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License to look? The role of permissive beliefs, desire thinking, and self-control in predicting the use of social networking sites

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ABSTRACT

Permissive beliefs are considered the most proximal predictor of actual behavior. Whereas they have frequently been researched in substance-use disorders, the field of social networking sites (SNS) use is missing the investigation as to how relevant permissive beliefs might be in this context, what might be causal precursors of permissive beliefs (i.e., desire thinking), and which processes might influence the effect that permissive beliefs have on actual behavior (i.e., self-control). To answer these questions, 116 people who use SNS participated in an online survey that contained an experimental manipulation of desire thinking and questionnaires measuring permissive beliefs, self-control, and severity of problematic SNS use. In a one-week follow-up, 85 participants reported their SNS usage times. Results showed that the association between permissive beliefs and tendencies to use SNS problematically was not significant. The experimental manipulation led to a decrease in permissive beliefs in the control condition, but did not increase permissive beliefs in the desire thinking condition. Permissive beliefs predicted SNS use in the follow-up assessment, which was not moderated by self-control. The results suggest that permissive beliefs seem to be unrelated to addictive tendencies of SNS use, but are nevertheless associated with daily use. Desire thinking does not appear to activate permissive beliefs in this study, possibly because the use of social networks is less often experienced as conflicting. Due to its ubiquitous availability, the use of social networks itself might quickly resolve the conflict between desires and possible regulatory attempts, making good reasons for use unnecessary.

1. Introduction

Difficulties in controlling the use of social networking sites (SNS) have been argued to resemble addictive behavior patterns (e.g., Hussain & Wegmann, 2021; Wegmann & Brand, 2020; Wegmann et al., 2021) and to cause detriments to subjective well-being (e.g., Kross et al., 2013; Verduyn et al., 2015). Consequently, the problematic use of SNS, also called social-networks-use disorder (SNUD), is considered a potential behavioral addiction. Although there is a debate whether some behaviors are addictive at all and we are actually over-pathologizing everyday behaviors (e.g., Billieux et al., 2015; Brevers & Noel, 2015), a main line of reasoning why some behaviors may become addictive stems from cognitive psychology approaches arguing the similarity of underlying

processes of several addictive behaviors as well as the clinical relevance of these behaviors (Brand et al., 2020, 2021). Next to established addictive behaviors such as gaming and gambling disorder (ICD-11; World Health Organization, 2019), SNUD is clinically relevant to a vulnerable minority as indicated by prevalence rates (for review, see Hussain & Griffiths, 2018). Therefore, it is important to investigate proximal precursors of SNS use in order to understand the occurrence of problematic SNS usage patterns.

When behaviors such as problematic SNS use stand in conflict with goals of restraint or abstinence, permissive beliefs are discussed as a candidate mechanism to resolve such a conflict. When reviewing the literature, there are numerous ways of describing the same process: permissive attitudes (King et al., 2022; Wright, 2022), self-forgiveness

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(Wohl & Thompson, 2011), self-licensing (de Witt Huberts, Evers, & de Ridder, 2012; Lalot et al., 2022; Prinsen et al., 2016), justificational beliefs (Kivetz & Zheng, 2006; Taylor et al., 2014), or facilitative beliefs (Caselli et al., 2020). These constructs all refer to the process of allowing oneself indulgence. Such beliefs can become problematic if they become a prominent 'excuse' for engaging in a particular behavior. According to Beck et al. (1993), people with substance-use disorders may activate permissive beliefs that consist of reasons as to why it is fine to consume a certain substance, putting permissive beliefs into the specific context of addiction. Thus, permissive beliefs serve as a license for the engagement in a (problematic) behavior, while ignoring the possible negative consequences. These assumptions stem from a schema-based therapeutic perspective where behaviors are mainly driven by manifested cognitive schemata. If these schemata are prompted, they are experienced as verbal beliefs (Beck et al., 1993; Tammam et al., 2020). Accordingly, permissive beliefs have been investigated in the context of hedonic consumption (de Witt Huberts et al., 2012, 2014) and unhealthy behavior (Wohl & Thompson, 2011), as well as more specific contexts such as eating disorders (Burton & Abbott, 2018; Cooper et al., 2004), prescription medication misuse (King et al., 2022), cannabis (Chabrol et al., 2004; Plancherel et al., 2005), alcohol-use disorder (AUD; Caselli et al., 2020), and also among (online and offline) gaming (Taquet et al., 2014). Since permissive beliefs seem to play a role in the context of regulated behaviors, it is conceivable that they might also be associated with problematic SNS use.

Next to the extent of permissive beliefs, research investigating their precursors is just as important. One such precursor that is suggested to have an impact on permissive beliefs when manipulated in clinical samples is desire thinking (Caselli et al., 2017, 2020). Desire thinking refers to the cognitive ability to - effortfully and voluntarily - prefigure future desired activities, objects, or states mentally, to create sensory images around these desired activities, and to be linguistically involved in planning how to achieve the favored target (Caselli & Spada, 2011, 2015). Accordingly, desire thinking conceptually divides into the imaginal prefiguration and verbal perseveration subcomponents. Desire thinking has been shown to be a transdiagnostic feature of substance and behavioral addictions that appears to be qualitatively similar among several targets (Caselli & Spada, 2010; May et al., 2004). It has been detected across a range of substances such as alcohol and nicotine (Caselli et al., 2015, 2017; Caselli, Ferla, et al., 2012; Caselli, Nikcevic, et al., 2012; Khosravani, Spada, Samimi Ardestani, et al., 2022; Martino et al., 2017; Solem et al., 2020), as well as among behaviors such as gaming, SNS use, pornography, gambling, and sexual behaviors (Brandtner & Brand, 2021; Brandtner et al., 2020; Caselli & Spada, 2015; Caselli, Nikcevic, et al., 2012; Efrati et al., 2020; Fernie et al., 2014; Khosravani, Spada, Sharifi Bastan, et al., 2022; Sharifi Bastan et al., 2022). Since desire thinking is assumed to be closely linked to the activation and persistence of craving (Caselli & Spada, 2015), it might also be likely involved in self-regulatory conflicts where craving to use SNS conflicts with attempts to restrict oneself. Thus, when desire thoughts are experienced although SNS use is perceived as problematic, permissive beliefs might serve as a permission and relieve individuals from this experienced conflict (de Witt Huberts, Evers, & de Ridder, 2013). In this regard, Caselli et al. (2020) have found that desire thinking activates permissive beliefs in AUD patients. This raises the question if such an effect might also be detectable and replicable in SNS users.

As a process that might serve as a technique to control urges and desires, self-control is often discussed in the context of addictive behaviors (e.g., Brand, 2022; Brevers & Turel, 2019; Hofmann & van Dillen, 2012; Tang et al., 2015). A high level of self-control is relevant for a variety of health-related behaviors such as breaking bad habits, exercising self-discipline, and resisting temptations (Baumeister & Heatherton, 1996; Baumeister et al., 2007; Bertrams & Dickhäuser, 2009; de Ridder et al., 2012; Tangney et al., 2004). Therefore, a variety of problematic behaviors are thought to be related to low self-control

such as addictive behaviors and unregulated SNS use in particular (e.g., Du, van Koningsbruggen, & Kerkhof, 2018; Zahrai et al., 2021; Zahrai et al., 2022). It is therefore conceivable that higher levels of self-control might be associated with a higher expression of permissive beliefs since highly regulated individuals might need better excuses. Permissive beliefs might therefore predict daily SNS use in interaction with self-control.

In summary, we hypothesize (1) a relation between permissive beliefs for using SNS and the problematic use of SNS; (2) that a desire thinking condition activates permissive beliefs for using SNS compared to a neutral thinking condition; and (3) that permissive beliefs interact with self-control in predicting SNS use in everyday life.

2. Methods

2.1. Participants

Sample size was determined by power analysis using G*Power. Previous research on permissive beliefs suggests an effect size of 0.15 when conducting desire thinking manipulations (Caselli et al., 2020). When α error probability was set to 0.05, power set to 0.8, number of groups set to 2, number of measurements set to 2, and correlation among repeated measures was set to 0.5, the power analysis revealed a required sample size of 90, resulting in 45 participants per experimental group and a statistical power of 0.8. Participants were recruited via online posts on SNS platforms like Facebook and Instagram. Inclusion criteria were a minimum age of 16 and self-reported regular SNS use. Due to the follow-up, a mother code was requested before entering the survey. This also served as a variable to detect duplicates. A total of 172 data sets were collected. After cleaning the sample (see statistical analyses), a population of 116 individuals who use SNS was included into data analyses (76 female; 0 non-binary; $M_{age} = 24.02$, $SD = 4.80$, range 17–49). Finally, a total of $n = 85$ participants could be recruited for the follow-up survey, indicative of a drop-out rate of 26 %.

2.2. Procedure

The procedure was pre-registered in OSF [<https://doi.org/10.17605/OSF.IO/HR5V3>]. The experimental manipulation and the follow-up assessment were conducted in an online setting. Participants started by giving informed consent about the study procedure which included the completion of a set of questionnaires and the thinking manipulation task (see below). For the thinking manipulation task, participants were randomly assigned to either the desire thinking or neutral thinking condition via a simple randomizer. Participants were blind to conditions. Just before and after the induction, participants rated their craving and current permissive beliefs. Once all questionnaires were completed, participants were asked to activate their screen-tracking tool on their smartphone with displayed instructions for iOS and Android. An alternative option was given (i.e., estimating their use of SNS), but not included in the analyses because subjective estimates correlate poorly with objective assessments (Ernala et al., 2020). After completing the questionnaires, participants were prompted 7 days after the first participation to report their use of SNS for the previous 5 days (day 2 to 6 – ensuring that only full 24 h-days were reported).

2.3. Questionnaires

2.3.1. Symptom severity

For the degree of impairments due to the use of SNS, the German version of the Assessment of Criteria for Specific Internet-use Disorders (ACSID-11; Müller et al., 2022) was used. Eleven items (e.g., "In the last 12 months, have you had trouble keeping track of when you started the activity, for how long, how intensely, or in what situation you did it, or when you stopped?") were responded to on a two 4-point Likert scale; one for the frequency of the symptom (0 *never* to 3 *often*) and one for the

intensity of the symptom (0 *not intense at all* to 3 *intense*). Three items each refer to the three main symptoms according to ICD-11 (impaired control, increasing priority, and escalation); one item each refers to functional impairment and marked distress due to the use of SNS. Higher values on each of the scales indicate a higher symptom frequency or intensity. The Cronbach's alpha of both subscales indicated good internal reliability (frequency: 0.884, intensity: 0.853).

2.3.2. Desire thinking

The Desire Thinking Questionnaire (DTQ; Caselli & Spada, 2011) in its German translation (Brandtner & Brand, 2021) was used as a covariate in the analysis to control for baseline desire thinking. It assesses desire thinking on two subscales with 5 items. These are the general tendency to prefigure imagery about a desired target ("I imagine myself doing the desired activity"), and verbal preoccupation with thoughts around the target ("I repeat mentally to myself that I need to practice the desired activity"). Items are rated on a 4-point Likert scale, ranging from 1 *almost never* to 4 *almost always* with higher mean scores indicating a higher tendency for desire thinking. In this sample, the DTQ showed good internal consistency with Cronbach's alpha = 0.843.

2.3.3. Permissive beliefs

Four items to assess the extent of permissive beliefs were translated and adapted from Caselli et al. (2020) (i.e., "I would be able to stop using social networks at any time", "After all, using social networks is not problematic per se", "I would deserve to use social networks", and "After all, it would not be a risk to use social networks"). Participants were instructed to evaluate how strongly they currently experience the four permissive beliefs on a unipolar 5-point Likert scale from 0 *not strong at all* to 4 *very strong*. The four items were aggregated to a mean score with higher scores indicating a greater activation of beliefs.

2.3.4. Craving

As a manipulation check, craving was measured on two visual analogue scales asking for the "urge" (i.e., "How urgently do you want to use social networks right now?") and a "sense of deficit" (i.e., "How much do you miss using social networks right now?").

2.3.5. Thinking manipulation task

Auditory mental imagery tasks were used that either instructed participants to imagine when, where, and how they use SNS or to imagine when, where, and how they brush their teeth as described in Brandtner et al. (2020). Both mental imagery scenarios were similarly instructed and employed the same length of time (approximately 1.5 min). Participants were instructed to sit calmly, close their eyes if possible, and use headphones to minimize destructive noise from the environment. Quality checks at the end of the questionnaires asked for whether participants listened to the full-length thinking manipulations, and whether they listened to it under the required conditions.

2.3.6. Self-control

The ability for self-control was measured using the German version of the Brief Self-Control Scale (BSCS; Tangney et al., 2004). This comprises 13 items (e.g., "I can resist temptations well.") and is measured using a 5-point Likert scale ranging from 1 *do not agree* to 5 *agree exactly*. Items 2, 4, 5, 7, 10, 12, and 13 are inversely worded and need to be inverted. A mean score was calculated with higher scores indicating higher self-control ability. In this sample, the BSCS showed acceptable internal consistency with Cronbach's alpha = 0.658.

2.3.7. Daily social networking sites use

For the daily use of SNS, participants were automatically sent an invitation link to an online survey that asked to report use time (in minutes) according to the tracking tool on their smartphones. Participants were asked to pick the application that they used the longest during the last 5 days according to the tracking tool, and to declare in the

survey which application that was. The most used application was chosen from a drop-down list and, if not listed, could be typed in freely. Minutes per day were averaged for each participant.

2.4. Statistical analysis

Analyses were carried out using SPSS v27 on a MacBook Pro v12.2.1. Before inferential analyses, the sample was cleaned (i.e., incomplete data sets; duplicates; participants who had taken too long or too short for the survey; participants who did not fulfill the requirements of the study protocol such as wearing headphones, listening to thinking manipulations until the very end; careless responder, and box-plot-screen for outliers). Hypothesis 1 was addressed using Person's correlations. Hypothesis 2 was addressed using a mixed ANOVA, with "time" (pre-test vs post-test of permissive beliefs) as the within-subjects factor and "condition" (desire thinking vs neutral thinking) as the between-subjects factor. Desire thinking was entered as a covariate to control for a general preference or ability for generating desire-related thoughts outside of the study manipulation. Homoscedasticity of residuals for the mixed ANOVA was given as indicated by Levene's tests. There was no need for a sphericity test since the levels of the independent variables do not exceed two. Bonferroni correction was applied to four post hoc *t*-tests after the ANOVA (independent pre- and post *t*-tests between conditions and dependent *t*-tests within each condition). Thus, a new level of significance was set by dividing the *p*-value by four, wherefore results were considered significant if $p < .0125$. Hypothesis 3 was addressed using a moderated regression analysis. Variables were mean centered before they were entered into the model. For this analysis, the sample was smaller ($n = 85$) since there was a drop-out for the follow-up investigation. A Durbin-Watson-Statistic of 1.8 indicated that there was no autocorrelation of residuals in the moderated regression model. Since the assumption for homoscedasticity was not met, bootstrapping with 1000 samples was used to compute 95 % CIs. Table 2 gives an overview of correlational patterns between study variables, showing that there is no indication for multicollinearity. All relevant study variables did not differ between males and females in the current sample wherefore we did not include gender as a covariate in the analyses (see Appendix for details).

3. Results

3.1. Descriptive statistics and correlation analyses

Baseline descriptive statistics were tested for differences between the two experimental conditions to ensure that there was no bias in the experimental manipulation (see Table 1).

The SNS application that was indicated as being used the most was

Table 1

Baseline descriptive statistics and differences between manipulation conditions.

	Desire thinking condition (n = 50)	Neutral thinking condition (n = 66)	Results of <i>t</i> -test (df = 144) for independent samples	
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>t</i>	<i>p</i>
Age	23.94 (4.91)	24.08 (4.74)	-0.15	0.881
Permissive beliefs T1	1.38 (0.68)	1.38 (0.63)	0.04	0.968
Symptoms frequency	1.07 (0.59)	1.01 (0.58)	0.55	0.583
Symptoms intensity	0.89 (0.50)	0.83 (0.51)	0.61	0.545
Desire thinking	17.28 (5.60)	16.39 (4.83)	0.93	0.355

Note. *M* = mean, *SD* = standard deviation; note that values depicted here are baseline measures and not indicative of the success/failure of thinking manipulations; *df* = degrees of freedom.

Table 2
Bivariate correlations of study variables.

	2)	3)	4)	5)	6)	7)
1) Symptoms frequency	0.914**	0.060	0.427**	0.406**	-0.379**	0.319*
2) Symptoms intensity		-0.031	0.446**	0.390**	-0.447**	0.181
3) Permissive beliefs T1			0.148	0.095	-0.025	0.252*
4) Verbal perseveration				0.640**	-0.189*	0.181
5) Imaginal prefiguration					-0.221*	0.287*
6) Self-control						-0.105
7) SNS use time (min)						1

Note. ** $p < .01$, * $p < .05$, $N = 116$; correlation analyses with 7) SNS use time (min) only included the follow-up sample, $n = 85$; T1 indicates the pre-experimental measure of permissive beliefs; SNS = social networking sites.

Facebook (25.9 %), followed by Instagram (23.3 %), WhatsApp and TikTok (each 14.7 %), YouTube (9.5 %), Telegram and Reddit (each 2.6 %), Snapchat (1.7 %), and the rest of the applications all scoring below or equal to 1 % (i.e., Discord, Signal, Threema, Twitch, Pinterest, and Twitter).

3.2. Permissive beliefs in relation to symptom severity

Against our pre-registration, we decided to make use of a dimensional approach for the relation of permissive beliefs and symptom severity of SNS. This is because up to now there is no validated cut-off for the ACSID-11 that differentiates between non-problematic and problematic SNS use. However, it can be assumed that there might be a gradual development from non-problematic to problematic SNS use with increasing symptoms and symptom severity. The correlation between permissive beliefs at T1 and the frequency and intensity measure of symptom severity of SNS use indicated that the variables were unrelated (see Table 2).

3.3. Effect of thinking manipulations on permissive beliefs

A manipulation check revealed no significant induction of craving in the desire thinking condition (urge: $t(49) = 0.39, p = .698$; sense of deficit: $t(49) = 1.97, p = .054$). A mixed ANOVA was nonetheless calculated to analyze how the thinking manipulations might have caused a change in the development of permissive beliefs. There was neither a significant main effect for time ($F(1,113) = 1.29, p = .259, \eta_p^2 = 0.011$), nor a main effect for condition ($F(1,113) = 0.49, p = .487, \eta_p^2 = 0.004$). The interaction term time X condition was significant ($F(1,113) = 4.49, p = .036, \eta_p^2 = 0.038$). Desire thinking as a covariate in the model did neither show a significant effect on the between-subjects effect ($F(1,113) = 2.15, p = .145, \eta_p^2 = 0.019$) nor on the within-subjects effect ($F(1,113) = 0.04, p = .843, \eta_p^2 < 0.000$). A paired t -test showed a significant decrease of permissive beliefs in the neutral thinking

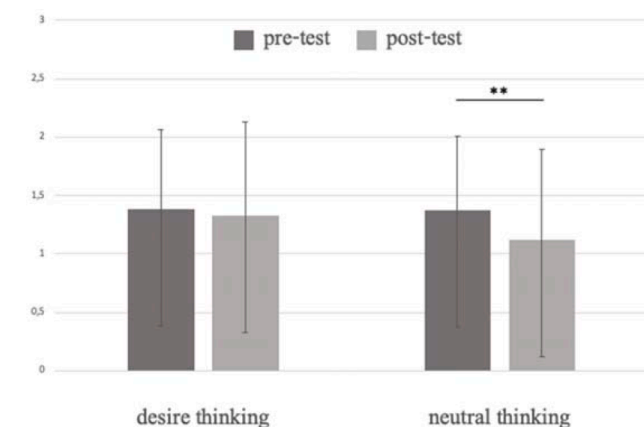


Fig. 1. Effects of thinking manipulations on expression of permissive beliefs
Note. ** $p < .001$.

condition after Bonferroni correction (see Fig. 1). All other post-hoc t -tests were not significant (see Table 3).

3.4. Effects of permissive beliefs and self-control on daily SNS use

Table 4 shows the descriptive statistics of the follow-up sample. For the moderated regression, the permissive beliefs measure before experimental manipulation was entered as predictor into the model. Model 1 including permissive beliefs and self-control as predictors was significant ($F(2,82) = 3.27, R^2 = 0.074, p = .043$), whereas the final model including the interaction was not ($F(3,81) = 2.40, R^2 = 0.082, p = .074$; see Table 5). Model (change) parameters for the two-step hierarchical regression are listed in Table 5.

4. Discussion

The aim of this study was to investigate a possible relation between permissive beliefs and a problematic use of SNS. Further, we examined whether desire thinking might be a significant precursor of permissive beliefs and whether permissive beliefs interact with self-control in predicting SNS use in daily life. The results found in this sample of people who use SNS show that permissive beliefs are not associated with symptom severity of SNS, but only with SNS use times in a correlational design. Permissive beliefs decrease in the neutral thinking condition whereas they remain constant in the desire thinking condition. Lastly, although permissive beliefs seem to predict the use of SNS in daily life, this effect is not moderated by self-control.

It appears that permissive beliefs are not associated with tendencies toward problematic SNS use, as appears to be the case with AUD (Caselli et al., 2020) or binge eating (Burton & Abbott, 2018). The statistical analyses violate our hypothesis since there are no significant correlations between permissive beliefs and symptom severity, but with SNS use times. In this sense, Chabrol et al. (2004) claim that permissive beliefs might be a dominant predictor of cannabis use, but not necessarily of addictive behavior; which is in line with our findings, but somehow contradicts the idea of the Cognitive Model of Substance Abuse (Beck et al., 1993) and empiric findings suggesting that permissive beliefs are strongly associated with addictive behaviors (e.g., Caselli et al., 2020). A reason for our results could be the absence of self-regulatory conflicts (de Witt Huberts, Evers, & de Ridder, 2013) or cognitive

Table 3
Post-hoc t -tests for mixed ANOVA calculations.

	Pre-test $M (SD)$	Post-test $M (SD)$	Paired t -tests (df)
Desire thinking condition	1.38 (0.68)	1.33 (0.80)	$t(49) = 0.76, p = .449$
Neutral thinking condition	1.38 (0.63)	1.13 (0.77)	$t(65) = 3.91, p < .001$
Independent t -tests (df)	$t(114) = 0.04, p = .968$	$t(114) = 1.39, p = .167$	

Note. Bonferroni correction was applied to all four t -tests, new level of significance: $p < .0125$; M = mean, SD = standard deviation, df = degrees of freedom.

Table 4
Descriptive statistics for variables of interest in the follow-up sample.

	<i>M</i>	<i>SD</i>
Age	23.38	4.68
Permissive beliefs	1.36	0.65
Self-control	37.37	5.78
SNS use time (min per day)	75.21	51.06

Note. *n* = 85; use times of SNS were averaged for each participant across the 5 follow-up days;

SNS = social networking sites.

dissonance (Festinger, 1957). That is, if a strong desire occurs in a situation where there is an attempt to curb the use of SNS, a conflict is experienced where long-term goals stand in conflict with spontaneous short-term temptations (c.f., Beck et al., 1993; de Witt Huberts, Evers, & de Ridder, 2013; Festinger, 1957). Permissive beliefs are thus necessary to resolve this tension and to have a good excuse to use SNS nonetheless. However, if participants in this sample did not experience such a conflict, they may have not experienced the need for permission. The absence of such a self-regulatory conflict could have several reasons: First, and as opposed to the addictive intake of substances such as alcohol, the act of using SNS, even if done in an addictive manner, might be more (individually or socially) acceptable. That is, permissive beliefs (and desire thoughts) might be more prevalent in more dangerous behaviors where individuals are more inclined to suppress their thoughts and might experience a self-regulatory conflict more easily. Second, the use of SNS is rather effortless (a smartphone may be pulled out the pocket in only a few seconds), wherefore craving SNS use might be quickly overcome by the use itself, making good reasons to attain it unnecessary. However, the absence of these conflicts remains an assumption since they were not specifically assessed in this study, but only approximated by assessing problematic SNS use.

Desire thinking, when triggered in an experimental setting, did not contribute to an increase in permissive beliefs. Rather, the neutral thinking condition caused a significant decrease in permissive beliefs. This aligns with findings from Caselli et al. (2020), who report that the experimental manipulation of desire thinking has little effect on individuals who drink for social reasons, but predominantly affects individuals with AUD. Instead, the control condition might serve as a cognitive distraction to the development of permissive beliefs. In a survey that mainly evolves around SNS use, it might be likely to assume that cue-reactivity and craving responses might increase among some individuals as a natural response to the questions on SNS serving as cues throughout the survey (Schmitgen et al., 2020). The results rather suggest that imagining how to brush one's teeth could reduce craving responses, as well as associated permissive beliefs. This might be explained by the working memory load hypothesis (Baddeley & Hitch, 1974; Baddeley, 2003), suggesting that individuals can only process one information of the same modality at a time. However, the implication that a simple distraction from the desired activity could be enough might be too unsophisticated since this might not be feasible for individuals with stronger tendencies for problematic use patterns. Instead, teaching individuals how to detect and regulate metacognitive responses to these

Table 5
Model parameters of hierarchical moderated regression analysis.

	β	<i>B</i> (<i>SE</i>)	95 % CI (LCI; UCI)	<i>t</i>	<i>p</i>	ΔR^2	ΔF	<i>p</i> for ΔF
Model 1						0.074	3.27	0.043
Permissive beliefs	0.251	98.85 (41.92)	15.47; 182.24	2.36	0.021			
Self-control	-0.103	-4.53 (4.70)	-13.88; 4.81	-0.97	0.337			
Model 2						0.008	0.70	0.409
Permissive beliefs	0.224	88.44 (43.83)	1.23; 175.64	2.02	0.047			
Self-control	-0.097	-4.29 (4.72)	-13.67; 5.09	-0.91	0.366			
Interaction permissive beliefs × self-control	0.092	5.63 (6.78)	-7.85; 19.11	0.83	0.409			

Note. *n* = 85; variables were mean centered before entered into the models; dependent variable is social networking sites use time (in minutes) in the follow-up assessment; LCI = lower bound of confidence interval; UCI = upper bound of confidence interval.

processes might be of particular importance for self-regulatory processes in psychological disorders, and addictive behaviors in particular (Spada & Wells, 2009; Spada et al., 2015; Wells, 2009) – and have recently shown to have valuable effects in patients with AUD (Caselli et al., 2018).

Although higher permissive beliefs might have a predictive value for heightened daily SNS use, albeit with a small effect size, a general tendency for self-control does not influence this association. This is against the assumption that self-control benefits the regulation of thoughts (Gross, 2015; Inzlicht et al., 2021), wherefore occurring permissive beliefs could be regulated more efficiently. Possible explanations for this missing moderating effect might be fluctuations of self-control between domains and over time: Domain-wise, there could be fluctuations in the effectiveness of how general self-control translates into behavioral inhibition in different areas of life (Haws et al., 2016; Wennerhold & Friese, 2020). Time-wise, even if the use of SNS (or associated beliefs, respectively) might be successfully controlled at one time, the next time the individual might fail due to a different preference, context, or intention (Jones et al., 2013). More specifically, self-control and permissive beliefs might be factors that are involved in a range of health-related behaviors, hedonic consumption, or in addictive behaviors (e.g., de Witt Huberts et al., 2012, 2014; Hofmann & Kotabe, 2012; Tang et al., 2015), making them rather unspecific predictors for SNS use. Recent research in this regard has depicted more specific predictors for problematic SNS use that include the fear of missing out (e.g., Gioia et al., 2021; Moore & Craciun, 2021; Rozgonjuk et al., 2020; Wegmann et al., 2017), self-disclosure (e.g., Ostendorf et al., 2020), and emotional dysregulation (e.g., Hussain, Wegmann, & Griffiths, 2021). Although SNS use can function as a resource (Wolfers & Utz, 2022), these studies put emphasis on specific social and emotional aspects that could contribute to a problematic use of SNS. These aspects are further in line with the Generalized Problematic Internet Use model (GPIU; Marino et al., 2017) in the context of SNS use where two key identifiers of problematic SNS use cover a preference for social interactions and the usage of SNS for mood regulation. Contrary, the involvement of attentional and self-regulatory deficits is still debated in recent research (e.g., Du, Kerkhof, & van Koningsbruggen, 2019; Koessmeier & Büttner, 2022; Thomson et al., 2021). Therefore, practical implications drawn from research on social or emotional aspects as predictors of SNS use might currently be more straightforward whereas the role of executive factors and self-regulation might be less clear.

Our study was an attempt to investigate whether permissive beliefs could play a role in the context of SNS use and whether they are associated with desire thinking. We conclude that, among people who use SNS, permissive beliefs might not be as important as more dangerous behaviors with higher negative consequences, such that they may play a minor role when considering interventions. However, these assumptions need to be interpreted along with several limitations of the study. We assume that the intention for self-control, length of the audio tasks, and individual contents of the imagination, the mental health status of participants, and emotional states might have had effects on our variables which we did not control for in our study. Additionally, our manipulation took place online and our design was cross-sectional,

which lowers the interpretive power of our results.

4.1. Conclusion

Taken together, the findings from this study suggest that permissive beliefs may predict the use of SNS, but do not appear to be related to addictive tendencies and desire thinking. This might be due to the ubiquitous and effortless availability of SNS, or simply because recreational users do not experience a need to cut-down their use times and associated thoughts.

Author agreement

Hereby I certify that all authors have seen and approved the final version of the manuscript being submitted. The article is our original work, has not received prior publication, and is not under consideration for publication elsewhere.

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CRediT authorship contribution statement

Annika Brandtner: Conceptualization, Methodology, Software, Formal analysis, Writing – original draft. **Philippe Verduyn:** Conceptualization, Writing – review & editing, Supervision. **Sofie Behrens:** Conceptualization, Writing – review & editing. **Marcantonio M. Spada:** Conceptualization, Writing – review & editing. **Stephanie Antons:** Conceptualization, Methodology, Formal analysis, Writing – review & editing, Supervision.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.addbeh.2022.107573>.

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