

**FoMO and Friends:  
Exploring the Inverse Relationship between Intensity of Meeting Friends and Closeness  
of Friendships and the Fear of Missing Out**

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## **Abstract**

Previous studies trying to explain the fear of missing out (FoMO) mainly focused on the influence of psychological needs (autonomy, competence and relatedness) in general, while the present study focused on the intensity of meeting friends and the closeness of the friendship separately. Furthermore, it was tested whether this relationship was affected by self-esteem. In this cross-sectional study, a sample ( $N= 2632$ ) of 7 and 8 graders ( $M = 13.94$ ,  $SD = 1.20$ ) of two secondary schools in the Netherlands from 'The Digital Youth Project' (T3) was utilized. It was hypothesized that the intensity of meeting friends and the closeness of the friendship uniquely and interactively (through self-esteem) had a relationship with feelings of FoMO. The findings revealed an association between the closeness of the friendship on FoMO, also partly through self-esteem. However, the intensity of meeting friends did not affect FoMO, neither did the combined effect of the intensity of meeting friends and the closeness of the friendship. Feelings of FoMO are repressed when adolescents have close friendships, also in combination with high self-esteem. The results emphasize the importance of meaningful and intimate friendships, as well as high self-esteem, in adolescents. Limitations and suggestions for future research are discussed.

*Keywords:* Adolescents, secondary school students, fear of missing out, closeness of the friendship, intensity of meeting friends, self-esteem

## Samenvatting

Eerdere studies naar de angst om iets te missen (FoMO) richtten zich voornamelijk op de invloed van psychologische behoeften (autonomie, competentie en verbondenheid) in het algemeen. De huidige studie richtte zich daarentegen op de intensiteit van het ontmoeten van vrienden en de mate van hechtheid van de vriendschap afzonderlijk. Ook werd getest of deze relatie werd beïnvloed door zelfvertrouwen. In de huidige cross-sectionele studie werd gebruik gemaakt van een steekproef van 2632 ( $N = 2632$ ) adolescenten ( $M = 13,94$ ,  $SD = 1,20$ ) uit de klassen 1 en 2 van twee middelbare scholen in Nederland van 'The Digital Youth Project' (T3). Er werd verondersteld dat de intensiteit van het ontmoeten van vrienden en de mate van hechtheid van de vriendschap (beide via zelfvertrouwen) uniek en interactief gerelateerd waren aan gevoelens van FoMO. De bevindingen toonden een associatie tussen de mate van hechtheid van de vriendschap en FoMO, deels ook via zelfvertrouwen. De intensiteit van het ontmoeten van vrienden had geen effect op FoMO, evenals het gecombineerde effect van de intensiteit van het ontmoeten van vrienden en de mate van hechtheid van de vriendschap. Dit betekent dat gevoelens van FoMO worden onderdrukt wanneer adolescenten een hechte vriendschap hebben, ook in combinatie met een hoog zelfvertrouwen. De resultaten benadrukken de noodzaak van betekenisvolle en intieme vriendschappen en een goed zelfvertrouwen bij adolescenten. De beperkingen van deze studie en suggesties voor toekomstig onderzoek worden besproken.

*Trefwoorden:* Adolescenten, middelbare school studenten, angst om iets te missen, hechtheid van de vriendschap, intensiteit van het ontmoeten van vrienden, zelfvertrouwen

## **Introduction**

The fear of missing out (FoMO) has become quite normalized in our society where everything seems to revolve around adventures and experiences (Bloemen & De Coninck, 2020). The feeling of missing out has been around for a long time, but since the rise of social media, FoMO really became a phenomenon. Social media enables individuals to constantly have digital access and to see what they are missing out on (Abel et al., 2016; Przybylski et al., 2013). Especially adolescents are the ones spending much of their time online (Bloemen & De Coninck, 2020), they self-reported spending between 6 and 7 hours a day on social media (Sewall et al., 2020; Verbeij et al., 2021).

Since social media enables individuals to constantly watch each other, this contributes to developing a fear of missing out of events when they are not attending them: FoMO (Reid Chassiakos et al., 2016). FoMO is conceptualized as “the desire to stay continually connected with what others are doing and feeling worried that others are having a good time without them” (Przybylski et al., 2013, p. 1841). FoMO has been found to stimulate feelings of isolation, irritability, anxiety, dissatisfaction, stress and, unworthiness (Abel et al., 2016; Andreassen et al., 2012; Fabris et al., 2020; Przybylski et al., 2013; Sela et al., 2020). It particularly affects the development and functioning of children, adolescents, and young adults (Hetz et al., 2015; Milyavskaya et al., 2018; Scott, 2020). Since FoMO has so many mental and physical adverse consequences, it is important to research this topic and investigate how those negative feelings might be tackled. Being aware of the risk and protective factors of FoMO can help to create more awareness about this issue and ensure this fear will attenuate in our society.

## **Background**

### ***Intensity of meeting friends/closeness of friendships and FoMO***

Przybylski et al. (2013) and Xie et al. (2018) found that individuals who have unfulfilled basic psychological needs are more susceptible to experiencing FoMO. The studies utilized the Need Satisfaction Scale (La Guardia et al., 2000) and the Basic Psychological Needs Satisfaction Scale (Chen et al., 2015) which measure the fulfilment or hindrance of autonomy, competence and relatedness in the social environment. These scales are based on the self-determination theory (SDT), which emphasizes the role of psychological needs in promoting well-being and personal growth (Ryan & Deci, 2000). The measurement of relatedness within these scales assesses feelings of connection and closeness with important individuals in one's life. Xie et al. (2018) and Przybylski et al. (2013) found direct relationships between the

different psychological needs satisfaction (competence, autonomy and relatedness) and FoMO, but none of these made a distinction between the different types of psychological needs, nor the different forms of relatedness such as the need for friendships.

It is important to examine the need for friendships on its own, because previous research indicated that FoMO mostly happens in situations involving peers and friends (Rifkin et al., 2015). To develop a better idea of the specific role of satisfaction from friendships, in the current study a distinction will be made between two elements of friendships: the intensity of meeting friends and the closeness of friendships. The intensity of meeting friends refers to the frequency and duration of social interactions with friends (Amati et al., 2018). When the intensity of meeting friends is low, it seems plausible that FoMO is higher, since it might be possible that the individual experiences the feeling of missing out on friends more often and feels like he/she is missing out on more. Not being included in social activities or events by friends, might lead to individuals experiencing higher levels of FoMO. The closeness of friendships on the other hand, refers to the level of emotional intimacy and connection between the individual and its peers (Amati et al., 2018). Coyle and Malecki (2018) and Schneider and Tessier (2007) concluded that the closer a friendship, the higher the fear (in general) of an individual. FoMO has never been investigated in those earlier studies. It is important to distinguish intensity of meeting friends and the closeness of the friendship in the current study, because this helps to make a more convincing conclusion on factors of friendships influencing FoMO. Starting from the above presented theoretical background and results of previous research, this study aims to test the hypotheses that there is an inverse relationship between the intensity of meeting friends and the perceived FoMO (H1a), and the closeness of the friendship and the perceived FoMO (H1b).

### ***Self-esteem as a mediator***

Self-esteem refers to an individual's overall sense of self-worth or personal value (Abel et al., 2016; Leary & Baumeister, 2000). It is the way in which individuals perceive themselves and the value they place on themselves. According to De Jong et al. (2012), self-esteem can be divided into explicit self-esteem and implicit self-esteem. Explicit self-esteem refers to the conscious and verbalizable thoughts and feelings that an individual holds about themselves. Implicit self-esteem, on the other hand, refers to the unconscious and non-verbalizable thoughts and feelings that an individual holds about themselves (De Jong et al., 2011).

Social interactions with others play a significant role in shaping our sense of self-worth and self-esteem (Bos et al., 2006), but little is known about the relationship between the

intensity of meeting friends specifically and self-esteem. Some researchers indicated that individuals who interact more frequently with friends have higher levels of self-esteem (Keefe & Berndt, 1996; Yamada et al., 2021), but in the longitudinal study of Keefe and Berndt (1996), the intensity of meeting friends was more strongly associated with perceived social acceptance than with self-esteem. Furthermore, the study of Yamada et al. (2021) concluded that individuals who interacted more frequently with friends and neighbours reported higher levels of self-esteem, and did not make a distinction between the two types of interactions. Yamada et al. (2021) conducted the study among individuals with disabilities aged between 0 and 80 years old, while Keefe and Berndt (1996) conducted the study among seventh and eighth graders without any disabilities. Additionally, according to Hall-Lande et al. (2007), spending less time with friends can lead to feelings of isolation, which can further contribute to low self-esteem (Leary & Baumeister, 2000).

Having many friends and seeing your friends regularly does not necessarily mean that the friendships are of high quality (Amati et al., 2018). When individuals are lacking social support and validation in their friendships, it is hard for them to maintain a positive self-image (De Jong et al., 2011). Several studies found a significant relationship between the closeness of a friendship and the level of self-esteem (Balluerka et al., 2016; Berndt, 2002; Gorrese and Ruggieri, 2013; Keefe and Berndt, 1996; Wilkinson, 2004). Balluerka et al. (2016), Berndt (2002) and Wilkinson (2004) looked at the effect of peer attachment on psychological health, with self-esteem as one of the measurements, and found a positive relationship. Keefe and Berndt (1996) used longitudinal data, included seventh and eighth graders, and found that when the level of emotional intimacy and connection between the individual and its peers are low, the level of self-esteem is low as well. In addition, Goresse and Ruggerie (2013) reviewed 22 articles about the correlation between the closeness of the friendship and self-esteem in adolescents and emerging adulthood, and concluded that of those 22 articles, 19 articles reported a positive relationship.

Moreover, self-esteem is an important factor to take into account here, because we know that self-esteem plays a significant role in influencing different types of fears in individuals (De Jong et al., 2012; Hulme et al., 2012; Schreiber et al., 2012). Individuals with high self-esteem tend to have a more positive and confident outlook on life, which can make them less susceptible to developing fears. On the other hand, individuals with low self-esteem may be more likely to develop fears because they lack the confidence and self-assurance to face them (Hulme et al., 2012). More specifically, self-esteem has been proven to have a negative

relationship with FoMO (Buglass et al., 2017; Przybylski et al., 2013; Servidio, 2021). Individuals with lower self-esteem compare themselves to others more frequently, which leads to feelings of FoMO as they perceive others to be enjoying experiences or opportunities that they are not (Wood et al., 1994). In addition, individuals with low self-esteem are more susceptible to making frequent and extreme upward social comparisons on social media, which can further threaten their already low self-esteem (Midgley et al., 2021; Vohs & Heatherton, 2004).

In conclusion, it seems logical that both the intensity of meeting friends and the closeness of the friendship have a positive relationship with self-esteem. Moreover, this would be in line with the Sullivan hypothesis (2013) which posits that close friendships during adolescence have a beneficial impact on an individual. Besides, individuals with higher self-esteem may be less likely to experience FoMO as they have more confidence in their own abilities and are more comfortable with themselves, they may be more likely to be contented with what they have, and less likely to compare themselves to others. Therefore, it seems logical that the relationship between self-esteem and FoMO is negative. We thus expect self-esteem to be the mediator between the two elements of friendships and FoMO. Therefore, this study aims to test the hypotheses that self-esteem is a mediator in the relationship between the intensity of meeting friends and the perceived FoMO (H2a), and in the relationship between the closeness of the friendship and the perceived FoMO (H2b).

### ***Interaction effect of the intensity of meeting friends and the closeness of the friendship***

According to McGuire and Weisz (1982), adolescents with more supportive friendships interact with their friends more frequently. A supportive friendship is a type of relationship in which friends provide emotional and practical support to one another (Berndt & Perry, 1986). Close friends are often individuals we rely on for emotional and practical support, and a supportive friendship can strengthen the bond between two individuals (Berndt & Perry, 1986). Therefore, it is logical that when the closeness of the friendship is higher, the intensity of meeting friends becomes higher as well. However, it is worth noting that supportiveness is not the only aspect of a close friendship, shared interests, trust, and intimacy also play important roles (Amati et al., 2018).

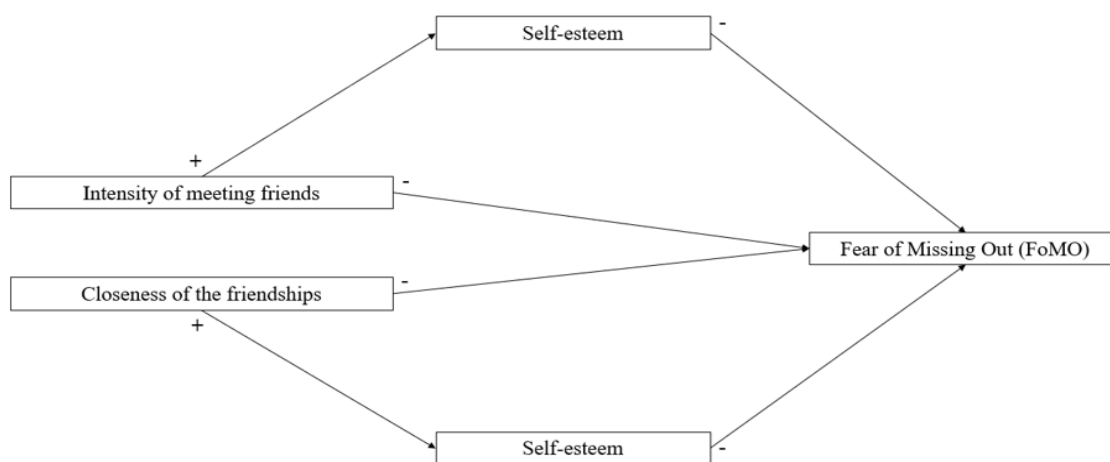
Besides, Amati et al. (2018) studied the relationship between social relationships and life satisfaction, specifically the intensity of meeting friends and the closeness of friendships. They tested the interaction effect of these two factors before testing their relationship with life satisfaction. The parameters were not significant, but both the intensity of meeting friends and



the closeness of friendships individually were positively related to life satisfaction. In the current study the interaction effect of the intensity of meeting friends and the closeness of the friendship will be considered, as it was found by Amati et al. (2018) that there is a strong correlation between the two concepts of friendship, which emphasizes the importance of these factors in relation to FoMO. The study conducted by Amati et al. (2018) investigated a different concept than the current study and therefore, it does not provide any insights into the current study's examination of the interaction effect of the intensity of meeting friends and the closeness of the friendship on FoMO. Additionally, the findings of Keefe and Berndt (1996) support the need to investigate the interaction effect of the two concepts of friendships in the current study because they found a positive relationship between the intensity of meeting friends and the closeness of the friendship in seventh and eighth graders. Based on this theoretical background, it can be expected that there is an interaction effect between the intensity of meeting friends and the closeness of the friendship in explaining FoMo (H3). This enables testing whether when the intensity of meeting friends is high and the friendship is close, it results in a decrease in feelings of FoMO.

### Figure 1

*Graphic presentation of research hypotheses*



### Contributions of the current study

The contributions of the current study are fourfold. First, this study separates friendships from psychological needs in general and from other relationships in particular. Second, in the current study a distinction will be made between the intensity of meeting friends and the closeness of the friendship. Third, in the current study there will be looked at self-esteem as a protective factor of FoMO. Lastly, in the current study there is a focus on

adolescents enrolled in grades 7 and 8 secondary schools, while other studies about psychological needs in relation to FoMO mostly looked at adults.

## Methods

### Procedure and Participants

In this cross-sectional research, secondary data were analysed in which the researcher used the Dutch dataset ‘The Digital Youth Project’ (DiYO) (Van den Eijnden et al., n.d.). The DiYO collected longitudinal data from 2015 to 2019. In the current study, data from the third wave (T3) of the DiYO were used. The implementation of the DiYO study has been approved by the Faculty Ethics Review Committee of the Faculty Social Sciences of Utrecht University (FETC16-076). In addition, the implementation of the current study has been approved by this review committee as well (FETC22-2268).

The DiYO study involved the participation of adolescents ( $N = 2632$ ) enrolled in grades 7 and 8 of the two secondary schools in the Netherlands. At T3 the average age of the sample (53.5% boys) was 13.94 years ( $SD = 1,20$ ; range 11 – 17). The majority of the participants (95.3%) had a Dutch background, and both of their parents were born in the Netherlands.

The study was conducted by online surveys during school hours. Participation in the study was voluntary and confidential. Parents and students were free to refuse or end the participation at any point and there is active consent for the participating students.

### Measurements

**Fear of missing out.** FoMO was assessed using five items of the fear of missing out scale (Przybylski et al., 2013) measuring the degree to which one fears missing out on social events, in particular involving their friends. Participants rated how true each statement, included in Table 1, is for their general experiences on a 5-point Likert-type frequency scale ranging from 1 = “Not at all true of me” to 5 = “Extremely true of me”. They answered according to what really reflects their experiences rather than what they thought their experiences should be. The total score on FoMO was calculated by summing up the five items (Cronbach’s  $\alpha = 0.83$ ).

**Intensity of meeting friends.** To assess the intensity of meeting friends four statements on a 6-point Likert-type scale were used. This scale indicated what the intensity of meeting friends was (1 = “Never” to 6 = “Very often”) with statements included in Table 1.

The total score on the intensity of meeting friends was calculated by summing up the four items (Cronbach's  $\alpha = 0.86$ ).

**Closeness of friendships.** The closeness of the friendship was assessed using five items of the Dutch version of the Competence Experience Scale for Adolescents (Straathof & Scheffers, 1989). A 5-point Likert-type scale ranging from 1 = "Not correct at all" to 5 = "Totally correct", was used with statements included in Table 1. Four items were reverse coded and one item was deleted due to low reliability. The total score on the closeness of the friendship was calculated by summing up the four remaining items. Cronbach's  $\alpha$  without the deleted item was 0.70.

**Self-esteem.** To assess self-esteem, five items of the Rosenberg et al. (1989) self-esteem scale were used. Participants gave responses on a 5-point Likert-type scale (1 = "Strongly disagree" to 5 = "Strongly agree") with statements, included in Table 1, dealing with general feelings about themselves. Since the Rosenberg et al. (1989) scale is used to assess explicit self-esteem, the focus of the current study is on explicit self-esteem. One item was reverse coded and the total score on self-esteem was calculated by summing up the five items (Cronbach's  $\alpha = 0.81$ ).

**Table 1**  
*Variables and items*

<i>Variable</i>	<i>Items</i>	<i>M</i>	<i>SD</i>	<i>Cronbach's <math>\alpha</math></i>
Intensity of meeting friends	How often do you spend time with friends or girlfriends outside of school?	4.00	1.31	0.70
	How often are you at your friends' homes?	3.6	1.32	
	How often do you go out at night or how often do you go to a party with friends?	2.54	1.35	
	How often are friends at your house?	3.46	3.46	
Closeness of the friendship	I can maintain a good friendship for a long time.*	4.34	0.97	0.83
	I have (a) close friend(s) with whom I can keep a secret together.	4.12	1.37	
	I have (a) really good friend(s) to do things with together.	4.55	0.93	
	I find it easy to get friends whom I can really count on.	4.16	1.08	
Self-esteem	I have friend(s) with whom I can share very personal thought.	4.44	0.98	0.81
	I feel that I am a person worth something, at least as much as others.	3.72	1.06	
	I feel positive about myself.	3.76	1.01	
	I can do things at least as well as most other young people.	3.66	0.96	
	I feel like I have a lot to be proud of.	3.90	1.04	
FoMO	I feel like I have some good qualities.	3.93	0.91	0.86
	I'm afraid others are having more fun than me.	1.62	0.84	
	I am worried when I find out that friends are having fun without me.	1.71	0.94	
	I get restless when I don't know what my friends are doing.	1.41	0.70	
	It bothers me when I miss an opportunity to meet up with friends.	2.03	1.11	
	If I have to miss scheduled appointments with friends, I worry about it.	2.00	1.10	

*Note.* \*Item was deleted.

## **Data preparation and analysis**

Statistical analyses were conducted with the program SPSS 28. Prior to data analysis, multivariate outliers, unreliable values, and unreliable respondents were removed. Thus, 2632 participants ( $N = 2632$ ) of the 4716 participants remained in the sample. Thereafter, unidimensionality and reliability of the dependent variable, independent variable, and mediator were checked and descriptive analyses were conducted. Prior to each analysis, assumptions of normality, linearity, multicollinearity, and homoscedasticity were assessed independently. Demographic variables were included in the analysis as control variables if they were identified as potential confounding variables, which was the case for gender and passive social media use.

A hierarchical linear regression was used to determine the relation between the intensity of meeting friends/the closeness of the friendship in relation to FoMO. Additionally, a mediation analysis was conducted using the method of Baron and Kenny (1986) to test the mediating effect of self-esteem. The first step was testing the effect of the intensity of meeting friends/the closeness of the friendship on FoMO (c). Thereafter, the effect of the intensity of meeting friends/the closeness of the friendship on self-esteem (a) and whether self-esteem had a significant effect on FoMO (b). Lastly, the effect of intensity of meeting friends/the closeness of the friendship on FoMO, controlled by self-esteem was tested (c'). In the last model, the interaction effect of the independent variables (the intensity of meeting friends and the closeness of the friendship) were evaluated. Beforehand, both the intensity of meeting friends and the closeness of the friendship were centred.

## **Results**

Table 1 shows descriptive statistics and Spearman correlations of all variables. A total of 81.5% of the participants ( $N = 2272$ ) stated that the closeness of their friendship was good to very good, while 14,3% of the participants ( $N = 504$ ) reported meeting with their friends often to very often. The majority of participants reported their self-esteem was good to very good ( $N = 1861$ ). The intensity of meeting friends was positively related with the closeness of the friendship and self-esteem. Self-esteem and the closeness of the friendship were negatively related with FoMO and each other. Gender and passive social media use revealed correlations with at least one other variable and were therefore included as control variables in

the analysis of this research. The results of analyses exploring multicollinearity do not point to its existence (VIF values ranging from 1.01 to 1.18).

**Table 2**

*Descriptive statistics and correlations of study variables*

Variable	<i>M</i>	<i>SD</i>	<i>Range</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
1. Age	13.94	1.20	11-17	—					
2. Gender	—	0.5	—	0.07**	—				
3. Passive social media use	4.27	1.69	1-7	0.11**	0.76**	—			
4. Intensity of meeting friends	3.4	1.11	1-6	0.05**	0.10**	0.26**	—		
5. Closeness of the friendship	4.32	0.8	1-5	0.02	0.09**	0.08**	0.22**	—	
6. Self-esteem	3.8	0.75	1-5	-0.05*	0.09**	-0.07**	0.18**	-0.29**	—
7. FoMO	1.75	0.73	1-5	0.04*	0.11**	0.08**	0.02	-0.25**	-0.29**

*Note.* N = 2632; FoMO = Fear of Missing Out. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ . Spearman correlations are shown.

## Main effects

### *Intensity of meeting friends/closeness of friendships on FoMO*

In this study, multivariate hierarchical linear regression analyses was utilized to investigate if the intensity of meeting friends on the one hand and closeness of the friendship on the other hand was related with higher scores on FoMO (model fit respectively:  $F(3,2628) = 15.61$ ;  $p < 0.001$ ,  $F(3,2628) = 65.93$ ;  $p < 0.001$ ). The results presented in Table 3 demonstrate a non-significant effect of the intensity of meeting friends on FoMO when controlling for gender and passive social media use. Contrary, Table 4 illustrates a significant negative effect of the closeness of the friendship on FoMO ( $\beta = -0.21$ ,  $p < 0.001$ ) when controlling for gender and passive social media use, indicating the closer the friendships, the lower the feelings of FoMO. The proportion of explained variance was found to be 7.0%.

**Table 3***Linear regression analysis of the intensity of meeting friends and FoMO (N = 2632)*

Predictor	B	SE B	$\beta$	p	Model fit	R <sup>2</sup>	$\Delta R^2$
Step 1					$F(2,2629) = 23.40^{***}$	0.02	0.02 <sup>***</sup>
Gender '	-0.14	0.03	-0.10	< 0.001			
Passive social media use	0.04	0.01	0.08	< 0.001			
Step 2					$F(3,2628) = 15.61^{***}$	0.02	0.00
Intensity of meeting friends	-0.03	0.13	-0.004	0.84			

Note. ' Reference category = boys. \*p < .05.. \*\*p < .01.. \*\*\*p < .001.

**Table 4***Linear regression analysis of the intensity of closeness of the friendship and FoMO (N = 2632)*

Predictor	B	SE B	$\beta$	p	Model fit	R <sup>2</sup>	$\Delta R^2$
Step 1					$F(2,2629) = 23.40^{***}$	0.02	0.02 <sup>***</sup>
Gender '	-0.14	0.03	-0.10	< 0.001			
Passive social media use	0.04	0.01	0.08	< 0.001			
Step 2					$F(3,2628) = 65.93^{***}$	0.07	0.05 <sup>***</sup>
Closeness of the friendship	-0.21	0.02	-0.23	< 0.001			

Note. ' Reference category = boys. \*p < .05.. \*\*p < .01.. \*\*\*p < .001.

### ***Self-esteem as a mediator***

With the multivariate hierarchical linear regression analysis of the two independent variables, the first step of the Baron and Kenny method (1986) was met for the closeness of the friendship and was not met for the intensity of meeting friends. Therefore, the following steps only needed to be followed for the closeness of the friendship, but for the completeness the steps were taken for the intensity of meeting friends as well.

The subsequent analysis, shown in Table 5, revealed that the intensity of meeting friends had a significant positive effect on self-esteem ( $\beta = 0.26, p < 0.001$ ), which, in turn, had a negative effect on FoMO ( $\beta = -0.28, p < 0.001$ ). The effect of the intensity of meeting friends, controlled for self-esteem, on FoMO was still significant ( $\beta = 0.07, p < 0.001$ ). Contrary, there is no mediation since the first step of the Baron and Kenny method was not met. Therefore, a Sobel test was not performed.

**Table 5**

*Linear regression analysis of mediator self-esteem between intensity of meeting friends and FoMO (N = 2632)*

Predictor	B	SE B	$\beta$	p	Model fit	R <sup>2</sup>	$\Delta R^2$
<b>Outcome Self-esteem</b>							
Step 1					$F(2,2629) = 11.94^{***}$	0.01	0.01 <sup>***</sup>
Gender '	0.10	0.03	0.06	0.001			
Passive social media use	-0.03	0.01	-0.7	< 0.001			
Step 2					$F(3,2628) = 69.01^{***}$	0.07	0.06 <sup>***</sup>
Intensity of meeting friends	0.18	0.01	0.26	< 0.001			
<b>Outcome FoMO</b>							
Step 1					$F(2,2629) = 23.40^{***}$	0.02	0.02 <sup>***</sup>
Gender '	-0.14	0.03	-0.10	< 0.001			
Passive social media use	0.04	0.01	0.08	< 0.001			
Step 2					$F(3,2628) = 91.10^{***}$	0.09	0.08 <sup>***</sup>
Self-esteem	-0.27	0.02	-0.28	< 0.001			
<b>Outcome FoMO</b>							
Step 1					$F(2,2629) = 23.40^{***}$	0.02	0.02 <sup>***</sup>
Gender '	-0.14	0.03	-0.10	< 0.001			
Passive social media use	0.04	0.01	0.08	< 0.001			
Step 2					$F(3,2628) = 72.07^{***}$	0.10	0.08 <sup>***</sup>
Intensity of meeting friends	0.05	0.01	0.07	< 0.001			
Self-esteem	-0.29	0.02	-0.30	< 0.001			

Note. ' Reference category = boys. \*p < .05.. \*\*p < .01.. \*\*\*p < .001.

Thereafter, the mediation effect of self-esteem in the relation between the closeness of the friendship and FoMO was tested. Table 6 shows that the closeness of the friendship had a significant positive effect on self-esteem ( $\beta = 0.25, p < 0.001$ ), which, had a negative effect on FoMO ( $\beta = -0.28, p < 0.001$ ). A partial mediation effect occurred, since the effect of the closeness of the friendship, controlled for self-esteem, on FoMO was still significant ( $\beta = -0.17, p < 0.001$ ). A Sobel test resulted in a significant finding ( $z = -8.75, p < .001$ ). It was observed that self-esteem accounted for 9.4% of the variance in FoMO.

**Table 6**

*Linear regression analysis of mediator self-esteem between closeness of the friendship and FoMO (N = 2632)*

Predictor	B	SE B	$\beta$	p	Model fit	R <sup>2</sup>	$\Delta R^2$
<b>Outcome Self-esteem</b>							
Step 1					$F(2,2629) = 11.94^{***}$	0.01	0.01 <sup>***</sup>
Gender '	0.10	0.03	0.06	0.001			
Passive social media use	-0.03	0.01	-0.7	< 0.001			
Step 2					$F(3,2628) = 65.86^{***}$	0.07	0.06 <sup>***</sup>
Closeness of the friendship	0.23	0.02	0.25	< 0.001			
<b>Outcome FoMO</b>							
Step 1					$F(2,2629) = 23.40^{***}$	0.02	0.02 <sup>***</sup>
Gender '	-0.14	0.03	-0.10	< 0.001			
Passive social media use	0.04	0.01	0.08	< 0.001			
Step 2					$F(3,2628) = 91.08^{***}$	0.09	0.08 <sup>***</sup>
Self-esteem	-0.27	0.02	-0.28	< 0.001			
<b>Outcome FoMO</b>							
Step 1					$F(2,2629) = 23.40^{***}$	0.02	0.02 <sup>***</sup>
Gender '	-0.14	0.03	-0.10	< 0.001			
Passive social media use	0.04	0.01	0.08	< 0.001			
Step 2					$F(3,2627) = 90.93^{***}$	0.12	0.10 <sup>***</sup>
Closeness of the friendship	-0.16	0.02	-0.17	< 0.001			
Self-esteem	-0.23	0.02	-0.24	< 0.001			

*Note.* ' Reference category = boys. \*p < .05.. \*\*p <.01.. \*\*\*p < .001.

### ***Interaction effect of the intensity of meeting friends and the closeness of the friendships***

To test the interaction effect of the intensity of meeting friends and the closeness of the friendship, a multivariate hierarchical linear regression analysis was used. The results presented in Table 7 demonstrate a non-significant interaction effect of the intensity of meeting friends and the closeness of the friendship on FoMO ( $\beta = -0.01$ ,  $p = 0.63$ ) when controlling for gender, passive social media use, the intensity of meeting friends and the closeness of the friendship.



**Table 7**

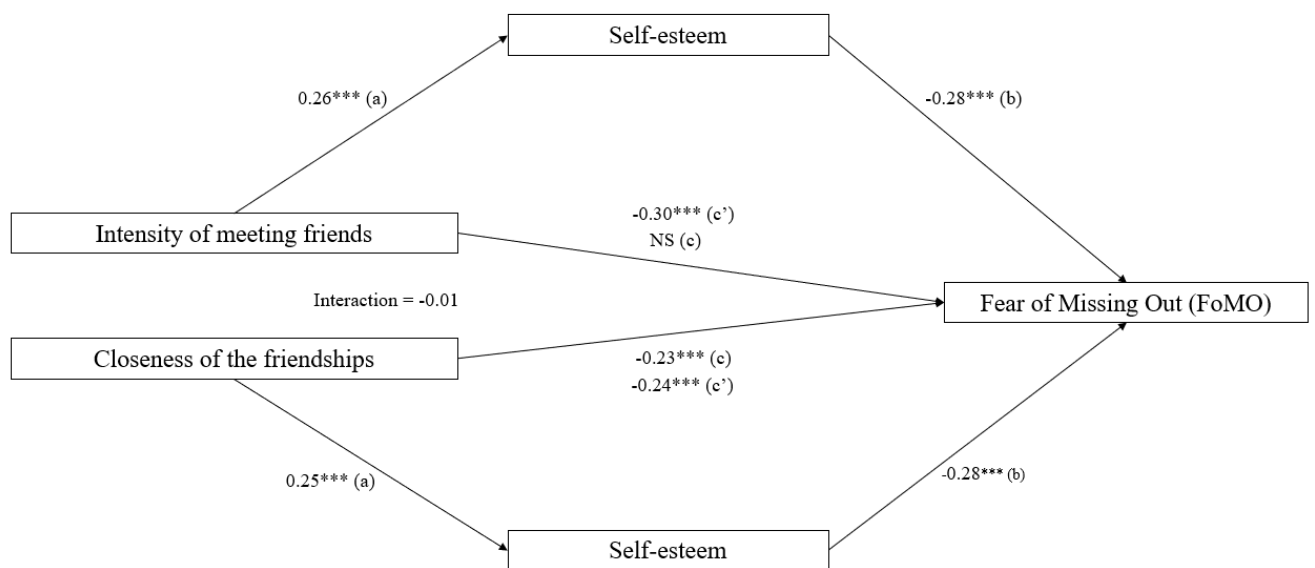
Linear regression analysis of the interaction term of the intensity of meeting friends and the closeness of the friendship on FoMO (N = 2632)

Predictor	B	SE B	$\beta$	p	Model fit	R <sup>2</sup>	$\Delta R^2$
Step 1					F(2,2629) = 23.40***	0.02	0.02***
Gender '	-0.14	0.03	-0.10	< 0.001			
Passive social media use	0.04	0.01	0.08	< 0.001			
Step 2					F(4,2627) = 50.71***	0.07	0.05***
Intensity of meeting friends	0.03	0.01	0.04	0.03			
Closeness of the friendship	-0.22	0.02	-0.24	< 0.001			
Step 3					F(5,2626) = 40.61***	0.07	0.00***
Intensity of meeting friends * Closeness of the friendship	-0.01	0.01	-0.01	0.63			

Note. ' Reference category = boys. \*p < .05.. \*\*p < .01.. \*\*\*p < .001.

**Figure 2**

Direct and indirect effect sizes



Note. \*p < .05.. \*\*p < .01.. \*\*\*p < .001.

## Discussion

This study aimed to expand the knowledge on the role of friendship on FoMO. First, a regression analysis was conducted with the intensity of meeting friends as the predictor (H1a). Thereafter, a regression analysis was conducted with the closeness of the friendship as the predictor (H1b). Following, the Baron and Kenny method (1986) was used to add self-esteem as a mediator in both analyses (H2). Finally, the interaction effect of the intensity of meeting friends and the closeness of the friendship was tested (H3). The results of the current study

suggest that there is a relationship between the closeness of the friendship and FoMO, while the intensity of meeting friends and the interaction between the intensity of meeting friends and the closeness of the friendship do not have a significant impact on this fear.

### **Results and literature**

Contrary to hypothesis 1a, the findings of the current study showed that adolescents who interact with their friends frequently do not have less feelings of FoMO. This finding is not in line with the results of Przybylski et al. (2013) and Xie et al. (2018) who stated that when a basic psychological need is not sufficiently fulfilled, this could make an individual more prone to FoMO. Therefore, the results of the current study suggest that the intensity of meeting friends is not part of an individual's basic psychological needs or that there are other factors (within those basic psychological needs) more important in the association with FoMO. Meaning that it is important to make a distinction between basic psychological needs in general and autonomy, competence and relatedness, and the different factors within those three concepts. Since hypothesis 1a is not significant, hypothesis 2a (the mediating effect of self-esteem in the relationship between the intensity of meeting friends and FoMO) was not significant as well.

In line with hypothesis 1b, the findings showed that adolescents with close friendships have less feelings of FoMO. This result is in line with the results of Przybylski et al. (2013) and Xie et al. (2018) who stated that when a basic psychological need is not sufficiently fulfilled, this could make an individual more prone to FoMO. This supports the connection between unfulfilled basic psychological needs according to the Self-Determination Theory and the occurrence of FoMO (Ryan & Deci, 2000). These findings suggest that the closeness of the friendship of an individual is part of his/her basic psychological needs. In addition, the results of the current study are in line with the results of Coyle and Malecki (2018) and Schneider and Tessier (2007), who concluded that the closer a friendship, the higher the fear (in general) of an individual. The fact that the relationship between the intensity of meeting friends and FoMO was not significant, but the relationship between the closeness of the friendship and FoMO was significant, confirms the importance to distinguish between those factors. In research about loneliness for instance, it is common to distinguish between the intensity of meeting friends and the closeness of the friendship, which emphasize the need to do this (Martina & Stevens, 2006; Mazurek, 2014; Nangle et al., 2003).

The relationship of the closeness of the friendship and FoMO, was partially mediated by self-esteem. This was in line with hypothesis 2b and means that adolescents with close

friendships, have higher self-esteem and therefore less feelings of FoMO. This result is a confirmation of the Sullivan hypothesis (2013) which posits that close friendships during adolescence have a beneficial impact on an individual. In addition, this result confirms the studies of De Jong et al. (2012), Hulme et al. (2012) and Schreiber et al. (2012) which possess that self-esteem has a large role in affecting various forms of fears in individuals and according to Buglass et al. (2017), Przybylski et al. (2013) and Servidio (2021) especially in developing FoMO. While the relationship between the intensity of meeting friends and FoMO was not significant, the effect of the intensity of meeting friends on self-esteem was significant. This is in line with the results of Keefe and Berndt (1996) and Yamada et al. (2021) who stated that the intensity of meeting friends influences an individuals' self-esteem. The results of the current study add, to the little knowledge about self-esteem in this context, that friendships are important in this relationship.

The results do not support hypothesis 3 as the findings suggest that there is no interaction effect between the intensity of meeting friends and the closeness of the friendship with regard to FoMO. Those findings are consistent to the research of Amati et al. (2018) who stated that meeting with your friends more often, does not automatically lead to closer friendships. Furthermore, it was stated by McGuire and Weisz (1982) that adolescents with more supportive friendships interact with their friends more frequently, but Amati et al. (2018) made clear that a supportive friendship is not necessarily synonymous with a close friendship. The present study has provided clarification in line with the research of Amati et al. (2018) and clarified that the closeness of a friendship goes further than supportiveness, it also includes trust, reliability, intimacy, and shared experiences.

### **Strengths and limitations**

The foremost strength of the current study was the large sample size ( $N = 2632$ ), which increased its external validity. Furthermore, to conduct three of the four variables, validated scales were used (Przybylski et al., 2013; Rosenberg et al., 1989; Straathof & Scheffers, 1989). Therefore, the questionnaire measures are fairly valid indicators of the variables used in the study. Cronbach's alfa of the variables used, were all higher than 0.70 and only one item needed to be deleted. Having fairly valid indicators of the variables improved the internal validity of the study.

When interpreting the findings of this study, it should be borne in mind that FoMO was not normally distributed. Due to the size of the sample, the skewed FoMO was left as it was. In addition, the scale of the closeness of the friendship was skewed to the right. Almost

1000 participants scored the maximum score on this variable. In addition, while the data were collected by self-surveys there is a potential for response bias, where participants may provide socially desirable responses or distort their answers. Furthermore, the data were collected prior to the COVID-19 outbreak. The pandemic has the potential to alter friendships, self-esteem, and FoMO either temporarily or permanently (Hayran & Anik, 2021, Vall-Roqué et al., 2021, Wright & Wachs, 2022). Therefore, results of the current study with a sample from after the COVID-19 outbreak can be substantially different. The last limitation of this study is that the data were cross-sectional, this makes it impossible to check for reverse causation. FoMO has been found to stimulate feelings of anxiety (Fabris et al., 2020), which in turn are bad for friendship quality (Crawford & Manassis, 2011).

### **Implications and future research**

In the current cross-sectional study a distinction was made between friendships and other types of relationships, as well as psychological needs in relation to FoMO. While past studies looked at psychological needs in general in relation to FOMO, this study focused especially on friendships. In addition, in the current study a distinction is made between the intensity of meeting friends and the closeness of the friendship. Based on the results of the current study, it can be suggested that the closeness of the friendship is more important than the intensity of meeting friends, in relation to FoMO. Based on those results, it is important to make the distinction between those two aspects, just as in studies about loneliness, in future research (Martina & Stevens, 2006; Mazurek, 2014; Nangle et al., 2003). To gain a deeper understanding of the complex relationships of social connections, friendship quality, and FOMO, future research should have a longitudinal design. Such analyses would provide useful insights into how these characteristics interact over time. Furthermore, since the data of this study were cross-sectional, a longitudinal study would aid in determining the directionality of the relationship.

This study discovered a substantial link between the closeness of the friendship and FoMO. Schools and parents should therefore foster and support the development of meaningful and intimate friendships among children and adolescents. This can be accomplished through creating environments that promote social connections, organizing group activities and encouraging positive social dynamics in schools and communities (Hochman et al., 2015). Furthermore, according to the findings, self-esteem is a mediator in the relationship between friendships and FoMO. As a result, schools and parents should prioritize the development of good self-esteem in children and adolescents. This can be

accomplished through offering chances for personal development, emphasizing individual talents and accomplishments and promoting a supportive and inclusive atmosphere (Fanning & McKay, 2005).

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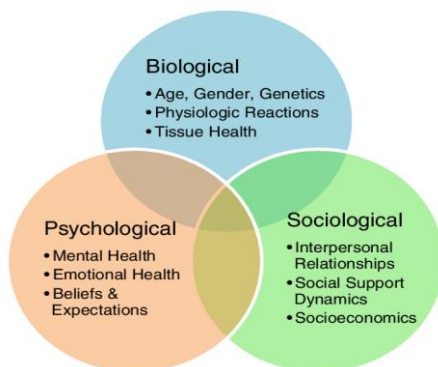
## Appendices

### Appendix 1: Interdisciplinary approach

Interdisciplinarity is a central component of the master program ‘Youth studies’, since it is part of the Interdisciplinary Social Science department of the University of Utrecht. Therefore, when conducting research in this master program, an interdisciplinary approach is preferred. A study is interdisciplinary when it has more than one level of the biopsychosocial model by Gliedt et al. (2017), more than one level of the ecological model by Bronfenbrenner (1989) or more than one level of the transactional model of development by Sameroff (2009). The levels of the biopsychosocial model by Gliedt et al. (2017) are biological, psychological and sociological (Figure 2). The levels of the ecological model by Bronfenbrenner (1989) are individual, microsystem, mesosystem, exosystem, macrosystem and chronosystem (Figure 3). The influences of the transactional model of development by Sameroff (2009) are personal influences, social influences and broader social influences (Figure 4).

#### Figure 2

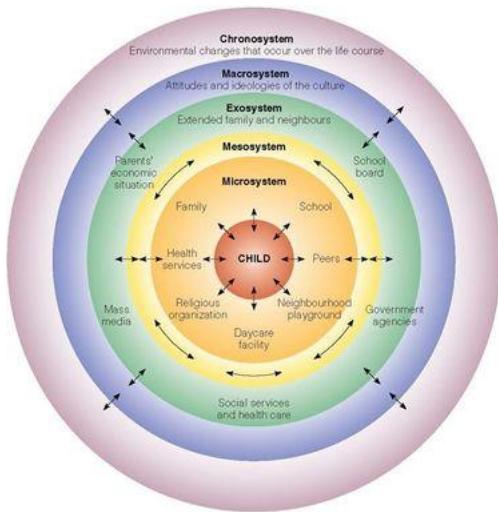
*Biopsychological model (Gliedt et al., 2017)*



When looking at the biopsychosocial model by Gliedt et al. (2017), this research has an interdisciplinary approach, because it looks at both the sociological level and the psychological level. The intensity of meeting friends and the closeness of the friendships are both sociological factors. The science of sociology investigates the manner in which individuals live together and in which individuals influence each other. The friendships of an individual are therefore of sociological level. Furthermore, self-esteem and FoMO are both psychological factors. Self-esteem is how we value and perceive ourselves and is part of an individual's mental and/or emotional health. It's based on our opinions and beliefs about ourselves and therefore of psychological level. FoMO is a fear which is an unpleasant emotion. This can influence the mental health of an individual.

**Figure 3**

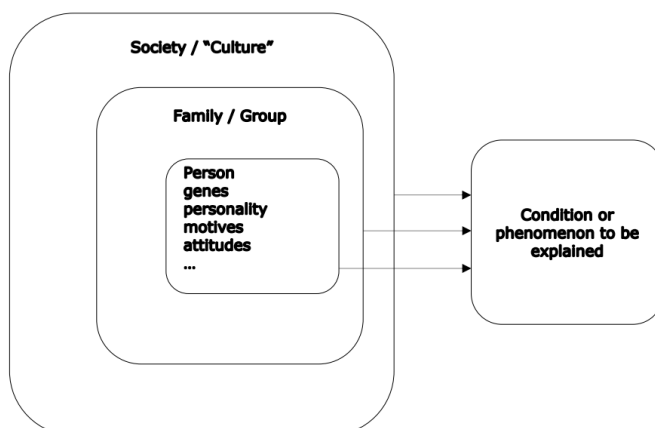
*Ecological model (Bronfenbrenner, 1989)*



When looking at the ecological model by Bronfenbrenner (1989), this research has an interdisciplinary approach, because it looks at both the individual level and the microsystem. The intensity of meeting friends and the closeness of the friendships are both part of the microsystem. The microsystem is the first level of Bronfenbrenner's (1989) theory, and are the things that have direct contact with the individual in their immediate environment. Friendships of individuals are mostly formed with peers and therefore the peers are an important part of the friendship. In addition, self-esteem and FoMO are both of individual level. Those factors lay within the individual, but can be influenced by systems that lay outside the individual.

**Figure 4**

*Transactional model of development (Sameroff, 2009)*



When looking at the transactional model of development by Sameroff (2009), this research has an interdisciplinary approach, because it looks at both the personal influences

and the social influences. The intensity of meeting friends and the closeness of the friendships are both social influences. The science of sociology investigates the manner in which individuals live together and in which individuals influence each other. The closeness of the friendships of an individual and the intensity of meeting with friends are partly dependent on the role of peers. Additionally, self-esteem and FoMO are both personal influences. Self-esteem is how we value and perceive ourselves and is part of an individual's personality. FoMO is a fear which is an unpleasant emotion. An emotion can influence the personality and attitude of an individual.

## Appendix 2: Contract data-use TED track

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Utrecht, 2022

This letter constitutes formal confirmation of the fact that the data from the Utrecht University, Digital Youth Project have been made available to J.G.M. Boeijen of Utrecht University.

These data will not be made available to others, and the data may be used only for analysis and reporting on topics for the thesis, about which agreement has been reached with Gaëlle Ouvrein (promotor) and Regina van den Eijnden (project leader).

J.G.M. Boeijen will receive access to the data from the dataset in order to answer the following research questions within the framework of the thesis:

### Research question:

**RQ1a:** Does the intensity of meeting friends influence the perceived fear of missing out (FoMO)?

**RQ1b:** Does the closeness of the friendships influence the perceived fear of missing out (FoMO)?

**RQ2a:** Is the relationship between the intensity of meeting friends and the perceived fear of missing out (FoMO) mediated by self-esteem?

**RQ2b:** Is the relationship between the closeness of the friendships and the perceived fear of missing out (FoMO) mediated by self-esteem?

The following variables will be used:

- Dependent variable:
  - o FoMO (Q36)
- Independent variables:
  - o Competentiebeleving hechte vriendschappen (CBSA)/Competency experience close friendships (Q78)
  - o Omgang met vrienden (intensiteit) (FFS)/Intensity of meeting friends (Q81)
- Other variables:
  - o Mediator:
    - Zelfwaardering/Self-esteem (Q39)
  - o Confounder:
    - Ben je een jongen of een meisje? (vanaf 2016)/Are you a boy or a girl? (Q3)
    - Passief gebruik sociale media/Passive use social media (Q10)

No report based on the data from the project entitled Digital Youth Project will be made public, unless permission has been obtained in advance from the Project Coordinator for the Digital Youth Project.

After the expiration of this contract, dated 15/08/23, J.G.M. Boeijen shall delete the Digital Youth Project data.

Dates and signature: 23/01/23

Name of student:

J.G.M. Boeijen



Name of Project Coordinator:

Gaëlle Ouvrein

