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The Effect of Social Comparison and Fear of Missing Out on Anxiety Symptoms in Late Adolescents

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Abstract

Social comparisons between peers are generally adaptive in that they facilitate social learning. However, certain forms of social comparison, especially upward comparison in the form of fear of missing out (FoMO), are posited to relate to both depression and anxiety. Empirical evidence supports that increased FoMO is associated with increased depression in adolescents, both in terms of trait-like aspects as well as in daily fluctuations. However, scant evidence exists for ties to anxiety. This study examined social comparison in the form of FoMO and anxiety in late adolescents to examine potential daily relationships between the two constructs across time. Ninety participants were recruited for a 7-day daily diary examination of their FoMO and anxiety to examine daily fluctuations between these variables. A final sample of 50 undergraduates completed all assessments in the experiment. Repeated self-reports were hierarchically nested within each person's daily reports, and thus multi-level method (MLM) were used to examine results. Results indicated that daily FoMO predicted feelings of anxiety, that this relationship was consistently significant over a 7-day period within each person (Level 1), and that this interaction existed for all persons in the study (Level 2). Findings are discussed in terms of mitigating potential harm from social comparison, particularly for FoMO on social media, given its ties to daily fluctuations of anxiety in the current study, as well as to depression in the extant literature.

Key words: anxiety, fear of missing out, late adolescents, social comparison, MLM

The Effect of Social Comparison and Fear of Missing Out on Anxiety Symptoms in Late Adolescents

Adolescence is a period of strong sensitivity to peer influence and is an extremely crucial phase in social learning (Leigh & Clark, 2018). Social learning takes place in a social context, and much of that learning is done through social comparison and modeling (Stibe et al., 2003). Social comparison provides a beneficial way of measuring personal development as well as motivation to improve and develop a more positive self-image (Wheeler & Miyake, 1992). However, adolescents are particularly vulnerable to the negative aspects of social comparison based on the fact that they are increasingly independent from their family unit and instead more reliant on their peer group. A potential negative aspect of social comparison may be present in the frequency and duration of certain types of social comparison taking place via increased communication within social media outlets, which may increase the overall potential deleterious effects of social comparison. A specific type of social comparison that is widespread in social media is instantly messaging one's whereabouts, good times, and social activities, which are viewed instantly by many more adolescents than is typical given more traditional means of communication. Social comparisons in regard to these types of activities are increasing, whether via social media or via traditional forms of communication. Empirical evidence is emerging that this form of social comparison, the apprehension that others are engaging in rewarding activities while you have less likelihood of engaging in rewarding social behaviors, as particularly dysfunctional for adolescents (Leigh & Clark, 2018). The examination of this particular form of social comparison has increased in the past six years given the rise of social media use and correlational exponential increase in social comparisons available to adolescents. Research has primarily focused on cross-sectional research at a given point in time, yet given the instantaneous

nature of social media, an analysis of the daily impact of these comparisons and mood is rarely explored by only a handful of studies focusing on depression and loneliness. This study examined daily fluctuations in anxiety and social comparison, FoMO, in late adolescents to examine the potential nature of this relationship on a daily basis.

Social Comparison and its Relation to Depression

Examination of social comparison and its relationship to depression in adolescents has begun to receive empirical investigation. Although a recent meta-analysis examining the relationship between social comparison and mood noted that social comparison plays a role in depression and anxiety, only a few studies with adolescent samples were noted (McCarthy & Morina, 2020). However, there is growing research in this developmental period, that generally shows that social comparison is related to depressed mood in late adolescents. Bazner et al. (2006) studied the effect of social comparison on current depressed mood state, as well as interactions with presenting depression, in late adolescents and adults. Participants consisted of 913 students and employees at a large university who completed multiple questionnaires. Participants were then asked to imagine a friend who always gets what they want out of life. Five questions followed this exercise that asked participants to compare themselves with this person. Their mood was then reassessed. First, it was found that upward social comparison induced a negative change in positive affect for all participants, as participants were more likely to view themselves as less successful as the example person who gets what they want out of life. Second, participants entering the study with self-reported depression demonstrated a greater change in positive affect than participants without current depressive symptoms. These results supported the negative effect of upward comparison in temporary shifts of depression symptoms. In an undergraduate sample, social comparisons made either in-person or on social media were positively associated with depression symptoms for males

and females (Steers et al., 2014). Interestingly, although the data were cross-sectional, for those students using Facebook, usage of Facebook's association with depressive symptoms was mediated by social comparisons, highlighting the importance of these social comparisons, rather than mere usage of social media.

Depressed symptoms have also been linked to social comparison on specific forms of social media, namely Facebook and Instagram. Higher self-reported Facebook use correlated with greater depression symptoms and envy in undergraduates (Tandoc et al., 2015). A direct examination of content on Facebook to examine specific use of social comparison, rather than merely duration of use, supported similar findings. Adolescents' depressive and loneliness symptoms were related to negative social comparisons on their Facebook communication as well as to negative peer feedback (Ehrenreich & Underwood, 2016). Eighteen-year-olds completed a series of questionnaires assessing their social and psychological adjustment, and two months of the Facebook content was coded for social comparisons. Results indicated that depressive and loneliness symptoms related to Facebook communication was different for boys and girls. For girls, these internalizing symptoms positively predicted posts containing negative affect, somatic complaints, and requests for support as an after effect of negative social comparison to other posts they had seen on Facebook. None of these were supported in boys' Facebook posts. Girls with high levels of internalizing symptoms also received more comments from peers with negative affect and offers of support. For girls, a secondary peer process involving symptom talk, also occurred on Facebook. Thus, both social comparisons as measured by communication patterns and problem talk were linked to negative affect, somatic complaints, and requests for support in females. Similar findings were noted in adults, in that those with pre-existing depressive symptoms

were more likely to report envy, depression, and lower self-esteem following social comparisons on Facebook, compared to those not reporting current depressive symptoms (Appel et al., 2015).

The relationship between social comparison and depression has also been examined in short-term longitudinal designs examining daily fluctuations. Problem-related discussion on social media involving social comparison was significantly related to daily depressed mood state (Starr, 2015). In this study, the influence of social comparison seeking behavior on daily depressed mood was examined using a two-week daily diary method in 51 undergraduates. Participants completed baseline questionnaires and interviews during an initial laboratory visit and were then asked to complete daily diary surveys nightly for 14 days beginning the night of the baseline interview for measures of social comparison, depression, and co-rumination. Starr hypothesized that daily reassurance seeking about missed social events would predict depressed mood. Fluctuations in daily reassurance seeking about missed social comparison events co-occurred at a significant level with daily depressed mood. There was also evidence that baseline depression increased the likelihood of this finding; in other words, undergraduates that entered the study with subclinical or clinical levels of depression were more likely to report negative social comparisons and depression on a daily basis. Similar results were noted for individuals at a university that logged Facebook time, social comparisons and depressive symptoms daily over 14 days. Results indicated that social comparisons mediated the relationship of daily Facebook usage and daily depressive symptoms (Steers et al., 2014).

In terms of prevention, some results suggest a helpful role in limiting time on social media with subsequent positive influences on mood. Undergraduates volunteered to limit their use of Facebook, Instagram and Snapchat to 30 minutes per day, while a control group continued use as was typical during baseline use from the previous week (Hunt et al., 2018). Following three weeks,

the group of late adolescents that limited their use of social media reported significantly lower depression and loneliness, as compared to the control group. The results supported the conclusion that limiting social media use to 30 minutes per day might lead to improved functioning in terms of depression and isolation. What was not explored directly was the role of social comparison in these results.

Social Comparison and Anxiety

Social comparison has been suggested to also play a role in the maintenance of social anxiety. Those with social anxiety downplay their importance in social situations and are more likely to perceive their performance as worse than others' performances (Mitchell & Schmidt, 2014). As well, anxiety is positively associated with upward comparison among undergraduate students and is linked to more frequent negative self-appraisals. Individuals who were more uncertain about their lives were more likely to have higher levels of anxiety and were more likely to engage in social comparisons (Butzer & Kuiper, 2006). Results were interpreted that individuals making downward social comparisons can come off as conceited or condescending, which in turn created more stress and anxiety in relationships.

FoMO and its Relation to Depression

Fear of missing out (FoMO) refers to a specific type of social comparison, an upward social comparison wherein there is a persistent apprehension that others are engaging in rewarding experiences when you are not present (Przybylski et al., 2013). It is typically characterized by the desire to stay continually connected with and informed about what others are doing. FoMO is a construct that involves unmet social needs and is conceptualized to result in both depression and anxiety. Studies in high school and college students have noted that both social comparison and FoMO are highly impactful on the development and sustainment of depressed mood (Elhai et al.,

2018; Reer et al., 2019; Wolniewicz et al., 2020). A study in students at a university (Baker et al., 2016) found that higher levels of FoMO were associated with more depressive symptoms and less mindful attention. Interestingly, they also found that more time spent on social media was not related to depressive symptoms or physical symptoms once FoMO was accounted for, underscoring the importance of this variable in the association of social media use and depressive symptoms.

FoMO and its Relation to Anxiety

Fear of missing out has been shown to be related to social anxiety, though there is a lack of literature examining the correlation between FoMO and generalized anxiety. Much of the existing literature focuses on FoMO, social anxiety, and problematic social media usage. Two studies found that FoMO mediated relations between levels of social anxiety and variables involving problematic internet usage (Dempsey et al., 2019; Oberst et al., 2017). Individuals with social anxiety reported that they used social media as a way to decrease their anxiety; however, social media use instead found to be associated with higher FoMO. Similarly, a study by Holte & Ferraro (2020) found that anxiety attachment influences how boredom proneness predicts feelings of FoMO by mediating anxiety and depression severity. These studies have begun to highlight the association between FoMO and social anxiety and attachment anxiety in particular, with preliminary support of the association with FoMO.

Current Study

In summary, the literature on the fear of missing out and social comparison demonstrates concurrent and prospective relationships with depressed mood and social anxiety. However, the extent to which the fear of missing out is related to the production of anxiety symptoms in late adolescents remains to be examined. The study of the possible relationship is exceedingly

important because FoMO is theorized to derive from both anxiety and depression, but there is a lack of literature focusing on anxiety, instead focusing only on depression and social anxiety. As well, the connection between social comparison, and FoMO in particular, with anxiety have been examined at a general level; daily fluctuations between social comparison and mood state have only been examined in depression. Therefore, this study will examine how social comparison, the fear of missing out, relates to daily fluctuations of general anxiety symptoms in college-age late adolescents.

To better understand the interactions between the fear of missing out and anxiety this study used a seven-day daily diary method to look at day-to-day feelings and symptoms. The purpose of the proposed study was to examine the peer risk factor of social comparison between friends, FoMO on anxiety symptoms in a short-term longitudinal design in late adolescents. It was hypothesized that individuals that reported more frequent FoMO social comparisons were more likely to experience symptoms of anxiety. Secondly, it was hypothesized that the relationship between FoMO and anxiety would be consistent for all late adolescents. The goal of the study was to better understand how the social comparison of fear of missing out produced anxiety symptoms in late adolescents in order to inform future prevention and intervention methods. Specifically, it was hypothesized that daily fluctuations in FoMO would be related to daily anxiety score across individuals.

Method

Participants

Participants consisted of 87 undergraduates recruited from a northeastern university. Enrollment employed two strategies. First, undergraduates enrolled in General Psychology I and II were recruited to participate in this study as part of their course requirements or for extra

credit. Participants from this population were recruited from the Psychology Department Participant Pool. Participants were also recruited from an advertisement on the campus daily digest.

There was no cost for the participant to partake in this study. Compensation was given via experimental credit for participants enrolled in the general psychology class. Participants received 1 credit for every 30 minutes of participation in the experiment, per their syllabus, resulting in a total of 5 credits by the end of the study (140 minutes total). Those who enrolled in the study via the campus daily digest received a $7 Dunkin Donuts gift card as compensation.

Of these 87 participants, 74% were female and 25% were male, with 1% of participants choosing the "prefer not to say" option when reporting their gender. The median age of the participants was 19 years old, with all participants in a range of 18 to 23 years old. Participants endorsed diverse racial and ethnic backgrounds, with a prominent number of participants being White, at 67%, with Asian American following close behind at 18%. There were 3% Black participants, 2% Hispanic/Latino participants, 1% Middle Eastern participants, and 7% Mixed Ethnicity participants. Around 40% of participants were Freshman, 26% of participants were Sophomores, 11% of participants were Juniors, and 20% of participants were Seniors, with 2% of participants choosing to withhold their class year.

Though 87 participants originally enrolled in the study, only 50 participants completed all seven surveys. Of these 50 remaining participants, 76% were female and 22% were male, with 2% of participants choosing the "prefer not to say" option when reporting their gender. The median age of the participants was 19 years old, with all participants in a range of 18 to 23 years old. Of the final sample, 62% were White, 18% were Asian American, 6% were Black, 4% were Hispanic/Latino, 2% were Middle Eastern, and 8% were of mixed ethnicity. Around 40% of

participants were Freshman, 26% were Sophomores, 14% were Juniors, and 18% were Seniors, with 2% choosing to withhold their class year.

Procedure

All procedures were approved by the Institutional Review Board (see Appendix A). After signing up for the study, participants received an email requesting that they confirm their choice to enroll. When they confirmed, they received an email stating that their first survey would be sent on the day that they had signed up for. The first page of the survey contained an informed consent information sheet. Participants were informed that participation was voluntary and that they may withdraw at any time without penalty to obtaining course credit. After a full review and the opportunity to ask questions via email, participants were able to begin the study.

Participants received a link to a Qualtrics survey nightly, at 7 pm, for 7 consecutive days. The participant first completed a daily diary entry where they described what they had done that day and any emotions that they felt from those occurrences. They then went on to complete measures on FoMO and anxiety. They completed the same procedure nightly until the 7 days were complete. After completing the last questionnaire, the participant was debriefed and offered the reference of mental health resources. The participant signed to confirm that they looked at the resources and copied them down if they felt it necessary.

Measures

The **Fear of Missing Out (FoMOS) Scale** is a 10-item measure where subjects rate statements about their fear of missing out in everyday experiences on a five-point Likert scale ranging from '*not at all true of me*' to '*extremely true of me*' (Przybylski et al., 2013). Higher scores indicate higher fear of missing out. Statements included "*It bothers me when I miss an opportunity to meet up with friends*" and "*I get anxious when I don't know what my friends are*

up to". The FoMOS demonstrated strong internal reliability (α = .87 to .90), as well as convergent and divergent validity in terms of associations in expected directions with mood and life quality. The internal reliability of FoMO for the current study was α = .881.

The **Depression Anxiety Stress Scales (DASS-21)** is a 21-item scale designed to measure dimensions of depression, anxiety, and stress on a four-point Likert scale ranging from "did not apply to me at all" to "applied to me very much, or most of the time" (Henry & Crawford, 2005). Higher scores indicate higher psychological distress and general stress. This measure of depression, anxiety, and stress demonstrated high internal consistency (α = 0.88 to 0.93), and the Anxiety subscale also yielded high internal consistency (α = 0.90). Adequate convergent and discriminant validity were supported for the DASS. Confirmatory factor analysis supported a three-factor solution consistent with each subscale. For the purpose of this study, only the 7-item anxiety subscale was used (DASS-A). The internal reliability of the DASS-A for the current study was α = .834.

Data Analytic Plan

Sample characteristics. First, the data was evaluated for normal distribution. To do this, stem and leaf plots, histograms, and tests of normality were examined. Next, completers versus non-completers were compared for differences in baseline values. Then, the baseline characteristics of the remaining sample would be used to characterize the final sample.

Hypothesis testing. Multilevel Modeling (MLM**;** see Appendices B-D for results) was planned to analyze a longitudinal model for individual change in anxiety as a result of FoMO across 7 days within each participant. MLM was utilized due to the non-independence of daily diary data. In other words, the repeated measures of daily self-reports were related to each other for each individual. Due to this, one cannot assume that the observations, that is, repeated

measures level of anxiety and social comparison, were independent, which would be a requirement for a regression equation, or that is, ordinary least squares regression (OLS). Instead, the methodological design of this study had nested data. Each person's 7 days of self-reports were 'nested' within the person. These were not independent of each other. Next, multiple participants were also used, and each of these persons were viewed as independent from each other. This level of analysis was then viewed as the between-subjects portion of the study design. Multilevel modeling is the proper statistic to use to evaluate the study's hypothesis because it provides one level of analysis that is nested within observations at another level. In this study, observations were within persons – daily self-reports on anxiety and social comparison. The estimates provided in this form of statistics incorporates the effects of the hierarchy of the observations – the first level of days of the week for each person, and the second level of each person. The advantage of using MLM is that it examines not just the variance, but also the covariance, which is the relationships between variables, which can differ across the levels of analysis.

To determine if MLM was appropriate, the study first determined, "Do I have samples?" and then "Do I have enough observations to make a level?". It was determined that indeed the data did have a sample at each level, and they were nested. First, at Level 1, days were sampled across each individual from the population of all of their days. Second, undergraduates were sampled from the larger population of late adolescents enrolled in the university. Thus, is was determined that meaningful samples had been obtained. Then, sufficient observations at each level were also obtained. Level 1 was the number of diary days, and at Level 2 was a sufficient number of participants completing the experiment to perform MLM.

Also, the intraclass correlation (ICC) was calculated, which is the distribution of means. This statistic does not yield a relationship, in a way that MLM does, but instead provides a description of between subject, so to speak. It was not used to determine whether MLM should be used, but rather added information about the distribution of means. SPSS does not calculate this score, and it was planned to be calculated by hand, with the formula being the variance at level 2 divided by the sum of variance of Level 1 plus Level 2 (see Appendix A for input data for this calculation).

To complete MLM analyses, first an unconditional model was evaluated. This was done to provide descriptive information about the data. Then, the Level 2 variable was added in the next model. This is when the Level 1 observations are estimated for each Level 2 unit. In other words, it is akin to running a regression equation for each person across their days, to yield an average regression model for each person. The intercepts are seen as each person's grand average (mean). The slopes of these are viewed as covariances, which is like the traditional regression coefficient.

Next, the MLM model added the specific predictors at each Level 1 day level. This was to analyze the Level 1 coefficients at Level 2. In other words, for what type of people are the days of self-reports (i.e., daily social comparisons) important to predict their anxiety. Or, is there something about each person that varies such that daily variations in FoMO and anxiety are only valid for some of the persons sampled.

Results

Sample Characteristics

To examine if there were differences between those participants that completed (n = 50) and those that did not (n = 37) complete the surveys, t-tests were conducted to examine baseline

characteristics. When an independent sample t-test was performed, the two groups did not differ on baseline measures for age, $t(83) = .645$, $p = .521$, FoMO, $t(84) = 0.168$, $p = 0.867$, nor did they differ on baseline for anxiety, $t(84) = -0.331$, $p = 0.741$.

For the final sample, three participants had missing data for the two outcome measures. As each participant had only one item missing from one scale each, the mean item score for that person for that scale was used for the missing item to compute the scale mean for that subject. Next, the variables of interest were examined for normality. Stem-and-leaf, histograms and tests for normality noted no significant skew or kurtosis for FoMO, $F = .846$, $t(86) = .168$, $p = .360$, or anxiety, $F = .016$, $t(86) = -.331$, $p = .900$. Therefore, analyses proceeded as planned.

The average FoMO at baseline was 27.40 ($SD = 7.52$). The average anxiety at baseline was 4.94 ($SD = 4.60$). Next, a Pearson correlation was conducted to examine the correlation between FoMO and anxiety. It was found that FoMO and anxiety were significantly correlated at $r = 0.274$, $p = 0.011$.

Hypothesis Testing

Unconditional Model. The main hypothesis examined if daily fluctuations in FoMO impacted anxiety. This was evaluated in the broader context of anxiety variations between individuals across time. First the unconditional model (Level 1) was examined that included no predictors or structured co-variance to address whether there was significant variability among participants' anxiety across time that would require further explanation. This model tested three parameters; the fixed effects associated with the intercept, the variance of the intercepts (random effects), and the level 1 residual variance (see Appendix B). This unconditional repeated-measures model indicated that there was significant variability within groups with regards to anxiety (Appendix B; Wald Z = 2.94, $p < .001$). The Wald Z statistic evaluates variance

components that provide information about whether there is remaining variance to be explained by other variables. Based on the Wald Z statistic there was variance that needs explaining. For the variance of day, the Wald Z = 13.993, $p < .001$, and for the intercept Wald Z = 6.352, $p < .001$. Therefore, additional models in MLM were developed to explain this variability in intercepts within persons.

To explain between group variance across time a conditional model (Level 2) was examined with centered daily FoMO as a predictor (see Appendix C). For means and standard deviations of FoMO and anxiety at each assessment point see Table 1. Covariance structure was chosen for repeated effects and a first-order autoregressive matrix was utilized, indicating that the variability of FoMO was homogeneous at each time point and that measurements of FoMO closer to each other in time are more correlated with one another and as time is further apart measurements of FoMO are less correlated. For this level of prediction, each participant's FoMO score was centered and used for the MLM. This model evaluated four parameters. The estimate of the fixed effect for FoMO was significant, $t(472.833) = 4.028$, $p < .001$.

Finally, the model added the mean for FoMO at Level 2, that is, each person's average across the 7 days was added as a model parameter to examine whether the variable of person impacted the within-person findings. This model tested 4 parameters (see Appendix D). The estimate for the parameters of person at Level 2 was not significant, $t(347) = 1.772$, $p = .08$

Discussion

This study sought to better understand the interactions between the fear of missing out and anxiety by using a seven-day daily-diary method to look at day-to-day feelings and symptoms. The peer risk factor of social comparison between friends in the form of fear of missing out (FoMO) on anxiety symptoms in a short-term longitudinal design was evaluated. Participants filled out

nightly surveys, reporting their activities and subsequent feelings in a diary format for 7 consecutive days, followed by the FoMOs scale and DASS-21 anxiety subscale to gauge feelings of FoMO and anxiety. The results imply that participants' FoMO impacted anxiety on a daily basis as hypothesized. Daily FoMO predicted an increase in anxiety not only on the same day, but on the days following the original feeling and fear of missing out. The data also indicated that, no matter who you are, FoMO predicted anxiety, with no across-person variations that impacted this level 1 relationship. It does not vary person-by-person but, instead, is a constant that stays true for everyone.

These findings are in line with findings from similar previous studies. Bazner et al. (2006) found that there was a positive correlation between negative affect and social comparison. Similarly, we found that when FoMO increased (a form of social comparison), the negative affect of anxiety also increased. These findings also follow the findings of Butzer & Kuiper (2006), who found that individuals who are more uncertain about their lives are more likely to have higher levels of anxiety and are more likely to engage in social comparisons. Dempsey et al. (2019) found that people with social anxiety used social media as a way to decrease their anxiety, but instead found that it increased their FoMO and rumination. Though this study did not focus on social media use, it did similarly find that anxiety was affected by FoMO.

This study also expanded previous literature about the relationship between FoMO and anxiety in two important ways. First, this study evaluated a robust measure of general anxiety that has been highly validated in adolescent and adult populations. The finding that FoMO was related to anxiety extends that literature beyond its relationship with social anxiety (Dempsey et al., 2019; Oberst et al., 2017) to anxiety in general. Second, previous studies have noted that the two constructs are significantly correlated at one point in time (Holte & Ferraro, 2020). This study provides an

important contribution to the literature by examining daily fluctuations between FoMO and anxiety in a longitudinal framework. The findings of the current study suggest that in nonclinical samples, negative social comparisons are related to that day's anxiety level. This relationship was similar across a variety of persons in the sample.

This study has important implications for prevention of anxiety. It implies that social comparisons in terms of evaluating social situations that you are excluded from, can be detrimental to one's mental health. Results in the present study, combined with the literature, indicate that both at a cross-sectional nature and longitudinally, FoMO serves as a risk factor for increased anxiety, depression, and loneliness. Implications are that decreasing FoMO would potentially decrease this risk for increased anxiety and depression. To the extent that monitoring social media, such as Facebook or other forms, or direct communication of missing out of social events, would serve to decrease FoMO and hence decrease the risk of increased anxiety via this risk factor. Although this study did not examine decreasing FoMO, anxiety and FoMO did fluctuate together on a daily basis.

There are several limitations to this study. Because this study sampled undergraduate students at one university, the results may not generalize to the wider population. Additionally, social comparison, FoMO, and anxiety were measured by self-report methodology, which may have compromised validity. There was low control due to the characteristics on memory and self-report measures. Some relevant information may have been lost due to participants forgetting what happened that day. Also, this study had a large drop in participation from those who signed up to participate in the study to those who actually completed all 7 surveys. This attrition rate is higher than normal in other longitudinal studies in undergraduates.

In conclusion, this study noted a significant relationship between FoMO and anxiety on a daily basis across time. FoMO is a strong predictor for future anxiety and it does not vary greatly

person-to-person. Future studies may choose to look into how FoMO and resulting anxiety differ across people. Though it was found to be constant that anxiety stems from FoMO no matter the person, it still remains to be understood the nature of those interactions and how one's FoMO and anxiety may differ from another's. It may be useful to study how these interactions differ in different age and developmental groups, such as middle school or high school age adolescents. These methods could advance the understanding of how FoMO and social comparison affect anxiety, and how those interactions differ person-to-person.

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Table 1

Means (SD) for FoMO and Anxiety Across Time

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
FoMO	27.49	25.25	24.36	24.48	24.48	24.86	25.40
	(7.87)	(8.16)	(8.54)	(8.75)	(9.13)	(9.32)	(9.21)
Anxiety	4.80	4.03	3.84	3.53	2.88	3.45	3.68
	(4.61)	(4.84)	(4.92)	(5.11)	(4.01)	(4.47)	(4.41)

Appendices

Appendix A - Measures

Information Form for Participation in a Research Study

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Principal Investigator: Dr. Kimberli Treadwell
Student Researcher: Olivia Adams
Study Title: Worrying and FOMO in Daily Life

Overview of the Research

You are being asked to provide consent to participate in a research study. Participation is voluntary. You can say yes or no. If you say yes now you can still change your mind later. Some key points to consider are summarized in this overview, but you should consider all of the information in this document carefully before making your decision.

Introduction

You are invited to participate in a research study to investigate how fear of missing out (FOMO) relates to anxiety in day-to-day situations. You are being asked to participate because you are in the age group of persons we are looking to study.

Why is this study being done?

This research is being done to examine the peer risk factors of social comparison between friends and the fear of missing out (FOMO) on anxiety symptoms in a short-term longitudinal design in late adolescents.

What are the study procedures? What will I be asked to do?

Participation will involve approximately 20 minutes of your day for seven consecutive days.

If you agree to take part in this study, you will receive an email each night at 7pm with a link to the study materials. You will be asked to complete a diary entry each night, followed by several questionnaires about worry, fear of missing out, and mood. In the daily diary entry, you will detail what you did that day and how you feel about those occurrences. The measures in this study have been widely used and none contain questions that are personally embarrassing.

What are the risks or inconveniences of the study?

We believe there are no known risks associated with this research study; however, a possible inconvenience may be the time it takes to complete the study. Questionnaires may assess some personally distressing areas, in which case you may refrain from answering any questions that make you feel uncomfortable or distressed. Additionally, at any time during the tasks or questionnaires you may stop your participation in this study. You will also be given a list of mental health resources at the end of the study should you choose to discuss any feelings of distress. Completing the questionnaires and the conversation task should take about 20 minutes each night, which can be an inconvenience.

What are the benefits of the study?

You may not directly benefit from this research; however, we hope that your participation in the study may assist in the understanding of the relationship between the fear of missing out (FOMO) and anxiety.

What other options are there?

Each psychology class will list alternate activities for earning course credit or course extra credit on the syllabus. Please consult your syllabus to view what alternatives are available rather than completing an experiment. There also are studies on campus available to any UConn student which are often posted where flyers and announcements can be found, such as the bulletin boards in Bousfield Hall.

Will I receive payment for participation? Are there costs to participate?

There are no costs to participate in this study.

If you are enrolled in General Psychology I or II and signed up on the Participant Pool, then you will receive 5 experimental credits upon completion of the study. If you enrolled in the study via the Daily Digest, you will receive a $7 Dunkin Donuts gift card as compensation upon completion of the study.

How will my personal information be protected?

The following procedures will be used to protect the confidentiality of your data. The researchers will keep all study records (including any codes to your data) locked in a secure location. Research records will be labeled with a code. The code will be derived from a sequential 3-digit code that reflects how many people have enrolled in the study. A master key that links names and codes will be maintained in a separate and secure location. The master key and any recordings will be destroyed after 3 years. All electronic files (e.g., database, spreadsheet, etc.) containing identifiable information will be password protected. Any computer hosting such files will also have password protection to prevent access by unauthorized users. Only the members of the research staff will have

access to the passwords. Data that will be shared with others will be coded as described above to help protect your identity. At the conclusion of this study, the researchers may publish their findings. Information will be presented in summary format and you will not be identified in any publications or presentations.

We will do our best to protect the confidentiality of the information we gather from you but we cannot guarantee 100% confidentiality. We will do our best to protect the confidentiality of the information we gather from you but we cannot guarantee 100% confidentiality. Your confidentiality will be maintained to the degree permitted by the technology used. Specifically, no guarantees can be made regarding the interception of data sent via the Internet by any third parties.

If you choose to withdraw from the study before completion, the information we gather from you will be discarded.

*Y*ou should also know that the UConn Institutional Review Board (IRB) and Research Compliance Services may inspect study records as part of its auditing program, but these reviews will only focus on the researchers and not on your responses or involvement. The IRB is a group of people who review research studies to protect the rights and welfare of research participants.

Can I stop being in the study and what are my rights?

You do not have to be in this study if you do not want to. If you agree to be in the study, but later change your mind, you may drop out at any time for any reason. There are no penalties or consequences of any kind if you decide that you do not want to participate.

You will be notified of all significant new findings during the course of the study that may affect your willingness to continue.

Whom do I contact if I have questions about the study?

Take as long as you like before you make a decision. We will be happy to answer any question you have about this study. If you have further questions about this study or if you have a research-related problem, you may contact the principal investigator, *Dr. Kimberli Treadwell (860-919-3218)* or the student researcher *Olivia Adams (203-917-521).* If you have any questions concerning your rights as a research participant, you may contact the University of Connecticut Institutional Review Board (IRB) at 860-486-8802.

FoMO Scale - Daily Events

Below is a collection of statements about your everyday experience. Using the scale provided please indicate how true each statement is of your general experiences ***for today****. Please answer according to what really reflects your experiences rather than what you think your experiences should be. Please treat each item separately from every other item.*

Response Anchors Not at all true of me 1

Slightly true of me 2
Moderately true of me 3
Very true of me 4
Extremely true of me 5

1. I fear others have more rewarding experiences than me.
2. I fear my friends have more rewarding experiences than me.
3. I get worried when I find out my friends are having fun without me.
4. I get anxious when I don't know what my friends are up to.
5. It is important that I understand my friends "in jokes."
6. Sometimes, I wonder if I spend too much time keeping up with what is going on.
7. It bothers me when I miss an opportunity to meet up with friends.
8. When I have a good time it is important for me to share the details online (e.g. updating status).
9. When I miss out on a planned get-together it bothers me.
10. When I go on vacation, I continue to keep tabs on what my friends are doing

DASS- 21

Please read each statement and circle a number 0, 1, 2 or 3 that indicates how much the statement applied to you ***today***. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time

1	I found it hard to wind down	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I experienced trembling (eg, in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting agitated	0	1	2	3
12	I found it difficult to relax	0	1	2	3
13	I felt down-hearted and blue	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15	I felt I was close to panic	0	1	2	3
16	I was unable to become enthusiastic about anything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life was meaningless	0	1	2	3

Appendix B – Unconditional Model

Mixed Model Analysis

Model Dimension[a]

		Number of Levels	Covariance Structure	Number of Parameters	Subject Variables
Fixed Effects	Intercept	1		1	
Random Effects	Intercept[b]	1	Variance Components	1	Subject_L2
Residual				1	
Total		2		3	

a. Dependent Variable: Anxiety_Total.

b. As of version 11.5, the syntax rules for the RANDOM subcommand have changed. Your command syntax may yield results that differ from those produced by prior versions. If you are using version 11 syntax, please consult the current syntax reference guide for more information.

Note we have 3 paramter estimates in this model. 1. fixed effect associated w ith intercept; variance of intercepts (random effects), and level 1 residual variance.

Estimates of Fixed Effects[a]

						95% Confidence Interval	
Parameter	Estimate	Std. Error	df	t	Sig.	Lower Bound	Upper Bound
Intercept	3.948827	.479563	87.351	8.234	.000	2.995697	4.901957

a. Dependent Variable: Anxiety_Total.

Here we have the grand mean of the intercept across people (L2). In the Estim ate column, 3.94...That is, the average of the means cross people for Anxiety (dV).

Estimates of Covariance Parameters[a]

						95% Confidence Interval	
Parameter		Estimate	Std. Error	Wald Z	Sig.	Lower Bound	Upper Bound
Residual		2.939387	.210062	13.993	.000	2.555207	3.381330
Intercept [subject = Subject_L2]	Variance	19.204324	3.023462	6.352	.000	14.105511	26.146240

a. Dependent Variable: Anxiety_Total.

We have the within-group variance in anxiety is 2.939. The between group vari ance (reflecting variation in intercepts, which are simply the group means on the DV) is 19.204. They are each sig. Note: Wald Z is 2-tailed, but variance is never negative. So split your p value in half. Here, it is still sig. Als o - claculate the ICC. 19 / (2 + 19) = .86726

Appendix C

Model Dimension[a]

		Number of Levels	Covariance Structure	Number of Parameters	Subject Variables
Fixed Effects	Intercept	1		1	
	FOMO_cent	1		1	
Random Effects	Intercept[b]	1	Variance Components	1	Subject_L2
Residual				1	
Total		3		4	

a. Dependent Variable: Anxiety_Total.

b. As of version 11.5, the syntax rules for the RANDOM subcommand have changed. Your command syntax may yield results that differ from those produced by prior versions. If you are using version 11 syntax, please consult the current syntax reference guide for more information.

We now have 4 parameters. Fixed effects of grand mean (intercept), and FOMO L 1. variance estimate for the intercept, Ll residual variance.

Estimates of Fixed Effects[a]

						95% Confidence Interval	
Parameter	Estimate	Std. Error	df	t	Sig.	Lower Bound	Upper Bound
Intercept	1.478413	.758136	291.540	1.950	.052	-.013702	2.970527
FOMO_cent	2.417361	.600090	472.833	4.028	.000	1.238189	3.596534

a. Dependent Variable: Anxiety_Total.

Here we have the regression slope for fixed effects of intercept & FOMO. FOMO is positive and significant. more fomo more anxiety. On days that fomo was h igher, anxiety was higher.

Estimates of Covariance Parameters[a]

						95% Confidence Interval	
Parameter		Estimate	Std. Error	Wald Z	Sig.	Lower Bound	Upper Bound
Residual		2.942639	.212249	13.864	.000	2.554705	3.389481
Intercept [subject = Subject_L2]	Variance	16.555216	2.675367	6.188	.000	12.060864	22.724340

a. Dependent Variable: Anxiety_Total.

Appendix D

Model Dimension[a]

		Number of Levels	Number of Parameters
Fixed Effects	Intercept	1	1
	FOMO_cent	1	1
	FOMO_stand_mean	1	1
Residual			1
Total		3	4

a. Dependent Variable: Anxiety_Total.

Estimates of Fixed Effects[a]

						95% Confidence Interval	
Parameter	Estimate	Std. Error	df	t	Sig.	Lower Bound	Upper Bound
Intercept	-.587286	.774785	347	-.758	.449	-2.111152	.936581
FOMO_cent	.665495	1.955497	347	.340	.734	-3.180624	4.511615
FOMO_stand_mean	.146392	.082631	347	1.772	.077	-.016127	.308912

a. Dependent Variable: Anxiety_Total.

Estimates of Covariance Parameters[a]

					95% Confidence Interval	
Parameter	Estimate	Std. Error	Wald Z	Sig.	Lower Bound	Upper Bound
Residual	18.526312	1.406498	13.172	.000	15.964916	21.498656

a. Dependent Variable: Anxiety_Total.