



Life aspirations, school engagement, social anxiety, social media use and fear of missing out among adolescents

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Abstract

Fear of Missing Out (FoMO) – people’s intense concerns that they might miss pleasant moments that their peers may enjoy—has been found to relate to a variety of undesired outcomes, including poor academic functioning. Yet, little is known about why some students may exhibit more FoMO than others. In this cross-sectional study with a sample of Turkish adolescents ($N_I = 506$; 50.8% males; $M_{age} = 15.8$ years; $SD = 0.83$), we examined to what extent intrinsic and extrinsic life goals for using social media predict FoMO over and above social anxiety. We found through path analyses that extrinsic goals of attaining popularity, garnering attention, and conveying a positive image of oneself to others related to FoMO which in turn related to lower grades by means of in-class distraction and out-of-class study interference. Taken together, the present results suggest that the goals that adolescents try to attain through social media use may explain why FoMO might be more prevalent in that age group.

Keywords Fear of Missing out · Self-determination Theory · Extrinsic and Intrinsic Aspirations · Social Media · Academic Engagement · Social Anxiety · Adolescence

Social media platforms such as Twitter™, Facebook™, and Instagram™ afford unobtrusive online communication (Greenwood et al., 2016; O’Keeffe & Clarke-Pearson, 2011; Valkenburg & Peter, 2011); they enable users not only to stay connected with their friends and family, but also to remain updated with a variety of social events, activities, and information in real-time (Gemmill & Peterson, 2006; Przybylski et al., 2013). This new social media world has yielded, among other things, a new phenomenon, called Fear of Missing Out (FoMO), which refers to people’s aim to stay constantly connected and updated so as not to miss any information about what is going on (Przybylski et al., 2013). An ever-growing number of studies have been investigating how FoMO may relate to young people’s mental health, such as depression,

anxiety, and obsessive–compulsive symptoms (Andreasen et al., 2016; Alt, 2016; De Choudhury et al., 2013; Elhai et al., 2020a; Rosen et al., 2013) and negatively with aspects of well-being (such as life satisfaction) (Alt, 2016; Elhai et al., 2020b; Przybylski et al., 2013; Riordan et al., 2015; Wegmann et al., 2017). However, why are some young people obsessed with FoMO more than others? Is it just a matter of anxiety about being left out of some important events (Elhai et al., 2020a)? Or is it also a matter of the goals that adolescents try to pursue through social media use?

In this cross-sectional study, we aimed to investigate, through path modeling, to what extent FoMO might be predicted by intrinsic life goals (namely, the goals for self-development, establishing and maintaining meaningful social relationships and community contribution), and extrinsic life goals (namely, attractiveness, popularity, and garnering attention and admiration), as these are defined through Self-Determination Theory (SDT; Ryan & Deci, 2017). Furthermore, we examined in such a path model the degree to which FoMO in turn relates to school-related functioning and achievement among adolescents, and hence mediates the relation of intrinsic and extrinsic life goals to school-related outcomes. While doing so we took into account social anxiety to statistically control for variance of self-reported FOMO.

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Fear of missing out

FoMO seems to take place on a regular basis and across different times, days, and circumstances, and mostly at the weekends or during social activities, most likely because of the additional spare time that people can have (Milyavskaya et al., 2018). This finding supports the idea that FoMO does not necessarily depend on social media use, though the latter seems to accentuate the phenomenon (Milyavskaya et al., 2018), as FoMO has been found to relate to problematic internet use and having multiple social media accounts (Alt, 2015; Barry et al., 2017; Tomczyk & Selmanagic-Lizde, 2018).

Aside from the prevalence of the phenomenon, a recent systematic review showed that time spent on social network sites is linked with psychosocial distress, as well as depression and anxiety among adolescents (Keles et al., 2020). Indeed, given that FoMO by definition implies a type of anxious concerns (Wang et al., 2018), it should not come as a surprise that it has been associated with diminished physical and psychological functioning. For instance, FoMO has been related to delayed bedtime (Adams et al., 2017) and sleep problems (Milyavskaya et al., 2018) as well as increased stress, and depressive symptoms (Barry et al., 2017; Beyens et al., 2016). Moreover, FoMO has been found to be associated with behavioral problems, including problematic internet use (Alt, 2015; Barry et al., 2017; Tomczyk & Selmanagic-Lizde, 2018) and academic disengagement (Coskun & Karayagız-Muslu, 2019; Rosen et al., 2018).

The possible negative implications of FoMO in learning contexts can be indirectly inferred through several studies which have shown social media and internet overuse to be negatively linked with students' academic engagement (Alt, 2015; Li et al., 2019; Stavropoulos et al., 2013). While it should be noted that some other studies contradicted these findings as they showed no relation between FoMO and academic engagement (Qutishat & Abu Sharour, 2019), a recent study does show that FoMO behavior, namely checking social media accounts in class, is linked to learning disengagement and attention distraction (Al-Furaih, & Al-Awidi, 2021).

Due to the apparent need to further investigate the issue, we tried to address it in our study by examining whether FoMO relates to poor academic engagement via in-class distraction (due to social media checking) and out-of-class study interference (due to extensive social media use). We use these two as proxies for behavioral engagement in and outside of the classroom.

From a psychological perspective, FoMO behavior seems to be a signal of self-worth concerns and doubts about one's way of life. Most likely, this is the reason for which FoMO has been related to decreased self-esteem (Buglass et al., 2017) and jealousy through online interaction (Fox &

Moreland, 2015; Lennarz et al., 2017). Given that decreased self-esteem and feeling of jealousy usually spring from unfavorable social comparisons with other people (Salovey & Rodin, 1984), it is prudent to assume that adolescents who suffer from FoMO are more likely to engage in intensive social comparisons, something which is more prevalent among social media users (Burnette et al., 2017). Such adolescents are thus presumed to have an outward orientation, which is typically characterized by attempts to impress others and garner their attention (Van Hiel et al., 2010). According to SDT (Ryan & Deci, 2017; Vansteenkiste et al., 2010), such aspirations are considered extrinsic and they are also indicators of self-esteem (e.g., Ryan et al., 1999; Soenens et al., 2015) and self-worth concerns (Kasser et al., 2007; Vansteenkiste et al., 2006). Extrinsic aspirations stand in contrast to intrinsic aspirations that are characterized by inward orientation and include self-growth, personal relationships cultivation, and community contribution (Kasser & Ryan, 1996).

FoMO and intrinsic versus extrinsic goals

According to SDT (Ryan & Deci, 2017), people aspire to attain two broad types of life goals, or aspirations: Intrinsic and extrinsic ones. Intrinsic life goals include self-growth, community contribution, and establishing warm and meaningful relationships, whereas extrinsic life goals include the pursuit of financial success, physical appearance and attraction, and fame (Deci & Ryan, 2000; Kasser & Ryan, 1996). Several studies have shown that compared to extrinsic life goals, intrinsic ones are more conducive to well-being (Hope et al., 2019), life satisfaction (Romero et al., 2012), and desired positive behaviors (Unanue et al., 2016). For instance, longitudinal research has shown intrinsic aspirations to predict striving for learning and extrinsic aspirations competitive goals and test anxiety among adolescents (Ku et al., 2012; Mouratidis et al., 2013). Moreover, a recent study with Chinese adolescents revealed that adolescents who prioritized intrinsic relative to extrinsic life goals were more likely to report prosocial behaviors as well as other-oriented and less self-oriented considerations (Fu et al., 2018). Concurrently, many studies have pointed out that extrinsic relative to intrinsic life goals could be a vulnerable factor as they seem to predict more interpersonal stress, depressive symptoms (Auerbach et al., 2011), and unwanted health-risk behaviors (Williams et al., 2000).

In the context of FoMO, an important theoretical and practical question is whether intrinsic and extrinsic life goals also relate to FoMO. From the perspective of Self-Determination Theory (Ryan & Deci, 2017), intrinsic life goals entail an *inward orientation* as these goals are in line

with people's basic, innate psychological needs of autonomy, competence, and relatedness. In contrast, extrinsic life goals entail an *outward orientation* as these goals are not in line with those three basic psychological needs, as people seek self-worth validation from external sources (Kasser & Ryan, 1996). Such an outward orientation seems to be inherent to the definition of FoMO, as it implies social comparisons (e.g., “to fear if others have more rewarding experiences than me”), self-promotion (e.g., “to share the details online”), and obsession with what others might be doing (e.g., “to get worried when finding out that my friends are having fun without me”). Three relevant studies support this possible link between intrinsic and extrinsic life goals and FoMO, showing that FoMO relates to social comparison (Tandon et al., 2021), popularity desire (Beyens et al., 2016), and the need for approval (Lai et al., 2016), the goals which are considered extrinsic, according to the Self-Determination Theory.

While two studies reported the link between conformity consumption behavior and sport event consumption, which were linked to external motives in both, and FoMO behavior features (Kang et al., 2019; Kim et al., 2020), the likely links between intrinsic and extrinsic aspirations and FoMO seem to be tested more since those have remained untested so far; as to the best of our knowledge, there is no systematic research investigating the relation between adolescents' FoMO behavior and life goals. To the best of our knowledge, there is only one recent study which has shown that materialism – an extrinsic life goal, according to SDT – is associated with FoMO among adolescents (Long et al., 2021).

Therefore, we relied on SDT (Ryan & Deci, 2017) to examine to what extent intrinsic and extrinsic life goals may predict FoMO and in turn whether FoMO relates to academic achievement by referring to students' GPA. Although the relation between FoMO and academic performance is rather limited, there is indirect evidence in the literature that shows a negative relation between FoMO and academic achievement. This indirect evidence is coming from studies that showed that adolescents with high levels of FoMO are more likely to overuse social media (Andreassen et al., 2016), which relates to academic disengagement (e.g., Alt, 2015; Li et al., 2019; Stavropoulos et al., 2013).

The present study

In this study, we aimed to investigate to what extent life aspirations and academic engagement relate to FoMO, and whether FoMO, in turn, relates to academic achievement (school grades) by means of academic engagement via in-class distraction (as indexed through social media checking) and out-of-class study interference (through social media checking as well). We focused on educational outcomes because a growing body of research has related FoMO to

study interference and its possible aftermath: decreased academic performance. For instance, a recent study with university students has pointed out that FoMO relates to surface strategies learning with daily activity disruptions (e.g., the checking of smartphone pop-up notifications from a voice or video call and texting or instant messaging) partly mediating this relation (Rozgonjuk et al., 2019). We used in-class social media checking and out-of-class study interferences as proxies of students' academic engagement and therefore as potential mediators of the relation between FoMO and students' school achievement.

To study the associations among intrinsic and extrinsic life goals, FoMO, in-class distraction and out-of-class study interference and school grades, we took into account social anxiety, defined herein as excessive fear that adolescents may experience during social interactions because they feel that others may evaluate them (American Psychiatric Association (APA), 2013; Westenberg et al., 2004). We did control for social anxiety because research has shown that social anxiety relates to FoMO (Dempsey et al., 2019; Oberst et al., 2017; Wolniewicz et al., 2018), given that socially anxious people tend to prefer to communicate through social media, most likely because they feel safer in online settings than in real-life social ones (Lee & Stapinski, 2012). For similar reasons, we also examined for likely associations between social anxiety and school-related outcomes such as grades, though previous research has shown no relation to academic performance (but still, to poor academic adjustment; see Strahan, 2003). Specifically, research has pointed out that socially anxious people seem to opt for excessive online social interactions (Apaolaza et al., 2019), a preference that seems to have negative implications at school, such as missing classes, and having trouble with school because of being online (Caplan, 2007). Therefore, we suggest that a more meticulous test of the associations among intrinsic and extrinsic goals, FoMO, and educational outcomes should statistically control for social anxiety. Equally important is that we examined these associations among adolescents, given that most of this emerging research on FoMO has been conducted with emerging adults (e.g., college students).

We formulated the following hypotheses. First, on the understanding that extrinsic goals but not intrinsic goals orient people towards seeking popularity and admiration from others as a means of self-validation (Kasser & Ryan, 1996) and that FoMO is associated with the need for approval (Lai et al., 2016) and popularity-seeking (Beyens et al., 2016), we hypothesized that FoMO would be predicted positively by extrinsic life goals (Hypothesis 1a) and negatively by intrinsic life goals (Hypothesis 1b). Additionally, we expected that FoMO would be associated positively with both in-class social media checking and out-of-class study interference (Hypothesis 2a and 2b, respectively), given that inherent to FoMO is the almost obsessive urge to constantly check one's

social media accounts (Andreassen et al., 2016). In turn, we expected that in-class social media checking and out-of-class study interference as indices of poor academic engagement would negatively relate to school grades. We thus anticipated an indirect, negative, relation between FoMO and school grades (Hypothesis 3). When testing the hypothesized associations, we statistically controlled for social anxiety, and for gender and age, given that some prior research has revealed that (Alt, 2015) males and younger people tended to report more FoMO (Przybylski et al., 2013; cf. Alt, 2015; Tomczyk & Selmanagic-Lizde, 2018).

Method

Participants

The sample consisted of 506 (age range: 14 to 18 years) students (50.8% females; $M_{age} = 15.84$ years; $SD = 0.83$) and (49.2% males; $M_{age} = 15.77$ years; $SD = 0.88$). The majority of students, ($N = 261$; 51.6%) attended the 10th grade, followed by 123 students (24.3%) who attended an English preparation class, 96 (19.0%) 11th-graders, 23 9th-graders (4.5%), and three students did not report their grade level. When being asked to indicate their perceived family income, 13 students (2.6% of the sample) reported lower than average family income, 396 (78.3%) reported average, and 90 (17.8%) higher than average (seven students omitted to answer to that question). The number of social media accounts participants used ranged from 1 to 23 ($M = 4.39$ $SD = 2.77$).

Procedure

The data were collected in two phases; the first between December 2017 and February 2018 and the second in May 2018. All the schools were state high schools. In all instances, the principal investigator visited the high schools located in Ankara, Turkey. Upon each school principal's permission, she handed the informed consents to each student to be signed by their parents. The informed consent described the aim of the study, and was ensuring the parents that their child's participation was voluntary and that they had the right to withdraw from the study at any time without any further implications. Moreover, the consent form made it clear that there were no irritative questions and that the children's responses would remain anonymous and confidential. On the second visit to the schools a few days later, the principal investigator distributed the battery of scales to students whose parents had signed the informed consents. She also orally explained to the students the purpose of the study, and emphasized their right to withdraw, that there were no right or wrong answers, and that their responses were untraceable.

Filling-in the scales took place during regular class hours and lasted about 30 min in both samples.

Measures

The students filled out the following forms.

Demographic form Participants were asked to report their gender, age, socioeconomic status, whether they have a smartphone and permanent internet connection, and how many hours and how often they were checking their social media accounts during class and also out-of-class on a daily basis. They were also asked to write down their current GPA.

Social anxiety To assess adolescents' social anxiety, we used the scale of La Greca et al. (1988), as adapted for adolescents by La Greca and Lopez (1998). It comprises three dimensions: fear of negative evaluation (8 items; e.g., "I worry about what others say about me"), social avoidance and general distress (4 items; e.g., "I feel shy even with peers I know very well"), and social avoidance specific to new situations or unfamiliar peers (6 items; e.g., "I get nervous when I meet new people"). All the questions were rated on a 5-point Likert-type scale, ranging from 1 (*Not at all*) to 5 (*All the time*). The Turkish version of the scale was successfully adapted by Aydın and Tekinsav-Sütçü (2007) for early and Zorbaz and Dost (2014) for late adolescents. The Cronbach alpha for the full set of items was 0.89.

Intrinsic and extrinsic life goals To measure intrinsic and extrinsic life aspirations that adolescents set in their lives, we used the Life Aspiration Index (Kasser & Ryan, 1993, 1996) and its Turkish version, developed by İlhan (2009). Both Kasser and Ryan (1993, 1996) and İlhan (2009) reported good internal consistency for internal and external life goals ($\alpha > 0.70$). Since some of the items were not included in the Turkish version and because the scales were originally designed for adults, the first author translated the missing items and revised the other ones to render them relevant for adolescents.

Students who participated in the first phase of our data collection ($N = 315$) were asked to indicate to what extent they endorsed the extrinsic life goals of image (e.g., "to be beautiful"), and fame (e.g., "to be famous"). Accordingly, they rated to what extent they endorsed the intrinsic life goals of personal growth (e.g., "to know myself and accept myself as I am"), cultivating meaningful social relationships (e.g., "to making good and meaningful relationships"), and community contribution ("e.g., to work for the peace of the society"). In the second stage of data collection (i.e., in May) and because of the limited time available to collect our data, we used a shortened version of the scales that we used in

stage 1. Specifically, we used three items for intrinsic life goals (the items were: “to know and accept who I really am; to establish sincere and lasting relationships with people; to grow and learn new things”) and five items to assess extrinsic life goals (the items were: “to be admired by lots of different people; to have my name known by many people; to keep up with fashions in hair and clothing; to do things to be frequently mentioned; to be beautiful/handsome”). The Cronbach alpha for intrinsic and extrinsic life aspirations was, respectively, $\alpha = .82$. and $\alpha = 0.89$ for participants in stage 1, and $\alpha = 0.74$ and $\alpha = 0.61$ in stage 2.

Fear of missing out (FoMO) The original scale was developed by Przybylski et al. (2013) and consists of 10 items in a five-point Likert-type scale format (1 = *Not at all true of me*; 5 = *Extremely true of me*). The scale measures to what extent people fear that they might be missing out on events or information about what is going on. Przybylski et al. (2013) reported good internal consistency ($\alpha = 0.90$), with an example item being “I get worried when I find out my friends are having fun without me.” The Turkish version of the scale was adapted by Gökler et al. (2016), and in the present study, the Cronbach Alpha coefficient was 0.82.

Social media checking behaviors To assess to what extent the adolescents use social media in a way that might distract/interfere with their in-class attention, we asked the students to indicate how often were they checking their social media during class hours. The students rated this item from 1 (*once every 15 min*) to 4 (*once every 60 min*). Moreover, to assess out-of-class study interference, we took an item from Bergen Social Media Addiction Scale (adapted by Andreassen et al., 2016), which asks to what degree participants were using social media so much that it had a negative impact on their studies. The students’ responses were anchored between 1 (*never*) and 5 (*most of the time*).

Results

Preliminary analyses

Means, standard deviations, and bivariate correlations of the measured variables of the study are shown in Table 1. As can be noticed, females presented a somewhat better pattern as they reported higher grades than males ($t_{[477]} = -3.34$, $p < 0.001$, Cohen’s $d = 0.30$). Also, intrinsic and extrinsic goals were positively intercorrelated, and they both related positively to FoMO and social anxiety and, rather unexpectedly, negatively to school grades. Furthermore, both extrinsic goals and FoMO related positively to in-class social media checking and study interference.

Main analyses

To test our hypotheses, we examined in a path model to what extent intrinsic and extrinsic goals relate to FoMO, which in turn relates to in-class distraction and out-of-class study interference (i.e., social media checking and study interference, respectively) and grades. The most suitable model is shown in Fig. 1. The path models yielded acceptable fit, ($S-B\chi^2 [11, N = 471] = 17.25$, $p = 0.069$, CFI = 0.974, SRMR = 0.022, RMSEA = 0.040 [90%-CI: 0.000, 0.071]). In partial support of our first hypothesis, extrinsic goals were positively related to FoMO, even after controlling for social anxiety which was also positively related to FoMO. Additionally, as expected, intrinsic goals did not relate to FoMO. Moreover, FoMO was linked positively with both in-class social media checking and study interference, both of which were in turn negatively linked with school grades. These findings provide full support to our second and third hypotheses.

A direct path also emerged in the most suitable model, negatively linking extrinsic goals with grades. Next, we performed a test of indirect effects via bootstrap sampling with

Table 1 Means, Standard Deviations, and Bivariate Correlations for the Sample

Variables	Males		Females		1	2	3	4	5	6	7
	M	SD	M	SD							
1. Age	15.91	0.85	15.72	0.85	-						
2. Intrinsic goals	5.04	1.25	4.99	1.53	.19**	-					
3. Extrinsic goals	3.37	1.59	3.03	1.55	.19**	.52**	-				
4. Social anxiety	2.28	0.60	2.38	0.63	.07	.22**	.17**	-			
5. FoMO	2.24	0.69	2.40	0.73	.02	.23**	.29**	.31**	-		
6. In-class check	0.49	0.50	0.47	0.50	.12**	.08	.16**	.02	.25**	-	
7. Study interference	2.65	1.29	2.70	1.30	.05	.03	.10*	.18**	.31**	.25**	-
8. GPA	79.17 ^a	11.49	82.35 ^b	9.47	-.24**	-.26**	-.35**	-.06	.07	-.10*	-.14*

* $p < .05$. ** $p < .01$. FoMO = Fear of Missing Out. Gender was dummy-coded (0 = Males; 1 = Females). Subscripts with different notation differ at the $\alpha = .006$ level (two-tailed)

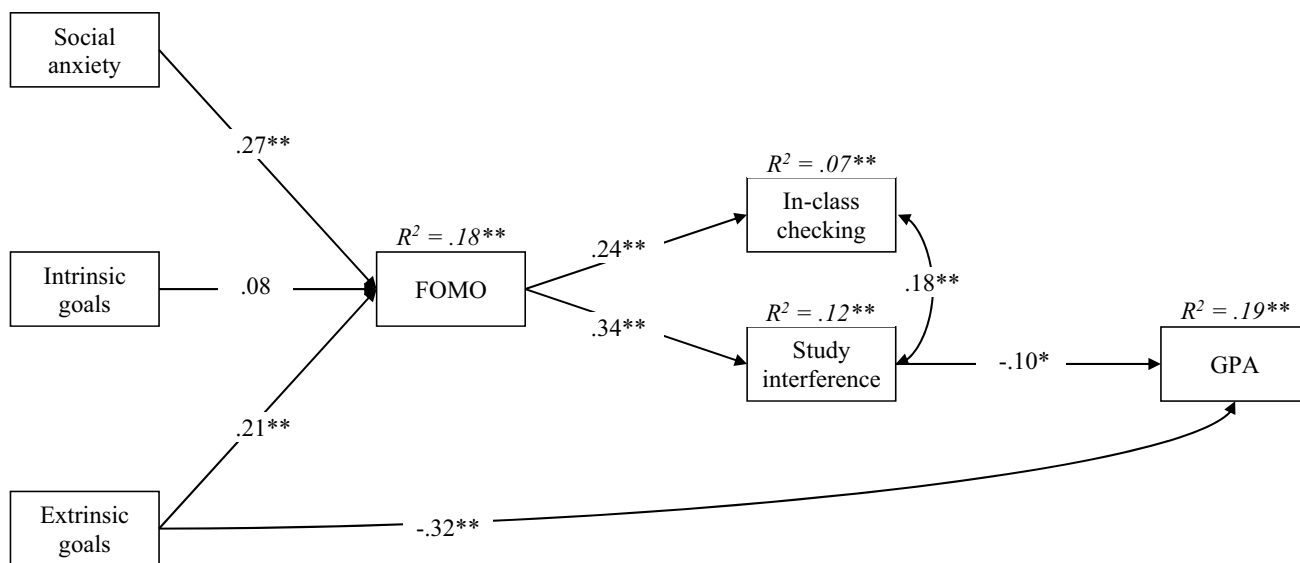


Fig. 1 The Best Fitting Model All paths are standardized. Gender and age were included as Covariates, but are not shown for the sake of parsimony. *Note.* * $p < .05$. ** $p < .01$

10,000 replications. Those tests revealed that social anxiety and extrinsic life goals were indirectly positively related to disruptive behaviors via FoMO, and negatively to GPA via FoMO and in turn via study interference (see Table 2).

Furthermore, there were also some statistically significant associations between the main variables of the model and the two covariates, age and gender (not shown in the model). Specifically, compared to males, females were found to report higher FoMO ($B = 0.16, SE = 0.06, z = 2.58, p = 0.010, \beta = 0.11$) and higher grades ($B = 2.20, SE = 0.92, z = 2.38, p = 0.017, \beta = 0.10$). Also, age related negatively to grades ($B = -2.24, SE = 0.55, z = -4.09, p < 0.001, \beta = -0.18$) and positively to in-class social media checking ($B = 0.06, SE = 0.03, z = 2.21, p = 0.027, \beta = 0.10$). These findings suggest that older students were more likely to admit that they check their social media accounts during class hours.

Data analysis

We proceeded in two steps. In preliminary analyses, we inspected the means, standard deviations and bivariate correlations among the variables of our study. Then, in our main analyses, we set up a path model where intrinsic and extrinsic life goals, along with social anxiety, served as predictors of FoMO, which in turn was modeled to predict school grades by means of in-class social media checking and out-of-class study interference. In our path model, we also included as covariates students’ age and gender to control for possible statistical differences due to these factors. We relied on the cut-off criteria suggested by Hu and Bentler (1999) and considered as an appropriate solution to a model with a CFI > 0.950, RMSEA < 0.050 and SRMR < 0.050. To control for a likely multivariate non-normality, we used the Maximum-Likelihood algorithm with the Satorra-Bentler

Table 2 Indirect Relations of Social Anxiety, Intrinsic and Extrinsic goals to GPA by means of FoMO and Disruptive In-class and Out-of-class Behaviors

From antecedents to GPA via FoMO and disruptive behaviors				B	(SE)	95%-CI		
Social anxiety	→	FoMO →	Study interference →	GPA	-0.152*	(0.071)	-0.330,	-0.035
Social anxiety	→	FoMO →	Study interference -	-	0.189**	(0.040)	0.117,	0.276
Social anxiety	→	FoMO →	In-class check -	-	0.051**	(0.012)	0.031,	0.078
Intrinsic goals	→	FoMO →	Study interference →	GPA	-0.019	(0.015)	-0.065,	0.001
Intrinsic goals	→	FoMO →	Study interference -	-	0.006	(0.004)	-0.006,	0.056
Intrinsic goals	→	FoMO →	In-class check -	-	0.024	(0.015)	-0.001,	0.016
Extrinsic goals	→	FoMO →	Study interference →	GPA	-0.152*	(0.071)	-0.110,	-0.011
Extrinsic goals	→	FoMO →	Study interference -	-	0.058**	(0.016)	0.029,	0.094
Extrinsic goals	→	FoMO →	In-class check -	-	0.016*	(0.005)	0.007,	0.028
-	-	FoMO →	Study interference →	GPA	-0.492*	(0.213)	-0.959,	-0.104

All coefficients are unstandardized and obtained after Bootstrap with 10,000 replications

scale chi-square statistic (S-B) which is robust to non-normality. All the analyses were conducted with the R software program (2020) and the statistical package of lavaan (Rosseel, 2012).

Discussion

In this study, we investigated to what extent intrinsic and extrinsic life goals relate to FoMO, and whether FoMO would, in turn, predict social media checking behaviors that may interfere with school grades. We tested our hypotheses that FoMO would be positively linked to extrinsic goals and negatively to intrinsic goals, after controlling for social anxiety. We also hypothesized that FoMO would be associated positively with both in-class distraction (through social media checking) and out-of-class study interference, which in turn would be negatively correlated with school grades.

In support of Hypothesis 1a, we found extrinsic life goals to relate positively to FoMO and in turn positively to both in-class social media checking and out-of-class study interference and, eventually, negatively to grades. This association seems to fit well with the few studies being conducted in the field of online social networking. For instance, Beyens et al. (2016) have shown that the need for popularity, an extrinsic life goal from the SDT perspective (Ryan & Deci, 2017), was positively associated with FoMO. As Sheldon and Kasser (2008) have shown, extrinsic life goals are more likely to invoke psychological threats. Regarding these, an SDT-based study showed that FoMO mediated the positive relation between adolescent problematic internet use and materialism – the importance of possessions to one’s life (Long et al., 2021). Even more, while narcissism and FoMO were associated positively, narcissism also played the role of a mediator between problematic internet use and FoMO. This is an important finding since it gives a broader perspective on how FoMO can play an important part in one’s psychological situation and also their extrinsic life values. As such, extrinsic life goals may also activate FoMO, given that the latter reflects people’s concerns that they are left out from pleasant activities or events. Future experimental studies are certainly needed to investigate the mechanisms that may explain the observed association between extrinsic life goals and FoMO.

A similar line of research will also be needed to further investigate the relation between FoMO and poor academic functioning. Previous research has shown that FoMO relates to students’ poor learning strategies (Alt & Boniel-Nissim, 2018), and extrinsic motivation for learning (Alt, 2015). In line with these studies, our study has revealed that the more FoMO behavior the students reported, the more they admitted that they checked their social media accounts during class hours and that such extensive use of social media has

a negative impact on their study efforts. In the literature, there is some inconsistency regarding the relation between FoMO and academic achievement. For instance, some recent studies found FoMO unrelated to GPA (Qutishat & Abu Sharrour, 2019), whereas there is one study that even showed a positive relation between FoMO and academic performance (Lemay et al., 2019).

Certainly, future research needs to clarify the degree to which FoMO is a direct indicator of school performance. Until then, our results can provide a broader perspective regarding the mechanisms through which FoMO might relate to school performance. As our model suggests, FoMO seems to drive students to constantly check their phones, something which might interfere with the quality and the quantity of their studying, which in turn might have an impact on their school grades. If that indirect association is correct, then effective interventions may want to focus on FoMO as the underlying reason of students being distracted from their schoolwork due to constant checking of social media accounts; and if such interventions want to make one step further then they might focus on the underlying goals that may feed such FoMO concerns. As our Hypothesis 1a was supported, it seems that extrinsic goals, such as goals of popularity attainment and attention attraction, are closely associated with FoMO.

In contrast to Hypothesis 1a, our Hypothesis 1b was not supported as intrinsic life goals did not negatively predict FoMO. Previous studies have indicated that certain needs that may partly reflect intrinsic goals, such as the need to belong (Wang et al., 2019), to stay in touch with others (Elhai et al., 2016), or the aim for self-discovery, the need for interpersonal connection and social enhancement (James et al., 2017) may relate positively to FoMO through certain processes such as social media use (Roberts & David, 2020). From that perspective, the goal to stay connected with friends is likely to increase the feeling of fear of missing out on what is going on. Still, however, the reason for which self-growth goals, community contribution, or cultivating meaningful relationships are related to FoMO is puzzling and awaits further investigation. From the SDT standpoint, people endorsing such intrinsic life goals are expected to be more satisfied with their lives (Vansteenkiste et al., 2010) and, therefore, have no reason to experience FoMO.

Taken together, the present results suggest that both intrinsic and extrinsic goals seem to intertwine in one’s online FoMO-related behaviors, though it is the extrinsic goals which seem to play a more crucial role, especially when this behavior is driven mainly by extrinsic goals. This might serve us to have a new view on people meeting their intrinsic life goals as well as extrinsic ones via FoMO behavior. As a result, this behavior might not be perceived as pure negative behavior, but as behavior which might help maintain these life goals.

Furthermore, we found a positive relation between social anxiety and FoMO, a finding consistent with the literature. For example, social anxiety has been positively linked with pathological use of social networking sites (Wegmann et al., 2015), with FoMO acting as a mediator (Dempsey et al., 2019; Wolniewicz et al., 2018). This relation can provide us with a deeper insight into why adolescents with social anxiety symptoms tend to spend more time in online settings and develop FoMO. Future research may need to examine to what extent several factors such as loneliness, family relations, or coping strategies may moderate this association so that a more convenient treatment plan can be applied for the people who suffer from it.

Regarding gender differences, our study indicated that females had higher grades and higher levels of FoMO than males; a finding consistent with some studies (Beyens et al., 2016; Elhai et al., 2018; Stead & Bibby, 2017), but not with some others which reported higher levels of FoMO among males (Przybylski et al., 2013; Qutishat & Abu Sharour, 2019). The fact that such gender differences emerged in our study may not necessarily suggest that there are systematic gender differences regarding FoMO.

As for the age variable, older students tended to report lower grades and more incidents of in-class social media checking than their younger counterparts. Lastly, the lack of association between age and FoMO among adolescents coincides with the inconsistent findings being reported in the literature, in which some studies showed that FoMO and age relate positively (Beyens et al., 2016; Oberst et al., 2017) and others negatively (Blackwell et al., 2017; Elhai et al., 2018; Przybylski et al., 2013). We suggest that the relation between FoMO and age might depend on other variables. Given the scarcity of research among adolescents, more research might be needed with samples of that age group that will contain a wider range of different academic levels and ages.

Limitations

Like many other studies, this one too is not limitation-free research. Firstly, it is a correlational study which prevents us from claiming any causality. It is equally prudent to assume that students with FoMO may gradually endorse more extrinsic goals or that poor school performance may render some students to focus less and less on their schoolwork; such low performance may lead them to obsessively use social media and thus experience more FOMO in the long run. Secondly, this study was conducted with Turkish adolescents only, which prevents the results from being generalizable. Furthermore, the range of the students' grade level and age restrict generalizability claims. Additionally,

since students self-reported their GPA, this might have introduced errors into the GPA data. Thirdly, although the hierarchical structure of our data (as students were nested into classrooms) required a multilevel statistical approach to examine the hypothesized relations, this was not done due to technical reasons. Specifically, at the time of data collection, we disregarded recording students' class membership. Therefore we could not test our hypothesis through a multilevel path model. However, we believe that even if we had statistically controlled for the shared variance due to classroom membership (through multilevel modeling), the expected relations at the student level would have not dramatically differed. Moreover, the present findings are based only on students' self-reports. Testing the hypothesized associations in a more rigorous way would require future research to include parents and teachers to contain the error due to mono-method bias.

Conclusion

Despite its limitations, the present study reveals a noteworthy association between extrinsic life aspirations and FoMO behavior among adolescents, and between FoMO and in-class distraction and out-class study interference that could affect students' academic performance. Given that adolescents are in a critical developmental period of their life, and that their school success can largely determine their future life, seeing that FoMO may undermine such success, and that it relates to extrinsic goals, downplaying such goals may be the key for better academic adjustment.

Declarations

Conflict of interest The authors declare that there is no conflict of interest.

Data Policy Regarding the data policy, the anonymised data sets generated and analyzed during the current study are available from the corresponding author on reasonable request.

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References

- Adams, S. K., Williford, D. N., Vaccaro, A., Kisler, T. S., Francis, A., & Newman, B. (2017). The young and the restless: Socializing trumps sleep, fear of missing out, and technological distractions in first-year college students. *International Journal of Adolescence and Youth*, 22, 337–348. <https://doi.org/10.1080/02673843.2016.1181557>
- Alfuraih, & Alawidi, H. M. (2021). Fear of missing out (FoMO) among undergraduate students in relation to attention distraction and learning disengagement in lectures. *Education and Information Technologies*, 26, 2355–2373. <https://doi.org/10.1007/s10639-020-10361-7>
- Alt, D., & Boniel-Nissim, M. (2018). Links between Adolescents' Deep and Surface Learning Approaches, Problematic Internet Use, and Fear of Missing Out (FoMO). *Internet Interventions: The Application of Information Technology in Mental and Behavioural Health*, 13, 30–39. <https://doi.org/10.1016/j.invent.2018.05.002>
- Alt, D. (2016). Students' wellbeing, fear of missing out, and social media engagement for leisure in higher education learning environments. *Current Psychology*, 1, 1–11. <https://doi.org/10.1007/s12144-016-9496-1>
- Alt, D. (2015). College students' academic motivation, media engagement and fear of missing out. *Computers in Human Behavior*, 49, 111–119. <https://doi.org/10.1016/j.chb.2015.02.057>
- American Psychiatric Association (APA). (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). American Psychiatric Publishing.
- Andreassen, C. S., Billieux, J., Griffiths, M. D., Kuss, D. J., Demetrovics, Z., Mazzoni, E., & Pallesen, S. (2016). The relationship between addictive use of social media and video games and symptoms of psychiatric disorders: A large-scale cross-sectional study. *Psychology of Addictive Behaviors*, 30, 252–262. <https://doi.org/10.1037/adb0000160>
- Apaolaza, V., Hartmann, P., D'Souza, C., & Gilsanz, A. (2019). Mindfulness, compulsive mobile social media use, and derived stress: The mediating roles of self-esteem and social anxiety. *Cyberpsychology Behavior and Social Networking*, 22, 388–396. <https://doi.org/10.1089/cyber.2018.0681>
- Auerbach, R. P., Webb, C. A., Schreck, M., McWhinnie, C. M., Ho, M.-H.R., Zhu, X., & Yao, S. (2011). Examining the pathway through which intrinsic and extrinsic aspirations generate stress and subsequent depressive symptoms. *Journal of Social & Clinical Psychology*, 30, 856–886. <https://doi.org/10.1521/jscp.2011.30.8.856>
- Aydın, A., & Tekinsav-Sütçü, S. (2007). Ergenler için Sosyal Kaygı Ölçeğinin (ESKÖ) geçerlik ve güvenilirliğinin incelenmesi [Analysis of validity and reliability of Social Anxiety Scale for Children]. *Çocuk Ve Gençlik Ruh Sağlığı Dergisi*, 14, 79–89.
- Barry, C. T., Sidoti, C. L., Briggs, S. M., Reiter, S. R., & Lindsey, R. A. (2017). Adolescent social media use and mental health from adolescent and parent perspectives. *Journal of Adolescence*, 61, 1–11. <https://doi.org/10.1016/j.adolescence.2017.08.005>
- Beyens, I., Frison, E., & Eggermont, S. (2016). “I don't want to miss a thing”: Adolescents' fear of missing out and its relationship to adolescents' social needs, Facebook use, and Facebook related stress. *Computers in Human Behavior*, 64, 1–8. <https://doi.org/10.1016/j.chb.2016.05.083>
- Blackwell, D., Leaman, C., Tramposch, R., Osborne, C., & Liss, M. (2017). Extraversion, neuroticism, attachment style and fear of missing out as predictors of social media use and addiction. *Personality and Individual Differences*, 116, 69–72. <https://doi.org/10.1016/j.paid.2017.04.039>
- Buglass, S. L., Binder, J. F., Betts, L. R., & Underwood, J. D. M. (2017). Motivators of online vulnerability: The impact of social network site use and FoMO. *Computers in Human Behavior*, 66, 248–255. <https://doi.org/10.1016/j.chb.2016.09.055>
- Burnette, C. B., Kwitowski, M. A., & Mazzeo, S. E. (2017). “I don't need people to tell me I'm pretty on social media:” A qualitative study of social media and body image in early adolescent girls. *Body Image*, 23, 114–125. <https://doi.org/10.1016/j.bodyim.2017.09.001>
- Caplan, S. E. (2007). Relations among loneliness, social anxiety, and problematic internet use. *CyberPsychology & Behavior*, 10, 234–242. <https://doi.org/10.1089/cpb.2006.9963>
- Coskun, S., & Karayagız-Muslu, G. (2019). Investigation of problematic mobile phones use and fear of missing out (FoMO) level in adolescents. *Community Mental Health Journal*, 55, 1004–1014. <https://doi.org/10.1007/s10597-019-00422-8>
- De Choudhury, M., Gamon, M., Counts, S., & Horvitz, E. (2013). Predicting depression via social media. *Proceedings of the Seventh International AAAI Conference on Weblogs and Social Media*, 2, 128–137. <https://doi.org/10.1109/IRI.2012.6302998>
- Deci, E. L., & Ryan, R. M. (2000). The “What” and “Why” of goal pursuits: Human needs and the Self-Determination of Behavior. *Psychological Inquiry*, 11, 227–268. https://doi.org/10.1207/S15327965PLI1104_01
- Dempsey, A. E., O'Brien, K. D., Tiamiyu, M. F., & Elhai, J. D. (2019). Fear of missing out (FoMO) and rumination mediate relations between social anxiety and problematic Facebook use. *Addictive Behaviors Reports*, 9, 100150. <https://doi.org/10.1016/j.abrep.2018.100150>
- Elhai, J. D., Gallinari, E., Rozgonjuk, D., & Yang, H. (2020a). Depression, anxiety and fear of missing out as correlates of social, non-social and problematic smartphone use. *Addictive Behaviors*, 105, 106335. <https://doi.org/10.1016/j.addbeh.2020.106335>
- Elhai, J. D., Rozgonjuk, D., Liu, T., & Yang, H. B. (2020b). Fear of missing out predicts repeated measurements of greater negative affect using experience sampling methodology. *Journal of Affective Disorders*, 262, 298–303. <https://doi.org/10.1016/j.jad.2019.11.026>
- Elhai, J. D., Levine, J., Alghraibeh, A., Alafnan, A., Aldraiweesh, A., & Hall, B. (2018). Fear of missing out: Testing relationships with negative affectivity, online social engagement, and problematic smartphone use. *Computers in Human Behavior*, 89, 289–298. <https://doi.org/10.1016/j.chb.2018.08.020>
- Elhai, J. D., Levine, J. C., Dvorak, R. D., & Hall, B. J. (2016). Fear of missing out, need for touch, anxiety and depression are related to problematic smartphone use. *Computers in Human Behavior*, 63, 509–516. <https://doi.org/10.1016/j.chb.2016.05.079>
- Fox, J., & Moreland, J. (2015). The dark side of social networking sites: An exploration of the relational and psychological stressors associated with Facebook use and affordances. *Computers in Human Behavior*, 45, 168–176. <https://doi.org/10.1016/j.chb.2014.11.083>
- Fu, X. Y., Liu, X. L., Yang, Y., Zhang, M. Y., & Kou, Y. (2018). The role of relative intrinsic aspirations in Chinese adolescents' prosocial behaviors. *Youth & Society*, 50, 75–92. <https://doi.org/10.1177/0044118x15588552>
- Gemmill, E., & Peterson, M. (2006). Students: Implications for student affairs professionals. *National Association of Student Personnel Administrators*, 43, 280–300. <https://doi.org/10.2202/1949-6605.1640>
- Gökler, M. E., Aydın, R., Ünal, E., & Metintaş, S. (2016). Sosyal ortamlarda gelişmeleri kaçırma korkusu ölçeğinin Türkçe sürümünün geçerlilik ve güvenilirliğinin değerlendirilmesi [Analysis of validity and reliability of FoMO scale]. *Anadolu Psikiyatri Dergisi*, 17, 53–59. <https://doi.org/10.5455/apd.195843>
- Greenwood, S., Perrin, A., & Duggan, M. (2016). *Social Media Update 2016*. [ONLINE] Available at: <http://www.pewinternet.org/2016/11/11/social-media-update-2016/>. [Accessed 11 June 2018].
- Hope, N. H., Holding, A. C., Verner-Filion, J., Sheldon, K. M., & Koestner, R. (2019). The path from intrinsic aspirations to

- subjective well-being is mediated by changes in basic psychological need satisfaction and autonomous motivation: A large prospective test. *Motivation and Emotion*, 43, 232–241. <https://doi.org/10.1007/s11031-018-9733-z>
- Hu, L.-T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1–55. <https://doi.org/10.1080/1070519909540118>
- James, T. L., Lowry, P. B., Wallace, L., & Warkentin, M. (2017). The effect of belongingness on obsessive-compulsive disorder in the use of online social networks. *Journal of Management Information Systems*, 34, 560–596. <https://doi.org/10.1080/07421222.2017.1334496>
- İlhan, T. (2009). *Üniversite öğrencilerinin benlik uyumu modeli: Yaşam amaçları, temel psikolojik ihtiyaçlar ve öznel iyi oluş.* [Self-congruity model of university students: Life goals, basic psychological needs and subjective well-being.] (Unpublished doctorate thesis), Gazi University.
- Kang, I., Cui, H., & Son, J. (2019). Conformity consumption behavior and FoMO. *Sustainability (Basel, Switzerland)*, 11, 4734. <https://doi.org/10.3390/su11174734>
- Kasser, T., Cohn, S., Kanner, A. D., & Ryan, R. M. (2007). Some costs of American corporate capitalism: A psychological exploration of value and goal conflicts. *Psychological Inquiry*, 18, 1–22. <https://doi.org/10.1080/10478400701386579>
- Kasser, T., & Ryan, R. M. (1996). Further examining the American Dream: Differential correlates of intrinsic and extrinsic goals. *Personality and Social Psychology Bulletin*, 22, 280–287. <https://doi.org/10.1177/0146167296223006>
- Kasser, T., & Ryan, R. M. (1993). A dark side of the American dream: Correlates of financial success as a central life aspiration. *Journal of Personality and Social Psychology*, 65, 410–422. <https://doi.org/10.1037/0022-3514.65.2.410>
- Keles, B., McCrae, N., & Grealish, A. (2020). A systematic review: The influence of social media on depression, anxiety and psychological distress in adolescents. *International Journal of Adolescence and Youth*, 25, 79–93. <https://doi.org/10.1080/02673843.2019.1590851>
- Kim, J., Lee, Y., & Kim, M.-L. (2020). Investigating “Fear of Missing Out” (FOMO) as an extrinsic motive affecting sport event consumer’s behavioral intention and FOMO-driven consumption’s influence on intrinsic rewards, extrinsic rewards, and consumer satisfaction. *PLoS ONE*, 15, e0243744–e0243744. <https://doi.org/10.1371/journal.pone.0243744>
- Ku, L., Dittmar, H., & Banerjee, R. (2012). Are materialistic teenagers less motivated to learn? Cross-sectional and longitudinal evidence from the United Kingdom and Hong Kong. *Journal of Educational Psychology*, 104, 74–86. <https://doi.org/10.1037/a0025489>
- La Greca, A. M., & Lopez, N. (1998). Social Anxiety among adolescents: Linkages with peer relations and friendships. *Journal of Abnormal Child Psychology*, 26, 83–94. <https://doi.org/10.1023/A:1022684520514>
- La Greca, A. M., Dandes, S. K., Wick, P., Shaw, K., & Stone, W. L. (1988). Development of the Social Anxiety Scale for Children: Reliability and concurrent validity. *Journal of Clinical Child Psychology*, 17, 84–91. https://doi.org/10.1207/s15374424jccp1701_11
- Lai, C., Altavilla, D., Ronconi, A., & Aceto, P. (2016). Fear of missing out (FoMO) is associated with activation of the right middle temporal gyrus during inclusion social cue. *Computers in Human Behavior*, 61, 516–521. <https://doi.org/10.1016/j.chb.2016.03.072>
- Lee, B. W., & Stapinski, L. A. (2012). Seeking safety on the internet: Relationship between social anxiety and problematic internet use. *Journal of Anxiety Disorders*, 26, 197–205. <https://doi.org/10.1016/j.janxdis.2011.11.001>
- Lemay, D. J., Doleck, T., & Bazalais, P. (2019). Self-determination, loneliness, fear of missing out, and academic performance. *Knowledge Management & E-Learning: An International Journal*, 11, 485–496. <https://doi.org/10.34105/j.kmel.2019.11.025>
- Lennarz, H., Lichtwarck-Aschoff, A., Finkenauer, C., & Granic, I. (2017). Jealousy in adolescents’ daily lives: How does it relate to interpersonal context and well-being? *Journal of Adolescence*, 54, 18–31. <https://doi.org/10.1016/j.adolescence.2016.09.008>
- Li, Y., Yao, C., Zeng, S., Wang, X., Lu, T., Li, C., ... & You, X. (2019). How social networking site addiction drives university students’ academic achievement: The mediating role of learning engagement. *Journal of Pacific Rim Psychology*, 13, 1–7. <https://doi.org/10.1017/prp.2019.12>
- Long, J., Wang, P., Liu, S., & Lei, L. (2021). Materialism and adolescent problematic smartphone use: The mediating role of fear of missing out and the moderating role of narcissism. *Current Psychology*, 40, 5842–5850. <https://doi.org/10.1007/s12144-019-00526-0>
- Milyavskaya, M., Saffran, M., Hope, N., & Koestner, R. (2018). Fear of missing out: Prevalence, dynamics, and consequences of experiencing FoMO. *Motivation and Emotion*, 42, 725–737. <https://doi.org/10.1007/s11031-018-9683-5>
- Mouratidis, A., Vansteenkiste, M., Lens, W., Michou, A., & Soenens, B. (2013). Within-person configurations and temporal relations of personal and perceived parent-promoted aspirations to school correlates among adolescents. *Journal of Educational Psychology*, 105, 895–910. <https://doi.org/10.1037/a0032838>
- O’Keeffe, G. S., & Clarke-Pearson, K. (2011). The impact of social media on children, adolescents, and families. *Pediatrics*, 127, 800–804. <https://doi.org/10.1542/peds.2011-0054>
- Oberst, U., Wegmann, E., Stodt, B., Brand, M., & Chamarro, A. (2017). Negative consequences from heavy social networking in adolescents: The mediating role of fear of missing out. *Journal of Adolescence*, 55, 51–60. <https://doi.org/10.1016/j.adolescence.2016.12.008>
- Qutishat, M., & Abu Sharour, L. (2019). Relationship between fear of missing out and academic performance among Omani University students: A Descriptive correlation study. *Oman Medical Journal*, 34, 404–411. <https://doi.org/10.5001/omj.2019.75>
- Przybylski, A. K., Murayama, K., Dehaan, C. R., & Gladwell, V. (2013). Motivational, emotional, and behavioral correlates of fear of missing out. *Computers in Human Behavior*, 29, 1841–1848. <https://doi.org/10.1016/j.chb.2013.02.014>
- R Core Team. (2020). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing, Vienna, Austria. <https://www.R-project.org/>
- Riordan, B. C., Flett, J. A. M., Hunter, J. A., Scarf, D., & Conner, T. S. (2015). Fear of missing out (FoMO): The relationship between FoMO, alcohol use, and alcohol-related consequences in college students. *Annals of Neuroscience and Psychology*, 2, 1–7. <https://doi.org/10.7243/2055-3447-2-9>
- Roberts, J. A., & David, M. E. (2020). The social media party: Fear of missing out (FoMO), social media intensity, connection, and well-being. *International Journal of Human-Computer Interaction*, 36, 386–392. <https://doi.org/10.1080/10447318.2019.1646517>
- Romero, E., Gómez-Fraguela, J. A., & Villar, P. (2012). Life aspirations, personality traits and subjective well-being in a Spanish sample. *European Journal of Personality*, 26, 45–55. <https://doi.org/10.1002/per.815>
- Rosen, L. D., Carrier, L. M., Pedroza, J. A., Elias, S., O’Brien, K. M., Lozano, J., Kim, K., Cheever, N. A., Bentley, J., & Ruiz, A. (2018). The role of executive functioning and technological anxiety (FoMO) in college course performance as mediated by technology usage and multitasking habits. *Psicología Educativa*, 24, 14–25. <https://doi.org/10.5093/psed2018a3>
- Rosen, L. D., Whaling, K., Rab, S., Carrier, L. M., & Cheever, N. A. (2013). Is Facebook creating “iDisorders”? The link between clinical symptoms of psychiatric disorders and technology use,

- attitudes and anxiety. *Computers in Human Behavior*, 29, 1243–1254. <https://doi.org/10.1016/j.chb.2012.11.012>
- Rosseel, Y. (2012). lavaan: An R Package for Structural Equation Modeling. *Journal of Statistical Software*, 48, 1–36. <https://doi.org/10.18637/jss.v048.i02>
- Rozgonjuk, D., Elhai, J. D., Ryan, T., & Scott, G. G. (2019). Fear of missing out is associated with disrupted activities from receiving smartphone notifications and surface learning in college students. *Computers & Education*, 140, 103590–103590. <https://doi.org/10.1016/j.compedu.2019.05.016>
- Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. The Guilford Press.
- Ryan, R. M., Chirkov, V. I., Little, T. D., Sheldon, K. M., Timoshina, E., & Deci, E. L. (1999). The American dream in Russia: Extrinsic aspirations and well-being in two cultures. *Personality and Social Psychology Bulletin*, 25, 1509–1524. <https://doi.org/10.1177/01461672992510007>
- Salovey, P., & Rodin, J. (1984). Some antecedents and consequences of social-comparison jealousy. *Journal of Personality and Social Psychology*, 47, 780–792. <https://doi.org/10.1037/0022-3514.47.4.780>
- Sheldon, K. M., & Kasser, T. (2008). Psychological threat and extrinsic goal striving. *Motivation and Emotion*, 32, 37–45.
- Stead, H., & Bibby, P. A. (2017). Personality, fear of missing out and problematic internet use and their relationship to subjective well-being. *Computers in Human Behavior*, 76, 534–540. <https://doi.org/10.1016/j.chb.2017.08.016>
- Stavropoulos, V., Alexandraki, K., & Motti-Stefanidi, F. (2013). Recognizing internet addiction: Prevalence and relationship to academic achievement in adolescents enrolled in urban and rural Greek high schools. *Journal of Adolescence*, 36, 565–576.
- Soenens, B., Wuyts, D., Vansteenkiste, M., Mageau, G. A., & Brening, K. (2015). Raising trophy kids: The role of mothers' contingent self-esteem in maternal promotion of extrinsic goals. *Journal of Adolescence*, 42, 40–49. <https://doi.org/10.1016/j.adolescence.2015.04.001>
- Strahan, E. Y. (2003). The effects of social anxiety and social skills on academic performance. *Personality and Individual Differences*, 34, 347–366. [https://doi.org/10.1016/s0191-8869\(02\)00049-1](https://doi.org/10.1016/s0191-8869(02)00049-1)
- Tandon, A., Dhir, A., Talwar, S., Kaur, P., & Mäntymäki, M. (2021). Dark consequences of social media-induced fear of missing out (FoMO): Social media stalking, comparisons, and fatigue. *Technological Forecasting and Social Change*, 171, 1–15. <https://doi.org/10.1016/j.techfore.2021.120931>
- Tomczyk, Ł., & Selmanagic-Lizde, E. (2018). Fear of Missing Out (FoMO) among youth in Bosnia and Herzegovina — Scale and selected mechanisms. *Children and Youth Services Review*, 88, 541–549. <https://doi.org/10.1016/j.chilyouth.2018.03.048>
- Unanue, W., Vignoles, V. L., Dittmar, H., & Vansteenkiste, M. (2016). Life goals predict environmental behavior: Cross-cultural and longitudinal evidence. *Journal of Environmental Psychology*, 46, 10–22. <https://doi.org/10.1016/j.jenvp.2016.02.001>
- Valkenburg, P. M., & Peter, J. (2011). Online communication among adolescents: An integrated model of its attraction, opportunities, and risks. *Journal of Adolescent Health*, 48, 121–127. <https://doi.org/10.1016/j.jadohealth.2010.08.020>
- Van Hiel, A., Cornelis, I., & Roets, A. (2010). To have or to be? A comparison of materialism-based theories and self-determination theory as explanatory frameworks of prejudice. *Journal of Personality*, 78, 1037–1070. <https://doi.org/10.1111/j.1467-6494.2010.00642.x>
- Vansteenkiste, M. P., Soenens, B., & Niemiec, C. (2010). The development of the five mini-theories of self-determination theory: An historical overview, emerging trends, and future directions. *Advances in Motivation and Achievement*, 16, 105–165.
- Vansteenkiste, M., Lens, W., & Deci, E. L. (2006). Intrinsic versus extrinsic goal contents in self-determination theory: Another look at the quality of academic motivation. *Educational Psychologist*, 41, 19–31. https://doi.org/10.1207/s15326985ep4101_4
- Wang, J., Wang, P., Yang, X., Zhang, G., Wang, X., Zhao, F., Zhao, M., & Lei, L. (2019). Fear of missing out and procrastination as mediators between sensation seeking and adolescent smartphone addiction. *International Journal of Mental Health and Addiction*, 17, 1049–1062. <https://doi.org/10.1007/s11469-019-00106-0>
- Wang, P., Xie, X., Wang, X., Wang, X., Zhao, F., Chu, X., Nie, J., & Lei, L. (2018). The need to belong and adolescent authentic self-presentation on SNSs: A moderated mediation model involving FoMO and perceived social support. *Personality and Individual Differences*, 128, 133–138. <https://doi.org/10.1016/j.paid.2018.02.035>
- Wegmann, E., Oberst, U., Stodt, B., & Brand, M. (2017). Online-specific fear of missing out and Internet-use expectancies contribute to symptoms of Internet-communication disorder. *Addictive Behaviors Reports*, 5, 33–42. <https://doi.org/10.1016/j.abrep.2017.04.001>
- Wegmann, E., Stodt, B., & Brand, M. (2015). Addictive use of social networking sites can be explained by the interaction of Internet use expectancies, Internet literacy, and psychopathological symptoms. *Journal of Behavioral Addictions*, 4, 155–162. <https://doi.org/10.1556/2006.4.2015.021>
- Westenberg, P. M., Drewes, M. J., Goedhart, A. W., Siebelink, B. M., & Treffers, P. D. A. (2004). A developmental analysis of self-reported fears in late childhood through mid-adolescence: Social-evaluative fears on the rise? *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 45, 481–495. <https://doi.org/10.1111/j.1469-7610.2004.00239.x>
- Williams, G. C., Cox, E. M., Hedberg, V. A., & Deci, E. L. (2000). Extrinsic life goals and health-risk behaviors in adolescents. *Journal of Applied Social Psychology*, 30, 1756–1771. <https://doi.org/10.1111/j.1559-1816.2000.tb02466.x>
- Wolniewicz, C. A., Tiamiyu, M. F., Weeks, J. W., & Elhai, J. D. (2018). Problematic smartphone use and relations with negative affect, fear of missing out, and fear of negative and positive evaluation. *Psychiatry Research*, 262, 618–623. <https://doi.org/10.1016/j.psychres.2017.09.058>
- Zorbaz, O., & Dost, M. T. (2014). Lise öğrencilerinin problemli internet kullanımının cinsiyet, sosyal kaygı ve ekran ilişkileri açısından incelenmesi [Examination of high school students' problematic internet use in term of gender, social anxiety and peer relationships]. *Examination Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, 29, 298–310.

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