Misattribution of duties as free choices: The role of emotional awareness in self-infiltration☆

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ABSTRACT

Individuals sometimes mistake others' expectations or imposed duties for self-chosen goals, even though they are not congruent with their emotional preferences or integrated values—a phenomenon coined as self-infiltration. Previous studies demonstrated that self-infiltration is more likely to occur in individuals with reduced self-regulation abilities. Here, we investigated in a sample of 250 students whether this association may be mediated by trait emotional awareness, the ability to recognize and understand one's emotions. This mediation hypothesis could be confirmed. We discuss our findings with respect to their potential relevance for research on motivated goal pursuit and health and practical applications.

1. Introduction

Imagine Laura who has been spending most of her free time after school with her passion for acting, which she would have loved to turn into a career. Her parents are both physicians and hold the opinion that their profession is a "more solid job." After finishing high school, Laura enrolls in a medical school to become a dentist, stating that this was her own wish. Despite her competencies and intellect that may have made her become a successful dentist, she experiences little joy in studying medicine and needs to invest unproportionally high effort in preparing exams compared to her fellow students. She is frustrated, feels stressed, and ruminates about her supposedly own choice of career. May Laura not have listened to her emotions so that her "self" became "infiltrated" by her parents' expectations of becoming a physician instead of following her passion for acting?

Misattributing others' expectations or even imposed duties as self-chosen goals has been coined as *self-infiltration* (Kuhl & Beckmann, 1994b; Kuhl & Kazén, 1994) and considered an unaware form of introjection—a suboptimal, conflictive form of goal internalization (Ryan & Deci, 2000, 2017). Research on self-infiltration as a nonconscious form of goal introjection is important as a continuous inclination to it may result in non-motivated goal pursuit and reduced well-being (Baumann, Kaschel, & Kuhl, 2005; Kehr, 2004a, 2004b; Ryan &

Deci, 2000, 2017; Sheldon et al., 2004; Sheldon & Kasser, 1995). Previous research (Baumann & Kuhl, 2003; Kaufmann et al., 2020; Kazén et al., 2003; Kuhl & Kazén, 1994) has demonstrated that self-infiltration is associated with low levels of *self-regulation abilities* in terms of self-regulation of emotions (see, for instance, Koole & Aldao, 2016) or threat-related action versus state orientation (Baumann et al., 2007; Baumann & Kuhl, 2002; Koole & Jostmann, 2004; Koole & Kuhl, 2008; Kuhl, 1994a, 1994b; Kuhl & Beckmann, 1994b). Accordingly, self-regulation refers to the ability to regulate one's emotions under challenging conditions and to disengage from goal-distracting negative emotions and concomitant ruminative thoughts. In response to thoughts about goal-distracting experiences, individuals with low self-regulation abilities (for whom these thoughts appear as uncontrollable ruminations) are supposed to lose awareness of their emotional preferences connected to a goal or action representation. Consequently, imposed goals (i.e., others' expectations) can more readily become misconceived as self-chosen goals (i.e., self-infiltrated; Baumann, Kuhl, & Kazén, 2005; Baumann & Kuhl, 2003; Kaufmann et al., 2020; Kazén et al., 2003; Kuhl & Kazén, 1994; for a recent overview, see Baumann et al., 2018;). However, losing awareness of one's emotional preferences as a driver of self-infiltration has not yet been directly and empirically tested, although its knowledge may contribute to practical interventions. Here, we intend to investigate the degree to which the relationship between

self-regulation abilities and self-infiltration is mediated by *emotional awareness*—the ability to recognize and understand one's emotions (Quirin & Kuhl, 2018). Additionally, the present study serves to replicate previous findings on the link between self-regulation abilities and self-infiltration based on a large sample.

We begin by explaining the construct of self-infiltration and how previous research has measured it. Subsequently, we report existing evidence on the relationship between self-regulation abilities and self-infiltration. Next, we address the role that emotional awareness may play in explaining the relationship between self-regulation abilities and self-infiltration by building upon diverse research traditions on emotional awareness and similar constructs.

1.1. Self-infiltration

Social beings grow up in close interaction with other individuals and therefore have some tendency toward aligning their goals with others' expectations. Often, this social alignment may not be congruent with an individual's emotional preferences, motives, personal goals, or values, or, briefly, with their *integrated self* (Baumann et al., 2018; Kuhl et al., 2015; Quirin et al., 2019; Ryan & Deci, 2000, 2017; Sheldon & Kasser, 1995). This self-incongruent goal is typically called an *introject* (Ryan & Deci, 2000, 2017). Previous research has demonstrated that individuals may not be aware of this self-incongruent status of a goal as they may misconceive others' expectations as self-chosen goals. Such a non-conscious form of introjection has been coined as self-infiltration (Kuhl & Kazén, 1994; for a recent overview, see Baumann et al., 2018).

Self-infiltration is of fundamental interest to personality and social psychologists because it may constitute a central mechanism underlying the motivational paradox that individuals set and strive for self-incongruent goals (e.g., Grund et al., 2018; Kehr, 2004b; Sheldon, 2014; Sheldon & Elliot, 1999; Sheldon & Kasser, 1995). Moreover, a huge body of research indicates that self-infiltration directly and as a non-conscious form of introjection may have detrimental effects on psychological functioning and well-being. For example, self-infiltration has been directly associated with rumination (Baumann & Kuhl, 2003), reduced ability to experience flow (Baumann & Scheffer, 2011), physiological stress response (Quirin et al., 2009), and depression and anxiety (Baumann et al., 2018). As a non-conscious form of introjection, self-infiltration has been associated with heightened susceptibility to persuasion (Kazén et al., 2003; Koestner & Losier, 2002), reduced vitality, life satisfaction, and subjective well-being (Ryan & Deci, 2000, 2017; Sheldon et al., 2004; Sheldon & Kasser, 1995) as well as increased depressive symptoms in response to major life transitions, such as entering college (Koestner et al., 2010). Self-infiltration can be considered an insidious form of introjection as its unavailability to the individual obscures their understanding of why they may suffer from lacking motivation or well-being and thus renders functional goal disengagement unlikely.

The non-conscious status of self-infiltration also thwarts its investigation via direct self-report questionnaires and therefore warrants a non-reactive, objective assessment. Kuhl and Kazén (1994) assessed self-infiltration by the degree to which imposed duties are misremembered as self-chosen goals in the context of a working day in an office simulated at the computer. Specifically, in their experiments, participants chose relatively unpleasant activities (e.g., "sharpening pencils" or "sorting letters") for later enactment, while other activities were assigned by a boss. Some activities remained neither chosen nor assigned. In a later phase of the experiments, participants performed an unexpected memory test for the original source of the activities. A tendency to falsely ascribe more originally assigned than remaining activities as self-chosen was used as a measure of self-infiltration. Individual differences in memory performance were controlled for by comparing these two different sources of error (i.e., false self-ascriptions of assigned vs. remaining activities). Hence, this self-other goal discrimination procedure measures the degree to which individuals can differentiate between self-chosen and imposed goals.

1.2. Self-infiltration and self-regulation abilities

Previous research investigated the relationship between self-infiltration and self-regulation abilities and found that deficiencies in self-regulation abilities were associated with increased self-infiltration (Baumann & Kuhl, 2003; Kaufmann et al., 2020; Kazén et al., 2003; Kuhl & Kazén, 1994). Individuals low in self-regulation abilities are supposed to be particularly sensitive to implicit or explicit forms of pressure imposed by their social environment (Kazén et al., 2003; Koole et al., 2005). When confronted with unpleasant demands or duties of an authority in a controlling situation (as experimentally induced in Kuhl & Kazén, 1994), individuals low in self-regulation abilities are expected to adopt a reactive mode of processing that directs their attention to potential threats in the environment (Mattie et al., 2016; Quirin et al., 2019). Due to this shift of attention, they lose their holistic accessibility to their goals, needs, preferences, and action alternatives (Baumann & Kuhl, 2002) or, briefly, they lose access to their integrated self (Kuhl et al., 2015; see also Baumann et al., 2018). Consequently, they may feel compelled to comply to the extent that they mistake these external directives for self-chosen goals (e.g., Kazén et al., 2003; Koole et al., 2005). In summary, self-regulation abilities involve the regulation of a variety of cognitive, affective, and behavioral processes over time and across changing situations (Diefendorff et al., 2018) that allows for the pursuit of goals in a self-determined manner (Ryan & Deci, 2000, 2017).

Several studies have already found that individuals with low levels of self-regulation abilities as measured by low scores in the failure-related action orientation scale (Kuhl, 1994a, 1994b) showed increased self-infiltration (Kuhl & Kazén, 1994), particularly under elevated levels of self-reported or induced negative mood (Baumann & Kuhl, 2003; Kazén et al., 2003, Exp. 3; Quirin et al., 2009) and external pressure (Kazén et al., 2003, Exp. 2). Similar results were found in scenarios where participants were to discriminate between their own preferences and recommendations putatively made by experts concerning suitable mini actions for training preschool children, that is, activities unrelated to the office (Kazén et al., 2003, Exp. 1).

1.3. The mediating role of emotional awareness

It has been assumed that the activation of a goal automatically co-activates an episodic memory trace of variables about the adoption of or decision for a goal, which conveys temporal, spatial, and emotional features as well as a felt commitment and other contextual variables (Heckhausen & Kuhl, 1985; Kuhl & Kazén-Saad, 1988; see also Gollwitzer, 1996). We assume that the emotional component is of particular relevance when it comes to sensing whether an activity was self-chosen or not. This is because self-chosen activities typically lead to a positive, not necessarily consciously experienced, revaluation of the goal (Brehm, 1956; Linder et al., 1967). The ability to accurately recognize and understand one's emotions, emotional awareness (e.g., Lane, 2008), therefore qualifies as a meaningful prerequisite for checking the extent to which a given activity is compatible with one's preferences or not (Kazén et al., 2003). However, shifting attention away from internal processes, such as emotions, toward potential environmental threats (e. g., negative signals from authorities) renders a successful checking of imposed goals with one's preferences difficult. This, in turn, increases an individual's vulnerability to mistake external directives for self-chosen goals. Therefore, it is likely that emotional awareness plays a central role in mediating between self-regulation abilities and self-infiltration.

Support for the role of emotional awareness as a central aspect of self-congruent and successful goal pursuit comes from various lines of research. Kehr and von Rosenstiel (2006), for example, who developed an intervention program called Self-Management Training (SMT) based on the compensatory model of work motivation and volition (Kehr, 2004b), consider an individual's awareness of implicit needs as a

fundamental prerequisite for intrinsically motivated goal pursuit. Grund et al. (2018), who extensively reviewed research on congruent goal selection, came to the same conclusion. According to the motivational competence model (Rheinberg & Engeser, 2010), the first and most important competence in setting self-congruent goals is an individual's access to own personal preferences. Strick and Papies (2017) provided empirical evidence for the pivotal role of emotional awareness in forming self-congruent goals. They showed that a brief mindful exercise helped individuals to set goals in line with their true preferences by becoming more aware of one's affective responses to need-relevant information during goal formation. Kreibich et al. (2020) disclosed that state and trait self-awareness positively predicted the identification of goal-related obstacles, a key element in the process of self-congruent goal pursuit. Stavrova et al. (2019) found in cross-sectional and longitudinal studies that individuals with high (vs. low) self-control are more successful at goal attainment because they select goals that reflect their true, authentic self. Consequently, the role of emotional awareness as an essential determinant of self-congruent and successful goal pursuit has already received considerable attention.

1.4. Present research and hypotheses

Here, we attempted to investigate whether emotional awareness mediates the relationship between self-regulation abilities and self-infiltration. Self-regulation abilities and emotional awareness were based on trait measures that account for mechanisms explicating reactions to different situations with different behaviors and perceptions (see Whole Trait Theory; e.g., Fleeson & Jayawickreme, 2015; Jayawickreme et al., 2019). Self-infiltration, in contrast, was assessed using a variant of the self-other discrimination task as applied in previous research (e.g., Quirin et al., 2009). As self-infiltration has been shown to be elevated in situations of negative mood, we induced ostracism via Cyberball (Williams, 2006) in the experiment. Different from previous research on self-infiltration, we used a large sample to investigate our hypotheses. To replicate previous findings, we hypothesized that reduced self-regulation abilities predict increased self-infiltration. Moreover, and most importantly, we hypothesized that emotional awareness mediates the assumed relationship between self-regulation abilities and self-infiltration.

Our hypotheses in the present study were not preregistered. In view of Open Science recommendations, we report how we determined our sample size, all data exclusions, all manipulations, and all measures related to our hypotheses. All study materials, including additional variables measured for different research purposes, are publicly available on the Open Science Framework (https://osf.io/b39sk/?view_only=f669594118bc42ac9a3bad0865277acb). Unfortunately, the data cannot be made openly accessible as our informed consent form for the study did not inform the participants of this possibility. The data are available on request.

2. Materials and methods

2.1. Participants

Basing our effect size estimates on the literature ($R^2 = 0.06$ as reported in Baumann & Kuhl, 2003; Exp. 1), we performed a statistical power analysis for estimating our sample size requirements. The power analysis with *GPower* ($\alpha = 0.05$, $\beta = 0.95$; Faul et al., 2009) yielded a sample size requirement of 186. We recruited 269 undergraduate students from the TUM School of Management and TUM School of Education, Technical University of Munich, who received course credits in exchange for participation. Technical problems with the online questionnaire and the experiment (incomplete online questionnaire data or shut down of experiments), erratic behaviors (unfinished experiments due to wrongdoing or a time-to-finish under 15 min given an average time-to-finish of 52 min), and insufficient German language proficiency

(CEFR level lower than C1) resulted in the exclusion of 19 participants. The final sample consisted of 250 participants (111 women; $M_{age} = 21$, ranging from 18 to 31 years; 222 students from the TUM School of Management).

2.2. Measures

2.2.1. Self-regulation abilities

We measured self-regulation abilities via the failure-related subscale of the Action Control Scale (ACS-90; Kuhl, 1994a, 1994b), which contains 12 failure-related items, each of which conveys a brief scenario with two alternative response options *a* and *b*, reflecting either an action-oriented or state-oriented response. For example, "When I am told that my work has been completely unsatisfactory: (a) I don't let it bother me for too long or (b) I feel paralyzed" with the latter response reflecting state orientation. A participant's final score is calculated by the sum of the answers that ranged from 0 to 12, with low scores indicating deficiencies in self-regulation abilities (state orientation). The internal consistency value (Cronbach's alpha) of the scale was 0.62, and the distribution of participants' average scores relatively normal ($M = 4.88$, $SD = 2.48$). Previous research empirically supported the construct validity of the scale by documenting positive relationships between low self-regulation abilities (i.e., state-orientation) and rumination (Düsing et al., 2016), committing oneself to unrealistic and need-incongruent goals (Brunstein, 2001), an increased incongruence between needs and goals (Baumann, Kaschel, & Kuhl, 2005), impaired volitional control (Kazén & Kuhl, 2020; Kuhl & Beckmann, 1994b), as well as impaired complex, intuitive processing (Baumann & Kuhl, 2002; Radtke et al., 2020).

2.2.2. Emotional awareness

To measure trait emotional awareness, we used the Self-Access Form (SAF; Quirin & Kuhl, 2018), which assesses an individual's subjective ability to access emotional self-referential information and thus to recognize and understand one's emotions. The measure contains five statements such as "When I am moody, it happens that I do not really know why" and participants indicate the extent to which they agree or disagree with each statement on a 4-point Likert scale ranging from 1 (*doesn't fit at all)* to 4 (*fits completely*). The internal consistency value (Cronbach's alpha) was 0.65, and the distribution of participants' average scores relatively normal ($M = 2.91$, $SD = 0.53$).

2.3. Experimental procedure and measurement of self-infiltration

2.3.1. Procedure

Participants completed an online questionnaire (ACS-90, SAF) at least one day before their appointment for the experiment in our laboratory. In the experimental session, groups of no more than eight participants were tested at different laboratory workstations. All participants signed an informed consent form before participating. We used the behavioral experiment software E-Prime (Version 3.0.3.80) to assess self-infiltration that has been applied in more recent studies (e.g., Quirin et al., 2009). It is an elaborated computer version of the paper-and-pencil method used by Kuhl and Kazén (1994) and builds upon the PANTER (Process-Analytic Neuroticism Test for Adults). Similar to Kuhl and Kazén (1994), the cover story of the experiment dealt with the simulation of a working day as a secretary and the ability to cope with a high daily workload.

In a first experimental phase, participants rated the attractiveness of 96 rather simple and unpleasant office activities according to "When you visualize the following activity and imagine yourself conducting it: How much fun is this activity for you?" on a 9-point Likert scale, ranging from 1 (*no fun*) to 9 (*a lot*). These office activities reflected activities typically occurring in a working day as a secretary and comprised, for example, "scanning documents" or "revising texts." In its original German version, each activity consisted of two terms, a verb and an object. To reduce the

likelihood to confound self-infiltration (unconscious introjection) with identification (Ryan & Deci, 2000, 2017), we confined the experiment to activities that were judged as low to moderate attractive in previous studies (e.g., Baumann & Kuhl, 2003; Kazén et al., 2003).

In a second experimental phase, participants engaged in a virtual ball-tossing game called Cyberball (Williams, 2006), which served as a mood induction in the experiment. We raised negative mood in all participants as previous research has demonstrated that variance in self-infiltration increases with negative mood or stress (see Baumann et al., 2018, for an overview). Cyberball is a minimal ostracism paradigm in which participants are ignored and excluded by putatively real other players within the context of a ball-tossing game. Cyberball has shown to be effective in previous research (see Hartgerink et al., 2015, for a meta-analysis of 120 studies). As a mood manipulation check, participants were instructed to rate their mood ("How do you feel at the moment?") immediately before and after Cyberball (as well as several times throughout the rest of the experiment for explorative reasons). Three negative items ("uncomfortable," "irritated," "depressed") and one positive item ("relaxed") were used. The scale ranged from 1 (*not at all*) to 9 (*totally*).

In a third experimental phase, participants received the information that part of a secretary's job was not only to select daily activities on one's own but also to enact the office assignments of a superior. Hence, all 96 office activities were presented in pairs of two that were of equal attractiveness according to the rating in the first experimental phase. After participants selected one of the two activities they want to perform, participants received the information which of the two activities was assigned by the superior. To equate salience of external assignment and self-selection, the assigned activity was highlighted by a frame, and participants had to click a checkbox below the assigned activity as a sign of confirmation. In total, all participants selected 48 activities on their own in addition to 48 activities assigned by the superior.

The combination of self-selection and superior's assignment resulted in four categories as the actual source of items: (a) both, that is, self-selected by participants and assigned by the superior; (b) self, that is, only self-selected by participants; (c) other, that is, only assigned by the superior; and (d) remaining, that is, neither self-selected nor assigned (Baumann & Kuhl, 2003). Through built-in algorithms, E-Prime completely balanced the number of activities in the above-listed categories (i.e., 24 activities per category).

In a fourth experimental phase, participants rated several non-sense words as a filler activity of 5 min on average to keep their mood relatively low or neutral (as effects may disappear in the presence of positive mood; Baumann et al., 2018). In a fifth and final experimental phase, they performed an unexpected memory task that assessed the remembered source of the activities. As a cover story for the memory test, participants were told that coping with situations of high workload would require an appropriate overview of activities, including a correct recall of the source of a given activity. In two separate classification tasks, participants were exposed to each activity sequentially appearing on the screen in random order. In the self-classification task, participants had to indicate whether the presented activity was previously self-selected or not. In the other-classification task, they had to indicate whether the presented activity was previously assigned to them by the superior or not. The order of both classification tasks was counterbalanced among participants, allowing us to control for possible sequence effects.

2.3.2. Measures of memory performance including self-infiltration

Data can be described using the 4 × 2 matrix as shown in Table 1 (Baumann & Kuhl, 2003). The rows represent the actual source of the activity (both, self-selected, assigned, or remaining), whereas the columns represent the participants' reported source in the two classification tasks (self-selected or assigned). The combination of the actual source and the reported source results either in "Correct," "FSA" (false self-

Table 1

Resulting Categories for activities based on the actual source and reported source in the two classification tasks.

Actual source	Reported source	
	Self-selected	Assigned
Both	Correct	Correct
Self-selected	Correct	FOA$_{\text{self-selected}}$
Assigned	FSA$_{\text{assigned}}$[a]	Correct
Remaining	FSA$_{\text{remaining}}$	FOA$_{\text{remaining}}$

Note. Rows represent the actual source of an activity, whereas the columns represent the subjective classifications made by participants; Both = activities that were self-selected by the participant and assigned by the superior; Remaining = activities that were neither self-selected by the participant nor assigned by the superior; FSA$_{\text{assigned/remaining}}$ = false self-ascription of assigned/remaining activities; FOA$_{\text{self-selected/remaining}}$ = false other-ascription of self-selected/remaining activities.

[a] This combination of actual source and reported source represents a case of self-infiltration.

ascription), or "FOA" (false other-ascription).

In line with previous research (Baumann et al., 2018), we measured self-infiltration by the participants' rates of false self-ascriptions of assigned activities (FSA$_{\text{assigned}}$; actual source = assigned, reported source = self-selected; see Table 1). Thus, the dependent variable self-infiltration represents the percentage of assigned activities that the participant mistook for self-chosen (0–100%). An FSA$_{\text{assigned}}$ rate of 0.5 indicates that 50% or 12 out of 24 originally assigned activities were falsely remembered as self-selected. Additionally, we followed the established procedure applied in previous research (see, for instance, Kazén et al., 2003, for a detailed description) to rule out alternative interpretations of self-infiltration. First, we controlled in our analyses for false self-ascriptions of remaining activities that were neither self-selected by the participant nor assigned by the superior (FSA$_{\text{remaining}}$; actual source = remaining, reported source = self-selected; see Table 1). In this way, we accounted for a possible memory confusion in terms of a general self-ascription tendency of assigned and remaining activities instead of a specific tendency toward false self-ascription of only assigned activities (i.e., self-infiltration) in individuals with low self-regulation abilities. Because the total number of assigned activities and the total number of remaining activities were identical in the third experimental phase, the null hypothesis expects an equal distribution of FSA$_{\text{assigned}}$ and FSA$_{\text{remaining}}$ rates or, put differently, that FSA$_{\text{assigned}}$ is completely explained by FSA$_{\text{remaining}}$. Any significant relationship with FSA$_{\text{assigned}}$ while controlling for FSA$_{\text{remaining}}$ can be seen as proof for the existence of self-infiltration and the respective predictive validity of each additional predictor. Second, we accounted for a possible global memory deficit concerning self-selected and assigned activities. In case of a global memory deficit, participants low in self-regulation abilities should not only show a higher tendency for FSA$_{\text{assigned}}$ but also a higher tendency to falsely classify self-selected activities as assigned by the superior (FOA$_{\text{self-selected}}$; actual source = self-selected, reported source = assigned; see Table 1) while controlling for FOA$_{\text{remaining}}$ (actual source = remaining, reported source = assigned; see Table 1).

3. Results

3.1. Descriptive statistics

Table 2 displays zero-order correlations among all study variables. As hypothesized, self-regulation abilities were significantly correlated with emotional awareness, $r = 0.20$, $p = .001$, and emotional awareness was significantly correlated with FSA$_{\text{assigned}}$, $r = -0.17$, $p = .006$. However, self-regulation abilities were not significantly related to FSA$_{\text{assigned}}$, $r = -0.11$, $p = .080$. FSA$_{\text{remaining}}$ was significantly correlated with FSA$_{\text{assigned}}$, $r = 0.62$, $p < .001$, in addition to the counterbalanced sequence of classification tasks, $r = 0.78$, $p < .001$. As expected, both

Table 2

Means, Standard Deviations, and Intercorrelations for all Variables of Interest.

Variable	M	SD	1	2	3	4
1. Self-regulation abilities (IV)	4.88	2.48				
2. Emotional awareness (MV)	2.91	0.53	0.20**			
3. FSA$_{assigned}$ (DV)	0.43	0.23	−0.11	−0.17**		
4. FSA$_{remaining}$ (CV)	0.35	0.17	−0.07	−0.05	0.62***	
5. Sequence CTs (CV)[a]	0.50	0.50	−0.02	−0.08	0.78***	0.50***

Note. $N = 250$. IV = independent variable; MV = mediator variable; DV = dependent variable; CV = control variable; FSA$_{assigned/remaining}$ = rate of false self-ascriptions of assigned/remaining activities; Sequence CTs = counter-balanced sequence of classification tasks.

[a] Self-classification task followed by other-classification task = 0, vice versa = 1.

** $p < .01$.

*** $p < .001$.

variables contributed to the presented findings and were included as control variables in further analyses.

3.2. Mood induction analysis

Mean ratings on the mood adjective items immediately prior to and following Cyberball were analyzed conducting a paired-samples *t*-test for each mood item. All mood items showed a significant difference between pre- and post-induction ratings in the expected direction: "Relaxed" ($M_{before} = 6.60$, $M_{after} = 5.78$, $t(249) = 6.32$, $p < .001$), "uncomfortable" ($M_{before} = 2.37$, $M_{after} = 2.88$, $t(249) = −5.19$, $p < .001$), "irritated" ($M_{before} = 2.39$, $M_{after} = 3.57$, $t(249) = −9.41$, $p < .001$), "depressed" ($M_{before} = 2.48$, $M_{after} = 2.93$, $t(249) = −4.57$, $p < .001$). The results indicate that our mood induction was successful.

3.3. Hierarchical multiple regression analysis

To test our hypothesis and replicate previous results that reduced self-regulation abilities predict increased self-infiltration, we conducted a hierarchical multiple regression on FSA$_{assigned}$. We entered FSA$_{remaining}$ and the sequence of classification tasks in Step 1, followed by self-regulation abilities in Step 2. Consistent with expectations and previous research, deficits in self-regulation abilities significantly predicted increased FSA$_{assigned}$, β = −0.08, $t(3, 246) = −2.15$ $p = .032$; $R^2 = 0.68$, $\Delta R^2 = 0.006$; $\Delta F(1, 246) = 4.64$, $p = .032$. To rule out a global memory deficit (or other alternative explanations like lower conscientiousness) concerning self-selected and assigned activities in individuals with low self-regulation abilities, we conducted the same analysis on FOA$_{self-selected}$. The hierarchical multiple regression analysis on FOA$_{self-selected}$ while controlling for FOA$_{remaining}$ and the sequence of classification tasks in Step 1 revealed that deficits in self-regulation abilities in Step 2 did not significantly predict FOA$_{self-selected}$, β = −0.02, $t(3, 246) = −3.0$, $p = .762$; $R^2 = 0.18$, $\Delta R^2 = 0.001$; $\Delta F(1, 246) = 0.09$, $p = .762$. It should be highlighted that the model fit is considerably worse compared to the model fit with FSA$_{assigned}$ as the dependent variable ($R^2_{FOA} = 0.18$ vs. $R^2_{FSA} = 0.68$). Therefore, results on FOA$_{self-selected}$ did not indicate a global memory deficit in individuals with low self-regulation abilities (which is congruent with previous findings; see Kazén et al., 2003, for instance).

3.4. Mediation analysis

To test our central hypothesis that emotional awareness mediates the effect of self-regulation abilities on self-infiltration, we followed the recommendations by Preacher and Hayes (2004, 2008). We used a total of 10,000 bootstrapping resamples and 95% percentile confidence

intervals to test whether the size of an indirect effect is significantly different from zero (Shrout & Bolger, 2002). Percentile bootstrapping is a non-parametric approach that determines confidence intervals by two percentile cut-offs of the sampling distribution (2.5% and 97.5%), which is why it enables an accurate and robust test of the indirect effect (Preacher & Hayes, 2004, 2008). Using IBM SPSS (Version 26) PROCESS macro (Model 4; Hayes, 2018), we entered FSA$_{assigned}$ as the dependent variable, self-regulation abilities as the independent variable, emotional awareness as the mediator, FSA$_{remaining}$ and the sequence of the classification tasks as covariates.

The mediation analysis revealed that the effect of self-regulation abilities on FSA$_{assigned}$ was significant, $b = −0.01$, $SE = 0.003$, $t(246) = −2.15$, $p = .032$. The effect of self-regulation abilities on emotional awareness was significant, $b = 0.04$, $SE = 0.01$, $t(248) = 3.25$, $p = .001$. Furthermore, the effect of emotional awareness on FSA$_{assigned}$ while controlling for self-regulation abilities was also significant, $b = −0.04$, $SE = 0.02$, $t(245) = −2.66$, $p = .008$. Self-regulation abilities were no longer a significant predictor of FSA$_{assigned}$ while controlling for the mediator emotional awareness, $b = −0.005$, $SE = 0.003$, $t(245) = −1.60$, $p = .111$, suggesting a full mediation model. The indirect effect of self-regulation abilities on FSA$_{assigned}$ through emotional awareness was found to be significant, $b = −0.002$, $SE = 0.001$, 95% CI [−0.004, −0.0003]. Hence, in line with our hypothesis, emotional awareness mediated the relationship between reduced self-regulation abilities and increased self-infiltration. The results remained the same when removing all control variables, that is, the indirect effect stays significant, $b = −0.003$, $SE = 0.002$, 95% CI [−0.006, −0.0005]. In further support of our hypothesis, the mediation model only works in the expected direction in line with our theoretical reasoning, that is, the indirect effect of emotional awareness on self-infiltration through self-regulation abilities was found to be non-significant, $b = −0.005$, $SE = 0.004$, 95% CI [−0.013, 0.001].

4. Discussion

The present study found that trait emotional awareness mediated the effect of self-regulation abilities on self-infiltration. This result suggests that being able to recognize one's emotions may constitute a critical variable in individuals with high self-regulation abilities that safeguards them from unwittingly being infiltrated by others' expectations. Moreover, the present study replicated previous results on an association between reduced self-regulation abilities and increased self-infiltration in a large sample (e.g., Baumann & Kuhl, 2003; Kazén et al., 2003).

Our findings extend previous research by providing a full mediation model that takes the central role of emotional awareness into account. Until now, reduced emotional awareness in individuals with low self-regulation was assumed but not directly and empirically tested. Our results show that individuals low in self-regulation abilities possess reduced emotional awareness and may thus have difficulties in perceiving their emotions connected to a goal.

Apart from self-infiltration, alienated goal pursuit has also been investigated for attitudes and motives. The present findings are mostly compatible with this research. For example, previous research suggested that self-awareness may explain congruencies between implicit and explicit self-concepts (Hofmann et al., 2005). Research on motives predominantly investigated and confirmed potential effects of implicit-explicit discrepancies on reduced well-being (Baumann, Kaschel, & Kuhl, 2005; Kehr, 2004a; McClelland et al., 1989). Similar to previous and the present research on self-infiltration, Baumann, Kaschel, and Kuhl (2005) investigated the role of self-regulation abilities in motive discrepancies and provided evidence for a buffering role. Also, future research would be needed to investigate the exact quality of self-awareness, that is, whether a more conceptual-propositional (drawing putatively logical conclusions from one's behavior) or emotional-interoceptive form of awareness lies at the core of these effects. Our findings support the latter. In sum, future research may be motivated by

the present results to investigate the role of emotional awareness in buffering implicit-explicit discrepancies in attitudes or motives, but combining assessments of either type of self-awareness would be desirable.

Which could be the functional or even neurobiological mechanisms underlying self-infiltration? Self-infiltration has been discussed to be a phenomenon that can causally be attributed to limited access to the integrated self (Baumann & Kuhl, 2003; Baumann, Kuhl, & Kazén, 2005; Kaufmann et al., 2020; Kazén et al., 2003; Kuhl & Kazén, 1994; Quirin et al., 2009). According to Personality Systems Interactions (PSI) theory (Kuhl, 2000, 2001), individuals with low self-regulation abilities contain perseverating negative affect and stress with themselves, conscious or non-conscious (e.g., Brosschot et al., 2010), and this negative affect reduces access to information about personal motives, preferences, and values and integrated autobiographical memories. These self-referential representations are considered to be hosted by the integrated self as a neuropsychological system (Kuhl et al., 2015). The integrated self is considered to provide broad and remote connections among these self-representations as a process of internalization and self-growth that attaches personal meaning to novel experiences (Kuhl et al., 2020). When confronted with demands of an authority in a controlling manner (e.g., Baumann & Kuhl, 2003; Kazén et al., 2003; Kuhl & Kazén, 1994), accessibility to this holistic network of integrated self-representations is particularly diminished in individuals with low self-regulation abilities—a necessary condition to consider in parallel different internal states connected to an imposed goal such as needs, preferences, feelings, and action alternatives (Baumann & Kuhl, 2002). Consequently, this loss of introspective overview, including emotional preferences for a goal, is thought to make these individuals more inclined to attend to and prioritize external demands (Kazén & Quirin, 2018). Two studies on self-infiltration from Baumann, Kuhl, and Kazén (2005) suggest that a right-hemispheric network might be involved in the integrated self, which is in line with much evidence on the role of the right anterior insular cortex in momentary interoception of emotions (i.e., emotional awareness) and bodily sensations (Craig, 2009). These neuropsychological findings support an understanding of the mechanisms underlying personality (Quirin et al., 2020).

Personality researchers show an increasing interest in the dynamic mechanisms underlying personality congruence and personality functioning in general (e.g., Baumert et al., 2017; Cervone & Shoda, 1999b; DeYoung, 2015; Vallacher et al., 2002). To be able to properly investigate within-person dynamics that may engender alienated goal pursuit, researchers need to go beyond correlating personality questionnaires by applying, among others, experimental and objective cognitive procedures (Quirin et al., 2020; Robinson et al., 2019). This is also the case for investigating potential determinants of the consistency versus inconsistency of behavior (e.g., Cervone, 1997, 1999; Cervone & Shoda, 1999a; Fajkowska, 2013; Mischel, 1973). Specifically, the pursuit of introjected goals is, by definition, associated with low pleasure. Consequently, individuals need to maintain high levels of effort over time to reach their goals (Kehr, 2004a; Ryan & Deci, 2000, 2017). This evidently puts the consistency of behavior at risk. For example, Koestner et al. (1992) found that participants who regulate their behavior in an autonomous (vs. controlled) manner not only displayed significantly higher attitude-behavior correlations but also showed greater consistency between self-descriptions of conscientiousness and a behavioral criterion. In sum, the examination of self-infiltration by means of a memory paradigm and relating it to personality traits (self-regulation abilities, emotional awareness, or others) strongly contributes to an understanding of the intraindividual dynamics of personality and behavior.

If emotional awareness plays a crucial role in buffering self-infiltration, as supported by the present study, can individuals protect themselves from self-infiltration by temporarily but also permanently (see Roberts et al., 2017, for a recent meta-analysis on trait changes through interventions) increasing one's emotional awareness? If yes, to which degree? For example, in the studies mentioned above on right-hemispheric involvement in the integrative self, participants squeezed a ball with the left hand for only 1 min, which led to immediate reductions in self-infiltration. One may also hypothesize that increasing an individual's emotional awareness by a mindfulness intervention (Strick & Papies, 2017), a self-motivation imagery exercise (Baumann & Kuhl, 2020), or affect-focused goal imagery (Job & Brandstätter, 2009) might function as short and effective ways to safeguard oneself from self-infiltration. However, Kaufmann et al. (2020) found that mindfulness-based practices actually increase self-infiltration among state-oriented individuals. Thus, individuals with low self-regulation abilities may need special guidance to partake in the benefits of techniques that have become popular self-help tools (see Cebolla et al., 2017, for evidence of potential negative effects of mindfulness techniques in general). Alternatively, they may turn to more specifically tailored interventions (Baumann & Kuhl, 2020; Friederichs et al., 2020). Therefore, future research is needed to advance state and trait emotional awareness and, thus, the ability to differentiate personal goals from others' expectations or their self-compatibility. Increasing individuals' self-insight in this regard would enable them to make conscious decisions in favor of or against a goal, thus raising self-determination in life (Ryan & Deci, 2000, 2017).

The question of developing interventions to improve emotional awareness and therefore to reduce self-infiltration is directly linked to the question of the role of emotional awareness in psychopathology. In fact, emotional awareness revealed to be a predictor of subjective mental health in previous research (Quirin & Kuhl, 2018) and is typically reduced in psychological disorders (e.g., Lane, 2008). Along with findings on a link between self-determination and health (Ryan & Deci, 2000, 2017), the present finding suggests that self-infiltration, that is, a form of alienation the individual does not realize, may play a role in psychopathology as well. Because self-infiltration by definition is latent to the individual, the present research demonstrates the relevance of using indirect measures (e.g., memory classification tasks used here) to uncover mechanisms underlying alienation not only in personality but also clinical research, as it may help to uncover the dynamics underlying putatively endogenous depression.

It also remains an open question for future research to investigate cultural differences concerning self-infiltration. Iyengar and Lepper (1999) showed that external choice (and not personal choice) by trusted authorities produced the highest level of intrinsic motivation for interdependent individuals. Accordingly, future research may investigate whether external choice in interdependent cultures (or individuals) is related to higher levels of identification as compared to introjection. Since compliance is highly valued in interdependent cultures, there might be a bias toward a positive evaluation of external choices made by trusted authority figures which, in turn, promotes an internalization through identification rather than introjection.

In interpreting the present findings, it is also important to delineate self-regulation abilities in terms of failure-related action and state orientation (as applied here) from self-control (e.g., Friese et al., 2019). Self-regulation and self-control have been used interchangeably in self-control research, although referring to different constructs (also known as "jingle-jangle fallacy"; see, for instance, Milyavskaya et al., 2019). While self-control in terms of self-discipline and controlling dominant responses is broadly understood as a mentally demanding or "effortful" and exhaustible type of regulation (e.g., Friese et al., 2019), self-regulation in terms of failure-related action orientation can be considered an "effortless" and inexhaustible type of regulation through the activation and participation of the integrative self (see Quirin et al., 2021, for more information on the difference between the self-control and self-regulation abilities). We, therefore, want to motivate future research to carefully distinguish between effortful and effortless types of self-regulation since they may refer to different lines of research, include different assumptions, and also have different implications for research and practice.

4.1. Limitations and future directions

We found relatively small effects for the mediation model, which may be attributed to the circumstance that individual differences in self-infiltration increase in the presence of negative affect. According to previous research, situational antecedents of self-infiltration are overt stressors, such as external pressure (Kazén et al., 2003), negative mood inductions (Baumann & Kuhl, 2003), and stress inductions (Quirin et al., 2009). Although we could successfully induce self-reported negative mood by the Cyberball game, this game may not be effective or lasting enough (short time period to full recovery; Hartgerink et al., 2015) to allow for stronger effects on self-infiltration (Prentice & Miller, 1992). Although this question is not central to the present study, future research may include an experimental group that controls for the effects of Cyberball. Furthermore, according to Walters (2019), mediation coefficients are typically small, which may be explained by strong control variables. The strong correlation of both control variables with self-infiltration (more precisely, the rate of false self-ascriptions of assigned activities) may thus explain our small effects. In addition, comparably low internal consistency found for self-regulation abilities and emotional awareness may have also contributed to smaller effects. Future research may, therefore, replicate the present study also with an alternative measure of self-regulation abilities to prove not only its replicability and robustness but also its generalizability. Still, our findings are based on a strong theoretical consideration. They demonstrate that self-infiltration can be predicted by self-regulation abilities under low or absent levels of negative mood and is mediated by emotional awareness, which is in line with our central hypothesis.

Second, the present findings are based on a correlational research design, relying on trait measures of emotional awareness and causal interpretations derived from theory. Although self-regulation abilities via emotional awareness may constitute a functional mechanism explaining self-infiltration, it may not be excluded that an individual's proneness to self-infiltration along with potentially negative consequences may be an indicator of reduced access to the integrated self and consequently impair emotional awareness and self-regulation abilities. Both directions have been considered plausible based on feedback loop dynamics and may aggravate each other (i.e., loss-of-autonomy cycle; Kuhl & Beckmann, 1994a). To create a more precise understanding of the underlying process, future research could apply state in addition to trait measures of emotional awareness and examine how an individual's emotional awareness is affected by specific personality-by-situation interactions. The same applies to self-infiltration that may also be measured at multiple points of time to better differentiate between a current and dispositional tendency toward misattributing other's expectations as self-chosen goals. To finally answer the question of causality, future research might also consider longitudinal designs.

4.2. Conclusion

Reduced emotional awareness mediated the relationship between self-regulation deficiencies and increased self-infiltration. Emotional awareness thus may explain why individuals with low self-regulation abilities may be more prone to self-infiltration as a latent form of alienated goal representation. This finding is important because self-infiltration, as a non-conscious form of introjection, may compromise motivation and goal pursuit. This research may stimulate further research on the mechanisms underlying personality functioning using experimental paradigms and objective measurements.

Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Declaration of competing interest

We have no known declaration of interest to disclose.

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