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Hospitality in a theatre: The role of physical warmth

Ruth Pijls[1]*, Mirjam Galetzka[2], Brenda H Groen[1], & Ad T H Pruyn[2]

[1]*Hospitality Business School, Saxion University of Applied Sciences, Enschede, The Netherlands*
[2]*Department of Communication Sciences, University of Twente, Enschede, The Netherlands*
**Correspondence: r.pijls@saxion.nl*

ABSTRACT: Insight into psychological mechanisms offers service organisations the opportunity to increase their hospitality performance. The present research shows that physical warmth positively contributes to people's experience of hospitality. In a field experiment among 127 visitors to a theatre, the effects of cold versus hot drinks and furniture on the experience of hospitality were examined using the Experience of Hospitality Scale (EH scale), measuring the three experiential factors of hospitality: *inviting*, *care* and *comfort*. In line with embodiment theory, hot drinks positively influenced the experience of the *care* factor of hospitality in the theatre foyer by triggering the abstract metaphor of mental warmth. However, warm furniture showed no effect, which supports the assumption that the effects of short- and long-term exposure to physical warmth are different. This study is the first to show a relationship between physically warm objects and the experience of hospitality in a service-oriented environment.

KEYWORDS: customer experience, embodiment, hospitable environment, service delivery, service environment

Introduction

Hospitality is an essential part of service quality these days. In the field of hospitality management, more and more literature is being published on the subject. This literature examines hospitality mainly from the host's point of view, focusing on how service organisations can organise their services in such a way that they increase their hospitality performance. However, do we not first need to know what customers experience as hospitality before we can increase the hospitality performance of organisations? Despite the large amount of literature on hospitality, little attention has been paid to the viewpoint of the guest, i.e. the experience of hospitality and the psychological mechanisms involved. The research presented in this article is part of a project on understanding the influence of environmental stimuli on the experience of hospitality in service-providing environments. This article specifically focuses on the influence of perceptions of warm environmental objects on the hospitality experienced in a theatre foyer.

Although service organisations are paying increasingly attention to hospitality, they lack the tools to improve their hospitality performance. Despite all the knowledge that already exists, understanding of the concept of hospitality is still in its infancy (Brotherton & Wood, 2008; Lynch et al., 2011; Tasci & Semrad, 2016). A few studies delved into the meaning of hospitality from a customer's perspective, specifically focusing on service staff behaviour in the hospitality industry (Ariffin & Maghzi, 2012; Blain & Lashley, 2014; Tasci & Semrad, 2016). Pijls et al. (2017) took a broader perspective by concentrating on services in general and incorporating the whole servicescape, including the physical service environment. Their research resulted in an instrument that measures hospitality and distinguishes three factors of the experience of hospitality in service environments: *inviting*, *care*, and *comfort*. *Inviting* refers to the experience of openness, freedom and feeling invited. *Care* refers to aspects such as experiencing involvement, effort, interest, relief, importance and support. *Comfort* is about feeling at ease, relaxed and comfortable.

In addition to existing knowledge on the behaviour of service staff, how can service organisations communicate hospitality by means of their physical environment? And more specifically, which sensory stimuli increase the hospitality experienced by service customers?

Hospitality and warmth

Descriptions of hospitality often contain words that refer to sensory stimuli. The literature shows that *warmth* is one of the most frequently mentioned words when describing hospitality. Hospitality is associated with a warm welcome (Ariffin & Maghzi, 2012; Tasci & Semrad, 2016), warmth and friendliness (Brotherton, 2005), warm services (Brotherton & Wood, 2008) and a warm ambience (Sim et al., 2006). Additionally, Tasci and Semrad (2016) discern a hospitality dimension which they call *heart-warming*, which includes polite, welcoming, friendly, courteous, helpful, respectful and kind. Ariffin and Maghzi (2012, p. 194) state that "hospitality is not only about greeting and helping guests but the 'warmth' of the greeting and sincerity and the 'all out' nature of the help offered". In addition, Burgess (1982, p. 50) describes hospitality as a "social relationship

fostered by the warm, friendly, welcoming, courteous, open, generous behaviour of the host".

As can be seen in the examples above, warmth in relation to hospitality is used in the psychological sense and seems principally related to the *care* factor of the experience of hospitality as described by Pijls et al. (2017). Literature outside the field of hospitality also provides support for the link between psychological or mental warmth and *care*-related aspects. Ackerman et al. (2010), for example, describe mental warmth in terms of caring, and an emotionally warm person is generous, friendly, helpful and trustworthy (Asch, 1946; Fiske et al., 2007; Williams & Bargh, 2008).

But is this abstract concept of *mental warmth* linked to the physical sensation of warmth? There is some evidence for this connection. In 1958, Asch stated that most abstract mental concepts are metaphorically based on concrete physical experiences. Murphy (1996) and Williams et al. (2009) also argued that cognitive concepts are fundamentally grounded in the physical context and perceptual processes. According to this theory of embodied cognition, abstract mental concepts are given meaning by metaphorically connecting them with a physical experience. For example, some studies provide evidence that the physical perception of weight (heaviness as opposed to lightness) is metaphorically associated with concepts of seriousness and importance (Ackerman et al., 2010; Chandler et al., 2012), and the experience of physical space impacts the experienced psychological space or freedom (Meyers-Levy & Zhu, 2007; Okken et al., 2012). Returning to warmth, it has also been suggested that the perception of physical warmth is metaphorically associated with mental warmth (Lakoff & Johnson, 1980; Williams & Bargh, 2008; Fenko et al., 2010; Bargh & Shalev, 2012; Zwebner et al., 2014).

However, it should be noted that in recent years replication studies have been published that failed to reproduce the findings of, for instance, the weight-importance relationship (Beek et al., 2018) and the physical warmth-psychological warmth relationship (Lynott et al., 2014; Donnellan et al., 2015; Lynott et al., 2017). Notwithstanding, assuming that embodied concepts exist, concrete physical perceptions may help to define service elements that contribute to a hospitable experience.

The present research elaborates on the embodied concept of warmth. It examines whether the embodied perception of warm environmental objects enhances people's experience of hospitality. It is expected that physical warmth will influence the *care*-factor of hospitality by activating the mental representation of warmth.

The embodied concept of warmth

Mental warmth is an example of an abstract metaphor grounded in a concrete physical experience, in this case in the sensation of physical warmth (Lakoff & Johnson, 1980; Williams & Bargh, 2008). Lakoff and Johnson (1980) argue that such a specific relationship between body and mind stems from early moments in life. In childhood, people get to know and experience the concept of affection (mental warmth) through the physical experience of physical warmth. When crying babies are comforted, they simultaneously experience both physical and mental warmth because of the affection in the action of being held and caressed by their parents. Fay and Maner (2012) indicate that an important element of the experience of physical warmth is that warmth is spatially limited. Heat can only be perceived when the source of the heat is close. They state, "for example, human bodies are warm, but one must be close to a body to feel its warmth" (Fay & Maner, 2012, p. 1369). This may be the reason that physical warmth may evoke abstract concepts such as social closeness or intimacy (Williams et al., 2009; Fay & Maner, 2012; IJzerman et al., 2013).

Studies on the embodied relationship between physical and mental warmth can be divided into two main categories: studies examining effects of short-term exposure to warmth (such as warm drinks and therapeutic pads [products that are designed to relieve pain]) and studies examining the effects of warmth stimuli with long-term exposure (such as ambient temperature). These two types of warmth stimuli are different bodily experiences, and therefore should be distinguished theoretically (e.g. IJzerman et al., 2013; Lynott et al., 2017).

Concerning the first type of stimuli, the findings suggest a positive relationship between physical warmth and mental warmth, the so-called "warmer is better" effects (Lynott et al., 2017). The most well-known experiment is that of Williams and Bargh (2008), who found that subjects who briefly held a warm cup of coffee were more likely to perceive someone else as mentally "warm" (i.e. friendly, helpful and trustworthy) compared to subjects who held a cup of iced coffee. IJzerman and Semin (2009) additionally showed that subjects who were holding a hot beverage perceived a person in mind as mentally closer to them than did those who were holding a cold beverage. Furthermore, Miyajima and Meng (2017) showed that touching a warm cup, as opposed to a cold cup, leads to helping behaviour, but only for women.

Besides the effect of holding hot versus cold drinks, the effects of briefly holding (therapeutic) pads have also been found. Williams and Bargh (2008) showed that people who briefly held a warm (versus cold) therapeutic pad were more likely to choose a gift for friends instead of for themselves. Furthermore, evidence was found that briefly holding a warm pack led to higher connection with others (Inagaki & Eisenberger, 2013) and increased interpersonal trust in computer games (Kang et al., 2010; Storey & Workman, 2013). Additionally, Bargh and Shalev (2012) showed that, at the other end of the continuum, physical coldness leads to mental coldness. They found that briefly holding a cold pad, as opposed to a warm or neutral pad, increased feelings of loneliness.

In replication studies, however, some effects have been questioned. Despite the use of sample sizes of hundreds of participants at multiple test sites, Lynott et al. (2014) failed to reproduce the findings of the Williams and Bargh (2008) study with the therapeutic pad. Lynott et al. (2017) also found no evidence for this effect. Chabris et al. (2019) recently published an article presenting replications of both experiments of Williams and Bargh (2008). In neither of the studies did they find evidence that physical warmth leads to interpersonal warmth. Nevertheless, all the positive evidence for effects of momentary physical contact with warmth belongs to the category "warmer is better".

Regarding the second type of stimuli, the long-term exposure to warmth, there are different types of effects, which seem to be related to whether the temperature perception is comfortable or not. First, the literature shows, just as for the effects of short-term exposure to warmth, the "warmer is better" effects of comfortable warmth perceptions. Prolonged exposure to

physical warmth leads to mental warmth, such as interpersonal warmth (Fetterman et al., 2017), social affiliation (Fay & Maner, 2012) and social proximity (IJzerman & Semin, 2009; Huang et al., 2013; Schilder et al., 2014). To illustrate, IJzerman and Semin (2009) found that participants in a warm room (22–24˚C) felt significantly closer to the experimenter than participants in a cold room (15–18 ˚C). In a replication study, these findings were confirmed (Schilder et al., 2014). Huang et al. (2013) showed a positive effect of ambient temperature, via perceptions of social closeness, on conformity to others' opinions. Furthermore, Lynott et al. (2017) investigated the influence of outside ambient temperatures in one of their studies and found a slightly positive relationship with prosocial behaviour. Additionally, Fay and Maner (2012) showed that a chair with a heat pad leads to higher levels of social affiliative motivation, increasing people's desire for social bonding. However, this effect was only found for people low in avoidance attachment (feeling comfortable with intimacy) and people high in anxiety attachment, with the explanation that anxious people are especially motivated to maintain and increase intimacy with others.

Secondly, while comfortable warmth shows "warmer is better" effects, uncomfortable heat shows "warmer is worse" effects. For example, Belkin and Kouchaki (2017) found that high outdoor temperatures (up to 34°C), as opposed to normal temperatures, made prosocial behaviour less likely. Heat led to fatigue, which reduced prosocial behaviour. Outside the embodiment literature, epidemiological research has also shown that under uncomfortable heat conditions people's discomfort may lead to negative societal behaviour such as hostility and aggression (see Lynott et al. [2017] for an overview of the literature on this topic).

Thirdly, for uncomfortable physical coldness, a different embodied mechanism seems to play a role. The literature suggests that in addition to prosocial behaviour stimulated by comfortable physical warmth, physical coldness can also lead to prosocial behaviour (Hong & Sun, 2012; Kolb et al., 2012; Lee et al., 2013; Rai et al., 2017). An explanation for this seemingly opposite effect is that physical coldness induces the desire for mental warmth and the corresponding behaviour. People are inclined to compensate for the physical coldness by seeking mental warmth. To illustrate, Rai et al. (2017) showed that low ambient temperature (15–17°C), as opposed to higher ambient temperature (22–24°C), leads to a need for social connection, which in turn leads to a higher intention to donate money and to an increase in the amount of money. In another study, they found that watching pictures of people suffering from cold leads to a need for social connection, which in turn increases the likelihood of donating money to charities. Furthermore, Hong and Sun (2012) showed that physical coldness leads to an increased liking of romance movies for people who associate romance movies with psychological warmth.

Compensating for physical coldness also seems to work the other way around, with mental coldness producing a desire for physical warmth. It was found, for example, that social exclusion (mental coldness) leads to a desire for warm food and hot drinks (Zhong & Leonardelli, 2008). Furthermore, chronic loneliness is associated with an increased tendency to take warm baths or showers (Bargh & Shalev, 2012; Shalev & Bargh, 2015). However, Donnellan et al. (2015) failed to reproduce this effect.

Overall, the literature on the embodiment of warmth suggests a relationship between physical and mental warmth, distinguishing between effects of short-term contact with warmth and prolonged contact with warmth. When confronted with prolonged warmth, the effects seem to depend on the comfort of the temperature sensation. Table 1 provides an overview of the effects found in the various studies on the embodiment of warmth. The table distinguishes between studies showing effects of short-term exposure to warmth (hot drinks and hot/cold pads) and long-term exposure to warmth (e.g. ambient temperature, physical warmth/coldness, warm furniture).

However, there is also criticism of the evidence in favour of the embodied cognition hypotheses. Discussions on whether there is an embodied relationship between physical and mental warmth mainly concern methodological issues in the experimental research, such as sample sizes, type and order of questions and potential confounding variables. Nevertheless, some studies examined the phenomenon using different types of methods. For example, Fetterman et al. (2017) performed two diary studies in which people reported their felt temperature and their interpersonal warmth on a daily basis. On days when participants felt physically warmer, they perceived themselves to be interpersonally warmer and more agreeable, irrespective of the outdoor temperature. Inagaki and Eisenberger (2013) additionally measured brain activity in an MRI to ascertain a possible relationship between physical and social warmth. Physical and mental warmth showed simultaneous activation of two brain areas: the middle insula and the ventral striatum. This suggests a common neural mechanism underlying physical and social warmth.

Thus, although evidence should be interpreted with caution, there is support for the assumption that physical sensations of warmth generate feelings of mental warmth, measured by related concepts such as a warm personality, social closeness, emotional closeness and prosocial behaviour. The current research builds on the studies examining the embodied relationship between physical and mental warmth by exploring the effect of physical perceptions of warmth on the experience of hospitality in a real-life setting of a theatre, thereby focusing on the effects of comfortable sensations of warmth.

Aim of the study

The present study explores the role of the embodied concept of warmth. Based on people's associations and descriptions of hospitality, this seems to be the embodied concept that is most closely linked to the experience of hospitality. The study focuses on the effect of perceptions of physical warmth on the experience of hospitality as perceived in a theatre foyer.

Because it is unknown what type of warmth stimulus results in the experience of hospitality, it was also investigated whether it matters how physical warmth is primed. Elaborating on Lynott et al. (2017), who also examined the effects of two types of heat sources in one experiment, the effect of physical warmth is explored by two types of environmental stimuli: one providing momentary physical contact and one providing long-term physical contact.

Firstly, elaborating on Williams and Bargh (2008) and IJzerman and Semin (2009), the effect of briefly holding hot versus cold drinks is examined. As warmth is conceptually especially close to the *care* factor of the experience of hospitality, the effect is expected to be specific to *care*, not to *inviting* and *comfort*. It is expected that:

TABLE 1: Overview of studies examining physical warmth as independent variable, for warmth stimuli of brief and of prolonged exposure (AT = ambient temperature)

Exposure	Type of stimulus	Effect	Publications
Brief exposure	Hot drink	Briefly holding a cup of coffee, as opposed to iced coffee, leads to interpersonal warmth. However, the replication study showed no effect.	Williams and Bargh (2008); replication study: Chabris et al. (2019)
	Hot drink	Warm drinks, as opposed to cold drinks, lead to social proximity	IJzerman and Semin (2009)
	Hot cup	Touching a warm cup leads to helping behaviour, but only for females	Miyajima and Meng (2017)
	Warm pad	Briefly holding a warm pad, as opposed to a cold pad, leads to prosocial behaviour (gift for someone else instead of for themselves). However, both replication studies showed no effect	Williams and Bargh (2008); replication studies: Lynott et al. (2014); Chabris et al. (2019)
	Warm pad	Briefly holding warm pad, as opposed to a cold pad, leads to interpersonal trust, additional neurological support	Kang et al. (2010); Storey and Workman (2013)
	Cold Pad	Briefly holding a cold pad, as opposed to a warm or neutral pad, increased feelings of loneliness	Bargh and Shalev (2012)
	Warm pad	Briefly holding a warm pad, as opposed to a neutral ball, leads to higher connection with others, additional neurological evidence	Inagaki and Eisenberger (2013)
Prolonged exposure	Ambient temperature	High AT (22–24°C), as opposed to low AT (15–18°C), leads to more social proximity	IJzerman and Semin (2009); replication study: Schilder et al. (2014)
	Ambient temperature	High AT (24–25°C), as opposed to low AT (16–17°C) leads to perceptions of social closeness, which leads to conformity to others' opinions	Huang et al. (2013)
	Ambient temperature	Higher outside AT (max. 24°C) leads to more prosocial behaviour (weak effect)	Lynott et al. (2017)
	Ambient temperature	Low AT (mean 20.22°C), compared to high AT (mean 25,96°C) lead to more helping behaviour and giving of higher discounts to customers	Kolb et al. (2012)
	Ambient temperature	Social exclusion leads to lower perceived AT and to a desire for warm food and drinks	Zhong and Leonardelli (2008)
	Ambient temperature	Eating alone leads to lower perceived AT than eating with a partner	Lee et al. (2013)
	Ambient temperature & pictures of people suffering from heat/cold	Study 1: with hot outside temperatures (up to 34°C), as opposed to normal temperatures, prosocial behaviour is less likely. Study 2: heat leads to fatigue, which decreases prosocial behaviour.	Belkin and Kouchaki (2017)
	Ambient temperature & pictures of people suffering from heat/cold	Study 1: low AT (15–17°C), as opposed to high AT (22–24°C), leads to a need for social connection, which in turn leads to 1) a higher intention to donate money; and to 2) an increased the amount of money. Study 2: watching pictures of people suffering from cold leads to a need for social connection, which in turn increases the likelihood of donating money to charities	Rai et al. (2017)
	Physical warmth (body)	On days when participants felt physically warmer, they perceived themselves to be interpersonally warmer	Fetterman et al. (2017)
	Physical warmth (body)	Reading positive messages about close friends/family leads to feeling physically warmer	Inagaki and Eisenberger (2013)
	Physical coldness (body)	Physical coldness leads to the desire for a social consumption setting, whereas physical warmth leads to a desire for eating alone	Lee et al. (2013)
	Physical coldness (body)	Physical coldness leads to liking of and willingness to pay for romantic movies (when associated with psychological warmth)	Hong and Sun (2012)
	Warm pad in a chair	A chair with a heat pad, as opposed to a non-heated pad, leads to higher levels of social affiliative motivation, but is only found for people low in avoidance attachment and people high in anxiety attachment.	Fay and Maner (2012)
	Tendency to take warm baths & showers	Loneliness (social coldness) leads to the tendency to take warm baths or showers. However, the replication study showed no effect.	Bargh and Shalev (2012); Shalev and Bargh (2015); replication study: Donnellan et al. (2015)

- Hypothesis 1: Touching and drinking a hot drink leads to an increased experience of the *care* factor of the experience of hospitality compared to touching and drinking a cold drink.

Secondly, for the heat source providing continuous physical contact, it seemed most obvious to manipulate the ambient temperature. However, since it is difficult to control the ambient temperature in a field study, inspired by Fay and Maner (2012) and Fenko et al. (2010), the effect of cold versus warm furniture is studied instead. Again, the effects are expected to be specific to *care*:

- Hypothesis 2: Sitting on heated furniture leads to an increased experience of the *care* factor of the experience of hospitality compared to sitting on non-heated furniture.

Based on the studies by Williams and Bargh (2008) and IJzerman and Semin (2009) on the effect of holding a cold versus a hot drink, it is expected that the effects of touching and drinking a hot beverage on the experience of hospitality are mediated by mental warmth. This leads to the next hypothesis:

- Hypothesis 3: The effect of the type of drink on the experience of the *care* factor of the experience of hospitality is mediated by the experience of mental warmth.

Furthermore, based on, among others, Fenko et al. (2010) and Fay and Maner (2012), comfortable warm furniture is also expected to lead to the experience of *care* via mental warmth. This leads to the fourth hypothesis:

- Hypothesis 4: The effect of the temperature of furniture on the *care* factor of the experience of hospitality is mediated by the experience of mental warmth.

Material and methods

Design and participants

A 2 (warm versus cold drink) x 2 (heated versus non-heated furniture) between-subjects quasi-experimental design was employed. On eight days in May and June, 145 visitors of 11 different theatre performances participated in the experiment. Participants were randomly assigned to the conditions of furniture material; on each day, half of the seats was heated and half of the seats was non-heated. Visitors were either offered a hot drink or a cold drink: on days 1, 3, 5 and 7, they could choose between hot coffee or hot tea, and on days 2, 4, 6 and 8, between iced coffee or iced tea. The indoor ambient temperature did not differ between the days on which warm drinks (M = 23.9°C) and the days on which cold drinks (M = 23.8°C) were offered.

Prior to the analysis, data from 18 participants were deleted from the analytic sample (two because they took the questionnaire to a table outside the research area, two because they received a second drink from someone else, and 14 because they declined the drink), yielding a sample of 127 participants (74 female; 53 male).

Environmental manipulation

The *drink* variable was manipulated by the type of drinks participants received before filling out a questionnaire on their experience of hospitality. The participants received either a paper cup with a hot drink (they could choose between tea or coffee) or a cold drink (they could choose between iced tea or iced coffee). Hot drinks were served from a thermos, cold drinks from a carafe placed in a cooler with ice cubes.

The *furniture* variable was manipulated through the temperature of the furniture on which participants were sitting while filling out the questionnaire. A manufacturer of heated seat cushions supplied them for the study. In the *heated* condition, participants sat at a table with a wooden tabletop on a wooden chair with a seat cushion slightly heated to 36°C. In the *non-heated* condition, the table and chair were identical, but the heating of the cushion was turned off (22–26°C, depending on the indoor air temperature). Thus, unlike the cold condition in the drink manipulation, this represented a neutral control condition.

Measures

For all statements in this study, the participants were required to indicate on a seven-point Likert scale the degree to which they agreed with the statement (ranging from *strong disagreement* (1) to *strong agreement* (7)).

Experience of hospitality

The experience of hospitality was measured by the 13-item Experience of Hospitality Scale (EH scale) (Pijls et al., 2017) with three factors. The *inviting* factor consisted of three items on experiencing openness, freedom and feeling invited (Cronbach's α = 0.83). The *care* factor comprised seven items measuring among others the experience of involvement, effort, interest and support (Cronbach's α = 0.89). The *comfort* factor was measured by three items on feeling comfortable, at ease and relaxed (Cronbach's α = 0.87). The study was performed before the COVID-19 pandemic.

Mental warmth

Mental warmth was measured by the experienced mental warmth in the foyer ("the foyer of the theatre has a warm atmosphere" and "the foyer of the theatre has an intimate atmosphere", two statements, Pearson correlation r = 0.72).

Demographics

Additionally, the demographics of gender, age, frequency of visit and cultural background were registered.

Other measures

Three items served as manipulation checks. To assess the *perceived temperature of drinks*, respondents rated the statement "while drinking, my drink feels cold/warm" and "the cup of my drink feels cold/warm". To assess the perceived temperature of the furniture, respondents rated the statement "the furniture feels cold/warm". These questions were answered on an Osgood semantic differential (1 to 7: very cold/very warm). Furthermore, to avoid drawing attention to the manipulation and to control for potential confounders, some additional questions were asked about the furniture (attractiveness, matching the organisation and comfort), about the drinks (the type and the taste of the drink) and about the foyer (its perceived modernity and attractiveness). Finally, to avoid possible confounding effects of air temperature, the perceived ambient warmth in the foyer and the indoor air temperature were measured. The warm weather during the period the research was carried out resulted in a relatively warm indoor temperature in the foyer. At table height, the temperature range was 22°C to 26°C, with a mean temperature of 23.9°C. However, the mean indoor temperature did not differ between the conditions of drink ($F(1,123) = 0.00$, $p > 0.10$). Both furniture conditions were administered at the same time, so the indoor temperature was the same for both conditions.

Procedure

The procedure of the experiment was based on those carried out by Williams and Bargh (2008) and Lynott et al. (2014), who also examined the effect of physical warmth on psychological warmth. They first asked participants to evaluate a new product (a therapeutic pad), and then they asked questions about their main dependent variable (a reward choice).

Visitors were approached on entering the foyer from the cloakroom. They were asked to participate in the study. They were told that they would be taking part in a drink evaluation study combined with an evaluation of the theatre experience thus far. Participation took about 5 to 10 minutes. First, the participants were asked to choose a warm drink (tea or coffee) or a cold drink (iced tea or iced coffee) and bring it to an allocated seat. There they received the questionnaire containing an informed consent section, questions on the drink, questions on the experienced hospitality in the foyer, questions on the furniture and demographics. After completing the questionnaire, the participants were thanked for their participation and were told about the possibility to contact the researchers for more information about the research. The experimental situation is depicted in Figure 1.

Results

Manipulation check

The first aspect to be checked was whether the manipulations of physical warmth had been successful by performing a 2 (drink) x 2 (furniture) MANOVA. The *F*-test for the overall effect of both drink (Wilks's $\Lambda = 0.215$, $F(3,112) = 136.35$, $p < 0.001$, $\eta_p^2 = 0.79$) and furniture (Wilks's $\Lambda = 0.796$, $F(3,112) = 9.59$, $p < 0.001$, $\eta_p^2 = 0.204$) were significant. The univariate ANOVAs showed that the cups with hot drinks felt significantly warmer ($M = 6.00$, SD = 0.90) than the cups with cold drinks ($M = 2.79$, SD = 1.10; $F(1,114) = 291.02$, $p < 0.001$ $\eta_p^2 = 0.72$). In addition, the temperature of the hot drinks was rated significantly higher ($M = 5.85$, SD = 0.84) than the temperature of the cold drinks ($M = 3.07$, SD = 0.90; $F(1,114) = 291.83$, $p < 0.001$, $\eta_p^2 = 0.72$). Furthermore, participants perceived the heated furniture condition ($M = 5.73$, SD = 1.08) as warmer than the non-heated furniture condition ($M = 4.81$, SD = 0.89; $F(1,114) = 26.46$, $p < 0.001$, $\eta_p^2 = 0.19$).

FIGURE 1: Experimental setup in the foyer

Correlations factors EH scale and mental warmth

Table 2 shows the correlations between the factors of the experience of hospitality scale (EH scale) and mental warmth. The factors *inviting*, *care* and *comfort* of the EH scale are related, but the correlations between the factors are lower than the threshold of 0.85 (Kline, 2005), indicating discriminant validity. Additionally, all hospitality factors significantly correlate with mental warmth, but also remain below the threshold of 0.85.

Effects of drink and furniture

First, the hypothesised direct effects of drink and furniture on the experiential factors of hospitality were examined by performing a 2 (drink) x 2 (furniture) MANOVA. The *F*-test for the overall effect of drink approached significance (Wilks's $\Lambda = 0.930$, $F(3,107) = 2.67$, $p = 0.05$, $\eta_p^2 = 0.070$). The univariate ANOVAs showed an effect of *drink* on the *care* factor of the EH scale ($F(1,109) = 6.98$, $p < 0.01$, $\eta_p^2 = 0.060$). People who received a hot drink experienced more *care* ($M_{hotdrink} = 5.10$, SD = 1.12, versus $M_{colddrink} = 4.54$, SD = 1.03) than people who received a cold drink. In line with Hypothesis 1, no effects of drink were found on the factors *inviting* ($F(1,109) = 0.62$, $p > 0.05$), and *comfort* ($F(1,109) = 1.44$, $p > 0.05$).

MANCOVA (multivariate analysis of covariance) revealed that these effects of *drink* on the experience of hospitality did not result from the administered factors *liking of the drink, indoor temperature* and *perceived ambient temperature* in the foyer. Furthermore, MANOVA showed that effects of *drink* were only found for the measures of the experience of hospitality in the foyer, and not on the *perceived modernity*, *perceived luxury* and *attractiveness* of the foyer.

For *furniture*, no main effects were found in the experience of *care*, nor in the experience of *inviting* and *comfort*. Furthermore, no interactions between *furniture* and *drink* were found.

In conclusion, people who were served a hot drink experienced more *care* in the theatre foyer compared to people who were served a cold drink. However, the temperature of the drink did not affect the other two factors of the experience of hospitality

TABLE 2: Pearson Correlation between the factors of the EH scale and mental warmth

Variable	*M*	SD	1	2	3
1. Inviting	5.30	1.09			
2. Care	4.84	1.09	0.62		
3. Comfort	5.71	1.06	0.69	0.64	
4. Mental warmth	5.30	1.04	0.70	0.59	0.54

Note: All correlations are significant at $p < 0.01$

(*inviting* and *comfort*). These findings provide support for Hypothesis 1. No support was found for Hypothesis 2.

Mental warmth

Next, a mediation analysis using SPSS PROCESS was performed to test the mediating role of the experienced *mental warmth* on the influence of *drink* on the experience of *care*. The indirect effect was tested using a bootstrap estimation approach with 5 000 samples (Preacher & Hayes, 2004; Zhao et al., 2010). The unstandardised path coefficients are shown in Figure 2.

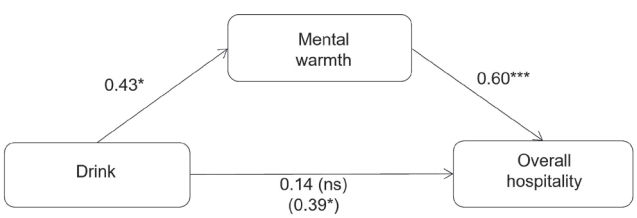
The direct effect of *drink* on the experience of *care* was fully mediated by the experience of *mental warmth* (Figure 2); indirect effects were found for *drink* on *care* (b = 0.24, SE = 0.117, 95% CI [0.0356, 0.4884]), with 95% confidence intervals, excluding 0. When including *mental warmth* in the model, *drink* was no longer a significant predictor of the *care* factor of the EH scale.

Thus, in line with Hypothesis 3, hot drinks increased the experience of *care* via the mental warmth experienced in the theatre foyer, providing support for embodied cognition as an underlying mechanism for the effect. Because we did not find an effect of furniture on the experience of hospitality-factors, no support was found for Hypothesis 4.

Discussion

Firstly, the study contributes to the literature on hospitality and provides support for our main hypothesis that the sensory perception of physical warmth perceived in a service environment has an impact on people's experience of hospitality, particularly on the experience of the *care* factor. This confirms the idea that not only interaction with service staff, but also atmospheric service attributes contribute to people's experience of hospitality. The impact of atmospherics was already known for customer experience in general (Ellis, 1982; Countryman & Jang, 2006; Lin, 2016), but now it is shown that this also applies specifically to the experience of hospitality, which people traditionally associate with staff behaviour (Ariffin & Maghzi, 2012; Blain & Lashley, 2014; Tasci & Semrad, 2016).

Secondly, this article contributes to the literature on the psychological mechanism of embodied cognition, as it has been demonstrated by mediation analysis that mental warmth is triggered by holding and drinking a hot drink. The present study additionally shows that physical sensations of warmth not only activate mental warmth attributed to a person (Williams & Bargh, 2008; Huang et al., 2013) or an object (Zwebner et al., 2014), but also to mental warmth associated with an environment, such as a theatre foyer.



Note: unstandardised coefficients and significance values (*p < 0.05; **p < 0.01; ***p < 0.001) are reported. The unstandardised coefficients in brackets indicate the effect ignoring the mediator

FIGURE 2: Mediation analyses in the effects of drink on care, with emotional warmth in the Foyer as mediator

The study further contributes to the need for the relatively new field of embodied cognition research to shift from descriptive research on the existence of the phenomenon of embodiment to explanatory research focusing on how and under which conditions embodiment occurs (Landau et al., 2010; Meier et al., 2012; Dijkstra et al., 2014). The present study provides additional evidence that different types of warmth stimuli differently affect people's experience of hospitality. The effect of physical warmth on the experience of hospitality was found for the temperature of drinks, affecting the experience of *care* through the mental warmth mediator. No effect was found for the temperature of the furniture.

The difference in the results of both types of warmth sensations might concern the duration of the physical sensation; consuming a hot drink concerns a momentary perception of warmth, while sitting on warm furniture concerns a prolonged exposure to warmth. Both the exposure to a hot drink and the slightly heated seat cushions were intended to produce comfortable warmth stimuli, which both were expected to cause a "warmer is better" effect. However, because of the exceptionally warm ambient temperature in the theatre foyer, the prolonged perception of the heated cushion may have turned out to be not as comfortable as in normal ambient circumstances, which could explain the absence of the effect of warm furniture in the present study. Apparently, the warm ambient temperature had no influence on the short exposure to the hot drinks. This in in line with previous research. The temperature of the hot drinks or pads seems to matter less than long-term exposure to warmth such as warm furniture or ambient temperatures.

Another explanation for the absence of the effect of warm furniture may be the smaller difference in temperature between the warm and the neutral condition, compared to the hot and cold drink conditions. Perhaps the difference in temperature of the seat cushions was, although significant, too small to cause an effect.

A third explanation for the difference in the effect of both types of physical heat might be the substantive association people have between offering coffee or tea and hospitality, which does not apply to warm furniture. Perhaps the habit (in the Netherlands) of offering coffee and tea in itself produces a hospitable feeling, because of its associations with cosiness, welcome and caring. In that case, it is not the warm temperature, but the symbolic meaning of coffee and tea that contributes to people's experience of hospitality. This is in line with ideas of authors who have a critical attitude towards embodied cognition and point to alternative explanations (e.g. Mahon, 2015; Dove, 2016).

Thus, the present findings are consistent with embodied cognition theory; physical warmth (hot drink) significantly influences the experience of the *care* factor of the experience of hospitality and not the experience of the *inviting* factor and the *comfort* factor, which are conceptually further from the concept of warmth. Moreover, the effect on *care* was mediated by mental warmth.

Furthermore, the findings support the idea that short-term and long-term exposure to warmth work out differently. However, the findings do not yet offer conclusive evidence for embodiment as an underlying mechanism of the effects. As with previous studies, in this study there could also be alternative explanations.

Practical implications

The present study is the first endeavour in applying embodied cognition to the context of hospitality. It contributes to the ongoing attempts to understand if and how embodied cognition plays a role in people's cognitive representations. In a real-life setting, the study shows that priming people with physical warmth leads to mental warmth, which in turn affects people's experience of *care*.

The present research is unique in examining embodiment in the applied setting of a theatre. Most research on embodied cognition concerns laboratory settings (e.g. Williams & Bargh, 2008; Hong & Sun, 2012; Huang et al., 2013; Lee et al., 2013). In a complex real-world environment, it is difficult to demonstrate effects. However, the present study shows that even in a practical setting like a theatre, specific relations between variables are observable.

For practitioners, the findings provide guidelines for creating hospitable service environments. The study underlines the importance of the physical aspects for the hospitality performance of an organisation by showing that atmospheric attributes, in this case hot drinks, influence the hospitality experienced in that environment. It furthermore shows that through research, abstract concepts such as hospitality can be translated into concrete environmental features. Service experts and designers can use these concrete insights for the design of hospitable service environments.

Concluding remarks

The body of knowledge on embodied cognition research shows that it is a phenomenon that is difficult to comprehend. Lynott et al. (2014) argued that research on the embodiment of warmth generally shows small effects which often hover around significance at a level of $p = 0.05$ (e.g. Williams & Bargh, 2008; IJzerman & Semin, 2009). This also applies to our study. As in every type of experimental setting, but maybe even more in a real-life setting such as this, it is important to replicate such studies to see whether the present findings can be confirmed. Additionally, more research must be done to further understand the mechanism of embodied cognition (Fay & Maner, 2014) and its relevance for the concept of hospitality.

ORCID iDS

Ruth Pijls — https://orcid.org/0000-0002-1384-8815
Mirjam Galetzka — https://orcid.org/0000-0003-0215-3601
Brenda H. Groen — https://orcid.org/0000-0001-6432-511X

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