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Evaluations versus stereotypes in emotion recognition: a replication and extension of Craig and Lipp's (2018) study on facial age cues

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ABSTRACT

Recently, *Cognition and Emotion* published an article demonstrating that age cues affect the speed and accuracy of emotion recognition. The authors claimed that the observed effect of target age on emotion recognition is better explained by evaluative than stereotype associations. Although we agree with their conclusion, we believe that with the research method the authors employed, it was impossible to detect a stereotype effect to begin with. In the current research, we successfully replicate previous findings (Study 1). Furthermore, by changing the comparative context, Study 2 provides a first test of age-stereotypes affecting emotions recognition. We discuss recommendations for future studies in the domain of social categorisation and emotion recognition.

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Emotion recognition is not only affected by the bottom-up input of facial expressions, but also by top-down processes such as the perceivers' expectations about expressers. Recently, *Cognition and Emotion* published an article (Craig & Lipp, 2018a) demonstrating that age cues affect the speed and accuracy of emotion recognition. Happiness was more easily categorised than anger and sadness on young male faces, but not on old male faces. The authors argued that the observed effect was consistent with the perceivers' *evaluative*, rather than *stereotype*, associations. Specifically, as facial stimuli depicting young people are generally more positively evaluated compared to facial stimuli depicting old people (Ebner, 2008), those positive evaluative associations may facilitate the recognition of positive emotions (happiness) and may slow down the recognition of negative emotions (anger/sadness) on young faces. Also, the authors argued that, if age-group stereotypes were to affect emotion recognition, an advantage for recognising anger on young and sadness on old faces was expected. That is, young people, compared to old people, are stereotypically more strongly

associated with anger and less strongly with sadness (reviewed in Fölster, Hess, & Werheid, 2014; Montepare & Dobish, 2014). However, the latter pattern was not observed by which the authors conclude that age cues influenced emotion recognition by means of evaluative rather than stereotype associations.

Although we agree with the authors' conclusion, we argue that the setup of the reported studies was ineffective to detect any stereotype emotion recognition effects to begin with. Previous research indicates that the task context may strongly affect whether evaluative or stereotype associations are activated (Wittenbrink, Judd, & Park, 2001) and what type of associations is used as a basis for judgements and behaviour (Amodio & Devine, 2006; Bijlstra, Holland, & Wigboldus, 2010). When employing an emotional recognition task that includes both a positive and a negative emotional expression (*dual-valence conditions*), valence differences between emotions become extremely salient and participants presumably judge faces merely based on general positive or negative affect instead of the discrete emotion at hand. Prior research showed a recognition advantage for happy faces over

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angry, sad (e.g. Hugenberg, 2005; Hugenberg & Sczesny, 2006), fearful, and “negative” surprise faces (Craig, Koch, & Lipp, 2017), while finding no difference in responses between the negative expressions that were employed (Bijlstra et al., 2010). Moreover, the discrete negative emotion that is pitted against happiness seems exchangeable. This suggests that participants apply a quick evaluative decision strategy to perform well on the task. As a consequence of the salience of valence differences within dual-valence conditions, evaluative associations strongly influence emotion recognition (e.g. Craig & Lipp, 2018a; Hugenberg, 2005).

Stereotype associations have only been found to affect emotion recognition when emotions in a recognition task do not differ in valence, i.e. two negative emotional expressions (*single-valence conditions*; Bijlstra et al., 2010; Bijlstra, Holland, Dotsch, Hugenberg, & Wigboldus, 2014; Bijlstra, Holland, Dotsch, & Wigboldus, 2018). This is illustrated in our previous work (Bijlstra et al., 2010) by participants’ recognition speed regarding sad male and female faces. In an evaluative dual-valence context (sad vs. happy), sadness was categorised faster on male than female faces. This finding is consistent with general negative associations towards men compared to women. In contrast, in a single-valence context (sad vs. angry), and in line with gender-stereotypes, those same sad faces were faster recognised for females than males. These and other recent findings (e.g. Bijlstra et al., 2018) strongly suggest that stereotype associations are only applied when participants cannot directly categorise faces based on valence differences. Thus, in designing these tasks, the selection of emotional expressions is of great importance and can strongly affect its results.

In sum, although Craig and Lipp (2018a) provided evidence for evaluative associations affecting emotion recognition, effects of age stereotypes on emotion recognition remain as yet untested, simply because their dual-valence task context was not suitable to test possible effects of stereotype associations. Applying the logic of prior single-valence context findings (Bijlstra et al., 2010, 2014, 2018) to the current social categories enables us to test whether emotion recognition on young and old faces is indeed affected by “anger-

young” and “sadness-old” stereotypes. In the current research, we designed two emotion recognition studies to (1) replicate the impact of age-related evaluative associations using a dual-valence task context and (2) provide a first test of possible age stereotype effects using a single-valence task context. A detailed description of the methods and results can be found as online Supplementary Materials.

First, we ran a pre-registered direct replication study¹ (<https://osf.io/8pd2s/>) of Craig and Lipp’s (2018a) dual-valence context. Participants were instructed to categorise happy and sad male faces as quickly and accurately as possible. The task included 128 trials with 16 angry and 16 happy unique portrait pictures, half of them being young and half of them being older men. Within this dual-valence context, we found support for an evaluative congruency effect, represented by the interaction between emotion and age-groups, $F(1, 28) = 16.04, p < .001, \eta^2 = .36$ (Table 1, see Figure 1 for example stimuli). Consistent with Craig and Lipp, we observed that happiness was detected faster than sadness on young, but not on old male faces.

Second, we conducted a study employing a single-valence context. Specifically, rather than categorising faces as either happy or sad, participants were now instructed to categorise faces as *angry* or *sad* (and we included only angry and sad faces of young and old men as stimulus materials). In doing so, we excluded the salience of valence in the emotion categorisation task. Within this single-valence context, we expected to find a stereotype effect. Following Montepare and Dobish (2014), we hypothesised a recognition advantage for older compared to younger sad male faces, and a recognition advantage for younger compared to older angry male faces. Contrary to our pre-registered hypothesis, we found no interaction between emotion and age-groups, $F(1, 24) = 0.01, p = .917, \eta^2 < .01$, but observed a main effect of emotion, $F(1, 24) = 9.13, p = .006, \eta^2 = .28$. For both male age-groups, we observed an advantage in recognising angry compared to sad faces.²

The results of Study 1 revealed a clear and straightforward replication of Craig and Lipp’s (2018a) findings of evaluative associations on emotion recognition and underscore the robustness of their findings. Study 2 consisted of the first actual test of age-related stereotypes on emotion recognition. Even though some research suggests that anger is stereotypically associated with young people and sadness with old people (Montepare & Dobish, 2014; see also Fölster et al., 2014), we did not find corresponding evidence for stereotype effects on emotion recognition. There are two possible

Table 1. Mean response latencies and standard deviation in milliseconds per study.

Age-Group	Study 1 (N = 29)		Study 2 (N = 25)	
	Happy	Sad	Angry	Sad
Young	499 (76)	533 (88)	627 (98)	658 (125)
Old	537 (94)	536 (101)	672 (145)	705 (125)

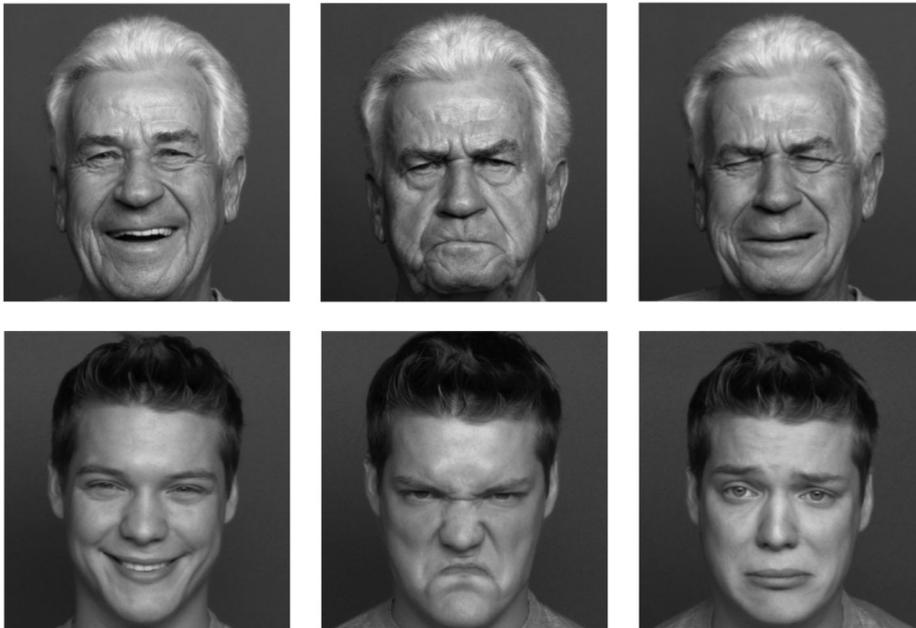


Figure 1. Example stimuli, representing the old (top row) and young (bottom row) age-group, displaying happiness, anger, or sadness respectively (for privacy reasons, we depict a young male group stimulus – #066 – that was not used in the current research).

explanations for these latter findings. A first explanation of this null-finding may relate to the possible gender dependency of age-related stereotypes. Montepare and Dobish (2014) demonstrated general age stereotype associations (“anger is related to young” and “sad is related to old”), independent and without mentioning gender. Perhaps the stereotype for old men differs from this general stereotype and may be more related to anger and less to sadness. In our previous research (Bijlstra et al., 2010) we found evidence that gender does make a difference when recognising emotional expressions depicted by young males and females. People associated anger with males and sadness with females. Taken together, stereotype associations between gender and emotions within different age-groups may very well exist (e.g. sadness with elderly women, and anger with elderly men; for a similar argument related to race and age stereotypes see Kang & Chasteen, 2009). A possible avenue for future work is to test this alternative explanation using multiple social categories, i.e. age and gender, within a single-valence task context (equivalent to Craig & Lipp, 2018b for evaluative associations).

A second explanation for our main effects in Study 2 is the possible role of bottom-up features, such as the overlap between male faces and features belonging to anger expressions (e.g. strong eyebrows; Becker,

Kenrick, Neuberg, Blackwell, & Smith, 2007). Such overlap may facilitate responses for anger compared to sad male faces. Future research could systematically examine these potential influences of gender-specific age stereotypes and bottom-up features on recognising emotional expressions.

The current work has several theoretical and empirical implications for emotion research. First, recognising the importance of replication (Open Science Collaboration, 2015), the current work provides additional evidence consistent with the Craig and Lipp’s (2018a) initial study of top-down effects in recognising emotional expressions on faces of different age-groups. High confidence in the replicability of these findings serves as a solid and interesting basis to further explore boundary conditions. For example, future studies, may focus on testing whether the associations tested here also apply to other samples as well, i.e. older participants. Although research has shown that the experience of discrete negative emotional expression changes over the adult lifespan (e.g. Kunzmann, Kappes, & Wrosch, 2014), less is known about evaluative and stereotypical associations and its effect on emotion recognition for this age-group.

Second, as yet, most studies in the field of social categorisation and emotion research concentrated on evaluative processes (e.g. Becker et al., 2007; Hugenberg,

2005; Craig & Lipp, 2018a). Employing a wide variety of social categories (e.g. race, age, gender, ethnicity) and emotions (happiness vs. anger, sadness, fear, and negative surprise) these studies contributed a lot to our understanding of the role of prejudice in emotion perception. Research demonstrating stereotype rather than prejudice effects in emotion recognition has hardly been conducted and was restricted to stereotypes related to gender and ethnicity (Bijlstra et al., 2010, 2014, 2018). We predicted that stereotypes related to age, could be an additional social category to test the generalisability of this effect. The present study shows, however, that stereotype associations may be present, but are more complex than we initially expected. Future research is needed to determine how associations between emotional expressions and age-groups, for instance by measuring participant's stereotype associations (see e.g. Bijlstra et al., 2014), can predict emotion recognition behaviour.

Finally, the present research has implications for experimental design. Our studies converge with the idea that the task context is crucial in activating stereotype or evaluative associations (Bijlstra et al., 2010, 2018; Wittenbrink et al., 2001). The kind of expectations that people use, either evaluation- or stereotype-based expectations, depend on whether valence differences are salient within the context. Such a better understanding of these circumstances is especially important since previous work showed that general evaluations versus stereotypes are predictive of different behavioural outcomes (e.g. Amodio & Devine, 2006). Therefore, the context should be well considered when planning future studies in this domain, rendering conclusions about the role evaluations versus stereotypes in behavioural outcomes more valid.

Notes

1. All materials and procedures were similar to Craig and Lipp (2018a). Moreover, we used the stimuli (FACES; Ebner, Riediger, & Lindenberger, 2010), in a single-valence task as well. That is, we combined the exact same anger (Study 1) and sadness (Study 2) images as Craig and Lipp (2018a) in our single-valence condition, see also the online Supplementary Materials.
2. In Study 1, we found that happiness was recognized faster than sadness, $F(1, 28) = 4.99, p = .034, \eta^2 = .15$. In both studies, we observed that emotional expressions were faster recognized on young compared to old faces (dual-valence, $p < .001, \eta^2 = .35$; single-valence, $p < .001, \eta^2 = .62$).

Disclosure statement

No potential conflict of interest was reported by the authors.

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