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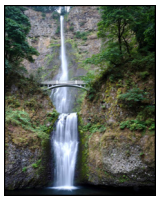

A picture paints a thousand words: The influence of taking selfies on place identification

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ABSTRACT

Selfies are omnipresent, yet quantitative research on the topic is sparse. Selfies are a form of self-expression; but selfie-taking also shapes the selfie-taker's self. We argue that taking selfies in a place strengthens selfie-takers' identification with that place. In three experimental studies (two-group post-test comparison design), the control group took pictures of a place (Studies 1 & 2: university; Study 3: city), whereas the experimental group took selfies in that place. Place identification was higher in the selfie condition than in the control condition (Study 1). Task enjoyment moderated the effect of taking selfies on place identification (Studies 2 & 3). However, not all sub-dimensions (i.e., affective, cognitive, and conative) of place identification were equally affected by the selfie-task across contexts. Our results suggest that taking selfies in a place can strengthen the linkage between selfie-takers and places. The effect can reverse for individuals who do not enjoy taking selfies.

1. Introduction

The selfie – "a photograph that one has taken of oneself, typically one taken with a smartphone or webcam and shared via social media" ("Selfie", 2013) – is becoming more and more popular in today's societies, especially among adolescent and young adult social media users (Dhir, Pallesen, Torsheim, & Andreassen, 2016). A survey by the Pew Research Centre conducted in 2014 revealed that 55% of millennials have posted a selfie on social media sites (Pew Research Center, 2014), and according to *Google* approximately 93 million selfies were taken each day by android phone users (as cited in Mishra, 2014). Furthermore, a number of gadgets have been developed allowing users to make their selfies even more "professional" (e.g., selfie sticks, lights, or drones). Barry, Doucette, Lofflin, Rivera-Hudson, and Herrington (2017) note that the "popularity of selfies on social media sites has captured public attention and […] countless non-empirical articles have been written in an attempt to describe and infer the factors involved in social media posts of selfies" (p. 2). For empirical scientists, however, the selfie constitutes a rather complex research topic. Hess (2015) argued that it might be conceptualised best as an assemblage of four elements: the self, the physical space, the technological device, and the social network.

1.1. The selfie in psychological research

The selfie assemblage (Hess, 2015) highlights that selfies are an expression of the self, but also involve an expression of a place and the interaction of the self with a place, technology (e.g., smartphones), and people (e.g., social networks). Psychological research on selfies has largely focused on the element of the self and the interaction of the self with the social network. Recent empirical studies, for example, revealed that selfies reflect the selfie-takers' "actual" and "ideal" selves and their personal and social identities (Ma, Yang, & Wilson, 2017; Michikyan, Subrahmanyam, & Dennis, 2015; Qiu, Lu, Yang, Qu, & Zhu, 2015). Furthermore, Burrow and Rainone (2017) found that the number of 'likes' individuals received on their *Facebook* self-photographs is significantly related to individuals' future self-esteem, and a number of studies provide evidence for the role of narcissism in predicting selfie-posting behaviour (e.g., Halpern, Valenzuela, & Katz, 2016; McCain et al., 2016). Thus, there is evidence that selfie-taking is a self-expressing and self-defining activity and that responses of the social network have an impact on the selfie-taker's self.

In contrast, the element of the physical space (and the technological device) has received little attention in psychological research on selfie-taking. Most previous studies reported only descriptive information regarding the places where individuals took the selfies (e.g., McCain et al., 2016). Qiu et al. (2015) additionally examined correlations

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between the selfie-takers' Big Five personality traits and various cues in selfies, including place-related aspects. They found that individuals high in conscientiousness were more likely to take selfies in public locations and to provide location information, whereas individuals high in neuroticism were less likely to provide location information. Moreover, Ma et al. (2017) revealed that Chinese *Sina Weibo* selfie-takers more frequently hid location information as compared with UK *Twitter* selfie-takers, which, according to the authors, might be explained by cultural differences.

However, to our knowledge, psychological research that addresses questions such as whether selfie-taking could have an impact on how individuals *relate* to places is largely missing. This is surprising in several respects. First, a selfie is a special form of photography that shows the self in a place, and as such, a selfie naturally is a means of expressing a connection of the self to a place. Second, qualitative psychological research has shown that photography "is a practice through which people actively engage in constructing meanings about identities, community, and belonging to place" (Sonn, Quayle, & Kasat, 2015, p. 90). Finally, extensive empirical and theoretical evidence demonstrates the importance of places for individuals' identities (e.g., Proshansky, Fabian, & Kaminoff, 1983; discussed in more detail below). Hence, with the present studies, we aim to contribute to selfie research by exploring the question of whether selfie-taking behaviour influences place identification. Place identification describes the linkage of the self to a place and will be conceptualised against the background of person-place constructs examined in environmental psychology research (e.g., Lewicka, 2011; Twigger-Ross, Bonaiuto, & Breakwell, 2016) and against the background of organisational identification research (Ashforth, Harrison, & Corley, 2008).

1.2. Place identification: the linkage of the self to a place

Within the field of environmental psychology, a place is defined as a "meaningful location" that has a physical basis as well as a social dimension (Lewicka, 2011). Environmental psychologists have considered a broad range of built and natural settings and have carried out comprehensive research on the linkage of the self to a place. A strong self-place linkage can accomplish many functions (e.g., expressive or regulative functions, Korpela, 1989; Proshansky et al., 1983), and is, therefore, considered beneficial. Most research supports this assumption, revealing positive correlations of self-place linkage with several indicators of health and well-being, as well as with environmentally responsible behaviours (Lewicka, 2011). Over the recent decade, a plentitude of definitions and measurements of people's linkage with places have evolved (see Lewicka, 2011, for a review), suggesting that self-place linkage might be best conceptualised in a multi-dimensional way (e.g., Scannell & Gifford, 2010). Accordingly, for the most part, researchers consider affective (a person's emotional connection to a place), cognitive (the knowledge or thoughts the person has regarding his or her connection), and conative (behaviours through which the person expresses the connection to the place, e.g., proximity-maintaining behaviour) aspects of self-place linkage (see Lewicka, 2011; Scannell & Gifford, 2010), and subsume these aspects under umbrella terms such as place attachment (e.g., Scannell & Gifford, 2010), place identity (e.g., Proshansky et al., 1983), place identification (e.g., Droseltis & Vignoles, 2010), or sense of place (e.g., Jorgensen & Stedman, 2006). Jorgensen and Stedman (2006) labelled the affective person-place linkage "place attachment", the cognitive linkage "place identity", and the conative aspect "place dependence". However, other authors have used the term "place attachment" or "place identity" to refer to any of the three aspects (cf. Kyle, Jun, & Absher, 2014; Lewicka, 2011). In this respect, environmental psychology research on person-place linkage has been challenged by inconsistent terminology, conceptualisation, and measurement, yet benefits from diverse research approaches applicable to different contexts.

Parallel to environmental psychology, organisational psychology has addressed certain kinds of self-place linkage, particularly in terms of the concept of organisational identification (Ashforth et al., 2008; Edwards, 2005; He & Brown, 2013; Riketta, 2005; Van Dick, Wagner, Stellmacher, & Christ, 2004). Organisational identification describes the linkage between a person and an organisation. Based on the definition of place stemming from the field of environmental psychology, organisations can also be regarded as "meaningful locations", as they usually have a physical basis as well as a social dimension (Lewicka, 2011); thus, an organisation could be considered a certain type of place. Most researchers agree that the person-organisation linkage comprises cognitive and affective aspects, while some researchers also propose conative or evaluative aspects (e.g., Van Dick et al., 2004). A wealth of empirical evidence shows that it predicts employee well-being, as well as key attitudes and behaviours in organisations (Ashforth et al., 2008; Lee, Park, & Koo, 2015; Riketta, 2005). Thus, the concept of organisational identification is rather similar to the concept of self-place linkage in environmental psychology, in terms of both multi-dimensional conceptualisation and its predictive value for well-being, attitudes, and behaviours.

In the present research, we rely upon research from both environmental and organisational psychology on self-place linkage. First, we conceptualise the linkage between the self and a place as a multi-dimensional construct that consists of affective, cognitive, and conative aspects (as these are the aspects that have been consistently considered in both environmental and organisational psychology; Kyle et al., 2014; Scannell & Gifford, 2010; Van Dick, 2001; Van Dick et al., 2004). Second, we address the question of whether selfie-taking will have an impact on self-place linkage from a social identity perspective, which has been discussed extensively in research on organisational identification, but has also received some attention in the field of environmental psychology. Corresponding to this theoretical background, we employ the term "place identification" (rather than place attachment or any of its equivalents) to refer to the linkage of the self to a place.

1.3. Why selfies may strengthen place identification

The social identity approach (which is based on social identity theory, Tajfel, 1981, and self-categorisation theory, Turner, Hogg, Oakes, Reicher, & Wetherell, 1987) assumes (a) that individuals strive for a positive sense of self, and (b) that the self is determined by personal and social identity. Social identities develop through the process of social identification, which happens when a person categorises him- or herself as a member of a social category such as nationality, ethnicity, gender, or profession. The social identity perspective has also been applied to fields outside traditional social psychology, particularly to the concept of organisational identification (Ashforth et al., 2008; Edwards, 2005; He & Brown, 2013; Riketta, 2005; Van Dick et al., 2004). There, it is assumed that organisations act as social categories and, consequently, can become part of individuals' social identities. Similarly, some researchers from the field of environmental psychology have discussed places as a social category with which individuals can develop social identification (Rooney et al., 2010; Twigger-Ross et al., 2016). In other words, from a social identity perspective, a person's linkage to a certain place will develop and become stronger when the person self-categorises as a member of that place. We propose that selfie-taking may promote this process of place identification.

First, as outlined above, selfie-taking is a type of self-defining activity. Engaging in self-defining activities produces flow and similar identity-related experiences (Coatsworth et al., 2005). Furthermore, self-defining activities performed within a group increase social identification with the group, and the identification becomes stronger as the activity-associated flow-experiences increase (Mao, Roberts, Pagliaro, Csikszentmihalyi, & Bonaiuto, 2016). More importantly, such activities not only increase identification with a particular group (if performed within that group), but also identification with the specific place where the activities have been performed (Bonaiuto et al., 2016). This is in

line with Proshansky et al.'s (1983) assumption that activities help individuals to define their identity in relation to their physical environment, as well as with findings on the role of leisure activities for person-place linkage (Kyle, Graefe, Manning, & Bacon, 2003). Thus, as selfie-taking is a self-defining activity happening in a specific place, selfie-taking should increase identification with the respective place.

Second, another, yet related, theoretical explanation for the hypothesised effect comes from researchers who conceptualise social-cognitive constructs in terms of associative networks (e.g., Greenwald et al., 2002; Lane & Scott, 2007). Within associative network models, constructs are defined as associative links between two concepts. These associations (i.e., the constructs) are assumed to be strengthened when the corresponding concepts are simultaneously active. Activation of concepts should occur through external stimuli or excitation transfer of current active concepts. Lane and Scott (2007), for example, conceptualised organisational identification as an associative link between the self and the organisation. Likewise, place identification might be conceptualised as an associative link between the self and a place. Hence, place identification could be strengthened when both concepts, the self and the place, are simultaneously activated. As selfies depict the self in a place, the simultaneous activation of the self and the place is exactly what should happen when individuals take selfies. Thus, selfie-taking might strengthen place identification simply as a result of associative processes. Similar conclusions may be reached through the identity association principle (Reed II, Forehand, Puntoni, & Warlopp, 2012), which suggests that stimuli (e.g., places) can be associated with identity-related content even if the association is not explicitly processed.

Lastly, according to Slater's (2007) reinforcing spirals model, media use and the outcomes of that media use are reciprocally related (i.e., certain types of media elicit corresponding cognitions and behaviours, and in turn, these cognitions and behaviours increase that type of media use). The so-called reinforcing spirals are assumed to be relevant for processes of social identification. Slater (2007) argued that when individuals identify with some type of social category, they attend to media content that reflects characteristics of that category, and this in turn strengthens the person's identification with the social category. Accordingly, it can be argued that when selfie-takers identify with a certain place, they will take selfies that show themselves in that place; in return, taking selfies in a particular place should strengthen the selfie-takers' identification with that place.

Taken together, the present research takes a contextual and integrative perspective by combining two lines of psychological research (i.e., environmental and organisational) and applying them to a media phenomenon which has yet to receive much attention by quantitative experimental psychology. Based on the social identity approach, the current work aims at providing a novel perspective to examine the influence of selfie-taking behaviour on place identification. Combining the different theoretical assumptions, this leads to the following hypothesis: selfie-taking increases place identification.

2. Overview of the present studies

To investigate this hypothesis, we conducted three experimental studies. We used a two-group post-test comparison design, in which the experimental group was instructed to take *pictures of themselves in a specific place* (i.e., selfies), whereas the control group was asked to only take *pictures of a specific place*. To achieve high validity – both internal and external – we conducted the first study in a more controlled setting. In the subsequent two studies, we modified the procedure slightly in order to resemble real-life picture-taking practices.

As outlined above, we conceptualise the construct of place identification as the linkage of the person to the place in affective, cognitive, and conative terms (Kyle et al., 2014; Scannell & Gifford, 2010; Van Dick, 2001). This multi-dimensional approach to conceptualisation was implemented to gain a more detailed understanding of the role of selfie-taking for place identification. It adds to the little studied topic of whether the different sub-dimensions of person-place linkage are related to the same or different predictors (e.g., Ashforth et al., 2008; Droseltis & Vignoles, 2010; Jorgensen & Stedman, 2006). Thus, the multifaceted measurement-approach aims at exploring the hypothesis in more detail and acknowledges potential context-dependence.

As self-categorisation can occur on different levels (Turner et al., 1987; Van Dick et al., 2004), we selected different targets or foci of place identification. In Studies 1 and 2, we focused on a university, whereas in the third study, we selected a city to also capture a "broader" focus of identification.

In all studies, we aimed at a sample size of $N = 128$ in order to detect medium-sized effects, $f = 0.25$, of experimental condition at $p < .05$ with a power of at least 0.80 (power analysis using G*power; Faul, Erdfelder, Buchner, & Lang, 2009).

To test the hypothesis that taking selfies in a particular place would strengthen the selfie-takers' identification with that place, we conducted multivariate analyses of covariance (MANCOVA) with the three aspects (i.e., affective, conative, and cognitive) of place identification as the dependent variables and the experimental condition (i.e., no selfies versus selfies) as the independent variable. We controlled for semester in Studies 1 and 2 (to control for the duration of their university affiliation) and residency in Study 3, task accomplishment with someone else versus alone (to control for the social component), and task enjoyment (to control for participants' attitude towards the task itself). Furthermore, to exclude potential interference effects between the three control variables and the experimental condition, we repeated the MANCOVA adding the corresponding interaction effects to the prediction (Dawson, 2014).

In the Appendix, we provide a detailed description of the participants, data exclusions, and all materials of the three studies.

3. Study 1

3.1. Method

Study 1 examined the effect of taking selfies on students' identification with their university in a laboratory setting.

3.1.1. Participants

Participants were 130 psychology students of a German university who received course credit for their participation. After data screening, the final sample comprised of $n = 122$ students (78% female; 52% in the selfie condition). On average, participants were $M = 21.55$ ($SD = 2.65$) years of age and had been studying for $M = 2.22$ ($SD = 1.87$) semesters.

3.1.2. Materials

Experimental manipulation. All participants received the same general instruction for the picture task, which was to take 5 to 10 pictures on campus within the next 10–20 min that show their life as a student of this university. Students in the experimental group were further asked to take selfies, while students in the control group were asked not to take selfies.

Place identification ratings. Students' affective identification with their university was measured with Bollen and Hoyle's (1990) three-item belongingness scale (e.g., "I feel a sense of belonging to < name of university > "). Conative identification was assessed with four items drawn from Cook, Purdie-Vaughns, Garcia, and Cohen (2012). These items measure the degree to which students perceive that they have the potential to succeed at their university (e.g., "I am the kind of person that does well in my university"). Finally, as a cognitively toned measure, the six-item organisational identification scale (e.g., "When I talk about this university, I usually say 'we' rather than 'they'") developed by Mael and Ashforth (1992) was administered. Participants indicated the extent to which they agreed with the 13 statements on a five-point

Likert scale (1 = *very weak* to 5 = *very strong*). Internal consistencies of the scales were considered good for the cognitive (Cronbach's α = 0.81) and the affective (α = 0.88) dimension, but only acceptable for the conative dimension (α = 0.68; with one item excluded).

3.1.3. Procedure

All instructions and questionnaires were administered via an online survey using *EFS Survey* (www.unipark.com) in a controlled lab environment. Participants were presented a cover story about the study's aim (i.e., to gather information about students' lives with the help of pictures). After being informed about data protection policies and receiving some general information about the procedure (three major parts: filling in a baseline questionnaire, taking pictures, and answering some final questions), all participants gave their informed consent. Then, they completed the baseline questionnaire assessing demographic characteristics, social media behaviour, and personality characteristics. Next, they were randomly assigned to the experimental condition (no selfies versus selfies) by means of a random number generator implemented in the survey tool, and received the corresponding instructions for the picture task. Having completed the picture task, participants returned to the lab and showed their pictures to the investigator, who checked whether they had followed the respective instructions. Finally, participants answered the questions about the picture task itself, completed the place identification ratings, and were debriefed.

3.2. Results

Almost all participants (99.2%) took the requested amount of pictures; 16% took the pictures together with another person, and 67% evaluated the picture task positively ("task enjoyment" with the response options ranging from −3 = *I did not like the task at all* to 3 = *I liked the task very much*, and 0 representing the neutral point; $M = 0.86$, $SD = 1.62$). Students' cognitive identification with their university, $M = 2.71$, $SD = 0.86$, was lower than their affective, $M = 3.44$, $SD = 0.90$, or conative identification, $M = 3.60$, $SD = 0.71$.

Overall, the hypothesis test revealed a significant multivariate main effect of experimental condition on place identification. The univariate results showed that this main effect was significant and small to medium in size (Cohen, 1988) for the affective and conative sub-dimension of place identification (see Table 1): Participants in the selfie condition reported higher levels of affective ($M = 3.50$, $SD = 0.86$) and conative identification ($M = 3.75$, $SD = 0.67$) than participants in the control condition ($M = 3.37$, $SD = 0.95$, and $M = 3.45$, $SD = 0.74$, respectively). Experimental condition was not significantly related to the cognitive sub-dimension (descriptively there was a similar trend towards higher levels in the experimental, $M = 2.77$, $SD = 0.86$, than in the control condition, $M = 2.64$, $SD = 0.87$). Adding the interaction effects between the control variables and the experimental condition to the prediction in a second step of the analyses did not change these results. Thus, taking selfies had similar effects on students' identification with their university, irrespective of the time they had been studying, $F(3, 112) = 1.47$, $p = .227$, whether they had accomplished the task together with another person or not, $F(3, 112) = 0.08$, $p = .972$, or how much they (dis)liked the task, $F(3, 112) = 0.37$, $p = .778$. The univariate results were comparable.

3.3. Discussion

Our hypothesis that taking selfies in a particular place would strengthen the selfie-takers' place identification was supported. A more detailed inspection regarding the sub-dimensions revealed that the effect specifically applied to the affective and conative aspect of identification, but not to the cognitive aspect. These results held true even after controlling for potential confounding effects of students' tenure, task accomplishment with someone else, and task enjoyment. Among the control variables, only task enjoyment had a significant effect on the affective aspect of place identification, suggesting that higher task enjoyment related to a higher affective identification with the university. Furthermore, none of the interaction effects between the control variables and the picture task reached statistical significance at $p < .05$. Thus, students' tenure, task enjoyment, or task accomplishment with someone else could not explain why taking selfies increased the conative and affective, but not the cognitive aspect of place identification. The fact that selfie-taking exerted the strongest effect on conative identification might be explained by the higher level of correspondence between the picture task (a behavioural task) and this aspect of identification (a behavioural aspect; cf. Van Dick et al., 2004). Furthermore, the affective measure of identification (i.e., a sense of belongingness) might have been more sensitive to change than the cognitive measure. However, these explanations are highly speculative and require future research to further explore the process of place identification.

Notably, previous research on organisational identification and place attachment found that the affective, cognitive, and conative aspects did not all behave in the same way (Lewicka, 2011; Van Dick et al., 2004). Van Dick et al. (2004), for example, reported that each sub-dimension of organisational identification predicted different

Table 1
Multivariate and univariate main effect of experimental condition and the control variables (semester/residency, task accomplishment with someone else versus alone, and task enjoyment) on affective, conative, and cognitive aspects of place identification in the three studies.

Main effects	Multivariate model			Univariate Models for the three aspects of place identification								
				Affective			Conative			Cognitive		
	F	*p*	f^2	*F*	*p*	f^2	*F*	*p*	f^2	*F*	*p*	f^2
Study 1												
Semester	1.29	.280	.03	1.96	.164	.02	0.71	.401	.01	0.47	.495	.00
Task accomplishment with someone else	1.45	.232	.04	2.65	.106	.02	1.02	.314	.01	0.64	.424	.01
Task enjoyment	4.59	.005	.12	13.67	< .001	.12	0.64	.424	.01	1.69	.196	.01
Experimental condition	2.88	.039	.08	5.05	.026	.04	5.84	.017	.05	1.55	.216	.01
Study 2												
Semester	1.71	.177	.10	0.10	.755	.00	3.51	.066	.06	0.28	.598	.01
Task accomplishment with someone else	1.86	.158	.11	0.00	.949	.00	3.07	.086	.06	1.06	.309	.02
Task enjoyment	1.16	.334	.07	1.12	.296	.02	0.00	.966	.00	2.98	.090	.06
Experimental condition	0.63	.600	.04	0.02	.878	.00	0.02	.891	.00	1.94	.169	.04
Study 3												
Residency	4.88	.003	.12	2.04	.156	.02	0.00	.951	.00	10.93	.001	.08
Task accomplishment with someone else	1.17	.325	.03	0.59	.445	.00	1.53	.210	.01	0.05	.825	.00
Task enjoyment	1.62	.187	.04	2.85	.094	.02	0.01	.927	.00	2.79	.097	.02
Experimental condition	1.25	.295	.03	1.15	.285	.01	0.31	.577	.00	0.26	.611	.00

criterion variables. However, to our knowledge, there is not much empirical evidence with regard to the questions of (a) whether the three aspects themselves are predicted by the same or different variables, and (b) whether there is a certain temporal or causal sequence of the aspects (e.g., one aspect predicting the others; Ashforth et al., 2008; Droseltis & Vignoles, 2010; Jorgensen & Stedman, 2006). Van Dick (2001) and Kyle et al. (2014) argued that the cognitive aspect would be a necessary precondition for the other aspects to develop. On the contrary, other research suggests that affective aspects of person-place linkage develop faster, while cognitive aspects are more time dependent (Hernández, Hidalgo, Salazar-Laplace, & Hess, 2007; Rollero & De Piccoli, 2010). Thus, empirical evidence regarding the temporal sequence of aspects of place identification from previous studies remains inconsistent.

4. Study 2

4.1. Method

The aim of Study 2 was to investigate whether the findings of Study 1 would also be found in a less artificial setting, which more strongly resembled real-life picture-taking behaviour. Therefore, the procedure was slightly modified.

4.1.1. Participants

Participants were recruited at an Austrian university with the help of the university's social media department, which distributed an announcement and the hyperlink to the baseline questionnaire through their main social media channels (*Facebook* and *Instagram*). Two hundred and twenty-eight students filled in the baseline questionnaire, but only $n = 65$ completed the study. After screening, the final sample comprised of $n = 59$ students (78% female; 39% in the selfie condition). Participants who dropped out tended to be higher educated and worked significantly more hours per week compared to participants who completed the study (please see the Appendix for the drop-out analysis). The final sample's mean age was slightly higher than in Study 1, $M = 24.85$, $SD = 4.11$. On average, participants had been studying for $M = 5.83$ ($SD = 3.07$) semesters.

4.1.2. Materials

Experimental manipulation. The experimental manipulation was the same as in Study 1, except that the instructions were slightly adapted in terms of the time interval in order to better resemble real-life picture-taking behaviour (the respondents were asked to take 10 pictures throughout a whole day, instead of within the next 10–20 min).

Place identification ratings. The criterion variables were measured with the same scales as in Study 1. The scales assessing the cognitive ($\alpha = 0.87$) and the affective ($\alpha = 0.84$) aspect of place identification demonstrated good internal consistencies. However, the internal consistency for the scale measuring the conative aspect was low, $\alpha = 0.59$, and could not be improved through the exclusion of items.

4.1.3. Procedure

The announcement, which was distributed through the university's main social media channels (*Facebook* and *Instagram*), comprised the cover story regarding the study's aim (as in Study 1), information about the procedure (three parts: 1. baseline questionnaire, 2. picture task, 3. picture upload and final questions), and the hyperlink to the baseline questionnaire. Additionally, students were informed about data protection policies and the reward system (lottery of 10 vouchers worth 10 Euros each). The baseline questionnaire was the same short online survey as in Study 1. However, upon completion, respondents were encouraged to provide an email address, to which the instructions for the picture task were sent (randomised assignment by means of a random number generator). The email included the instructions for the picture task and the hyperlink to upload the pictures and to fill in the second questionnaire. Thus, different to Study 1, the whole procedure was managed online (using the university's online survey tool *Limesurvey*), without students coming into a lab or interacting with an experimenter.

4.2. Results

Again, almost all participants (91%) took the requested amount of pictures. However, differing from Study 1, more than half of the participants (58%) took at least some of the pictures together with another person. Similar to Study 1, about two thirds (66%) of the participants evaluated the picture task positively, $M = 0.85$, $SD = 1.74$, and, on average, their cognitive identification with their university, $M = 2.90$, $SD = 0.85$, was lower than their affective, $M = 3.73$, $SD = 0.82$, or conative, $M = 3.71$, $SD = 0.64$.

The results of Study 2 did not support our hypothesis, as the multivariate main effect of experimental condition was not statistically significant, and neither were the univariate main effects on the individual sub-dimensions (see Table 1). Comparable to Study 1, we additionally examined potential interference effects between the control variables and the experimental condition. Students' tenure, $F(3, 49) = 0.46$, $p = .712$, and task accomplishment with someone else, $F(3, 49) = 1.47$, $p = .235$, did not significantly interact with the selfie intervention, but task enjoyment did, $F(3, 49) = 3.45$, $p = .024$, $f^2 = 0.21$. A more detailed inspection of this finding revealed that the significant interaction applied to the cognitive aspect of identification, $F(1, 51) = 4.80$, $p = .008$, $f^2 = 0.15$, but not to the affective, $F(1, 51) = 1.16$, $p = .286$, nor to the conative aspect, $F(1, 51) = 1.28$, $p = .263$. In other words, the effect of experimental condition on cognitive identification depended on students' enjoyment of the picture task. Taking selfies significantly increased cognitive place identification among students who liked the task (response option +2), $t = 2.75$, $p = .008$, whereas it tended to decrease identification among those who did not like the task (response option −2), $t = -1.63$, $p = .109$. Fig. 1 (left) illustrates the interactive effect.

4.3. Discussion

The findings from Study 2 suggest that taking selfies in a particular place can have beneficial effects on a person's cognitive identification with that place – but only if the person enjoys taking these selfies. On

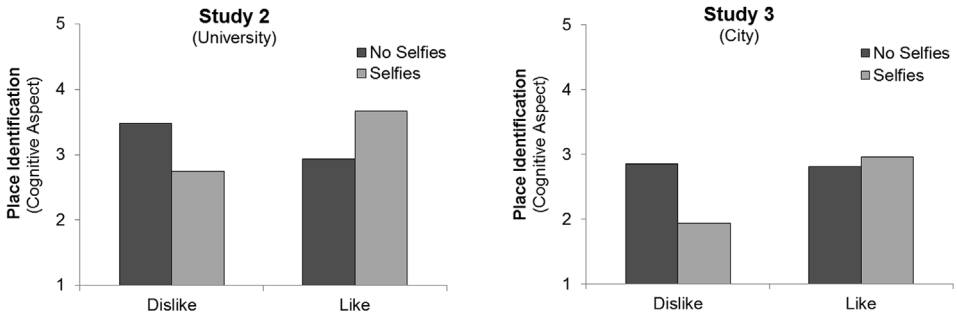

Fig. 1. Illustration of the Interaction between Experimental Condition (No Selfies vs. Selfies) and Task Enjoyment (Dislike vs. Like) on the Participants' Cognitive Aspect of Place Identification in the Two Field Studies. *Note.* Estimated Means Based on the Univariate Model for the Cognitive Aspect of Place Identification Including the Main Effect of Experimental Condition, the Main Effects of the Three Control Variables, and the Interaction Effect between Experimental Condition and Task Enjoyment (Dislike = Response Option −2; Like = Response Option +2).

the flipside, it might also have negative effects, if the person does not enjoy taking selfies. This tendency towards a negative effect of selfie-taking might have been caused by participants experiencing a loss of autonomy: If individuals were "forced" to take selfies, but did not like to do that, they might have experienced a threat to their freedom (i.e., psychological reactance; Brehm & Brehm, 1981). Consequential negative emotions could then have spread to the place where they had taken the selfies and could have led to a reduction of the participants' identification with that place. This argumentation is in line with a study by Knight and Haslam (2010), where lack of autonomy reduced psychological comfort, which in turn reduced organisational identification. The moderation effect is further explicable with research on activity involvement. Kyle et al. (2003) demonstrated that activity involvement is a significant predictor of a person's connection to the place where the activity was performed. Activity involvement is usually high if activities allow for self-expression – such as selfie-taking. However, high activity involvement also requires the activity to be enjoyable (Kyle et al., 2003). Therefore, in the current study, it is likely that activity involvement was high among those participants who enjoyed the activity of selfie-taking, which might explain why selfie-taking increased place identification only among those individuals.

The moderation effect was found for the cognitive, but not for the affective or conative aspect of identification. The non-significant finding for the conative dimension in this study might be attributable to the scale's poor psychometric properties. However, the significant effect on cognitive and the non-significant effect on affective identification stand in contrast to the results obtained in Study 1. As both studies employed the same measures, the argument concerning sensitivity to change of the measures provided for Study 1 is unlikely to hold. Rather, the different settings (lab vs. field) might have contributed to these results. It should be noted that these explanations, albeit plausible, have not been tested empirically and are highly speculative. Limitations associated with the sample (i.e., small size and high dropout) require caution in drawing any conclusions, as the study turned out to be underpowered.

5. Study 3

5.1. Method

Universities and other organisations are rather stable, homogenous, and bounded entities; conversely, public places or cities are more diverse and open (see also Lewicka, 2011). Therefore, Study 3 examined whether the hypothesised effect of taking selfies on individuals' place identification extended to open spaces and, thus, allowed a broader focus of identification.

5.1.1. Participants

The study was conducted in the public space of an Austrian city during the summer months. Two research assistants were instructed to recruit participants aged between 15 and 50 in areas of the city centre where diverse age groups are usually found (pedestrian area, shopping street, park by the riverside). The research assistants approached $N = 154$ passers-by and invited them to participate in a project that aimed to collect impressions of the city (cover story). The final, screened sample comprised of $n = 135$ participants (59% female; 52% in the selfie condition); 67 of them were residents of the city. The sample's mean age was $M = 22.53$ ($SD = 5.81$) years. Twenty-seven percent were pupils; 37% held a high-school diploma and 21% held a university degree.

5.1.2. Materials

Experimental manipulation. The experimental manipulation was similar to the other two studies, only the instructions of the picture task were slightly modified to fit the context. Participants were instructed to take about five pictures of the city; it was emphasised that the motifs should depict their personal connection to the city.

Place identification ratings. To our knowledge, the measures used in Studies 1 and 2 have not been tested with broader foci of identification such as a city, which is why we decided to use Kyle et al.'s (2014) place attachment measure instead. We selected the subscales "Affective Attachment" (2 Items, e.g., " < name of city > means a lot to me), "Place Dependence" (2 Items, e.g., " < name of city > is the best place for the activities that I enjoy"), and "Place Identity" (4 Items, e.g., "I feel that < name of city > is part of me") to measure the affective, conative, and cognitive aspect of identification, respectively (cf. Jorgensen & Stedman, 2001). Internal consistencies of the scales were good ($\alpha = 0.86$ for "Place Identity", with 1 item excluded due to its low factor loading; $\alpha = 0.78$ for "Place Dependence"; and $\alpha = 0.78$ for "Affective Attachment").

5.1.3. Procedure

Participants were informed about the procedure (similar to Study 1), data protection policies, and the reward system (voucher for two scoops of ice cream). Then, individuals who agreed to participate in the study received a booklet (2 pages). Having completed the first page of the booklet (demographic characteristics and social media activity, followed by the instructions for the picture task), participants handed the booklet over to the research assistants and went off for the picture task. After they had taken the pictures, participants returned to the research assistants and showed them their pictures, who ensured that they had followed the instructions. The research assistants passed their booklets back to them; participants filled in the questions on the second page of the booklet about the picture task itself and the place identification ratings, and received their ice-cream voucher. We could not use a completely randomised procedure to assign participants to the experimental conditions, as many participants were walking around in pairs or small groups. If they had been assigned to different conditions, they would have become aware of the experimental manipulation, which could have potentially confounded the results. Therefore, we "randomised" by alternating between the experimental and control condition, but assigned participants who were walking around in pairs or small groups to the same condition.

5.2. Results

Most participants (77.8%) took at least five pictures (Range 1–11), 65.9% evaluated the picture task positively ($M = 1.06$, $SD = 1.35$), and 66.7% took the pictures together with another person. Descriptively, among the three dimensions of person-place linkage, the affective aspect had – on average – the highest values, $M = 3.60$, $SD = 0.98$ ($M = 2.80$, $SD = 1.05$, and $M = 3.13$, $SD = 1.08$, for the conative and cognitive aspect, respectively).

Neither the multivariate main effect of experimental condition on place identification was significant, nor were the univariate main effects (see Table 1). Again, we re-analysed the data by adding the interactive effects between experimental condition and the control variables to the prediction. Similar to Study 2, the interaction between experimental condition and residency, $F(3, 124) = 0.69$, $p = .562$, and task accomplishment with someone else, $F(3, 124) = 0.05$, $p = .983$, were not statistically significant. However, task enjoyment significantly interacted with the selfie intervention, $F(3, 124) = 3.26$, $p = .024$, $f^2 = 0.08$. The interaction was significant in the univariate models predicting cognitive, $F(1, 126) = 4.00$, $p = .048$, $f^2 = 0.03$, and conative place identification, $F(1, 126) = 4.58$, $p = .034$, $f^2 = 0.04$. Fig. 1 (right) illustrates the pattern of the interaction for the cognitive aspect of identification (the pattern for the conative aspect was very similar). Taking selfies was positively (but not significantly) associated with cognitive, $t = 0.66$, $p = .508$, and conative, $t = 0.73$, $p = .465$, identification among participants who liked the task (response option +2). However, it significantly decreased identification with the city among participants who did not like the task (response option −2), $t = -2.02$,

$p = .045$, for the cognitive aspect, and $t = -2.23$, $p = .027$, for the conative aspect.

5.3. Discussion

Overall, the pattern of results was similar to that obtained in Study 2. However, overall effect sizes were smaller, and the negative effect of taking selfies among individuals who did not like the task was more pronounced than the positive effect among individuals who liked the task. Still, the same theoretical explanations for the moderation effect may apply as in the first field study of the current research (i.e., reduced feelings of autonomy and low activity involvement; cf. Knight & Haslam, 2010; Kyle et al., 2003).

As in the other two studies, we can only speculate why the moderation effect held for certain aspects of place identification only. Similar to Study 1, the strongest effect occurred for conative identification. This might be due to its operationalisation. The items for conative identification asked about how well the place served the participants to perform their preferred activities (rather than in terms of individuals' own achievement oriented behaviour, as in Studies 1 and 2). Thus, the conative aspect in this study had a stronger correspondence with the picture task than the other two aspects (Van Dick et al., 2004). Furthermore, similar to Study 2, effects were found on cognitive but not affective identification. This provides further support for the suggestion that different settings (lab vs. field) might foster effects on different aspects of identification.

In terms of comparability with the other two studies, two issues might be worth noting with respect to context-dependence and external validity. First, compared to Studies 1 and 2 the place identification values in this study were generally lower. Thus, it might be that participants had not chosen those places in the city that were most meaningful to them, but rather places that were nearby. In other words, participants in Study 3 might have accomplished the picture tasks in a less thorough manner than participants in Studies 1 and 2. The lower identification values, however, could have also been caused by the broader focus of identification in this study. Van Knippenberg and Van Schie (2000), for example, found that identification with social groups became stronger as group size decreased (e.g., higher identification with the work group than with the organisation). Thus, a lower quality of task accomplishment or a broader focus of identification may have caused lower place identification and might also be responsible for the lower effect sizes. Second, the conative aspect of identification with a city had a different quality. In the city context, behaviours such as spending spare time matter for conative identification to develop, whereas in the context of the university, academic performance is more relevant. Consequently, the picture task had an even higher category fit with the conative aspect of identification in this study than in the two previous studies (Van Dick et al., 2004). The higher correspondence between the task and this aspect of identification may again explain why the effect size was highest for conative identification.

6. General discussion

Can selfies change people's connection to places? The findings of this work provide initial evidence for this assumption across different research settings (lab vs. field) and places (university vs. city). Study 1 employed a lab setting and showed that taking selfies at the university increased students' *affective* and *conative* aspects of identification with their university. Study 2 aimed to replicate these findings in a field setting; and Study 3 further extended the scope of the study by applying it to the public space of a city. Neither of the two field studies could replicate the multivariate main effect found in the lab. However, both field studies revealed a significant effect of selfie-taking on *cognitive* place identification, if participants' task enjoyment was taken into account. Selfie-taking was positively associated with cognitive identification among participants who enjoyed taking selfies, but reduced cognitive place identification among participants who did not like taking selfies. In Study 3, this pattern also extended to the *conative* aspect of place identification. The more complex interaction between experimental condition and task enjoyment obtained in the field studies was not hypothesised in advance. However, as noted above, it is theoretically explainable with concepts such as autonomy (e.g., Brehm & Brehm, 1981; Knight & Haslam, 2010) or activity involvement (e.g., Kyle et al., 2003; see also Bonaiuto et al., 2016). We also did not hypothesise different effects of selfie-taking behaviour on the three aspects of place identification, as research and theorising on predictors of affective, cognitive, and conative place identification is scarce. Our findings suggest that taking selfies in an artificial lab setting affected other aspects of place identification than taking selfies in settings that more strongly resembled everyday life, though this remains to be theoretically addressed and empirically tested in future research. In sum, the results of the three studies revealed certain similarities, but were not perfectly consistent. This, however, does not undermine the contribution of the current research approach. Rather, it is quite common that results from laboratory and field studies differ in effect size and plainness (e.g., Mitchell, 2012). These divergences may indeed help advance theory, as they demonstrate the complexity of the processes underlying most psychological constructs.

6.1. Limitations

We employed different study designs to increase the external validity of our findings, which could be seen as a strength as well as a limitation. It might have been beneficial to first replicate the findings found in the lab study to ensure internal validity, before extending them to the field and other contexts to demonstrate external validity. A related issue concerns the use of different scales in Study 3 versus Studies 1 and 2 to ensure contextual validity. This raises the question of whether these scales assess the same underlying constructs. Although the similar pattern of results in the field studies speaks for the comparability of the affective and cognitive measures, the results for conative identification differed. This might be attributable to the low reliability of the scale in Study 2, but also to different qualities of conative identification captured with the measures. Future research may therefore address the question of convergent validity of measures developed for research on organisational identification and person-place linkage in environmental psychology.

Another similarity observed across the studies is the employment of self-report measures. We needed to rely on people's ability to reflect their feelings and cognitions towards a place, and only assessed explicit reflections towards the place. This limits our ability to draw conclusions on the underlying mechanisms of the effects. These limitations could be overcome by using technical tracking devices, such as eye tracking (see Diehl, Zauberman, & Barasch, 2016), or implicit measures of emotional and cognitive associations between the self and a place (e.g., in form of an implicit association test). In addition, all studies used a rather simple two-group post-test design. Generally, a random assignment of participants to experimental conditions ensures comparability of groups, in our case, comparability in terms of initial levels of place identification. Nevertheless, this cannot be substantiated, as we did not employ a pre-post measurement design. Even though we controlled for tenure in all three studies, a potential effect of initial place identification cannot be ruled out. Relatedly, it would be of interest to examine potential long-term effects of selfie-taking; yet, a follow-up measurement would be needed. For future studies, a pre-post control study design is recommended.

Finally, even though we tried to make the task resemble a realistic setting as much as possible, the design did not reflect a real world scenario. For instance, neither participants uploaded their photos on social media platforms, nor did they get any feedback by their social network on the pictures. In future studies, the inclusion of other variables such as real posting behaviour and feedback might increase the

effect of selfies onto a self-place-linkage. In addition, we did not explicitly consider social aspects of selfie-taking behaviour and places. Some people took their photos together with others, which already indicates that a social component might play an important role in feeling connected to a place and the desire to display this social connection in pictures (however, including task accomplishment with someone else as a control variable did not reveal any change in the results). Further, it remains an open question, whether the effects obtained were caused by the act of taking a selfie (i.e., taking a picture of oneself), or whether it was caused by creating a picture that shows oneself in a place, independently of who actually took the picture. Another control group in which participants were instructed to ask other people to take a picture of them at a place could give some indication concerning this question, also with respect to the applicability of the theoretical background (i.e., associative networks versus self-defining activity). These open questions were not the focus of the current research, yet they might inspire future research.

6.2. Implications

Despite these limitations and open questions that warrant future research and inspire theoretical development, our studies add to the sparse quantitative research on the selfie media phenomenon. By bridging the gap between several lines of research and combining a contemporary media phenomenon with long-standing theories, this work makes several important contributions, to both theoretical advancement and practical implications.

Our studies mainly contribute to the vast literature on place identification (and related concepts) by examining a contemporary media phenomenon based on the tradition of the social identity approach (Tajfel & Turner, 1986). We argue that selfies can be a contemporary form of expressing one's place-related identity (Proshansky et al., 1983). Over and above, our results suggest that selfies might not only serve an expressive function. As selfies are a form of active involvement with one's environment, they can reinforce the respective identification, and thus, serve a regulative function (Korpela, 1989; Slater, 2007). Considering the benefits of a strong self-place linkage concerning outcomes such as health, well-being, and environmentally responsible behaviours (Lewicka, 2011), we suggest that a certain kind of media behaviour, in this case, taking selfies, can strengthen the linkage of a person to a place, which as a potential consequence, could lead to spill-over effects in other domains.

Our results also indicate that individual differences regarding the enjoyment of taking selfies had a significant influence on the direction of the effect of selfie-taking on place identification. On a theoretical note, processes related to activity involvement or flow and autonomy are likely to account for these differential effects. From a practical perspective, one wonders whether the negative effect of selfie-taking behaviour among individuals who did not enjoy taking selfies would be relevant at all outside the scientific context. At first glance, one might not expect people to take selfies if they have no desire to do so. However, researchers are witnessing an increasing prevalence of selfies in social media (e.g., Dhir et al., 2016) as well as peer pressure in social network environments (Park, Kee, & Valenzuela, 2009). Furthermore, Charoensukmongkol (2016) found that peer pressure related to higher selfie-intensity. This suggests that outside a scientific context, presumably as a potential result of peer pressure, people might also take selfies despite not really enjoying it. The selfie-taking behaviour of such people may result in reduced identification with places.

Finally, as selfies can take various forms (e.g., in the gym, on the beach, in bed), their purpose and function also differ. Selfie-takers usually want to express themselves by logging a certain aspect of their life by camera, such as their hobby or social relationships, or documenting that they visited a special place. In some cases, selfies are taken at commemoration sites, such as Holocaust memorials – a phenomenon that has been frowned upon and controversially discussed in the media. Researchers suggest that so-called “dark selfies” might be an expression of young people's commiseration, respect or cultural involvement (Douglas, 2017). The current research approach bears potential to add to this argument, as taking selfies in such places might strengthen the connection between the self and the historic meaning of the place, or even augment feelings of empathy or compassion.

7. Conclusion

Taken together, our findings provide initial support to the assumption that the media phenomenon “selfie” shapes people's identification with the world around them. In times of *GoPros* and selfie-sticks, this research bears high practical relevance for marketing, social media, and users alike. A picture paints a thousand words when people use it to express themselves – yet a picture might also influence individuals in changing their identifications more than a thousand words could ever do.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.jenvp.2018.07.007.

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