Pathways Linking Media Use to Wellbeing during the COVID-19 Pandemic: A Mediated Moderation Study

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Abstract

During prolonged social isolation, media exposure is often intensified increases as individuals turn to the Internet, social media, television, and newspapers for information, communication, entertainment, and more. This exploratory study explores the correlations among media use, anxiety, and wellbeing in China during the COVID-19 pandemic. A survey questionnaire was designed to measure the following five constructs: media dependency, media attention, anxiety, wellbeing, and collectivism. A total of 722 respondents in China participated in the survey from November 2020 to December 2020. Structural equation modeling (SEM) was used to analyze the data. Our findings indicate that respondents who report collectivist norms tend to experience higher levels of wellbeing (and lower levels of anxiety), regardless of their scores for media use, media attention, or media dependency. Conversely, those respondents who record low collectivism tend to have higher levels of anxiety (and lower wellbeing), even if they report lower media use, attention and dependency during the pandemic. Study results also found that anxiety mediates the relationship between media use and wellbeing. Our introduction of collectivism as a possible moderating variable represents a significant contribution to current academic debates and suggests the inclusion of cultural factors for future studies on media use and anxiety/wellbeing during public health crises.

Keywords

media attention, media dependency, anxiety, collectivism, wellbeing, COVID-19

The global COVID-19 pandemic exerted pressure on every layer of society (Gong et al., 2021), particularly during the first year of the outbreak. In early 2020, in response to the rapid spread of COVID-19 and recommendations from the World Health Organization (WHO), nations across the world began implementing various social distancing, quarantine, and lockdown measures. Notwithstanding spikes that later accompanied easing of social distancing, quarantine and lockdown measures proved to be the most effective way of combating COVID-19. Lockdowns were effective in slowing down the spread of COVID-19, however, a range of negative consequences have also ensued. In addition to economic downturns and loss of livelihoods, the psychological impacts of the pandemic and its accompanying lockdowns are equally damaging.

A review of extant studies on previous disease outbreaks (e.g., SARS) indicates that being quarantined negatively affect mental health, as quarantined individuals display signs of anxiety, depression, and even posttraumatic stress disorder (PTSD; Hawryluck et al., 2004). More recent studies have found that social isolation (in the case of lockdowns and quarantines) leads to an increase in social media use for support, entertainment, and connection with others (Nabity-Grover et al., 2020). People rely on social media to stay in contact with their family and friends, while organizations and workplaces utilize online platforms to facilitate remote work and maintain work routines (Holmes et al., 2020). Consequently, surveys have revealed a visible and significant increase in online time. For example, social media (i.e., Facebook, Twitter, and WhatsApp) exposure and time increased up to 87% in India (Business Today, 30 March 2020). Globally, from February 2020 to March 2020,
Facebook and Instagram use increased by more than 40%, while messaging on Facebook, WhatsApp, and Instagram increased by 70%. The number of real-time streaming views has also doubled (Nabity-Grover et al., 2020).

Against this backdrop of heavy media usage during the second wave of COVID-19 outbreaks in China, this study examines correlations between media users’ wellbeing and media attention and media dependency, as well as anxiety. We also explore the possible moderating role of collectivism in counteracting anxiety and enhancing wellbeing.

Although the effects of media use, media exposure, and media dependency on wellbeing have been extensively examined in previous research (Dhir et al., 2018), this study contributes to the current literature in important ways. First, we consider the cultural variable “collectivism” in our model. Second, we add to the relatively small body of literature exploring media use, media exposure, and/or media dependency in relation to wellbeing whilst taking into consideration the possible mediating role of anxiety and moderating role of a cultural variable, namely collectivism. Third, our research context is China, a hierarchical society with a strong collectivist culture.

The subsequent section sets forth the theoretical foundations of this study. Next, we review relevant concepts and literature. We then present our research model and hypotheses, followed by the research methodology. Finally we present results of our data analysis and conclude the article by discussing the study’s implications and limitations.

**Theoretical Preliminaries**

This study draws upon Cultivation Theory (Gerbner & Gross, 1976) as well as the Differential Susceptibility to Media Effects Model, or DSMM (Valkenburg & Peter, 2013) to explore the correlations and possible relationships between COVID-19 related media use and media attention, as well as anxiety, wellbeing and collectivism.

Cultivation Theory, developed by Gerbner and Gross (1976), assumes that repeated and extensive watching of television influence people’s conceptions of reality to reflect what they see on television. This influence is reflected in the following two levels of effects: “first order” effects (general beliefs about the everyday world, such as the prevalence of violence) and “second order” effects (specific attitudes, for example, attitudes toward personal safety; Lett et al., 2004; Shah et al., 2020; Stein et al., 2021). More recent applications and references to Cultivation Theory have similarly posited that repeated and extensive exposure to mass media, online and social media content depicting the world as a dangerous place similarly influences people’s conceptions of, and feelings about, reality to reflect how it is depicted in media and social media (Intravia et al., 2017; Morgan et al., 2017; Tsyo et al., 2021).

DSMM was developed by Valkenburg and Peter (2013) and is an integrative model for understanding media effects from multiple layers, proposing that media effects are conditional and indirect. The model compiles and extends the central concepts, theories, and models of earlier media effect studies to explain (a) that some individuals are more susceptible to media effects than others, (b) how and why media influences those individuals, and (c) how media effects can be enhanced or counteracted (p. 221). The DSMM contains the following four interrelated components: individual susceptibility variables, media use, response state, and media effects.

The DSMM guides this study by arguing that self-selected media use and responses are conditional based on three susceptibility variables: Dispositional, which refers to a person’s disposition (i.e., personality); developmental, which means one’s stage of development; and Social, which is social context factors (e.g., friends and family) that influence an individual’s selective use of and responsiveness to media. As Valkenburg and Peter (2013) opined, “These variables are moderators, that is, variables that modify direction and/or strength of the effect of media use on a given outcome” (p. 223). If a moderator is valid, then a media effect is considered to be conditional, meaning that it cannot be generalized to all media users. DSMM lends itself as useful way for studying the moderating effects of social variables like culture and major events, and dispositional variables such as anxiety and wellbeing. It is a conceptually relevant model for examining media use and anxiety/wellbeing (i.e. media effects) within China’s collectivist culture during the COVID-19 pandemic (i.e. social variables of susceptibility).

In particular, DSMM offers a theoretical possibility of exploring the following three important questions: (a) how media attention and media dependency influence anxiety; (b) how media exposure and emotional and psychological responses relate to wellbeing; and (c) how differential susceptibility variables enhance or impede wellbeing.

In this study, we examine Chinese residents’ use of television news, newspaper, and social media to posit that increased media use and attention correlates with both distressing conceptions of the COVID-19 pandemic (i.e., first-order cultivation of “media effects”) as well as feelings of anxiety, depression, and lower levels of wellbeing (i.e., second-order cultivation of “media effects”). As will be detailed further below, this article is based on a survey conducted in China from November to December 2020. Survey data was analyzed using SEM analysis. However, given the nature of the survey and ongoing debates regarding the viability of SEM in measuring causal relationships, we refrain from making claims about media “effects.” At the same time, we are cognizant of DSMM and also media effects studies that have suggested that media exposure may influence some people’s conceptions of, and feelings about, the world around them. Thus, we propose to explore the possibility of positive/negative relationships between media use and anxiety/wellbeing, as well as the possible role that collectivism may play in moderating such relationships.
Study Variables and Research Questions

Media Attention and Dependency During the COVID-19 Pandemic

Broadly, media attention refers to the relatively high exposure to or use of certain media types, most commonly television, newspaper, the Internet, or social media. Slater et al. (2009) explained it as people’s tendency to devote cognitive effort to particular types of media messages. Attention is a significant concept as, from a theoretical lens, it is different from media exposure and media use. Unlike attention, mere exposure is unlikely to result in message influence, independent of the extent and nature of the processing of the message. In this research, we conceptualized media attention as the inclination to focus cognitive resources on a particular type of message (i.e., COVID-19 news) through television, newspaper, and social media. As was previously observed during the Influenza pandemic, individuals have an increased need for information and sense-making during outbreaks. Various studies have found that the positive use of media and effective communication ameliorates uncertainty and anxiety in addition to improving wellbeing (Freimuth et al., 2000; Wahl-Jorgensen, 2020). However, scholars have also pointed out that attention to news at uncertain times can worsen individuals’ state of mind as irresponsible, xenophobic, racialized, fear-mongering, and conspiratorial coverage perpetuates fright, panic, and discrimination (Allington et al., 2021; Mamun & Griffiths, 2020). Ultimately, media attention is an important indicator of message influence.

However, examining only media attention is insufficient for drawing conclusions regarding media influence on individual media users. It is also important to examine media dependency, as the former and the latter are empirically distinct variables (Jung, 2017; Morton & Duck, 2000). The media system dependency theory was originally proposed by Ball-Rokeach and DeFleur (1976), with the central tenet that individual media use is determined by the interrelations among society, media, and the audience. This theory explains micro-level individual media use through the analysis of structural dependency relationships at the macro-level, arguing that individual media use is a goal-oriented activity. Later, in attempts to refine the theory, a tripartite audience-media-society relationship was constructed and categorized into macro and micro levels. The macro level included structural dependency relations between audiences, mass media, political systems, and other social institutions. And the micro level involved asymmetrical effects from individuals’ needs and goals being controlled by social and media institutions. (Ball-Rokeach, 2008). Media dependency in particular relevant to this study on media use during COVID-19 as media dependency has been found to be a predictor of anxiety, fear, and depression during times of outbreaks (Curtis et al., 2022; Lowrey, 2004; Mongkhon et al., 2021).

Drawing upon the discussion above, we raise the following research question:

RQ1. What is the relationship between media attention and media dependency with anxiety?

Anxiety During the COVID-19 Pandemic

Anxiety is an emotion characterized by an unpleasant state of inner turmoil, often accompanied by nervous behavior such as pacing back and forth, somatic complaints, and rumination (Rosenhan & Seligman, 1989). Hemmings and Bouras (2016) explain that anxiety is a feeling of uneasiness and worry, frequently generalized and defined as an overreaction to a circumstance that is only subjectively perceived as dangerous. Overall, anxiety is a multidimensional phenomenon that includes uncomfortable feelings, physiological arousal, and its related physical sensations, thoughts of danger and avoidance, and other protective behaviors (Özdin & Bayrak Özdin, 2020, p. 505).

Previous studies have found that anxiety is highly salient during highly critical situations like a pandemic, typically as a result of media coverage. For example, Jones and Salathe (2009) revealed that during the H1N1 pandemic, extensive media coverage, coupled with a high degree of uncertainty about transmissibility and mortality rates, led to widespread concern and anxiety among the general public. Likewise, Hou et al. (2020) examined the associations between social media and technology use and anxiety among parents and children in the United States. Their findings revealed increased use of technology and among both adults and their children, with close correlation between levels of anxiety and social media use, whether for social support or health-related information seeking.

Amid increased media usage during the COVID-19 outbreak, studies have observed both positive and negative impacts on media users (Mongkhon et al., 2021; Ni et al., 2020). Excessive attention to, and reliance on, traditional and social media has been revealed to contribute to problems like depression, anxiety, and poor wellbeing (Gao et al., 2020; Özdin & Bayrak Özdin, 2020). For example, the cross-national study of Garfin et al. (2020) reported increased anxiety levels among media users along with health-protective and help-seeking behaviors during the pandemic. Another study also found a significant relationship between psychological distress, anxiety, and wellbeing during the COVID-19 lockdown in New Zealand (Every-Palmer et al., 2020). Thus, we present our second and third research questions:

RQ2. What is the relationship between anxiety and wellbeing?

RQ3. Does anxiety mediate the relationships between media attention and media dependency, with wellbeing?
**Wellbeing**

Wellbeing has been associated with life satisfaction (Argan et al., 2018; Diener et al., 1985); wellbeing has also been distinguished as being a comparison between negative and positive aspects of life ( Orden & Bradburn, 1969); and distinctions have also been made regarding psychological wellbeing and subjective wellbeing (Opree et al., 2018). The World Health Organization (WHO) highlights wellbeing as a vital element of health. WHO argues that health is not only the absence of disease but also the ideal state of mental, physical, and social wellbeing of an individual.

The WHO offers a widely used measurement of wellbeing. WHO’s five-index (WHO-5) scale is a short yet comprehensive measurement of wellbeing. The WHO Regional Office in Europe subsequently commissioned translations of the original English version of the WHO-5 into several other languages. At present, the WHO-5 has been translated into over 30 languages and is widely used by researchers all over the world. For example, Kilani et al. (2020) used the WHO-5 to examine the influence of COVID-19 home confinement on individuals’ lifestyle, mental wellbeing, nutritional status, and sleeping pattern. Garrett et al. (2019) also explored the relationship between blue space exposure and health and wellbeing among older adults in Hong Kong using the scale. The scale’s broad and persistent use indicates that it has good validity and reliability.

Literature has documented the effects of diseases on individuals’ wellbeing. For example, Lau et al. (2008) found that the outbreak of SARS had tremendously negative ramifications for elderly and younger people’s wellbeing. Multiple recent studies also observed a significant relationship between transmissible diseases and wellbeing ( O’Connor et al., 2021; Zacher & Rudolph, 2021). In particular, Fore (2020) revealed that COVID-19 exerts a detrimental impact on health and wellbeing. However, research on COVID-19 and wellbeing within the setting of collectivist societies, especially in relation to media attention, is still scarce.

The above-mentioned wellbeing studies during the SARS outbreak and the recent COVID-19 pandemic demonstrate that infectious disease outbreaks negatively impact wellbeing. These studies offer strong support for further study of the relationship between the COVID-19 pandemic and public wellbeing, while the WHO-5 offers researchers a validated instrument to examine wellbeing among Chinese-speaking respondents. In line with our research foci, we, thus, ask the fourth question:

**RQ4.** What is the direct relationship between media dependency and media anxiety with wellbeing?

**Collectivism as a Cultural Factor**

Collectivism is a value that is characterized by emphasizing cohesiveness among individuals and prioritization of the group over the self ( Hofstede, 1984; Schwartz, 1990). In collectivist culture, a strong hierarchy is emphasized within an interdependent collective, as people prioritize solidarity within the in-group, while and heeding authority ( Chahar, 2019). This cultural factor leads to a culturally nuanced approach to communication and information processing, as suggested by various studies that have found culture to play an important role in influencing the way individuals perceive and process information within their environment ( Coyle-Shapiro et al., 2019; Kickul et al., 2004).

Some studies suggest that collectivism influences individual personality constructs, such that individuals in collectivist societies are more prone to describe themselves as in relation to the group, prioritize in-group aims, and focus on context rather than content when communicating ( Triandis, 2001; Xie et al., 2008). These findings offer support to our proposition that a collectivistic culture like China nurtures collectivistic people ( i.e., Chinese citizens), subsequently shaping their subsequent emotions and behaviors. Literature has demonstrated the role of collectivism in enhancing wellbeing during uncertainties and dilemmas ( Ahuja et al., 2021; Ryff, 2014). In similar vein, this study explores the possibility of collectivism as a latent variable helping to buffer anxiety, enhance individual wellbeing, and contribute to China’s efforts to combat COVID-19.

Collectivism, as discussed earlier, is a cultural factor. While there may be a dearth of research on collectivism and wellbeing within the context of pandemics or epidemics, culture has long been recognized as an important health variable affecting people’s levels of wellbeing. For example, cultural factors were found to have a strong influence on variance in burnout and wellbeing in a study of large groups of medical students across 12 countries ( Molodentski et al., 2021). Furthermore, culture has been found to be a determinant of anxiety and depression, with discrepant clinical trial results ( Khambaty & Parikh, 2017; Kirmayer, 2001; Malik, 2021). Likewise, cultural response bias was found to be a contributing factor in the difference in subjective wellbeing among immigrants in Australia ( Lai et al., 2013). It must also be noted, however, these studies conceptualize culture as a generic variable, neglecting the collectivist–individualist nuances that distinguish different cultures and wellbeing within those cultures, particularly non-western cultures.

Conversely, this study recognizes the cultural importance of collectivism within non-western societies, like in China. Relatedly, we propose the following research questions:

**RQ5.** Does collectivism moderates the relationship between media attention and media dependency with anxiety?
RQ6. Does collectivism moderates the relationship between anxiety and wellbeing?

Figure 1 shows our conceptual model.

Methods

Study Sample

This study adopted a quantitative survey design. An online questionnaire was distributed from November 2020 to December 2020 through a well-known national online data collection service in China, Wen Juan Xing, which offers a broad and substantial nationwide sample. The advantages of using Wen Juan Xing dataset the reduction of sample homogeneity and better response rates. The survey was circulated in Chinese. A back-translation approach was used to translate the items between English and Chinese to ensure linguistic and conceptual equivalence. Participants who consented to willingly participate would click the “Continue” button and be directed to complete the self-administered questionnaire. Participants should answer all questions to be able to submit the survey to avoid any missing data. Eventually, a valid sample size of 722 responses was obtained. The data and materials for the project can be found here: https://osf.io/urcj3/.

Measures

Media attention. This study used a 5-point Likert-type scale (1 = never, 5 = always) to ask how often respondents pay attention to COVID-19 news from three types of media, that is, television, newspapers, and social media. A 3-item scale was adopted from Gong et al. (2021) and H. Huang (2016).

Media dependency. Four items adapted from Morton and Duck (2000) and Gong et al. (2021) were used to measure media dependency, with each item representing one of four dimensions of dependency: informative goals, social understanding, self-understanding, and interaction and action-orientation. These items assessed respondents’ reliance on media during the COVID-19 pandemic. Respondents stated their agreement on a 7-point Likert-type scale (1 = strongly disagree, 7 = strongly agree). Sample items included “Reading newspapers/Watching television/Surfing the internet helps me find out about COVID-19” and “Reading newspapers/Watching television/Surfing the internet helps me observe how others deal with COVID-19.”

Anxiety. To measure anxiety, this study adapted the Self-Rating Anxiety Scale (SAS) proposed by Zung (1971) and Olatunji et al. (2006). This scale was created following the definition of anxiety as a neurosis characterized by anxious overconcern, extending to panic, that is frequently associated with somatic symptoms. In this study, we modified the questions into “I feel more nervous and anxious than usual due to COVID-19,” “I feel afraid for no reason at all,” “I get upset easily or feel panicky,” and “I have sleeping problems during COVID-19.” The responses were rated on a 4-point scale (1 = none or a little of time, 4 = most or all the time). We retained only these four items and removed several low validity items and as well as several items overlapping with wellbeing scales (e.g., I feel calm, I fall asleep easily, and I feel everything is all right).

Collectivism. To measure collectivism, we adapted Heejung S. Kim et al. (2016) that was originally rated on a 7-point Likert-type scale (1 = strongly disagree, 7 = strongly agree). Examples of the statements were as follows: “My happiness depends on the happiness of those around me” and “Learning about the tradition, customs, values, and beliefs of my family is important to me.”

WHO Wellbeing Index. The WHO-5, as mentioned earlier, is a short self-report measure of one’s current mental wellbeing that was adopted in this study. The five items in the WHO-5 were rated on a 6-point scale beginning from zero (0 = at no time, 5 = all the time). Sample items included like “Over the past two weeks, I have felt calm and relaxed” and “My daily life has been filled with things that interest me.”

Data Analysis

Psychometric properties of constructs adapted from past studies are reviewed before proceeding with the main
Social Media + Society

analysis. This study conducted confirmatory factor analysis (CFA), composite reliability (CR), and average variance extracted (AVE) to measure the validity and reliability of constructs. First, the unstandardized goodness of fit index (GFI) was evaluated in the measurement model. The GFI had a value of 0.9, Normed Fit Index (NFI) value was 0.971, and other related indices, namely TLI, IFI, CFI, all reached the acceptable standard of 0.9 (Ramayah et al., 2018). Moreover, RMSEA was at 0.035 (less than 0.08), suggesting good values. Overall, our model results meet SEM criteria; therefore, this model is considered well-fitted.

In this study, Harman’s single factor test was used to detect common method bias. The results showed that there were five factors with eigenvalues greater than 1.0, and the variance explained by the first main factor was 33.109%, which was less than the critical limit of 50% (Kock, 2015). Based on Harman’s single factor test, there is no common method bias in this study.

Results

Measurement Model Assessment

The measurement model of this study was examined through convergent validity and reliability (see Table 1). The standardized factor loadings of media dependence, media attention, anxiety, collectivism, and wellbeing were greater than 0.6. The constructs also exhibited composite reliability (CR) values greater than 0.7 and average variation extracted (AVE) values greater than 0.5. Therefore, all the variables indicated satisfactory convergent validity and reliability (Hair, 2009; Ramayah et al., 2018).

Structural Model

The structural model is shown in Figure 2. It includes the standardized paths coefficients, $R^2$ square and mandatory test results to manifest appropriateness of structural model. The $R^2$ for the dependent variable was 0.34, indicating that the whole model could explain 34% of variance in wellbeing among the sample of this study. The value of $R^2$ improved when anxiety was introduced as mediator in the model. The $R^2$ value obtained was 0.47, indicating a 47% variance explained by media dependency and attention.

The path coefficient results are presented in Table 3. It shows that media attention has a significant positive relationship with anxiety ($\beta=.25, p<.001$), media dependence has a significant positive relationship with anxiety ($\beta=.329, p<.001$), and anxiety has a significant negative relationship with wellbeing ($\beta=-.547, p<.001$). Media dependence has a positive significant relation with wellbeing ($\beta=.137, p<.001$), whereas media attention has a negative insignificant relationship with wellbeing ($\beta=-.051, p=.171$).

Test of Mediation. In this study, the mediation results are tested following Hair et al. (2021) and Nitzl et al. (2016). Table 4 shows the total, direct and indirect effects of the hypothesized paths. It means that anxiety acts as a competitive mediator between media dependency and wellbeing because both direct and indirect effects are significant but point in opposite directions. For media attention and wellbeing, anxiety has indirect-only mediation since its direct effect is insignificant and indirect effect is significant.

Table 1. Convergent Validity and Reliability.

| Constructs   | Items | Factor loadings | CR  | AVE   | MaxR(H) |
|--------------|-------|-----------------|-----|-------|---------|
| Media dependency | MD1   | 0.789           | 0.85| 0.588 | 0.861   |
|              | MD2   | 0.838           |     |       |         |
|              | MD3   | 0.761           |     |       |         |
|              | MD4   | 0.67            |     |       |         |
| Media attention | MU1   | 0.905           | 0.843| 0.644 | 0.876   |
|              | MU2   | 0.746           |     |       |         |
|              | MU3   | 0.746           |     |       |         |
| Anxiety      | AX1   | 0.765           | 0.894| 0.678 | 0.901   |
|              | AX2   | 0.861           |     |       |         |
|              | AX3   | 0.872           |     |       |         |
|              | AX4   | 0.792           |     |       |         |
| Wellbeing    | WB1   | 0.731           | 0.916| 0.686 | 0.929   |
|              | WB2   | 0.917           |     |       |         |
|              | WB3   | 0.826           |     |       |         |
|              | WB4   | 0.844           |     |       |         |
|              | WB5   | 0.813           |     |       |         |
| Collectivism | CT6   | 0.74            | 0.898| 0.558 | 0.899   |
|              | CT7   | 0.732           |     |       |         |

AVE = average variance extracted; CR = composite reliability.

Table 2. Heterotrait-monotrait Ratio of Correlations Result.

| Constructs | 1   | 2   | 3   | 4   | 5   |
|------------|-----|-----|-----|-----|-----|
| Media dependency | 1.000|     |     |     |     |
| Media attention | 0.322|     |     |     |     |
| Anxiety      | 0.526| 0.594|     |     |     |
| Wellbeing    | 0.107| 0.378| 0.543|     |     |
| Collectivism | 0.023| 0.356| 0.319| 0.484|     |

The result of HTMT ratio shown in Table 2 indicates that all the values are below stringent criteria of 0.80. This means that discriminant validity is met.
Moderation Analysis. To test the moderating effect of collectivism on the relationship between media dependency, media attention, and anxiety, the imputed score from the measurement model for collectivism construct were used to create interaction effect in the path model. The moderation results in Table 5 show that collectivism positively and significantly moderates the association between anxiety and wellbeing ($\beta = .089$, $p < .001$), which indicates that at high level of collectivism, there is a stronger relationship between anxiety and wellbeing. However, collectivism has no moderation
effect on the relationship between media dependency and media attention with anxiety.

In addition, the significant interactions were further investigated using an interaction plot as suggested by Dawson (2014). Figure 3 suggests that when collectivism (dotted line) is high, it buffers the effect of anxiety on wellbeing, in other words, high levels of collectivism have a positive impact on wellbeing.

Discussion

The results above indicate that respondents with high-media attention and dependency during the pandemic also experience high levels of anxiety and correspondingly lower levels of wellbeing. These findings are consistent not only with studies indicating pandemic/epidemic time increase in media and social media use (Intravia et al., 2017; Nabity-Grover et al., 2020; Tsoy et al., 2021), but also with studies that have found that higher media dependency correlates with high levels of anxiety and other negative emotions for some users (Ferris et al., 2021). As the DSMM suggests, social contexts can amplify, diminish, and/or moderate individuals’ cognitive, emotional, and behavioral responses to media (Valkenburg & Peter, 2013). In other words, sociocultural and psycho-demographic factors mediate or moderate media effects. Given that collectivism is sociocultural force and psycho-demographic element, we can draw similar conclusions regarding the moderating role of collectivism.

As discussed earlier, collectivism runs strong in China both at the societal level and within families. Our findings indicate that respondents who report collectivist norms tend to experience higher levels of wellbeing (and lower levels of anxiety), regardless of their scores for media use, media attention, or media dependency. Conversely, those respondents who record low collectivism tend to have higher levels of anxiety (and lower wellbeing), even if they report lower media use, attention and dependency during the pandemic.

While we refrain from making causal claims in this study, it is worth noting the similarities between our findings and other studies’ conclusions regarding correlations between anxiety/wellbeing and media attention and dependency, as well as the correlations between anxiety/wellbeing and collectivism. Other studies have gone further to conclude that collectivism positively affects wellbeing and resilience during pandemic/epidemics (Ahuja et al., 2021; F. Huang et al., 2020; Kim et al., 2016) and positively influences public health behaviors curbing the spread of COVID-19 (Lu et al., 2021; Maaravi et al., 2021).

Notwithstanding our mindful approach with regard to drawing causality conclusions, our findings offer both theoretical and empirical contributions to the existing literature.

This study has expanded upon, and contributed to, the cultivation and media effects literature through a more detailed conceptualization and operationalization of media exposure (attention and dependency with three types of medium). Where Cultivation Theory, DSMM and effects research has traditionally focused on negative media effects, we explore integrating positive variables of wellbeing and collectivism into the media effects model. More interestingly, this study confirmed the mediating role of anxiety and the moderating effect of collectivism. To our best of knowledge, this is the first model that incorporates these variables to examine wellbeing during the pandemic.

As the DSMM theoretically suggests, social contexts can amplify, diminish, and/or moderate individuals’ cognitive, emotional, and behavioral responses to media (Valkenburg & Peter, 2013). We grounded our study in the DSMM model within a specific context that yielded interesting results. In the current DSMM model, the role of the differential susceptibility variables as moderators is only explicitly hypothesized to affect the interconnectedness between media use and response state. As findings indicated, it is also feasible that the link between the response state (emotional) and the media effect is moderated by certain differential susceptibility variables, like collectivism/individualism. Moreover, the results of this study suggest

### Table 5. Assessment of Moderating Effect.

| Interaction effect                      | B     | β      | SE  | CR   | p value |
|----------------------------------------|-------|--------|-----|------|---------|
| Collectivism × media dependency → anxiety | 0.027 | 0.038  | 0.021 | 1.245 | .213    |
| Collectivism × media attention → anxiety | 0.002 | 0.003  | 0.02  | 0.1  | .92     |
| Collectivism × anxiety → wellbeing      | 0.089 | 0.117  | 0.025 | 3.564 | <.001   |

CR = composite reliability; SE = standard error.

![Figure 3. Simple slope analysis.](image-url)
DSMM model can be used as an explanatory mechanism for understanding how certain people’s emotion and psychological moods are expressed under high-media exposure in uncertainty times such as a pandemic.

Empirically, through the context of a collectivist society in a global pandemic, we offer insights into media users’ levels of anxiety and wellbeing alongside (as possibly moderated by) their collectivist tendencies. From a practical perspective, our survey findings from over 700 respondents can serve as useful input for policymaking, and public health communication during major public health epidemics. For example, news coverage and social media postings should integrate health communication strategies that boost wellbeing and collectivism, to mitigate the negative psychological impacts of health crises, and improve individual and societal wellbeing.

Limitations and Future Directions

Although this study yields interesting results, several limitations need to be acknowledged.

Potential self-report bias might exist in the survey. Respondents may have overestimated or underestimated their media use, or their anxiety/wellbeing levels of anxiety and wellbeing. Future studies should thus use more objective measures, such as clinical assessments of mental and psychological status. In addition, the study was conducted in China. Due to the diversity of demographics in China, different personality and social backgrounds and digital inequalities might have an impact on the results. Hence, future studies should consider these aspects in Asia and beyond (Lim, 2020).

We acknowledge the limitations of SEM for inferring causality (Bollen & Pearl, 2013) and recommend future studies to identify more robust analytical tools to test the moderating role of collectivism in determining the relationship between media use and anxiety/wellbeing during health epidemics.

This study employs correlational design. Future research should use a longitudinal design or experimental methods to build these variables’ direction of causality. Furthermore, future studies should consider qualitative methods for a deeper and more nuanced understanding of the interplay between media use, anxiety/wellbeing, and collectivism.

Conclusion

This research was carried out amid the second wave of COVID-19 from November to December 2020, in China, to assess the relationship between media attention and dependency and users’ anxiety and wellbeing, as well as their correlations with collectivism. The results find anxiety acts as both competitive and indirect-only mediator between media dependency, attention, and wellbeing and serves as a significant moderator of collectivism between anxiety and wellbeing. Overall, this research has provided deep insights into media attention and media dependency during COVID-19 in China and their correlations with media users’ levels of anxiety and wellbeing. Our introduction of collectivism as a possible moderating variable represents a significant contribution to current academic debates, offers strong support for future inclusion of cultural contexts when examining media use and anxiety/wellbeing during public health crises.

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Supplemental material

Supplemental materials (raw/processed data, model results) for this article are available online https://osf.io/urcj3/.

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