Influencing Social Impressions Through Visually Induced Temperature in a Social Networking Site

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Abstract

Online social networking sites, such as LinkedIn, have become integral tools for career management purposes. Extant research has explored a range of explicit cues (e.g., textual descriptions related to education, work experience) individuals use in their impression management efforts. However, the literature has yet to pay attention to the effects of implicit cues in online settings. In the present research, we rely on the theory of grounded cognition to advance the field of consumer behavior by examining how the use of visual cues with metaphorical associations related to concrete experiences (i.e., temperature) may influence the perception of an individual's personality traits related to these concrete experiences (warmth, competence, coolness). We find that a LinkedIn banner image associated with hot temperatures can enhance the perception of warmth-related traits, but only when used by a female, and that an image associated with cold temperatures can enhance competence perceptions, but only when used by a male. Our findings suggest that high levels of concreteness in the concepts that the images evoke are critical for these effects to occur. The present work demonstrates that visual cues related to grounded experiences can enhance social perceptions in digitally mediated career settings. The present work represents a steppingstone for intriguing future research in the information systems literature leveraging the theory of grounded cognition in career-related platforms to influence social perception.

Keywords: impression management, social networking sites, grounded cognition.

Track: Consumer behavior

1. Introduction

Social perception is a critical aspect of career management, and personality assessments of job market candidates are an integral part of the recruitment process. Importantly, given the ever-increasing digitalization of work, online impression management has become critical, and professional social networking sites (SNSs), such as LinkedIn, have taken a major role (Garg & Telang, 2018). As a result, professionals must now be in a constant state of online impression management, in which professionals aim to shape the impressions others form about them, and correspondingly employers make increasing use of information from SNSs to assess job candidates (Berkelaar, 2017).

Following the aforementioned digitalization of career management, researchers have become increasingly interested in examining the influence of different cues used in online media on personality assessments. Although personality-driven impression management tactics can be conducted deliberately and strategically through explicit information, they can also rely on more implicit cues (Bolino et al., 2016). Existing research has largely relied on information that is explicitly and deliberately conveyed on SNSs, such as descriptions of education, professional experience, and hobbies (Berkelaar, 2017). Past studies have shown that information conveyed through profiles on LinkedIn can indeed help recruiting managers by gaining more knowledge about candidates (Pike et al., 2018). However, only a handful of studies have investigated implicit cues. These studies focused on clothing (Gunaydin et al., 2017) and the use of specific brands (Han et al., 2010), all of which can signal different personality traits. Nevertheless, an important cue that has yet to be studied, especially in the ever-increasing importance of SNSs, are visual backgrounds. This research gap is in spite of the latter's pervasiveness and spatially prominent place in these platforms, such as the banner image on LinkedIn profiles.

In the present research, we aim to reduce the aforementioned gap by investigating the effects of visual backgrounds in digital career-related platforms as implicit signaling cues that influence personality traits perception (Fernandez et al., 2021). Here, we target the universal dimensions of social cognition, namely warmth and competence (Cuddy et al., 2008), as well as the construct of coolness as a personality trait (Dar-Nimrod et al., 2012) given their close link with temperature through grounded experiences, metaphors, and emotions (Barbosa Escobar et al., 2021). Here, warmth is semantically associated with high temperatures, and competence encompasses personality traits that lead individuals to be perceived as *cold*. More specifically, we investigate whether visual backgrounds related to the physical concept of temperature (i.e., hot vs. cold) can influence social traits metaphorically linked to

temperature-related concepts (i.e., warmth, competence, coolness). The present work serves as a foundational step to leveraging state-of-the-art research on grounded cognition and property transfer in the context of online impression management.

2. Theoretical Background

In the present research, we build on the theory of grounded cognition (Barsalou, 2010), the conceptual metaphor theory (Lakoff & Johnson, 1980), and the general theory of property transference (Morales et al., 2018). In addition, we operationalize the development of stimuli with temperature associations building on the color-temperature crossmodal correspondence (Spence, 2020).

The theory of grounded cognition (Barsalou, 2010) poses that abstract concepts are grounded in concrete experiences of the world via conceptual metaphors, which the brain uses to make sense of the world. Here, metaphors conceptualize abstract ideas, which are less accessible than more concrete ones (Lakoff & Johnson, 1980). In this way, the brain may link the concrete experience of physical temperature with abstract social perception concepts via conceptual metaphors. For example, people often describe emotions and personality traits using temperature to ground said abstract traits in terms like ‘warm personality’ and ‘chill vibes’, terms commonly used in English with homologous terms in other languages. Relevant to the present study, a psychological construct connecting physical temperature and social impressions relates to social warmth, which refers to a universal dimension of social cognition, together with competence (together known as the Stereotype Content Model; SCM), that underlie perceptions of others (Cuddy et al., 2008). Individuals high in warmth are considered caring, warm, empathetic, friendly, and affectionate, whereas individuals high in competence, are considered intelligent, competent, efficient, capable, and clever (Abele et al., 2016), and hence they are considered as cold. In addition, related to low temperatures, the construct of *coolness* has been found to describe personality traits beyond those encompassed in the Big Five. Dar-Nimrod and colleagues (2012, 2018) identified two factors of coolness, namely *cachet coolness*, which reflects as friendly, attractive, and likable traits, and *contrarian coolness*, which manifests as rebellious, rough, and emotionally controlled traits.

The general theory of property transfer (Morales et al., 2018) poses that properties from a source can transfer to a target via any type of connection, be it physical or metaphysical, and that physical contact is neither necessary nor sufficient. These transferences may occur via symbolic and semantic mechanisms.

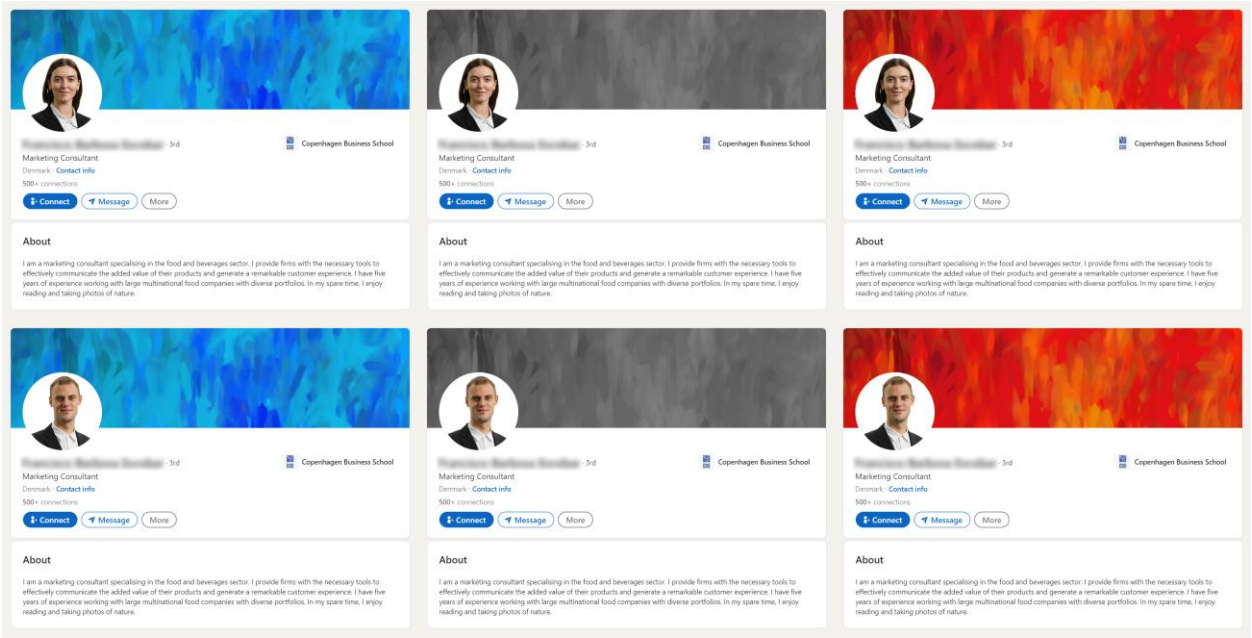
Following the principles delineated by the general theory of property transfer, it stands to reason that the properties of a physical concept (e.g., physical temperature) can transfer

metaphysically to a person via a symbolic interaction without the need for physical contact. Furthermore, based on the theory of grounded cognition, the (transferred) physical concept of temperature can activate metaphorical constructs related to it, such as social warmth. Based on this, we hypothesize that visual cues conveying qualitatively different temperatures (i.e., cold vs. hot) will transfer to a person, activate their corresponding metaphorical concepts and ultimately influence the congruent social impressions (i.e., coolness, warmth).

3. Methods

A total of 444 native English speakers from the UK (217 females, 219 males, 8 non-binary), aged 21–60 years (M_{age} = 36.47 years, SD_{age} = 10.11) participated in the experiment. Participants were recruited from Prolific (https://www.prolific.com/) and received GBP 0.45 as compensation for their time. The stimuli consisted of a partial mock-up LinkedIn profile of a male or female marketing consultant and university alum (Figure 1). The experimental manipulation was based on the banner image to convey specific temperatures. The banner consisted of a painting with patent brush strokes with specific range of colors associated with different temperatures (Ho et al., 2014), namely red–orange (for high temperature), blue–light blue (for low temperature), and black–grey (for control).

Figure 2. *Stimuli*



Note. The columns refer to the cold, neutral, and hot temperature conditions.

The experiment followed a 2 (gender: male, female) × 3 (banner temperature: cold, control, hot) between-subjects design. Each participant was randomly assigned to one of the six possible groups stemming from the interaction of the gender and backdrop temperature factors. Participants evaluated their impressions of the subject via 7-point ordinal questions from 1 (*strongly disagree*) to 7 (*strongly agree*). Participants evaluated coolness, warmth, and competence. In addition, they evaluated the different dimensions of coolness as per Dar-Nimrod et al. (2012), namely those corresponding to cachet coolness (i.e., friendly, ambitious, charismatic, confident, attractive, trending, caring, and detached [reversed]) and contrarian coolness (i.e., ironic, rebellious, tough, party animal, confident, and adventurous). The experimental stimulus were not visible while participants answered the questions. After evaluating the LinkedIn profile, participants evaluated their valence, arousal, and temperature associations of the banner image in isolation via 7-point visual analog scales (VASs).

4. Data Analyses

Warmth, competence, and overall coolness impressions were analyzed via separate ANOVAs on each of these variables with main and interaction effects of gender and temperature and attractiveness as a covariate in the models for warmth, competence, and overall coolness. Bonferroni-corrected pairwise comparisons were computed where appropriate. In the case of cachet and contrarian coolness expectations, two separate indexes for each construct were first created by averaging their underlying variables and then analyzed as the other variables.

5. Results

As manipulation check, the analysis revealed a significant effect of banner temperature on temperature association, $F(2, 447) = 799.38$, $p < .001$, $\eta_p^2 = .78$. The hot banner ($M_{hot} = 6.78$) was associated with the highest temperature and was significantly hotter than the cold banner ($M_{cold} = 1.91$; $p < .001$) and the control ($M_{control} = 2.08$; $p < .001$). However, the cold temperature associations of the cold banner were not significantly different than those of the control ($p = .666$).

Regarding warmth impressions, the analysis revealed only a significant main effect of banner temperature, $F(2, 437) = 4.26$, $p = .015$, $\eta_p^2 = .02$. Overall, the subjects with the hot banner were perceived as significantly warmer than the subjects with the control banner ($M_{hot} = 4.82$ vs. $M_{control} = 4.50$; $p = .020$) but not significantly warmer than those with the cold banner ($M_{cold} = 4.71$; $p = .980$). There were no differences in warmth perception between the

subjects with the cold and the control banners (p = .240). A closer examination of the effect of the banners on warmth impressions revealed that it was only significant for the female candidate. Participants considered the female with the hot banner as significantly warmer than the female with the control banner (M_{hot} = 4.87 vs. $M_{control}$ = 4.39; p = .016). There was neither a significant difference between the female with the hot banner and the cold one (M_{cold} = 4.63; p = .498) or between the cold one and the control (p = .459), which could have been by the valence of the cold banner offsetting differences in the dependent variables. When it comes to the male subject, there were no significant differences with any of the banner images (M_{hot} = 4.78, M_{cold} = 4.78, $M_{control}$ = 4.60; ps > .100).

In terms of competence, there was only a significant main effect of gender, F(1, 437) = 8.65, p = .003, η_p^2 = .02. Overall, the female subject was perceived as more competent than the male subject (M_{female} = 5.77 vs. M_{male} = 5.56; p = .006). As for coolness, the analysis did not reveal significant main effects of gender or banner temperature, or their interaction.

Regarding the broad dimensions of coolness, the cachet coolness index presented high internal reliability (ω = .82, 95% CI = .79, .85) but not so the contrarian coolness index (ω = .59, 95% CI = .52, .67). Consequently, we examined the effect of banner temperature solely on cachet coolness. The analysis revealed only a trend in the main effect of banner temperature, F(2, 438) = 2.67, p = .070, η_p^2 = .01. To explore potential drivers of this latter effect on cachet coolness, we ran independent ANOVAs on each of the cachet coolness dimensions as the previous models. Controlling for attractiveness, the analyses revealed a significant main effect of banner temperature on friendliness, F(2, 437) = 6.87, p = .001, η_p^2 = .03. Overall, the subjects with the hot banner (M_{hot} = 5.19) were expected to be friendlier than those with the control banner ($M_{control}$ = 4.82; p = .002), and the subjects with the cold banner (M_{cold} = 5.10) were expected to be friendlier than those with the control (p = .028). Nevertheless, this effect was also only significant for the female subject. Specifically, the female with the hot banner was expected to be significantly friendlier than the female with the control (M_{hot} = 5.28 vs. $M_{control}$ = 4.79; p = .004). There was no significant difference between the female with the hot banner and the cold one (M_{cold} = 5.01; p = .218) or between the cold banner and the control in the female condition (p = .467). There were no differences in the male condition between any of the banners (M_{cold} = 5.20, M_{hot} = 5.10, $M_{control}$ = 4.85; p > .100). Furthermore, the analysis revealed a significant main effect of banner temperature on charisma, F(2, 437) = 4.04, p = .018, η_p^2 = .02. Overall, the subjects with the hot banner were expected to me only marginally more charismatic than those with the control background (M_{hot} = 4.67 vs. $M_{control}$ = 4.39; p = .049).

6. General Discussion

The present research investigated whether visual cues with temperature associations can influence social impressions in digitally mediated career-related contexts. Overall, the results revealed that the effect of the visual cues varied depending on evoked temperature and the gender of the subject. We found that a hot banner enhanced a female's warmth impressions compared to a control background. Furthermore, the hot banner enhanced expectations on dimensions of cachet coolness (i.e., friendliness and charisma), which are tightly related to warmth (Dar-Nimrod et al., 2018). These results provide support to our hypothesis related to visual cues related to high temperatures and are partially consistent with past studies on hot visual cues and warmth perception in the context of advertising. Choi et al. (2016) found that people evaluated a male subject against a hot background (plain orange) as having a warmer personality than the same subject against a cold (blue), and neutral (black and white). The latter authors also found that a warm color background increased an observer's warmth perception of a brand when the background was used in advertisements and e-commerce websites. However, the literature thus far is silent as to whether these effects are present in digitally mediated career contexts, where social impressions are more critical.

It is important to highlight that the effects of the hot banner were only significant for the female subject. These results may be explained by the activation of specific gender stereotypes related to women and warmth. As extant literature has found, people tend to have robust associations between women and warm personality traits (Eagly et al., 2020). One way in which these gender stereotypes manifest relates to color (Cunningham & Macrae, 2011). Red-pinkish hues are considered feminine, whereas blueish hues are seen as masculine (Tham et al., 2020). These gender associations have been shown to influence the perception of individuals. For instance, a plain red background can make individuals categorize gendered-ambiguous upright faces as female rather than male significantly more often than with other background colors (Chen et al., 2023). As the latter authors argued, these effects are likely driven by top-down processing of learned associations between red and femininity. In other words, associations between physical and metaphorical warmth, red hues, and femininity seem to be all interrelated, either through statistical regularities or learned associations. Related to the present study, the hot background may have activated the concept of warmth as well as femininity via top-down processes. As such, the effect of the hot background may only appear when the activated temperature concept is congruent with the schemas related to the subject (i.e., femininity and warmth-related stereotypes). In turn, this congruence could

have led to better evaluations of the female subjects, as salient female identity triggers only the positive dimensions of the woman-equals-warm stereotype (Chatman et al., 2022).

Our work takes a multidisciplinary approach and, to the best of our knowledge, is the first to investigate the potential effect of visual background cues related to grounded sensory experiences (i.e., temperature) as implicit signals on social impressions (e.g., warmth, coolness) in digitally mediated career settings. Consistent with Roulin and Fernandez's (2022) call to explore how information from different elements in professional SNSs can be most effectively used, our results showed that banner images on LinkedIn profiles can indeed influence social impressions. Past literature has shown that cues that provide concrete information about individuals can affect social perceptions (Roulin & Stronach, 2022). However, until now, research has overlooked implicit cues (but see Tham et al., 2020). Our work contributes to the literature on impression management and demonstrates that these visual cues that do not provide explicit information about individuals' personality can serve as signals to enhance social impressions. Importantly, our results revealed the presence of gender effects likely driven by congruence between the schemas triggered by the visual cues and gender stereotypes. From a practical perspective, our findings elucidate an underutilized signaling tool that can enhance social impressions. This is especially important in digital settings given the pervasiveness of professional SNSs and the difficulty in conveying personality traits in such platforms.

It is worth noting different limitations of the present study. The effects found here may vary depending on idiosyncratic features of the subjects, as well as their self-description and position. In addition, while we leveraged crossmodal associations between colors and temperature, the possibilities of visual stimuli are virtually endless, and hence the magnitude of their effect may be different. Furthermore, there may be interaction effects between the visual stimuli and the subject's personal and professional background based on their level of congruence. For example, more artistic-looking backgrounds may be more congruent with more creative industries or positions. As part of our research agenda, we are currently conducting further experiments to investigate these potential interactions.

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