



# Showing with whom I belong: The desire to belong publicly on social media

Christiane M. Büttner<sup>a,\*</sup>, Fanny Lalot<sup>a</sup>, Selma C. Rudert<sup>b</sup>

<sup>a</sup> University of Basel, Switzerland

<sup>b</sup> University of Koblenz and Landau, Germany

## ARTICLE INFO

### Keywords:

Desire to belong publicly  
Scale validation  
Belonging  
Social media  
Instagram  
Facebook

## ABSTRACT

Despite a plethora of social media use research, surprisingly little is known about *what* social media users post about, and, more importantly, *why*. In three studies ( $N = 1,140$ ), we present novel evidence for a disposition describing individual differences in the desire to display belonging on social media: the *desire to belong publicly* (DTBP). We validate an eight-item DTBP scale, encompassing the desire to display both a high *quantity* (e.g., having many friends) and a high *quality* of belonging (e.g., having close friends) on social media. The scale shows good internal consistency and test-retest reliability over two weeks. DTBP is related to, but conceptually distinct from neighboring constructs such as need to belong and need for popularity, as well as other personality dimensions known to drive social media behaviors such as extraversion, public self-consciousness, and social comparison propensity. DTBP is related to indicators of active and passive social media use, daily use of social media, frequency of posting about belonging, and social media addiction, above and beyond other constructs, and on different social media platforms (i.e., Instagram and Facebook). In sum, DTBP is a reliable and valid construct that aids the understanding of *why* and *how* individuals use social media.

## 1. Introduction

Engagement rings, a sweatshirt with the University logo, or heraldic signs on knights' armors: Humans have a desire to display with whom they belong (e.g., Callahan & Ledgerwood, 2016; Keblusek et al., 2017). Today, social media surround people's daily lives and extend social interactions into the digital realm with new, virtually endless, opportunities to display belonging (e.g., in posted texts, in posted photos, or with follower numbers). Worldwide, social media have never been more popular: For instance, Facebook is still the most used social media platform and Instagram has the steepest growth rate among US American adults in 2021, (Auxier & Anderson, 2021). In 2022 in the UK, 60.5% of the population over the age of 13 used Facebook, and nearly half of the population used Instagram (Kemp, 2022). On social media, people fulfill basic psychological needs, such as needs for belonging and social interaction, achievement and competence, as well as self-identity, by interacting with others and by posting photos and texts (e.g., Karahanna et al., 2018; Sheldon & Bryant, 2016; Wu et al., 2010).

### 1.1. The desire to belong publicly

A growing amount of research has investigated how social media are

used and what psychological effects they have on users (e.g., Karahanna et al., 2018; O'Day & Heimberg, 2021). To date, comparably fewer research has investigated the content that social media users post about. However, there is emerging evidence that social media users frequently post pictures with friends and pictures of activities with friends (e.g., Christofides et al., 2009), and posts featuring people receive more "Likes" than posts that do not feature people (e.g., Aramendia-Muneta et al., 2021). Moreover, young social media users that were less likely to post pictures of themselves together with other people exhibit more depressive symptoms than young social media users who posted more pictures with others (Robinson et al., 2019).

Taken together, these findings suggest that posting pictures with other people on social media has specific effects compared to posting other content. However, to our knowledge, no research so far has systematically investigated *why* some people would post about their belonging, for example, about seeing friends, more than others. In the present contribution we introduce a new disposition, the *desire to belong publicly* (DTBP), defined as the individual difference in people's desire to post about their belonging on social media. Rather than reflecting the mere desire to *experience* belonging in real-life, DTBP reflects the desire to *showcase* this belonging to others on social media. It may be expressed in various ways that present belongingness on social media. Examples

\* Corresponding author. Social Psychology, University of Basel, Missionsstr. 64a, 4055, Basel, Switzerland.  
E-mail address: [c.buettner@unibas.ch](mailto:c.buettner@unibas.ch) (C.M. Büttner).

include postings of photos that show activities with friends, texts describing experienced belonging, or tagging the profile of close others in posted photos (e.g., Büttner & Rudert, 2022).

### 1.2. Functions of the desire to belong publicly

Social media platforms are built on self-presentation and impression formation goals and as such, their use is driven by a desire to present oneself favorably (e.g., Chua & Chang, 2016; Krämer & Winter 2008; Nadkarni & Hofmann, 2012; Qin et al., 2021; Seidman, 2013; Zhao et al., 2008). Individuals therefore choose strategically what they share on social media in order to present themselves in a positive way (e.g., Hong et al., 2020; Nadkarni & Hofmann, 2012; Utz et al., 2012). For instance, a study showed that individuals post different content on Facebook depending on whether they want to appear unique versus conforming to others' taste (Johnson & Ranzini, 2018).

Displaying belonging on social media may function as a strategic signaling tool. Indeed, by posting about belonging, social media users can present themselves as a favorable interaction partner to two types of people:

One, posting about belonging can signal to the people involved in the interaction that the user enjoyed the interaction and values their relationship. Further, social media cues may help to resolve the ambiguity of real-world interactions (e.g., Boothby et al., 2018; Cooney et al., 2021), both for the person who posts and for people who view the content (Büttner & Rudert, 2022): On social media, displays of acceptance and belonging through simplified cues like tags, emojis, "Likes", and reactions may be particularly powerful in resolving these ambiguities, thereby possibly aiding relationship maintenance and stability.

Second, other users can infer from postings that display belonging that the person who posts is a favorable interaction partner. Supporting the hypothesis that others infer from social media content how favorable a person is as an interaction partner, a study found that social media users with more followers on their profile were rated more favorably on likeability (Bradley et al., 2019). Moreover, any belonging that is displayed on social media platforms is, at least to some extent, presented publicly since many people can see a user's profile (e.g., Christofides et al., 2012).

To sum up, self-presentation on social media via postings may not only serve belongingness goals (e.g., Karahanna et al., 2018; Nadkarni & Hofmann, 2012; Wu et al., 2010) but may serve to *display* belonging that was experienced in the real world to a broader audience, thereby reinforcing the positive psychological effects of belonging—and this is what DTBP aims to capture.

We conceptualize DTBP as an individual disposition, with some social media users expressing it more than others. For example, individual differences in DTBP may be related to preferences regarding posting on social media in general (e.g., E. Kim et al., 2016), or to perceptions of what is acceptable to post about (e.g., Miller, 2020). Moreover, some individuals may prefer to share their belongingness experiences with their close circle only, while others may want for everyone connected to their social media profile to know about it.

### 1.3. Distinguishing DTBP from other drivers of social media use

Different psychological needs have been shown to motivate the use of social media (e.g., Karahanna et al., 2018; Sheldon & Bryant, 2016). Among other psychological concepts, social media use has been associated with *need to belong* (e.g., Mai et al., 2015; Nadkarni & Hofmann, 2012; Wong et al., 2019). Need to belong is defined as "a pervasive drive to form and maintain at least a minimum quantity of lasting, positive, and significant interpersonal relationships" (Baumeister & Leary, 1995, p. 497); yet, this definition does not include any desire to *showcase* these relationships to others. We argue that this makes DTBP conceptually different from the need to belong: DTBP precisely describes the desire to translate real-world belongingness into the digital world, thereby

making it visible for a broader audience.

Second, social media use has also been linked to the *need for popularity* (e.g., Beyens et al., 2016; Christofides et al., 2012; Longobardi et al., 2020), which describes "the motivation to do certain things in order to appear popular" (Utz et al., 2012, p. 38). This involves the wish that others should notice the performed actions, in this case, through social media postings. However, need for popularity is not specific to displays of belongingness, but could also involve displays of status or displays of intelligence, to name two examples. Although the need for popularity may also be reflected in aiming to present oneself favorably on social media (e.g., Nadkarni & Hofmann, 2012; Utz et al., 2012), we argue that DTBP goes beyond need for popularity in that (a) DTBP focuses more specifically on belonging and might hence be a more accurate antecedent of relevant social media behavior, and (b) DTBP motivates efforts to translate belonging to online presentations on social media.

The first aim of this contribution is to develop a scale to measure DTBP. Next, we aim to test whether DTBP is different, but related to, neighboring constructs, such as the need to belong and the need for popularity. Additionally, we will also examine whether DTBP drives social media use, specifically, whether it is related to frequency of active and passive social media use, frequency of posting about belonging on social media, and social media addiction. We hypothesize a positive relation of DTBP with these social media use behaviors because users with a higher DTBP may view social media as an integral part of their social interactions and daily life and as such use it more frequently. We focus here on *strongly photo-based* social media platforms like Instagram and Facebook since photo-based social media platforms have been shown to be particularly powerful in satisfying needs and desires for social connection as they afford more intimacy than text-based platforms (e.g., Allen et al., 2014; Couture Bue, 2020; Pittman & Reich, 2016). We define Facebook as a strongly photo-based social media platform since photos have a crucial role in Facebook, comparable (but not identical) to Instagram. This feature discriminates Facebook and Instagram from other platforms that are mainly text-based, such as Twitter (see also Pittman & Reich, 2016).

## 2. Overview of studies

In three studies<sup>1</sup> ( $N = 1,140$ ), we present evidence for the existence of the desire to belong publicly (DTBP) through the development of a psychometric instrument. The eight-item DTBP scale focuses on the desire to present belongingness on photo-based social media platforms like Instagram (Studies 1–3) and Facebook (Study 3). We show that DTBP is related to but different from the need to belong (Studies 1–3), need for popularity (Studies 2 and 3), Big-5 personality dimensions, public and private self-consciousness, and social comparison propensity (Study 3). Additionally, we show that DTBP is strongly related to various indicators of active and passive social media use (Studies 1–3), frequency of posting about belonging (Study 3), and social media addiction (Study 3). Moreover, the DTBP scale has good test-retest reliability in a time frame of two weeks.

All materials, data, code, analyses, and supplemental analyses are freely available via [https://osf.io/kb9u7/?view\\_only=67ec6f6ef2ac4766b6a70618f7d4d3e4](https://osf.io/kb9u7/?view_only=67ec6f6ef2ac4766b6a70618f7d4d3e4).

The studies were approved by the Institutional Ethics Committees of

<sup>1</sup> Studies 1 and 2 use data from a larger research project with a different, preregistered research question. The DTBP scale was developed as a part of that research project, however, not used in the final publication (Büttner & Rudert, 2022). Sample size and materials were preregistered (Study 1: <https://aspredicted.org/gx2rn.pdf>, Study 2: <https://aspredicted.org/kk8d7.pdf>). Note that a first 14-item version of the scale was developed and pre-tested in German, however, the subsequent refined version of the scale that we report here was always tested in English and with UK samples.

the University of Basel and the University of Koblenz-Landau and are in line with the Declaration of Helsinki.

### 3. Study 1

Study 1 aimed to provide an initial assessment of the newly developed desire to belong publicly (DTBP) scale. Further, we tested how DTBP scores are related to the need to belong and to social media use frequency. While we expected DTBP to be distinct from the need to belong, we still hypothesized the constructs to be positively related. We further expected that individuals with a higher DTBP use social media more frequently. As it is one of the most popular social media platforms at the time of this investigation (e.g., Auxier & Anderson, 2021; Kemp, 2022), we chose to focus on the photo-based platform Instagram in Study 1.

#### 3.1. Method

##### 3.1.1. Participants

Participants were recruited on the online platform Prolific Academic. Conditions for participation were being aged 18 to 30, currently living in the UK, and being an active Instagram user. Overall, 328 individuals completed the study. After applying the study's inclusion criteria (i.e., a complete data set, passing attention checks,<sup>2</sup> reporting no language problems, reporting serious participation, and not asking for withdrawing data from data analysis), the final sample included 286 participants (188 women, 1 undisclosed,  $M_{\text{age}} = 24.09$  years,  $SD = 3.54$ ).

##### 3.1.2. Procedure

Participants were first screened for being active Instagram users (one item: "I have an Instagram account that I use at least daily", those responding "no" were screened out). Next, participants answered a scale measuring the *need to belong* (see below), followed by the new *desire to belong publicly* scale. They next indicated demographics and provided information regarding their Instagram use (see below). For descriptive purposes, we also asked how long ago the joined Instagram in months ( $M = 58.91$  months,  $SD = 33.05$ , Range = 2–192) and whether their profile was visible to everyone (40.9%) or set to "private" (59.1%).<sup>3</sup> Finally, participants answered attention checks, rated the seriousness of their participation and had the opportunity to withdraw their data from data analysis.

##### 3.1.3. Materials

**Scale development: Desire to Belong Publicly.** After informal discussions and pilot testing, eight items were developed to measure the *desire to belong publicly*. Four pertained to a desire to display the *quality* of one's relationships (i.e., desire to display having very deep and meaningful interactions and relationships, example: "I want people who look at my Instagram profile to see that I have close friends") and four pertained to a desire to display the *quantity* of one's relationships (i.e., desire to display having many friends and connections, example: "It is important to me that people who look at my Instagram profile see that I

<sup>2</sup> Participants had to pass all attention checks for their data to be analyzed: These were one attention filter question during the study (i.e., "I am reading all of the instructions of this survey carefully, therefore I select "not at all" here") and six attention checks that referred to the content of the study that were asked at the end of the study (see Büttner & Rudert, 2022, Studies 2 and 3, 2022).

<sup>3</sup> In an exploratory fashion, we conducted Welch t-tests to analyze whether DTBP would differ between those participants who set their profile to "public" vs. "private". However, there was no evidence for such a difference in DTBP in any of the studies (Study 1:  $M_{\text{private}} = 3.22$ ,  $SD = 1.47$ ,  $M_{\text{public}} = 3.24$ ,  $SD = 1.63$ ,  $p = .892$ ,  $d = -0.02$ ; Study 2:  $M_{\text{private}} = 3.44$ ,  $SD = 1.46$ ,  $M_{\text{public}} = 3.74$ ,  $SD = 1.45$ ,  $p = .093$ ,  $d = -0.21$ ; Study 3:  $M_{\text{private}} = 2.53$ ,  $SD = 1.39$ ,  $M_{\text{public}} = 2.71$ ,  $SD = 1.55$ ,  $p = .178$ ,  $d = -0.13$ ).

have many friends"; see Table 3 for all items). We reasoned that some users might put more emphasis on showcasing that they have particularly strong relationships with deep and meaningful interactions while others might put more emphasis on showcasing that they have many friends and connections (and still some others might value quantity and quality equally). We therefore designed the scale so it would capture both facets. Answers were recorded on 7-point scales (1 = *not at all* to 7 = *very much*).

**Discriminant Validity: Need to Belong.** In order to assess the discriminant validity of the DTBP scale, we additionally measured need to belong. We relied on the 10-item *need to belong* scale (e.g., "I want other people to accept me", Leary et al., 2013; 1 = *not at all* to 7 = *very much*, Cronbach's  $\alpha = 0.82$ ,  $M = 4.35$ ,  $SD = 1.05$ ).

**Social Media Use.** We considered several indicators of Instagram use. Two items measured active Instagram use on a 9-point scale ("How often do you post photos to the feed on Instagram?" and "How often do you share stories on Instagram?"; 1 = *never* to 9 = *several times a day*), which we aggregated into a single score ( $r(284) = 0.51$ ,  $p < .001$ ;  $M = 3.22$ ,  $SD = 1.60$ ). Next, four items measured passive Instagram use (i.e., frequency of viewing posts, viewing stories, liking, and commenting; e.g., "How often do you look at other people's posts in the feed on Instagram?"; 1 = *never* to 9 = *several times a day*) aggregated into one score (Cronbach's  $\alpha = 0.65$ ,  $M = 6.98$ ,  $SD = 1.10$ ). Participants also reported daily time spent on Instagram ( $M = 46.42$  min,  $SD = 47.79$ ; see also Couture Bue, 2020; Sheldon & Bryant, 2016), their number of Instagram followers ( $M = 779.20$ ,  $SD = 5625.36$ ) as well as number of accounts followed on Instagram ( $M = 491.81$ ,  $SD = 643.69$ ).

#### 3.2. Results

##### 3.2.1. Exploratory factor analysis

Analyses were conducted using R version 4.1.1 and the *EFAtools* package (Steiner & Grieder, 2020). On the eight items considered for the DTBP scale, there was no missing data and univariate normality assumptions were respected (Skewness  $< |0.656|$ , Kurtosis  $< |2.333|$ ). Kaiser–Meyer–Olkin's (KMO) measure of sampling adequacy and Bartlett's test of sphericity indicated that items were suited for factor analyses (KMO = 0.94, Bartlett's  $\chi^2(28) = 2145$ ,  $p < .001$ ). Following recent recommendations, we relied on a multiple criteria approach to determine the number of factors to extract. We considered the following methods: sequential  $\chi^2$  model tests (and lower bound of RMSEA 90% confidence interval), revised parallel analysis, Hull's method (based on CFI and RMSEA), Ruscio's comparison data, and empirical Kaiser criterion. Given that we expected factors to correlate and that the sample was of medium-size (close to 300), we gave priority to the results obtained through comparative data, revised parallel analysis, and sequential  $\chi^2$  model tests (Auerswald & Moshagen, 2019; Finch, 2020). All methods but the empirical Kaiser criterion (which recommended one factor) reached a consensus, recommending to retain two factors/dimensions. We therefore conducted an EFA with extraction fixed on two factors (maximum likelihood method, oblique (oblimin) rotation). The 2-factor solution explained 76% of variance, with the four *quality* items loading on the first factor, and the four *quantity* items on the second (model fit:  $\chi^2(13) = 12.37$ ,  $p = .50$ , CFI = 1.00, RMSEA [90% CI] = 0.00 [0.00; 0.06]). Only one item had a cross-loading greater than 0.30 (see Table 1). The two factors *quality* and *quantity* were strongly and positively correlated,  $r = 0.83$ . In sum, the EFA suggests that the scale consists of two subdimensions pertaining to the *quality* versus *quantity* of belonging that people want to display on social media, although both dimensions are strongly interrelated.

The two dimensions presented good reliability as assessed by Cronbach's  $\alpha$  (quality: 0.91, quantity: 0.93;  $M_{\text{Quality}} = 3.45$ ,  $SD = 1.66$ ,  $M_{\text{Quantity}} = 3.01$ ,  $SD = 1.54$ ). Importantly, the global DTBP scale presented good reliability (Cronbach's  $\alpha = 0.95$ , McDonald's  $\omega_{\text{hierarch}} = 0.90$ ;  $M = 3.23$ ,  $SD = 1.54$ ), suggesting that DTBP can be apprehended and measured as a global concept, even if composed of two dimensions.

**Table 1**  
Results of the exploratory factor analysis conducted in Study 1.

	Communalities	Factor 1	Factor 2
DTBP item 1	.786		.636
DTBP item 2	.558		.551
DTBP item 3	.846		.997
DTBP item 4	.784	.454	.473
DTBP item 5	.729	.793	
DTBP item 6	.779	.705	
DTBP item 7	.829	.961	
DTBP item 8	.801	.914	

Note. Loadings < .25 are not displayed. Item wordings are reported in Table 3 following the same numbering.

Moreover, exploratory analyses showed that in linear regression models predicting the various indices of social media use, considering the two dimensions separately did not explain more variance as the global DTBP score. Thus, the global DTBP score represents a more parsimonious solution (see Appendix 1: [https://osf.io/kb9u7/?view\\_only=67ec6f6ef2ac4766b6a70618f7d4d3e4](https://osf.io/kb9u7/?view_only=67ec6f6ef2ac4766b6a70618f7d4d3e4)). Based on these results, the high correlation between the two factors *quality* and *quantity*, and the high reliability of the global DTBP score, all following analyses hence relied on the global DTBP score.

3.2.2. Convergent-discriminant validity

We then investigated the relationship between DTBP and need to belong. We submitted all items to an exploratory factor analysis with extraction fixed on two factors (maximum likelihood method, oblique rotation). Items were perfectly aligned with their theoretical distinction, with all eight DTBP items loading on the first factor and all 10 need to belong items on the second; no cross-loading exceeded 0.15 (see Appendix 2, here: [https://osf.io/kb9u7/?view\\_only=67ec6f6ef2ac4766b6a70618f7d4d3e4](https://osf.io/kb9u7/?view_only=67ec6f6ef2ac4766b6a70618f7d4d3e4)). DTBP was positively correlated with need to belong,  $r = .47, p < .001$ . In summary, results supported both convergent and discriminant validity of the DTBP as a construct related to, but

**Table 2**  
Hierarchical linear regressions assessing the effect of DTBP and need to belong on indices of social media use (Study 1).

	Active use					Passive use				
	t-test	p-value	Standardized $\beta$	$\eta^2$	$R^2$	t-test	p-value	Standardized $\beta$	$\eta^2$	$R^2$
<i>Step 1</i>										
Intercept	11.06	<.001	–	–	.066	43.94	<.001	–	–	.034
DTBP	4.47	<.001	.256	.07		3.16	.002	.184	.03	
<i>Step 2</i>										
Intercept	7.08	<.001	–	–	.071	24.58	<.001	–	–	.036
DTBP	4.54	<.001	.294	.07		3.14	.002	.207	.03	
Need to belong	–1.24	.22	–.080	.005		–0.78	.46	–.049	.002	
Daily use (mn)										
	t-test	p-value	Standardized $\beta$	$\eta^2$	$R^2$					
<i>Step 1</i>										
Intercept	28.02	<.001	–	–	.037					
DTBP	3.32	.001	.193	.04						
<i>Step 2</i>										
Intercept	16.69	<.001	–	–	.046					
DTBP	3.70	<.001	.243	.04						
Need to belong	–1.62	.107	–.106	.009						
	Number of followers		Standardized $\beta$	$\eta^2$	$R^2$	Number of accounts followed		Standardized $\beta$	$\eta^2$	$R^2$
	t-test	p-value				t-test	p-value			
<i>Step 1</i>										
Intercept	31.02	<.001	–	–	.046	41.29	<.001	–	–	.015
DTBP	3.71	<.001	.215	.05		2.10	.037	.124	.02	
<i>Step 2</i>										
Intercept	17.49	<.001	–	–	.048	21.01	<.001	–	–	.028
DTBP	3.60	<.001	.236	.05		0.96	.39	.064	.02	
Need to belong	–0.70	.48	–.046	.002		1.93	.055	.128	.01	

Note. Degrees of freedom for t-tests are 284 at Step 1 and 283 at Step 2. Daily use, number of followers, and number of accounts followed were subjected to a log transformation (LN) prior to analyses.  $R^2$  refers to the entire model.

conceptually distinct from the need to belong.

3.2.3. Concurrent validity: Social media use

Finally, we conducted a series of hierarchical linear regressions to investigate whether DTBP was related to social media use, above and beyond need to belong. We entered DTBP in a first step, then need to belong in a second step. Given the strong correlation between both variables, we initially checked for collinearity issues, however, the data were deemed appropriate for analyses (variance inflation factor (VIF) = 1.28). As dependent variables, we considered the different indices of social media use: aggregated scores of active and passive Instagram use, self-reported daily use in minutes, number of followers, and number of accounts followed. As the latter three variables were heavily skewed (Skewness scores of 6.05,  $SE = 0.14$ ; 16.46,  $SE = 0.14$ , and 4.64,  $SE = 0.14$ , respectively), we applied a log transformation prior to analyses. Results are reported in Table 2. As expected, DTBP scores were positively related with indicators of social media use. Specifically, higher DTBP corresponded with more frequent active and passive use of Instagram as well as longer daily use. Higher DTBP was also related to a larger number of followers and, to a smaller extent, to number of accounts followed (although this last finding was nonsignificant). In contrast, need to belong was not significantly related to any of the indicators when entered together with DTBP.

4. Study 2

Study 1 provided initial evidence for the reliability and validity of the newly developed DTBP scale. An exploratory factor analysis found the scale to consist of two highly related dimensions (of four items each) indicating the *quality* and *quantity* of belonging that people want to display on social media. Moreover, we found that the global score could be reliably used above and beyond the quality/quantity distinction. DTBP was related to, but conceptually distinct from the need to belong, and it was significantly related to more frequent social media use. Drawing from these initial results, we conducted a second study with a

**Table 3**

Results of the CFA testing the structure of the DTBP scale in Study 2 (N = 269) and Study 3 (N = 585).

DTBP items	Study 2				Study 3			
	Estimate (SE)	z-test	p-value	$\beta$	Estimate (SE)	z-test	p-value	$\beta$
<b>Factor 1 (quantity)</b>								
1. It is important to me that people who look at my [social media] profile see that I have many friends	1.000			.889	1.000			.912
2. I want my [social media] profile to reflect my popularity in real life	0.819 (.059)	13.81	<.001	.704	0.933 (.034)	28.92	<.001	.833
3. I want my [social media] profile to show that many people like me	1.048 (.054)	19.24	<.001	.854	1.045 (.032)	32.32	<.001	.875
4. It is important to me that other people see on my [social media] profile how good my social life is	1.019 (.050)	20.26	<.001	.876	0.997 (.033)	30.52	<.001	.853
<b>Factor 2 (quality)</b>								
5. I want people who look at my [social media] profile to see that I have close friends	1.000			.870	1.000			.860
6. I want people who look at my [social media] profile to see that I spend a lot of time with my friends	.976 (.048)	20.48	<.001	.892	0.949 (.030)	31.30	<.001	.912
7. On my [social media] profile, I want others to see that I have a lot of fun with my friends	.957 (.049)	19.43	<.001	.868	1.038 (.034)	30.38	<.001	.899
8. On my [social media] profile, I want others to see that I am part of a great group of friends	.993 (.049)	20.25	<.001	.887	0.996 (.034)	29.56	<.001	.887
Covariance Factor 1--2	2.005 (.210)	9.54	<.001	.889	1.915 (.131)	14.59	<.001	.939

Note. [social media] may be replaced with any photo-based social media platform, for example, Instagram (Studies 2 and 3) or Facebook (Study 3).

double aim. First, it was important to replicate the findings in another study, relying this time on a confirmatory factor analysis approach. Second, we pursued the tests of convergent-discriminant validity further, aiming to ensure the scale was distinct not only from *need to belong* but also from *need for popularity*.

#### 4.1. Method

##### 4.1.1. Participants

As in Study 1, participants were recruited via Prolific. Conditions for participation were being aged 18 to 30, currently living in the UK and being an active Instagram user. Overall, 307 individuals completed the study. After applying the same inclusion criteria as in Study 1, the final sample consisted of 269 participants (199 women, 1 undisclosed,  $M_{\text{age}} = 24.38$  years,  $SD = 3.54$ ).

##### 4.1.2. Procedure

Participants were first screened for being active Instagram users (one item: "I have an Instagram account that I use at least daily", those responding "no" were screened out). Next, we assessed DTBP, *need for popularity*, and finally, *need to belong*. Next, participants indicated demographics and provided information regarding their Instagram use (see below). For descriptive purposes and in line with Study 1, we also asked how long ago they joined Instagram in months ( $M = 58.96$  months,  $SD = 31.96$ , Range = 2–230) and whether their profile was visible to everyone (48.7%) or set to "private" (51.3%). To end the questionnaire, participants answered attention checks,<sup>2</sup> rated the seriousness of their participation and had the opportunity to withdraw their data from data analysis.

##### 4.1.3. Materials

**Desire to Belong Publicly.** Participants answered the 8-item DTBP scale (1 = *not at all* to 7 = *very much*). Responses were aggregated into a single score, as indices indicated good reliability (Cronbach's  $\alpha = 0.95$ , McDonald's  $\omega_{\text{hierarchical}} = 0.85$ ,  $M = 3.58$ ,  $SD = 1.46$ ).

**Convergent-Discriminant Validity: Need to Belong and Need for Popularity.** As in Study 1, we assessed the 10-item *need to belong* scale (Leary et al., 2013; 1 = *not at all* to 7 = *very much*, Cronbach's  $\alpha = 0.82$ ,  $M = 4.28$ ,  $SD = 1.00$ ). Participants were also presented with the 12-item *need for popularity* scale (e.g., "I often do things just to be popular with other people", Santor et al., 2000; 1 = *not at all* to 7 = *very much*, Cronbach's  $\alpha = 0.88$ ,  $M = 2.81$ ,  $SD = 1.15$ ).

**Concurrent validity: Social Media Use.** As in Study 1, we measured Instagram use with two items on active Instagram use aggregated into a

single score ( $r(267) = 0.53$ ,  $p < .001$ ;  $M = 3.53$ ,  $SD = 1.71$ ), four items on passive use, also aggregated into a single score (Cronbach's  $\alpha = 0.60$ ;  $M = 6.95$ ,  $SD = 1.12$ ), and daily time spent on Instagram in minutes ( $M = 48.79$ ,  $SD = 41.01$ ). We also asked for their number of Instagram followers ( $M = 455.03$ ,  $SD = 578.51$ ) and the number of accounts followed on Instagram ( $M = 452.39$ ,  $SD = 463.43$ ).

#### 4.2. Results

##### 4.2.1. Confirmatory factor analysis

We conducted a CFA to test the scale structure. Based on the results of Study 1, we tested a 2-factor model where the DTBP subdimensions of quality and quantity would be interrelated. Fit indices included root mean square error of approximation (RMSEA; Steiger & Lind, 1980) and standardized root mean residual (SRMR; Bentler, 1995). Indeed, Hu and Bentler (1999) advise the use of a "2-index presentation strategy" in order to minimize both Type I and Type II errors. RMSEA has, moreover, been declared one of the most informative fit indices (Diamantopoulos & Siguaw, 2000). We also report comparative fit index (CFI; Bentler, 1990) and chi-square. Typically,  $CFI \geq .90$ ,  $RMSEA \leq .08$ , and  $SRMR \leq .09$  indicate an acceptable fit (MacCallum et al., 1996).

The model yielded excellent fit indices,  $\chi^2 = 36.57$ ,  $df = 19$ ,  $\chi^2/df = 1.92$ ,  $CFI = 0.991$ ,  $RMSEA = 0.059$ , 90% CI [0.029, 0.087],  $SRMR = 0.021$  (see also Table 3). Likelihood ratio tests favored it over the independence model,  $\Delta\chi^2(\Delta df = 9) = 1861$ ,  $p < .001$ , and over the simpler single-factor model,  $\Delta\chi^2(\Delta df = 1) = 93.06$ ,  $p < .001$ .

##### 4.2.2. Convergent-discriminant validity

We then investigated the relationship between DTBP, *need to belong*, and *need for popularity*. We submitted all items to an exploratory factor analysis with extraction fixed on three factors (maximum likelihood method, oblique rotation). Items were perfectly aligned with their theoretical distinction, with all eight DTBP items loading on the first factor, all 10 *need to belong* items on the second, and all 12 *need for popularity* items loading on the third. No cross-loading exceeded 0.25 except for one *need for popularity* item (cross-loading on the DTBP factor = .31, loading on the *need for popularity* factor = .43; see all loadings in Appendix 2: [https://osf.io/kb9u7/?view\\_only=67ec6f6ef2ac4766b6a70618f7d4d3e4](https://osf.io/kb9u7/?view_only=67ec6f6ef2ac4766b6a70618f7d4d3e4)). DTBP was positively correlated with both *need for popularity*,  $r = .55$ ,  $p < .001$ , and *need to belong*,  $r = 0.44$ ,  $p < .001$  (themselves correlated at  $r = 0.48$ ,  $p < .001$ ). Again, results supported both convergent and discriminant validity of the DTBP as a construct related to, but conceptually distinct from both *need to belong* and *need for popularity*.

#### 4.2.3. Concurrent validity

We conducted a series of hierarchical linear regressions to investigate whether DTBP was related to social media use, above and beyond need to belong and need for popularity. Again, VIF values indicated no issue of multicollinearity ( $VIF_s < 1.60$ ). We entered DTBP in a first step, then need to belong and need for popularity in a second step. Indices of social media use included the aggregated scores of active and passive use of Instagram, as well as self-reported daily use in minutes, number of followers, and number of accounts followed. As the latter three variables were heavily skewed (Skewness scores of 2.23,  $SE = 0.15$ ; 4.01,  $SE = 0.15$ ; and 4.72,  $SE = 0.15$ , respectively), we applied a log transformation prior to analyses. Results are reported in Table 4.

As expected, DTBP scores were positively related with most indicators of social media use. Specifically, higher DTBP corresponded with more frequent active and passive use of Instagram as well as longer daily use (although this last result became nonsignificant,  $p = .102$ , when need to belong and need for popularity were introduced in the model). Higher DTBP were also related significantly to a greater number of followers and a greater number of accounts followed. Need to belong and need for popularity, when entered with DTBP, were not significantly related to any of the indicators.

### 5. Study 3

Studies 1 and 2 demonstrated that the DTBP scale successfully captures individual differences in *desire to belong publicly* and that the scores were related to different indices of social media use. Yet, both studies only focused on one specific social media platform, that is, Instagram. While there are plenty of social media platforms that are used to fulfill different psychological needs and desires (e.g., Karahanna et al., 2018), we expect social media users to express DTBP on a variety of social media platforms, as long as these easily allow to demonstrate belongingness. Text-based platforms such as Twitter might not be particularly relevant for expressing belongingness; in contrast, strongly photo-based platforms such as Instagram or Facebook would be typical social media platforms for expressing belongingness. This, however, remained to be tested. Study 3 therefore aimed to replicate findings from Studies 1 and 2 across two different social media platforms: Instagram (as a direct replication of Studies 1 and 2) and Facebook (thereby going beyond previous findings). We expected the scale to perform reliably across platforms.

Moreover, Study 3 aimed to assess the test-retest reliability of the DTBP scale after two weeks. As we conceptualized DTBP as a trait, individual scores should show stability over time.

Finally, Study 3 aimed to test further associations between DTBP and related psychological constructs as well as social media use-related constructs. Specifically, we investigated relationships with Big-5 personality traits, public and private self-consciousness, and social comparison propensity, as well as frequency of posting about belonging, and social media addiction, as we detail below.

#### 5.1. Additional constructs for convergent-discriminant validity

**Personality.** A plethora of research suggests personality differences in social media use frequency (e.g., Mark & Ganzach, 2014). For example, extraverts use social media more frequently (e.g., Caci et al., 2014; Correa et al., 2010; Gil de Zúñiga et al., 2017; Mark & Ganzach, 2014). Building on this, we suggest that DTBP may be particularly strong among extraverted individuals for at least two reasons: First, since extraverts use social media more frequently (e.g., Caci et al., 2014) they may also have a lower threshold to share on social media in general. Second, because extraverts have more social relationships than less extraverted individuals, both in real life and on social media (e.g., Feiler & Kleinbaum, 2015; Pollet et al., 2011; Shen et al., 2015), they have more belongingness experiences to post about compared to less extraverted individuals. We will test the other Big Five dimensions (i.e., openness,

conscientiousness, agreeableness, neuroticism) in an exploratory fashion.

**Public and Private Self-consciousness.** Scheier and Carver (1985) distinguish between public self-consciousness (capturing tendencies to think about “self-aspects that are matters of public display, qualities of the self from which impressions are formed in other people’s eyes”; p. 687) and private self-consciousness (capturing tendencies to think about oneself, such as one’s beliefs and feelings). Individuals with higher public self-consciousness post more on social media (e.g., Shim et al., 2008) and are more strongly concerned with the impression that they make on social media (e.g., Chae, 2017; Lee-Won et al., 2014). Therefore, and reflecting the distinction posited by Scheier and Carver (1985), we assume that DTBP would positively relate to individual differences in public, but not private, self-consciousness.

**Social Comparison Propensity.** Social media users frequently engage in social comparison processes, comparing their life to that of others as reflected by others’ posted content (e.g., S. Y. Lee, 2014; Vogel et al., 2015). Cues of belonging such as how many friends are shown in posts, at which frequency the posting person meets their friends, what they do when they meet, etc., can hence serve as a basis of social comparison, ultimately influencing one’s own perception of one’s social life and satisfaction with it. Based on literature suggesting that people do not merely benefit from passive upward social comparison but also try to actively create it (Blanton et al., 1999; Collins, 1996), we expect a positive association between social comparison propensity and DTBP.

**Frequency of Posting about Belonging.** As detailed in the introduction, posting about belonging, for instance by posting pictures with friends, is a frequent social media behavior (e.g., Christofides et al., 2009), which is rewarded with more “Likes” on social media (e.g., Aramendia-Muneta et al., 2021). We expect a positive association between frequency of posting about belonging and DTBP, as the DTBP is conceptualized to drive precisely this posting behavior.

**Social Media Addiction.** Social media use can have addictive qualities and some users may develop social media addiction characterized by a loss of control about how often social media is used, aggravated concern with using social media, and social media use impairing other areas of life (e.g., Andreassen et al., 2016; Andreassen & Pallesen, 2014). Studies 1 and 2 suggest that individuals with a higher DTBP use social media more frequently. Very frequent use can potentially evolve into addictive use. We therefore test whether DTBP scores also relate to social media addiction.

#### 5.2. Method

The study’s design, sample size, inclusion criteria, hypotheses, and analytical strategy were preregistered: <https://aspredicted.org/jb3hm.pdf>

##### 5.2.1. Participants

As in the previous studies, participants were recruited via Prolific. Conditions for participation were currently living in the UK and using the respective social media platform (Instagram or Facebook) at least once a week. In addition, we aimed at collecting a gender-balanced sample. Overall, 596 individuals completed the study. We applied the same inclusion criteria as in Studies 1 and 2 (exception: in this study, being 18–30 years old was not an inclusion criterion), including successfully passing two attention checks (i.e., participants had to pass both attention checks for their data to be analyzed: “This question tests your attentiveness, please select ‘not at all’” and “I am reading all of the instructions of this survey carefully, therefore I select ‘not at all’ here”). The final sample consisted of 585 active Instagram and/or Facebook users (277 women, 4 non-binary, 2 undisclosed,  $M_{age} = 39.15$  years,  $SD = 13.26$ ). Of all participants, 295 answered questions pertaining to Facebook and 290 participants answered questions pertaining to Instagram. In both samples, there were some participants who used both Instagram and Facebook, however, the presented questions referred to

**Table 4**  
Hierarchical linear regressions assessing the effect of DTBP, need to belong, and need for popularity on indices of social media use (Study 2).

	Active use					Passive use				
	t-test	p-value	Standardized β	η <sup>2</sup>	R <sup>2</sup>	t-test	p-value	Standardized β	η <sup>2</sup>	R <sup>2</sup>
<i>Step 1</i>										
Intercept	8.80	<.001	–	–	.083	35.78	<.001	–	–	.066
DTBP	4.92	<.001	.288	.08		4.34	<.001	.257	.07	
<i>Step 2</i>										
Intercept	5.88	<.001	–	–	.088	20.39	<.001	–	–	.083
DTBP	4.71	<.001	.342	.08		3.68	<.001	.268	.07	
Need to belong	–0.38	.70	–.026	<.001		1.91	.057	.132	.01	
Need for popularity	–1.02	.31	–.076	.005		–1.71	.088	–.127	.005	
Daily use (mn)										
	t-test	p-value	Standardized β	η <sup>2</sup>	R <sup>2</sup>					
<i>Step 1</i>										
Intercept	23.39	<.001	–	–	.026					
DTBP	2.70	.007	.163	.03						
<i>Step 2</i>										
Intercept	13.30	<.001	–	–	.030					
DTBP	1.64	.102	.123	.03						
Need to belong	0.56	.58	.040	.001						
Need for popularity	0.53	.60	.040	.002						
Number of followers										
	t-test	p-value	Standardized β	η <sup>2</sup>	R <sup>2</sup>	Number of accounts followed				
						t-test	p-value	Standardized β	η <sup>2</sup>	R <sup>2</sup>
<i>Step 1</i>										
Intercept	25.57	<.001	–	–	.097	34.17	<.001	–	–	.087
DTBP	5.35	<.001	.311	.10		5.04	<.001	.295	.09	
<i>Step 2</i>										
Intercept	15.02	<.001	–	–	.101	19.64	<.001	–	–	.090
DTBP	4.63	<.001	.334	.10		3.85	<.001	.279	.09	
Need to belong	0.63	.53	.043	.001		0.96	.34	.066	.003	
Need for popularity	–1.03	.31	–.075	.003		–0.32	.75	–.024	<.001	

Note. Degrees of freedom for t-tests are 267 at Step 1 and 265 at Step 2. Daily use, number of followers, and number of accounts followed were subjected to a log transformation (LN) prior to analyses. R<sup>2</sup> refers to the entire model.

either Instagram or Facebook, and only if participants used the respective platform at least once a week.

Two weeks after the first data collection, participants were recontacted to complete the DTBP scale again, in order to test for test-retest reliability. Of the original 585 participants, 506 (86.50%) answered the DTBP scale again (249 women, 3 non-binary, 2 undisclosed, M<sub>age</sub> = 40.21 years, SD = 13.34).

5.2.2. Procedure

**Pre-screening.** Participants were screened for active Facebook and Instagram use in a separate survey. To do so, we presented them with two items asking „Do you use Facebook?“, and „Do you use Instagram?“ (answer options: „No I don’t have a Facebook/Instagram account“, „I have a Facebook/Instagram account but I never use it“, „Yes, I use Facebook/Instagram a few times a year“, „Yes, I use Facebook/Instagram once a month“, „Yes, I use Facebook/Instagram 2–3 times per month“, „Yes, I use Facebook/Instagram once a week“, „Yes, I use Facebook/Instagram twice a week“, „Yes, I use Facebook/Instagram every other day“, „Yes, I use Facebook/Instagram daily“, „Yes, I use Facebook several times a day“). Participants that indicated using either Instagram or Facebook (or both) at least once a week or more often were eligible to participate in the main study. Participants that only used Instagram but not Facebook were assigned to the Instagram-specific main study, and vice-versa for the Facebook-specific main study. Participants that used Instagram and Facebook once a week or more often were assigned randomly either to the Instagram-specific study or the Facebook-specific study.

**Main Study.** In the main study, participants answered the DTBP scale and additional measures for convergent and discriminant validity (see details below). They answered questions on their Instagram or Facebook use frequency (see details below) and indicated demographics. As in the previous studies, we assessed time since joining the respective social media platform (Instagram: M = 61.97 months, SD

= 36.54, Range = 1–288; Facebook: M = 122.60 months, SD = 57.25, Range = 6–400) and whether participants’ profile was visible to everyone (Instagram: 41.4%, Facebook: 19.0%) or set to “private” (Instagram: 58.6%, Facebook: 81.0%). Finally, participants rated the seriousness of their participation and had the opportunity to withdraw their data from data analysis.

5.2.3. Materials

**Desire to Belong Publicly.** Participants answered the 8-item DTBP scale (1 = not at all to 7 = very much). The name of the social media platform was adapted in all items (e.g., “I want people who look at my [Facebook/Instagram] profile to see that I have close friends”). For Facebook, participants also read the following instruction: “Please note: Here “friend” refers to real-world connections, not “Facebook friend” in a sense of people that you are friends with on Facebook”. Responses were again aggregated into a single score as indices indicated very good reliability (Cronbach’s α = 0.96, McDonald’s ω<sub>hierach</sub> = 0.92, M = 2.59, SD = 1.44).

**Convergent-Discriminant Validity.** Descriptive statistics, reliability indices and correlations between all measures are reported in Table 5. As in Studies 1 and 2, participants completed scales measuring need to belong (Leary et al., 2013) and need for popularity (Santor et al., 2000). All items were measured on 7-point scales, 1 = not at all to 7 = very much. They additionally answered the 15 item Big-5-XS personality inventory (Soto & John, 2017; 1 = disagree strongly to 5 = agree strongly), a scale measuring public (7 items, e.g., “I care a lot about how I present myself to others”) and private self-consciousness (9 items, e.g., “I think about myself a lot”; Scheier & Carver, 1985; 1 = not at all to 7 = very much), and a scale measuring social comparison propensity (8 items, e.

**Table 5**  
Descriptive statistics, reliability indices and correlations between all measures in Study 3.

	$\alpha$	M (SD)	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1 DTBP	.96	2.59 (1.44)	.45***	.48***	.05	-.003	.22***	.06	.03	.37***	.22***	.33***	.32***	.38***	.15***	.12*	.07	.26***	.55***	.42***
2 Need to belong	.84	3.93 (1.05)		.49***	.01	-.15***	.06	.13**	.44***	.60***	.33***	.47***	.21***	.34***	.16***	.08	.17**	.13*	.37***	.41***
3 Need for popularity	.93	2.27 (1.12)			-.06	-.13**	.09*	-.09*	.16***	.44***	.25***	.32***	.10*	.24***	.04	.02	.16**	.23	.28***	.44***
4 Big-5: Openness	.68	3.41 (0.88)				.02	.20***	.11**	-.02	.07	.28***	.09*	.11**	.01	-.06	.05	.05	-.05	-.04	-.06
5 Big-5: Conscientiousness	.70	3.64 (0.87)					.26***	.25***	-.39***	-.08*	-.07	-.08	.07	.06	-.02	.04	.04	-.10	.01	-.22***
6 Big-5: Extraversion	.58	2.66 (0.80)					.09*	.11**	-.31***	.02	.10*	.17***	.14***	.18***	-.003	.12*	.08	.23	.23***	.03
7 Big-5: Agreeableness	.55	3.79 (0.74)					.26***	.11*	-.12**	.09*	.04	-.03	.12**	.10*	.08	.16**	.11	.12**	.12**	.01
8 Big-5: Neuroticism	.81	2.96 (1.05)					.09*	.11**	-.12**	.41***	.35***	.25***	.03	.10*	.08	.10	.03	.02	.34***	.01
9 Self-consciousness: Public	.85	4.40 (1.20)					.09*	.11**	-.12**	.58***	.58***	.41***	.13**	.24***	.14***	.01	.11	.14*	.22***	.41***
10 Self-consciousness: Private	.81	4.44 (0.99)					.09*	.11**	-.12**	.58***	.58***	.41***	.13**	.24***	.14***	.01	.11	.14*	.22***	.41***
11 Social comparison	.74	3.17 (0.66)					.09*	.11**	-.12**	.58***	.58***	.41***	.13**	.24***	.14***	.01	.11	.14*	.22***	.41***
12 Active social media use	.74	2.71 (1.56)					.09*	.11**	-.12**	.58***	.58***	.41***	.13**	.24***	.14***	.01	.11	.14*	.22***	.41***
13 Passive social media use	.71	5.86 (1.63)					.09*	.11**	-.12**	.58***	.58***	.41***	.13**	.24***	.14***	.01	.11	.14*	.22***	.41***
14 Daily use in minutes	-	43.76 (48.72)					.09*	.11**	-.12**	.58***	.58***	.41***	.13**	.24***	.14***	.01	.11	.14*	.22***	.41***
15 Instagram followers	-	449.31 (1284.75)					.09*	.11**	-.12**	.58***	.58***	.41***	.13**	.24***	.14***	.01	.11	.14*	.22***	.41***
16 Instagram accounts followed	-	540.77 (811.81)					.09*	.11**	-.12**	.58***	.58***	.41***	.13**	.24***	.14***	.01	.11	.14*	.22***	.41***
17 Facebook friends	-	277.96 (393.96)					.09*	.11**	-.12**	.58***	.58***	.41***	.13**	.24***	.14***	.01	.11	.14*	.22***	.41***
18 Posting about belonging	.92	3.28 (1.59)					.09*	.11**	-.12**	.58***	.58***	.41***	.13**	.24***	.14***	.01	.11	.14*	.22***	.41***
19 Social media addiction	.88	2.30 (1.27)					.09*	.11**	-.12**	.58***	.58***	.41***	.13**	.24***	.14***	.01	.11	.14*	.22***	.41***

Note. All items are measured on 7-point scales, except for social comparison (5-point), Big-5 personality dimensions (5-point), and active and passive social media use (9-point).

g., “I compare my achievements in life with my friends”; Houston et al., 2022; 1 = *strongly disagree* to 5 = *strongly agree*). The presentation order of the scales was randomized.<sup>4</sup>

**Concurrent Validity: Social Media Use.** As indices for social media use frequency, participants answered the same questions on active and passive social media use as in Studies 1 and 2, and reported their daily use of Instagram or Facebook in minutes, respectively. Instagram users also reported their number of Instagram followers and the number of accounts they follow on Instagram, while Facebook users reported their number of Facebook friends. In addition, all participants indicated how often they post about belonging on social media (3 items: “When I post on social media, I post about activities with my friends”, “When I post on social media, I post photos with my friends”, “When I post on social media, I post about my social life”; 1 = *never* to 7 = *always*). Finally, we assessed the 6-item social media addiction scale (6 items, e.g., “You feel an urge to use social media more and more”, Andreassen et al., 2016; 1 = *not at all* to 7 = *very much*).

### 5.3. Results

#### 5.3.1. Confirmatory factor analysis

**Overall Sample.** We repeated the CFA to test the scale structure as in the previous studies (two interrelated dimensions of DTBP). The model (considering Instagram and Facebook users together) yielded excellent fit indices,  $\chi^2 = 44.32$ ,  $df = 19$ ,  $\chi^2/df = 2.33$ , CFI = 0.995, RMSEA = 0.048, 90% CI [0.029, 0.066], SRMR = 0.012 (see also Table 2). Once again, likelihood ratio tests favored it over the independence model,  $\Delta\chi^2 (\Delta df = 9) = 4707$ ,  $p < .001$ , and over the simpler single-factor model,  $\Delta\chi^2 (\Delta df = 1) = 109.48$ ,  $p < .001$ .

**Scale Structure amongst Facebook and Instagram Users.** It was important to ensure that the structure of the scale was stable regardless of the specific social media platform it was referring to. We therefore conducted multiple-group CFA to assess measurement (in)variance between Facebook and Instagram users. We sequentially tested for configural, metric, and scalar invariance (see, e.g., Hirschfeld & von Brachel, 2014; Vandenberg & Lance, 2000). Changes in likelihood ratio tests are often reported to assess differences between the unconstrained model and models with measurement invariances constraints. However,  $\chi^2$  has been criticized for depending too much on the sample size, and thus, three other incremental indices have been proposed (Cheung & Rensvold, 2002): CFI, Steiger’s gamma hat (GH), and McDonald’s noncentrality index (NCI). Differences in nested models should be  $< 0.01$ ,  $< 0.01$ , and  $< 0.02$ , respectively (see also L. Milfont & Fischer, 2010).

Analyses (see Table 6) supported full configural invariance (Model 1), full metric invariance (Model 2), and full scalar invariance (Model 3). Strict invariance (i.e., residual invariances of the observed variables, Model 4), however, was not supported. We explored item variance across the groups to identify those with the largest difference and then incrementally freed these parameters from the model to try and obtain partial strict invariance. Partial strict invariance could be obtained if variance of items 5, 6, 7, and 8 was freed (that is, the quality subscale items). In other words, the Facebook-scale and Instagram-scale resulted in similar structure, intercepts, and loadings. Residual variance of the

<sup>4</sup> We also preregistered to assess participants’ subjective frequency of being socially excluded in the last two months (Rudert et al., 2020) and subjective frequency of loneliness (Hughes et al., 2004). Partial correlations, each analysis controlling for the other variable, showed that higher DTBP was related to more frequent social exclusion experiences,  $r(579) = 0.15$ ,  $p < .001$ , but to less frequent loneliness feelings,  $r(579) = -0.09$ ,  $p = .034$ . For reasons of simplicity, we chose to omit social exclusion and loneliness from the present contribution. All data and analyses on subjective frequency of social exclusion and loneliness are available via [https://osf.io/kb9u7/?view\\_only=67ec6f6ef2ac4766b6a70618f7d4d3e4](https://osf.io/kb9u7/?view_only=67ec6f6ef2ac4766b6a70618f7d4d3e4).



**Table 6**

Test of measurement invariance between Facebook (n = 295) and Instagram users (n = 290) in Study 3.

Model	$\chi^2$	df	$\chi^2/df$	CFI	GH	NCI	RMSEA [90% CI]	SRMR	Comparison	$\Delta\chi^2$	$\Delta$ CFI	$\Delta$ GH	$\Delta$ NCI	Decision
(1) Configural model	79	38	2.08	.991	.983	.965	.061 [.042, .080]	.014	–	–	–	–	–	
(2) Metric invariance	89	44	2.02	.990	.981	.962	.059 [.041, .077]	.029	Model 2 vs. 1	9.72(6) <sup>ns</sup>	.001	.002	.003	Accept
(3) Scalar invariance	99	50	1.98	.990	.980	.959	.058 [.041, .074]	.031	Model 3 vs. 2	9.67(6) <sup>ns</sup>	.000	.001	.003	Accept
(4) Strict invariance	153	58	2.64	.980	.961	.921	.075 [.061, .090]	.034	Model 4 vs. 3	54.91(8) <sup>***</sup>	.010	.019	.038	Reject
(5) Partial strict inv.	116	54	2.15	.987	.974	.948	.063 [.047, .078]	.035	Model 5 vs. 3	17.39(4) <sup>**</sup>	.003	.006	.011	Accept

Note. CFI = comparative fit index, GH = gamma hat, NCI = non-centrality index, RMSEA = root mean square error of approximation, SRMR = standardized root mean residual. Each difference test ( $\Delta$ ) compares the model on its line with the previous one. Partial strict invariance: the following variances were freed to improve model fit: items 5, 6, 7, and 8.

quantity subscale's items was also invariant; only residual variance of the quality subscale varied slightly between the two groups. In follow-up analyses, we therefore considered the two subgroups of Instagram and Facebook users together.

### 5.3.2. Convergent-discriminant validity

**Need to Belong and Need for Popularity.** As in previous studies, we investigated the relationship between DTBP, need to belong, and need for popularity. We submitted all items to an exploratory factor analysis with extraction fixed on three factors (maximum likelihood method, oblique rotation). Items were perfectly aligned with their theoretical distinction, with all 8 DTBP items loading on the first factor, 10 need to belong items loading on the second, and all 12 need for popularity items loading on the third (see Appendix 2: [https://osf.io/kb9u7/?view\\_only=67ec6f6ef2ac4766b6a70618f7d4d3e4](https://osf.io/kb9u7/?view_only=67ec6f6ef2ac4766b6a70618f7d4d3e4)). No cross-loading exceeded 0.18 except for one need for popularity item (cross-loading on the DTBP factor = .34, loading on the need for popularity factor = .54). DTBP was positively correlated with both need to belong,  $r = .45, p < .001$ , and need for popularity,  $r = 0.48, p < .001$  (themselves correlated at  $r = 0.49, p < .001$ ). Again, results supported both convergent and discriminant validity of the DTBP as a construct related to, but conceptually distinct from both need to belong and the need for popularity.

**Personality.** We then investigated relationships with the Big-5 personality traits. To better identify specific relationships with DTBP and because we anticipated that the different personality traits might share some common variance, we computed partial correlations, controlling for the four remaining personality traits when testing the correlation with the fifth one. Consistent with our preregistered hypothesis, there was a positive relationship between extraversion and DTBP,  $r(579) = 0.24, p < .001$ . We had preregistered to test the other Big Five dimensions (i.e., openness, conscientiousness, agreeableness, neuroticism) in exploratory fashion. However, correlations with the other traits were not significant (openness:  $r(579) = 0.00, p = .990$ , conscientiousness:  $r(579) = -0.04, p = .320$ , agreeableness:  $r(579) = 0.06, p = .190$ ), except for neuroticism, which showed a small positive relationship with DTBP:  $r(579) = 0.10, p = .022$ .

**Public and Private Self-Consciousness.** The same strategy was used to investigate links with public and private self-consciousness. We computed partial correlations with one form of self-consciousness while controlling for the other. Consistent with the preregistered hypothesis, DTBP was positively correlated with public self-consciousness,  $r(579) = 0.31, p < .001$ . Controlling for public self-consciousness, DTBP's correlation with private self-consciousness was not significant,  $r(579) = 0.01, p = .850$ .

**Social Comparison Propensity.** Social comparison propensity and DTBP correlate positively,  $r(585) = 0.33, p < .001$ , indicating that participants with greater DTBP scores also expressed a greater tendency to compare their achievements in life to those of others.

### 5.3.3. Concurrent validity

We conducted a series of hierarchical linear regressions to investigate whether DTBP predicted different indices of social media use, above and beyond need to belong and need for popularity. We entered

DTBP in a first step, then need to belong and need for popularity in a second step. VIF values indicated no issue of multicollinearity ( $VIF_s < 1.48$ ). All results are reported in Table 7.

**Common Indices of Social Media Use Across Facebook and Instagram.** Indices of social media use (either Facebook or Instagram) included the aggregated scores of active use, passive use, and self-reported daily use in minutes. As daily use in minutes was heavily skewed (Skewness = 2.96,  $SE = 0.10$ ), we applied a log transformation prior to analyses. Consistent with the preregistered hypotheses, DTBP was positively related to all three indices, above and beyond need to belong and need for popularity. Need to belong was also related to all three indices of social media use, but with smaller effect sizes compared to DTBP. Need for popularity only related to aggregated scores of active use, again, with a smaller effect size compared to DTBP (see Table 7).

**Posting about Belonging and Social Media Addiction.** We also investigated the frequency at which participants reported posting about belonging on social media, as well as self-reported social media addiction. Consistent with the preregistered hypotheses, DTBP was positively related to both more frequent posting about belonging and greater social media addiction. More frequent posting about belonging was also related to the need to belong. Social media addiction was also related to both need for popularity and need to belong. On this latter indicator, the three predictors showed additive effects of similar magnitude (see Table 7).

**Specific Indices for Instagram and Facebook.** Since users do not connect with others in the same way on Instagram and Facebook, some questions had to be customized to fit the specific platform. Instagram users reported how many *followers* they had and how many accounts they were *following*, while Facebook users reported their number of Facebook *friends*. All three measures were skewed and log-transformed before analyses (Skewness scores of 8.51,  $SE = 0.14$ ; 4.23,  $SE = 0.14$ ; and 6.75,  $SE = 0.14$ , respectively). DTBP was positively related to the number of Instagram followers and the number of Facebook friends, but not to the number of Instagram accounts being followed by the participants. Need to belong was only related to the number of Facebook friends, but with a smaller effect size compared to DTBP. Need for popularity was related to the number of Facebook friends, again with a smaller effect size compared to DTBP (see Table 7).

### 5.3.4. Test-retest-reliability after two weeks

As preregistered, we assessed test-retest reliability ( $N = 506$ ) by calculating the intraclass coefficient correlation (ICC) from a random effects model (S. Qin et al., 2019; Shrout & Fleiss, 1979). We followed Fleiss' classification to interpret the ICC as follows:  $< 0.40$ : poor,  $0.40-0.75$ : fair to good and  $> 0.75$ : excellent. Analyses were conducted on R using the *irr* package (Gamer et al., 2019) and indicated excellent reliability with an ICC = 0.807, 95% CI [0.774, 0.835],  $F(505, 506) = 9.35, p < .001$ .

## 6. Measurement invariance across studies 1, 2 and 3

We conducted multiple-group CFA to assess measurement (in)variance across the three studies. Again, as for the comparison between the Facebook and the Instagram sample in Study 3, we sequentially tested

**Table 7**  
Hierarchical linear regressions assessing the effect of DTBP, need to belong, and need for popularity on social media use (Study 3).

Common indices (I)	Active use					Passive use				
	t-test	p-value	Standardized β	η <sup>2</sup>	R <sup>2</sup>	t-test	p-value	Standardized β	η <sup>2</sup>	R <sup>2</sup>
<i>Step 1.</i>										
Intercept	14.39	<.001	–	–	.104	36.90	<.001	–	–	.145
DTBP	8.23	<.001	.322	.10		9.93	<.001	.380	.14	
<i>Step 2.</i>										
Intercept	6.28	<.001	–	–	.119	15.86	<.001	–	–	.179
DTBP	7.02	<.001	.325	.11		6.45	<.001	.288	.15	
Need to belong	2.59	.010	.120	.01		4.59	<.001	.206	.04	
Need for popularity	–2.48	.014	–.117	.005		0.00	.99	.000	.005	
<b>Common indices (II)</b>										
<b>Daily use (mn)</b>										
	t-test	p-value	Standardized β	η <sup>2</sup>	R <sup>2</sup>	<b>Posting about belonging</b>				
	t-test	p-value	Standardized β	η <sup>2</sup>	R <sup>2</sup>	t-test	p-value	Standardized β	η <sup>2</sup>	R <sup>2</sup>
<i>Step 1.</i>										
Intercept	–	<.001	36.68	–	.069	15.18	<.001	–	–	.298
DTBP	.380	<.001	6.56	.07		15.71	<.001	.545	.30	
<i>Step 2.</i>										
Intercept	–	<.001	16.14	–	.083	4.71	<.001	–	–	.319
DTBP	.288	<.001	4.59	.07		11.92	<.001	.485	.30	
Need to belong	.206	.003	3.01	.02		4.18	<.001	.171	.03	
Need for popularity	.000	.430	–0.79	<.001		–0.80	.43	–.033	.001	
<b>Common indices (III)</b>										
<b>Social media addiction</b>										
	t-test	p-value	Standardized β	η <sup>2</sup>	R <sup>2</sup>					
<i>Step 1.</i>										
Intercept	13.69	<.001	–	–	.176					
DTBP	11.15	<.001	.419	.18						
<i>Step 2.</i>										
Intercept	1.45	.15	–	–	.276					
DTBP	5.17	<.001	.217	.20						
Need to belong	4.78	<.001	.201	.04						
Need for popularity	5.46	<.001	.234	.09						
<b>Instagram Specific indices</b>										
<b>Instagram - Number of followers</b>										
	t-test	p-value	Standardized β	η <sup>2</sup>	R <sup>2</sup>	<b>Instagram - Number of accounts followed</b>				
	t-test	p-value	Standardized β	η <sup>2</sup>	R <sup>2</sup>	t-test	p-value	Standardized β	η <sup>2</sup>	R <sup>2</sup>
<i>Step 1.</i>										
Intercept	23.31	<.001	–	–	.075	29.21	<.001	–	–	.022
DTBP	4.83	<.001	.273	.07		2.57	.011	.150	.02	
<i>Step 2.</i>										
Intercept	10.84	<.001	–	–	.081	13.23	<.001	–	–	.037
DTBP	3.21	.002	.221	.08		0.98	.33	.069	.02	
Need to belong	0.93	.35	.062	.003		1.69	.092	.115	.010	
Need for popularity	0.72	.47	.049	.003		0.81	.42	.056	.006	
<b>Facebook Specific indices</b>										
<b>Facebook - Number of friends</b>										
	t-test	p-value	Standardized β	η <sup>2</sup>	R <sup>2</sup>					
<i>Step 1.</i>										
Intercept	31.69	<.001	–	–	.088					
DTBP	5.31	<.001	.296	.09						
<i>Step 2.</i>										
Intercept	3.78	<.001	–	–	.103					
DTBP	2.09	.038	.242	.09						
Need to belong	–0.19	.85	.142	.01						
Need for popularity	31.69	<.001	–.013	.002						

Note. Degrees of freedom for t-tests are 583 at Step 1 and 581 at Step 2 for the common indices (active and passive use, daily use, posting about belonging, and social media addiction). For Instagram-specific indices they are 288 at Step 1 and 286 at Step 2 (Facebook-specific index: 293 and 291). Daily use, number of followers, accounts followed, and Facebook friends were subjected to a log transformation (LN) prior to analyses. R<sup>2</sup> refers to the entire model.

**Table 8**  
Test of measurement invariance across studies.

Model	χ <sup>2</sup>	df	χ <sup>2</sup> /df	CFI	GH	NCI	RMSEA [90% CI]	SRMR	Comparison	Δχ <sup>2</sup>	ΔCFI	ΔGH	ΔNCI	Decision
(1) Configural model	132	57	2.32	.991	.984	.968	.059 [.046, .072]	.015	–	–	–	–	–	
(2) Metric invariance	150	69	2.17	.991	.982	.965	.056 [.044, .068]	.034	Model 2 vs. 1	18.64(12) <sup>ns</sup>	.000	.002	.003	Accept
(3) Scalar invariance	157	81	1.94	.991	.984	.967	.050 [.038, .061]	.034	Model 3 vs. 2	6.35(12) <sup>ns</sup>	.000	–.002	–.002	Accept
(4) Strict invariance	246	97	2.54	.983	.968	.937	.064 [.054, .073]	.035	Model 4 vs. 3	89.05(16) <sup>***</sup>	.008	.016	.030	Reject
(5) Partial strict invar.	211	95	2.22	.987	.975	.950	.057 [.046, .067]	.038	Model 5 vs. 3	54.23(14) <sup>***</sup>	.004	.009	.017	Accept

Note. CFI = comparative fit index, GH = gamma hat, NCI = non-centrality index, RMSEA = root mean square error of approximation, SRMR = standardized root mean residual. Each difference test (Δ) compares the model on its line with the previous one. Partial strict invariance: the variance of item 2 was freed to improve model fit.

for configural, metric, and scalar invariance. Analyses (see Table 8) supported full configural invariance (Model 1), full metric invariance (Model 2) and full scalar invariance (Model 3). Strict invariance (Model 4) was initially not supported; however, freeing just one parameter (variance of item 2) improved the model fit so that partial strict invariance was supported. In conclusion, the DTBP scale globally performed in a similar way in all three studies.

## 7. Concurrent validity: small-scale meta-analysis

### 7.1. Analytical strategy

Results regarding concurrent validity were mostly consistent across studies. However, some disparities appeared – notably regarding the number of accounts followed on Instagram. To better estimate the reliability of the findings, we therefore conducted a small-scale meta-analysis (Goh et al., 2016) including the findings of all three studies. We chose the correlation coefficient  $r$  as the effect-size indicator, calculated from the  $t$ -value for each test. Using the *metafor* package in R (Viechtbauer, 2010), we ran random-effect models (Paule & Mandel method; confidence intervals estimated with the Knapp & Hartung and Sidik & Jonkman calculation; see Veroniki et al., 2016) on the five indicators of social media use present in all studies (i.e., active and passive use, daily use in minutes, number of Instagram followers, and number of accounts followed on Instagram). We did not include frequency of posting about belonging, social media addiction, or number of Facebook friends because these variables were assessed in Study 3 only.

### 7.2. Results

Results, summarized in Table 9, indicated significant and homogeneous relationships between DTBP and active use of social media, daily use in minutes, and number of followers. The relationship with passive use was also significant but it was heterogeneous across studies (i.e., larger in Study 3). Finally, the relationship with number of accounts followed on social media was (homogeneously) non-significant. The relationship with daily use can be qualified as small ( $r < .24$ ) while relationships with active and passive use, and number of followers are of medium size (see Table 9).

## 8. General discussion

Social media have become ubiquitous and relevant for a number of domains in life, such as for well-being (e.g., Faelens et al., 2021; Marinucci et al., 2021), politics (e.g., Colliander et al., 2017), consumer behavior and advertising (e.g., Geng et al., 2021), but also for relationship formation and maintenance (e.g., Coundouris et al., 2021; Pennington, 2021). A plethora of research has investigated how much time people spend on social media and what consequences this may have (e.g., Song et al., 2014). Considerably less research has been devoted to

**Table 9**  
Results of the small-scale meta-analysis assessing concurrent validity across studies.

Variable	Meta $r$ (SE)	95% CI	$t$ -test ( $df$ = 2)	$p$ - value	Test for heterogeneity
Active use	.303 (.019)	[.222, .384]	16.20	.004	$Q(2) = 1.17^{ns}$
Passive use	.282 (.058)	[.030, .533]	4.82	.041	$Q(2) = 11.10^{**}$
Daily use (mn)	.226 (.030)	[.100, .353]	7.68	.017	$Q(2) = 2.57^{ns}$
Number of followers	.267 (.028)	[.146, .388]	9.46	.011	$Q(2) = 1.59^{ns}$
Accounts followed	.200 (.053)	[-.039, .419]	3.57	.071	$Q(2) = 5.66^{ns}$

the question of what social media users do when they are online – specifically, what they post about and which psychological functions this may serve. Crucially, social media offer people countless opportunities to display to others what they do, the things they own, as well as their social ties. In the present contribution, we argue that people differ in their specific desire to display their social ties, that is, their belonging, online on social media: a construct that we termed *desire to belong publicly* (DTBP).

### 8.1. Summary of findings

Building on three studies, we developed and validated an eight-item psychometric scale measuring DTBP, which shows excellent psychometric properties in terms of scale structure, reliability, and measurement invariance across three studies and two social media platforms, specifically, Instagram and Facebook. The scale also showed excellent test-retest reliability after two weeks.

In terms of convergent-discriminant validity, we showed that the DTBP is related to, but conceptually distinct from the need to belong (Studies 1, 2, and 3), as well as from need for popularity (Studies 2 and 3). DTBP is also significantly and positively related to extraversion and, to a smaller extent, to neuroticism (but not openness, agreeableness, or conscientiousness; Study 3). DTBP also relates to public self-consciousness (but not private self-consciousness) and to social comparison propensity (Study 3).

Finally, testing for concurrent validity, we showed that DTBP is positively and reliably related to social media use, both in terms of active use (e.g., frequency of posting pictures) and passive use (e.g., frequency of viewing other's postings). It is also positively related to daily use in minutes, frequency of posting about belonging on social media, and social media addiction. In addition, DTBP is positively related to *platform-specific* social media use indices, such as numbers of followers on Instagram and number of Facebook friends. As the internal meta-analysis revealed, the relationship of DTBP with numbers of accounts followed on Instagram was not reliably significant. For all indicators of social media use, DTBP was at least equally good as, and most often, a significantly better predictor than other constructs that had previously been linked to social media use, specifically, need to belong (Studies 1, 2 and 3) and need for popularity (Studies 2 and 3). This reinforces the notion that DTBP is a key factor to take into account when investigating social media use.

### 8.2. Strengths and implications

Social media seems to be becoming a second, digital layer to the majority of modern lives and social interactions. We believe DTBP is an important construct to better understand this digital world. Both as a construct and a scale, DTBP sheds light on *what* is posted to social media and *why*, rather than exclusively focusing on *how frequently* social media is used – as has been the primary focus in much prior research. Such a shift in focus requires further understanding of *why* people use social media and for what purpose. In this respect, DTBP may inform research surrounding how social media alters social interactions in the offline and online world, and especially how it may change the meaning of these interactions if they are later displayed online (e.g., Büttner & Rudert, 2022). Specifically, DTBP could foster research on drivers and functions of social media use, research into the development of social media use patterns—especially among new users such as adolescents and young adults—as well as research on social media addiction.

Social media platforms differ insofar that they can be classified along the use of visual content, such as photos, versus text content (e.g., Couture Bue, 2020; Marengo et al., 2018; Pittman & Reich, 2016). Still, posting pictures is one of the most frequent social media behaviors (e.g., D. H. Kim et al., 2016; E. Kim et al., 2016; Lee et al., 2015). In addition, strongly photo-based social media platforms are typically used for satisfying desires for social connection as they afford more intimacy than

text-based platforms (e.g., Allen et al., 2014; Couture Bue, 2020; Pittman & Reich, 2016). For these reasons, we focused here specifically on strongly visual, photo-based social media platforms, choosing the two photo-based social media platforms that were most frequently used at the time of this investigation: Instagram and Facebook (e.g., Auxier & Anderson, 2021; Kemp, 2022). However, we believe that DTBP exists and would demonstrate itself on any social media platform that meets the following three criteria: (1) the social media platform has a strong emphasis on self-presentation through self-created visual content, (2) permanent content is built up over time on some sort of profile (i.e., unlike Snapchat where postings disappear after a pre-defined time, see e.g., Utz et al., 2015), and (3) it is customary to share social interactions on profiles (unlike Pinterest for example where most people are passively collecting others' content without sharing own content; e.g., D. H. Kim et al., 2017; Phillips et al., 2014). This conceptualization allows for the applicability of DTBP to different social media platforms, including those that are currently being developed. This is important because social media platforms come and go: For instance, today, Instagram and Facebook may dominate the social media environments of many people in Western societies (e.g., Auxier & Anderson, 2021; Kemp, 2022), while a few years ago, platforms like MySpace (e.g., Ezumah, 2013; Pfeil et al., 2009) or the German platform StudiVZ (e.g., Wodzicki et al., 2012), among other platforms, were used widely. Moreover, in non-Western societies, other social media platforms may be more widely used, for instance, the Chinese platform WeChat (e.g., Montag et al., 2018; G. Wang et al., 2019). DTBP as a construct, and the DTBP scale, should be applicable to emerging and non-Western platforms as well.

What about text-based platforms? From a more general point of view, DTBP builds on the needs-affordance perspective, which holds that individuals use social media to fulfil certain needs and desires (e.g., Karahanna et al., 2018). While the DTBP scale might be a good instrument to identify people's more or less pronounced desire to post about belonging online, other motives could be present in non-photo-based social media platforms. For instance, on Twitter it may be more important to share content that aims at presenting one's opinion or content that aims at gaining voters' approval (e.g., Colliander et al., 2017) rather than to present belonging. However, even presentations of opinions or political affiliation might relate to broader conceptualizations of belonging, such as group memberships (i.e., of a certain political group, or a profession), and social identity in a broader sense, giving rise to interesting questions for future research.

### 8.3. Limitations and directions for future research

Despite the strengths of the present contribution and the reliability of the findings, the present studies also present some limitations that must be acknowledged. A caveat to interpreting the present findings is that we relied on convenience samples (recruited online through Prolific) that cannot be considered as representative of the general population, nor of the subpopulation of social media users. As such, it remains unknown which scores of DTBP can be considered 'normal', or average. This means that the DTBP scale cannot, at this stage, be used to provide individual diagnostics, but only to inform about groups' mean scores. Future research will need to systematically assess the DTBP scores of larger and more representative populations to allow for a more refined interpretation of raw scores. Future research should also include (sub-) clinical populations, for instance, individuals suffering from severe social media addiction.

The present studies were also limited to a single country (the UK) and a single language (English). Further research is needed to develop and validate the DTBP scale in other cultural contexts. DTBP scores might indeed be influenced by cultural and social norms (e.g., Marino et al., 2020; Masur et al., 2021), directing, for instance, what is acceptable to post on social media or whether a profile "should" be made visible to the public, or not. The temporal context and accompanying societal trends might also influence perceptions of acceptable social media behavior,

and thereby people's answers to the DTBP scale. For example, the restrictions on social contacts put in place during the COVID-19 pandemic meant that people were forbidden to meet others at times (i.e., during lockdowns). One would expect that posting about belonging would be drastically different then, as posting about in-person gatherings would equal publicly admitting to breaking lockdown rules. In fact, the presented studies shed some light on this: Studies 1 and 2 were conducted just before contact restrictions were put in place in the UK (i.e., in January 2020 and mid-February 2020, respectively), while Study 3 was conducted a few weeks after contact restrictions and COVID-19 regulations were lifted again in the UK (i.e., March 2022). Comparing the studies, we find differences of roughly one scale point (on a 7-point scale) with higher scores in pre-COVID Studies 1 and 2 than in restrictions-lifted-stage-of-COVID Study 3. Again, this highlights that individual scores should be interpreted with caution and with the full societal context in mind, while differential scores at a given timepoint are more reliable. Further research should investigate whether DTBP scores bounce back up once "normality" after COVID-19 has set in again and social norms shift again, making it acceptable again to post pictures with *many* people on social media.

The presented studies relied on cross-sectional designs, which limits claims of causality regarding the concurrent validity of the scale. Future studies will be required to better ascertain whether DTBP *causes* more frequent social media use and how DTBP-driven social media use evolves with time (e.g., in some cases even into forms of social media addiction).

Longitudinal studies investigating the influence of DTBP on the emergence of usage patterns would be of particular interest among new users, such as adolescents and young adults. Social media use heavily influences the development of children and adolescents (Wartberg et al., 2021). From a developmental perspective, if higher DTBP levels put children, adolescents, or young adults at a higher risk to develop problematic social media use or even social media addiction, it would provide a framework for targeted interventions in schools or at colleges, for instance, aiming to inform about DTBP and helping to identify different ways of fulfilling needs of belonging and self-presentation in offline environments.

Moving away from the developmental perspective, future research should consider the role of the DTBP in different domains of social media use. For instance, it might be interesting to test whether individuals with higher DTBP respond more favorably to social media advertisements that are matched to their high DTBP (see also Winter et al., 2021), for instance, by emphasizing belonging. Another context could be investigating whether individuals with higher DTBP respond more favorably to politicians that disclose more personal information about their social life (see also Colliander et al., 2017).

Another question that future research could ask is: Are social media profiles that are created by individuals with higher DTBP more attractive to other users? As the small-scale meta-analysis across all studies confirmed, individuals with higher DTBP have more Instagram followers, and as shown in Study 3, also more Facebook friends. On Instagram, different from Facebook friendship requests, following each other is not a mutual relationship per se; users can decide to follow someone's profile, but that person doesn't need to follow back. Interestingly, the small-scale meta-analysis shows that users with a higher DTBP have more Instagram followers, but do not follow more accounts. This raises the question whether DTBP-driven social media content makes profiles more attractive, thereby attracting more followers. This would dovetail with earlier findings that postings that show belonging receive more "Likes" on social media (Aramendia-Muneta et al., 2021).

Finally, it is important to note that, different from the need to belong, we do not conceptualize DTBP as a basic human need but rather as a desire. Indeed, in line with basic psychological need theory (Vansteenkiste et al., 2020), a general motivation can only be considered a basic human need when it is *fundamental* to individuals' psychological well-being and universal to *all* individuals (e.g., Benita et al., 2020;

Henning et al., 2019; Ryan & Deci, 2017; Vansteenkiste et al., 2020)—even if people might vary in the magnitude in which they experience this need. In contrast, DTBP focuses on a single context (social media) which, although growing in importance, cannot be considered universal. Moreover, in contrast to the vast literature on the positive effects that satisfaction of, for instance, the need to belong has (e.g., Steger & Kashdan, 2009; Walton & Cohen, 2007; Walton et al., 2012), and the vast literature on the detrimental effects of frustration of the need to belong (e.g., Rudert et al., 2021; Trepanier et al., 2016; Williams, 2009; Williams & Nida, 2022), there is no proof yet of DTBP’s fundamental nature for modern humans’ well-being. As another avenue for future research, it would hence be important to investigate the downstream consequences of situations where DTBP is satisfied versus not satisfied. For instance, future research could address the question whether taking away possibilities to act in line with one’s DTBP (such as, for instance, posting about belonging, using social media more frequently) elicits negative consequences for well-being that are comparable to need frustration of the need to belong (see e.g., Vansteenkiste et al., 2020). Such investigations could help to establish whether DTBP is a means to satisfy broader needs, such as the need to belong, and to establish a hierarchy between desires and needs (see e.g., Mowen, 2000) that drive social media use.

8.4. Conclusion

We present evidence for a new trait construct, the *desire to belong publicly* (DTBP), that represents individual differences in the desire to display one’s belonging online on social media. DTBP relates to various social media behaviors, ranging from active and passive use of social media, to daily duration of use, to specific posting behavior and social media addiction. In a world where social interactions increasingly transcend into the digital realm, the DTBP construct aids the understanding of *why* and *how* individuals use social media, a topic of high relevance, both in research and in practice.

Appendix 1

Separate linear regression models assessing the effect of overall DTBP, DTBP quantity, and DTBP quality on indices of social media use (Study 1). Each line represents a separate regression analysis.

	Active use					Passive use				
	t-test	p-value	Standardized β	η <sup>2</sup>	R <sup>2</sup>	t-test	p-value	Standardized β	η <sup>2</sup>	R <sup>2</sup>
DTBP overall	4.47	<.001	.256	.07	.066	3.16	.002	.184	.03	.034
DTBP quantity	4.73	<.001	.270	.07	.073	3.01	.003	.176	.03	.031
DTBP quality	3.88	<.001	.224	.05	.050	3.05	.002	.178	.03	.032
Daily use (mn)										
	t-test	p-value	Standardized β	η <sup>2</sup>	R <sup>2</sup>					
DTBP	3.32	.001	.193	.04	.037					
DTBP quantity	2.76	.006	.162	.03	.026					
DTBP quality	3.58	<.001	.208	.04	.043					
Number of followers										
	t-test	p-value	Standardized β	η <sup>2</sup>	R <sup>2</sup>	t-test	p-value	Standardized β	η <sup>2</sup>	R <sup>2</sup>
DTBP	3.71	<.001	.215	.05	.046	2.10	.037	.124	.02	.015
DTBP quantity	3.92	<.001	.227	.05	.051	2.27	.024	.133	.02	.018
DTBP quality	3.22	.001	.188	.04	.035	1.78	.077	.105	.01	.011

Credit authors statement

Christiane M. Büttner: Conceptualization, Validation, Formal analysis, Investigation, Methodology, Project administration, Supervision, Data Curation, Writing—original draft, Writing—review and editing. Fanny Lalot: Conceptualization, Validation, Formal analysis, Investigation, Methodology, Data Curation, Writing—original draft, Writing—review and editing. Selma C. Rudert: Conceptualization, Validation, Methodology, Supervision, Writing—review and editing.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of competing interest

None.

Data availability

Data, materials, and analysis code is freely available: [https://osf.io/kb9u7/?view\\_only=67ec6f6ef2ac4766b6a70618f7d4d3e4](https://osf.io/kb9u7/?view_only=67ec6f6ef2ac4766b6a70618f7d4d3e4)

Acknowledgments

We would like to thank Rasmus Möring for assisting with study material development and for comments that greatly improved the manuscript. We are also very grateful for the insightful comments on study material development offered by Elianne Albath, Mariela Jaffé, Melissa Jauch, Rainer Greifeneder, Dominik Maiori, and Matthias Stutz. We would also like to thank Anna-Marie Bertram and Leyre Macías for their assistance in preparing the manuscript.

## Appendix 2

Results of the exploratory factor analysis assessing convergent-divergent validity (maximum likelihood method, Oblimin rotation) conducted in Study 1 (N = 286; extraction fixed to 2 factors), Study 2 (N = 269, extraction fixed to 3 factors), and Study 3 (N = 585, extraction fixed to 3 factors).

	Study 1		Study 2			Study 3		
	Factor 1	Factor 2	Factor 1	Factor 2	Factor 3	Factor 1	Factor 2	Factor 3
DTPB1	.843		.772				.892	
DTPB2	.748		.678				.813	
DTPB3	.748		.760				.819	
DTPB4	.880		.790				.816	
DTPB5	.859		.850				.828	
DTPB6	.911		.881				.917	
DTPB7	.854		.846				.870	
DTPB8	.859		.896				.845	
Belong1		-.518			-.484			-.673
Belong2		.670			.496			.595
Belong3		-.329			-.273			-.388
Belong4		.400			.463			.413
Belong5		.789			.677			.722
Belong6		.442			.538			.395
Belong7		-.308			-.187			-.218
Belong8		.783			.677			.710
Belong9		.706			.700			.683
Belong10		.812			.799			.796
Popularity1				.832		.833		
Popularity2				.751		.722		
Popularity3				.854		.804		
Popularity4				.451	.259	.533		
Popularity5			.306	.433		.536	.340	
Popularity6				.707		.810		
Popularity7				.436		.555		
Popularity8				.558		.717		
Popularity9				.562		.723		
Popularity10				.427		.621		
Popularity11				.643		.744		
Popularity12				.701		.805		

Note. Cross-loadings < 0.30 are not displayed.

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