficiency | 9 [3-7, 10-12, 15] |
| Expanded Social Circle | 17 [2-6, 8-17, 20, 22] |
| Increased Information Volume | 11 [1-12, 15-16, 18-20, 22-23] |
| Better Self-Presentation | 13 [3-6, 9-12, 17, 19] |
| Better Understanding of Others | 12 [2-6, 9-12, 15-17] |
| Better Understanding of Society | 17 [1-12, 14-20, 22, 24] |

| Secondary Tree Node (Reference Points) | Material Source List |
|---|---|
| Enhanced Thinking | 9 [1-12, 15, 18] |
| Increased Communication | 8 [1-8, 10-13, 15] |

Through analysis of interview data, we found 12 key result characteristics: (1) Negative impact includes 4 key characteristics. Frequent mobile social media use has negative impacts on users, including wasting time, affecting concentration, reducing work/learning efficiency, and weakening face-to-face communication effects. The degree of impact is positively correlated with the severity of FOMO. (2) Positive impact includes 8 key characteristics. Frequent mobile social media use has positive impacts on users, including improving communication efficiency, increasing communication, expanding social circles, increasing information volume, broadening thinking, presenting oneself more comprehensively, understanding others better, and understanding society better. The degree of impact is closely related to the severity of FOMO, and the specific impact mechanism requires further research.

### 4.5 Psychology—Key Psychological Characteristics of Adolescent Users' FOMO in Mobile Social Media Environments

Users present completely different psychological characteristics before and after using mobile social media, meaning that the psychological characteristics of FOMO in mobile social media environments are not simply manifested as anxiety. The specific situations of related nodes are shown in Table 5 :

**Table 5. Statistical Results of "Psychology" Related Features**

| Secondary Tree Node (Reference Points) | Material Source List |
|---|---|
| **Pre-Behavior Psychology (2)** | |
| Boredom | 17 [5, 9-20, 22-26] |
| Anxiety | 17 [1-12, 14-16, 18-24] |
| **Post-Behavior Psychology (5)** | |
| Depression | 12 [1-8, 10-13, 15] |
| Regret | 15 [6-9, 14, 16-18, 21] |
| Satisfaction | 12 [9-12, 14-17, 22-26] |
| Relief | 13 [1-8, 10-12, 15-18] |
| Excitement | 8 [1-12, 15, 18] |

Through analysis of interview data, we found 7 key psychological characteristics: (1) Pre-behavior includes 2 key psychological characteristics. Users' psychology before using mobile social media mainly presents boredom and anxiety characteristics. Boredom is an early psychological characteristic of anxiety, belonging

to a mild anxiety state. (2) Post-behavior includes 5 key psychological characteristics. After using social media, users exhibit different psychological characteristics due to different FOMO levels, situations, and personal personality traits. For example, some users feel depressed and regretful because frequent checking of mobile social media during work/learning processes reduces work/learning efficiency due to anxiety. In contrast, some users feel satisfied and relieved because they obtained important information by timely checking mobile social media. The relationship between post-behavior psychological characteristics and FOMO needs to be considered in combination with specific behaviors and behavioral outcomes.

### 4.6 Summary of FOMO Key Characteristics

The definition of mobile phone dependence in psychology first emphasizes excessive mobile phone use, and second emphasizes the consequences brought by this excessive use [29]. Scholars' scales for measuring mobile phone dependence also mostly jointly determine users' mobile phone dependence severity from dependence level and consequences [30-31]. Currently available mobile social media FOMO scales are designed for research purposes, focusing on measuring psychological states and behavioral manifestations, lacking attention to usage contexts and behavioral outcomes that can directly reflect mobile social media users' FOMO levels. In other words, existing FOMO scales are not suitable for actually measuring FOMO levels among mobile social media users.

The above analysis shows that adolescent users with FOMO problems exhibit diverse characteristics when using mobile social media. We extracted 50 key characteristics from five dimensions: situation, purpose, behavior, result, and psychology. The extracted characteristics are more intuitive, comprehensive, and targeted compared to existing mobile social media FOMO scale items, better meeting the design requirements of practical measurement scales, thereby effectively supplementing and correcting existing mobile social media FOMO scales.

## 5. Conclusion and Outlook

The development of smartphones, the popularization of mobile internet, and the continuous emergence of new mobile social media enable adolescent users to access rich information and engage in diverse social activities anytime and anywhere. The FOMO problem has gradually evolved from an individual phenomenon to a widely existing social syndrome, further intensified and catalyzed, gradually attracting public attention and researchers' emphasis. This study extracted key characteristics of adolescent users' FOMO in mobile social media environments from five dimensions—situation, purpose, behavior, result, and psychology—establishing a foundation for developing a robust scale that can actually measure adolescent users' FOMO levels in mobile social media environments.

Compared to middle-aged and elderly users as digital immigrants, adolescent users as digital natives have the following unique characteristics: (1) They have stronger susceptibility to various emerging social media and stronger ability to learn to use emerging social media. Meanwhile, as their values are not yet fully formed, they are more susceptible to mobile social media influence while also being more amenable to education and guidance. (2) There are significant differences in the situations, purposes, behaviors, results, and psychology of mobile social media use. (3) Adolescent users are highly malleable. Accurately measuring adolescent users' FOMO levels and intervening and regulating adolescent users with high FOMO levels earlier has more practical significance to prevent them from developing from mobile social media FOMO problems into addiction problems.

Additionally, adolescent users in different age groups also have significant differences. In the future, based on further subdividing adolescent users of different age groups, we will use the research methods and conclusions of this study to obtain data through surveys and experiments, use statistical analysis software such as SPSS, and design practical measurement scales for adolescent users of different age groups that can truly discriminate specific users' mobile social media FOMO levels, providing certain references for FOMO-related research and solving problems caused by FOMO.

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## Author Contributions

Ye Fengyun: Responsible for topic selection, structural design, and paper writing;
Shen Si: Responsible for literature review and data analysis;
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## English Title and Abstract

**The Feature Extraction of Young Users' FOMO in Mobile Social Media Environment**

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**Abstract:** [Purpose/significance] FOMO of adolescent users has become more and more common and serious in mobile social media environment. In order to establish the foundation for building a robust and practical FOMO measurement scale in the future, the paper extracts the key characteristics of FOMO in the mobile social media environment. [Method/process] We obtain the original information with critical incident analysis and in-depth interview of qualitative analysis method and code the interview data with NVivo11, then extract the key characteristics of FOMO in mobile social media environment. [Result/conclusion] The key features of adolescent user FOMO with 50 nodes in the mobile social media environment are extracted from the 5 dimensions of situation, purpose, behavior, result and psychology.

**Keywords:** mobile social media; adolescent user; Fear of Missing Out; FOMO; feature

*Note: Figure translations are in progress. See original paper for figures.*