

Effects of Activated and Dispositional Self-Construal on Emotion Decoding Accuracy

Konstantinos Kafetsios · Ursula Hess

© Springer Science+Business Media New York 2013

Abstract The present study examined effects of temporarily salient and chronic self-construal on decoding accuracy for positive and negative facial expressions of emotion. We primed independent and interdependent self-construal in a sample of participants who then rated the emotion expressions of a central character (target) in a cartoon showing a happy, sad, angry, or neutral facial expression in a group setting. Primed interdependence was associated with lower recognition accuracy for negative emotion expressions. Primed and chronic self-construal interacted such that for interdependence primed participants, higher chronic interdependence was associated with lower decoding accuracy for negative emotion expressions. Chronic independent self-construal was associated with higher decoding accuracy for negative emotion. These findings add to an increasing literature that highlights the significance of perceivers' socio-cultural factors, self-construal in particular, for emotion perception.

Keywords Emotion perception · Accuracy · Self-construal · Priming

Introduction

A person complaining about work-load to a group of friends or a loved one sharing his or her feelings are commonplace examples of the important role of emotion in social interactions. Not surprisingly then, the factors that influence how one recognizes and responds to others' emotions, especially facial emotion expressions, have been of continued interest to researchers over the years (see e.g., Hess and Thibault 2009). Recently, complementary to evolutionary-based accounts that emphasize the universal characteristics of emotion perception (e.g., Ekman and Friesen 1971), the social and contextual factors that influence the perception of emotional facial expressions (e.g., Barrett and Kensinger 2010) have

K. Kafetsios (✉)
Department of Psychology, University of Crete, 74100 Rethymon, Greece
e-mail: k.kafetsios@psy.soc.uoc.gr

U. Hess
Humboldt University, Berlin, Germany

gained interest. Given the importance of decoders' schemas in emotion perception (Hess et al. 2007), the present study examined the influence of decoders' temporarily activated and chronic self-construal on the accuracy of perceiving facial emotion expressions in social interactions.

Self-construal is a central psychological construct (Cross et al. 2011). It refers to an individual's culturally contingent thoughts, feelings, and actions that are concerned with one's understanding of the self as connected with others (interdependence) or distinct from others (independence). These central representations of the self in relation to others derived from observations that individualistic, typically Western, cultures favor an independent self-construal, that emphasizes personal autonomy, individual needs, and self-fulfillment; conversely, collectivistic, usually Eastern, cultures favor an interdependent self-construal which emphasizes relationships with others, obligations, and especially obligations to in-group members (Markus and Kitayama 1991; Trafimow et al. 1991).

It is now widely accepted that individuals hold both independent and interdependent views of the self (Singelis 1994) and these can vary between as well as within cultures (Oysermann et al. 2002). The "culture as situated cognition" perspective understands this between and within cultures variation in self construal as dependent on social-contextual aspects that give rise to independent and interdependent mind-sets (e.g., Oyserman and Lee 2008; Oyserman et al. 2009). Within a given culture, self-construal can temporarily vary on the interdependence and independence continua (Oysermann et al. 2002) when primed with appropriate situational primes (e.g., relationships, groups, obligations). These primed self-construals give rise to independent and interdependent mind-sets that can consequently influence related cognitions, emotion, and behavior (e.g., Kühnen and Hannover 2000; Miyamoto et al. 2006; Oyserman 2011). These self-construals can be conceived of as states. By contrast, the chronic accessibility or activation of independent or interdependent mind-sets within any given culture leads to the formation of chronic, readily accessible knowledge that is equivalent to a trait (Oyserman and Sorensen 2009).

Several studies have examined the social consequences of both temporarily activated (e.g., Kühnen and Hannover 2000; Kühnen and Oyserman 2002) and chronic self-construal (e.g., Singelis and Brown 1995); yet research on how self-construals affect emotions and emotion-related processes is limited. The extant research has focused primarily on how persons with independent and interdependent self-construal differ in emotion experience and understandings (e.g., Mesquita and Karasawa 2002). Less interest has been invested in understanding the impact of self-construal on the cognitive or perceptual processes that underpin the recognition of emotions. This was the goal of the present study.

One may expect that interdependent self-construal would be associated with higher accuracy in inferring an interaction partner's emotional state because of the associated pro-social motivation and affiliative tendencies of individuals with interdependent self-construal. Supportive of this expectation, other-orientated traits are generally associated with interpersonal sensitivity and accurate decoding of emotion (see Hall et al. 2009). However, research on cross-cultural differences in facial emotion perception accuracy suggests the opposite. Compared to Americans of European descent, Lau et al. (2009) found that Asian Americans (born in Asia and in the US) scored lower in an emotion recognition task of facial expressions of emotion (the diagnostic analysis of nonverbal accuracy, Nowicki and Duke 1994). Compared to participants from Western countries (US, Poland, Hungary) participants from Eastern countries (Vietnam, Japan, Sumatra) had lower decoding accuracy scores for negative emotion in a decoding task that included facial expressions of emotion of both Western and Eastern target persons (Biehl et al. 1997). Also, African and mainland Chinese decoders had lower decoding accuracy for negative emotion expressions

(shame, sadness) compared to French Canadian participants in a decoding task that controlled for the in-group advantage hypothesis in emotion decoding (i.e., that different decoding processes occur when one judges facial expressions from in-group national participants; Beaupré and Hess 2005). However, in both these studies the expressions that were used were generated from Western prototypes. Yet, Elfenbein et al. (2007) who used dialect expressions from Gabonese and French Canadian expressers, also found the Gabonese raters to be lower in overall accuracy when rating in-group expressions. This suggests, that the finding is quite stable even for culturally congruent stimuli. In sum, compared to individualistic cultural contexts, persons in collectivistic cultures score lower in facial emotion perception accuracy tasks, especially for negative emotion expressions.

One possible explanation for those findings centers on the norms and motivations associated with an interdependent self. In interdependent societies, negative emotion display and perception is discouraged (Biehl et al. 1997; Markus and Kitayama 1991) so as not to endanger interpersonal harmony. This suppression may, in turn, lead to long term lower motivation to attend to negative emotion and therefore lower accuracy. However, research has yet to explicitly document relationships between independent and interdependent self-construal and the decoding accuracy for negative emotion. Related to this, there is research explicitly linking self-construal with the motivation to attend to emotions. A recent study that measured individual self-construal found that persons raised in a more individualistic cultural background and with an independent self-construal reported fewer difficulties in identifying and describing feelings (dimensions of alexithymia) than persons raised in a more interdependent cultural context and with higher chronic interdependent self-construal (Konrath et al. 2011). This finding was explained by the notion that independent self-construal is associated with being “psychologically minded” (Dion 1996). Specifically, those with a more independent self-construals (who think, act, and feel largely separately from others), may pay more attention not only to their own emotions but also to the emotions of others. Moreover, the study found that self-construal mediated ethno-cultural differences (people born in Asia or in the US) in the self-reported difficulties in identifying and describing feelings, yet no ability measures of emotion perception were used in that study.

The decoding of emotional facial expressions also involves processes that can be influenced by cognitive modes associated with independent and interdependent self-construals. Individuals with a more interdependent understanding of the self are more susceptible and attentive to the context in which the perceived event takes place, whereas an independent self-construal is associated with an analytic perceptual style and a focus on one’s own goals (Kitayama et al. 2003; Kühnen and Oyserman 2002; Nisbett 2003). The existing research on cultural differences in emotion recognition has typically utilized facial emotion perception accuracy tasks (in single faces) that limit testing of contextual effects in emotion perception (Matsumoto et al. 2012). One study that did consider the influence of context in encoders’ facial expressions of emotions (facial expressions of target persons within a group; Masuda et al. 2008), found that cultural differences in cognitive modes of susceptibility to context affected emotion perception. Decoders from an interdependent culture (Japan), were more likely than decoders from an independent culture (US) to attend to the group’s emotions and be influenced by them in their emotion perception. They also perceived targets’ facial emotion expressions as more intense when the group of persons surrounding the target had the same emotion as the target rather than a different one. These findings suggest that for people with chronically active interdependent self-schemas, emotion perception processes may be influenced to a larger degree by contextual factors (the group’s emotional congruence to the target person) consequently affecting emotion decoding accuracy.

Taken together, existing research suggests that individuals from cultures that promote an interdependent self-construal perform less well on facial emotion recognition tasks than individuals from cultures that promote an independent self-construal. Different causal processes have been identified: people in cultures where interdependence is dominant habitually suppress the recognition of emotion in general and negative emotion in particular, and may be less motivated to attend to and decode other people's emotion than those higher on chronic independent self-construal. Finally, in social perception processes, interdependent focus may be influenced more by the contextual factors.

However, most of the existing research has not explicitly assessed individual level self-construal. Hence existing research does not allow us to distinguish whether it is, indeed, independent and interdependent self-construal or some other culturally mediated process that is associated with emotion perception accuracy differences. One means to overcome this limitation is to experimentally manipulate the salience of independent and interdependent self-construal, for example, by priming self-construal (e.g., Kühnen and Hannover 2000). Priming constitutes a within culture experimental analogue to chronic between-culture differences by focusing participants' attention in the same way as the cultural difference does (Oyserman and Lee 2008). For example, the temporarily salient aspect of a person's self-construal has been found to influence perceptual processes in a manner that parallels cross-cultural differences (Kühnen and Oyserman 2002); individuals whose independent self was primed, found it easier (were faster) to process decontextualized information, whereas interdependence priming facilitated context-dependent memory tasks (Kühnen and Oyserman 2002). A recent single-culture study found that activating an interdependent focus led to perceiving a group member's negative emotions as more intense when the group was oriented towards the target rather than when it was not (Kafetsios and Hess 2013). Thus, the use of priming to selectively activate self-construals allows us to test the prediction that independence primed individuals would be better at recognizing especially negative emotions than interdependence primed individuals, without the possible confound of cultural norms, as these are held constant.

The Present Study

The present study aimed to assess the effect of both temporarily salient (primed) and chronic independent and interdependent self-construal influences on facial emotion recognition accuracy within one culture. Hence, we assessed the chronic self-construal of individuals and then primed self-construal as well.

Regarding the measurement of emotion perception, we employed a recently developed task that models emotion perception accuracy in the context of social interaction (in a group setting). Measuring emotion perception accuracy in such a way was driven by theoretical concerns of emotion perception as a highly social process (Hess et al. 2007) but also methodological concerns related to the rationale of the present study. Namely, the vast majority of the existing research has favored the use of a-contextual facial emotion perception stimuli that may not be as sensitive to subtle differences in emotion recognition accuracy, especially differences relating to cultural factors (Matsumoto et al. 2012). Yet, the preceding discussion suggests that self-construal should be associated with such cultural factors (e.g., suppression of emotion, attending to context over focal target) that can influence recognition rates or the "on-line" perception level when decoding emotions. Therefore, in order to test emotion perception accuracy in a way that provides opportunities to emulate actual social interactions and to tap social context factors in emotion

perception, we assessed accuracy and inaccuracy in emotion perception using a task that models emotion perception in a group of people expressing different emotions.

The assessment of contextualized emotions (ACE) task (Hess and Kafetsios 2013) consists of a series of cartoons showing a group of people around a central figure expressing happy, sad, angry, or neutral facial expressions. Cartoons were used because they allowed us to carefully vary the emotion expressions of the target person and the corresponding persons. Previous research has demonstrated that cultural differences are captured by this type of stimulus material (Masuda et al. 2008). The participants' task was to rate the central character's emotion expressions in terms of eight different emotions that were present or not in the cartoons' facial expressions. Following Hess et al. (2012), we assessed decoding accuracy and inaccuracy independently so that the rating on the scale corresponding to the emotion shown by the central character (i.e., anger for a character showing an angry expression) was considered accurate. The mean of the ratings on all other emotion scales (representing emotions not shown by the central character) represented the level of inaccurately perceived secondary emotions. Assessing accuracy and inaccuracy using non-exclusive scales allows a more fine-grained analysis of decoding accuracy than standard forced-choice emotion recognition tasks (Matsumoto 2005). In two recent studies, accuracy and inaccuracy in facial emotion perception ratings were both meaningfully related to emotion perception in everyday social interaction (Hess and Kafetsios 2013) and the recognition of emotion expressions in younger and older faces (Hess et al. 2012). We separately assessed decoding accuracy for positive and negative emotions based on the notion that negative emotions have different implications for the everyday social interactions of persons with independent versus interdependent selves (Markus and Kitayama 1991).

Hypotheses and Research Questions

We predicted that an independent self-construal will be associated with higher emotion recognition in the ACE task, as individuals high in independence pay more attention to the emotions of others. By contrast, interdependent self-construal, which is associated with a tendency to suppress emotions and their recognition, will lead to lower accuracy in this task. This will be the case for both chronic (Hypothesis 1) and temporarily salient self-construal (Hypothesis 2).

A third goal of this research was to assess whether chronic and temporarily salient self-construal interact. Following situated cognition models (e.g., Oyserman and Sorensen 2009) situational cues can result in "mind-set switching" between independent and interdependent self-construal, and it is important to see how the different aspects of the self (primed vs. chronic) interact with one another with regard to emotion perception outcomes. Two outcomes are possible: the activated self-construal can overshadow the chronic self (or vice versa), or conversely, the two aspects of self-construal could complement one another (see Oyserman and Lee 2008).

Methods

Participants

Seventy-three participants (55 women, 15 men and 3 gender unknown) with a mean age of 23 years ($SD = 3.4$) from a large state University in southern Greece took part

individually for extra course credit. Due to missing data, three cases were excluded from the analyses. The study was approved by the Psychology Department Ethics committee.

Materials and Procedure

On arrival at the laboratory, participants were informed about the aims of the study (how people perceive emotions) and that anonymity was guaranteed. After providing informed consent, they completed a battery of individual difference measures that included the Singelis (1994) Self-Construal Scale, a measure of trait or chronic self-construal (independence $\alpha = .71$, interdependence $\alpha = .73$, $r(73) = .19$, $p = .11$). We used the revised version of the SCS (Kwan et al. 1997) that consists of two orthogonal dimensions that measure the strength of independent and interdependent self-construal. Each subscale contained 15 items and responses were made on a seven point Likert-type scale (1 = *strongly disagree*, 7 = *strongly agree*). The independent self-construal subscale contains items that assess uniqueness in social behavior and related cognitions and emotions (e.g., “I do my own thing, regardless of what others think”); the interdependent self-construal subscale includes items that assess connectedness in social behavior especially emotions, cognitions, and behavior with regards to in-groups (e.g., “It is important to me to respect decisions made by the group”). Several studies have linked culture-level differences in individualism and collectivism with person level independent or interdependent self construal using the SCS (e.g., Singelis and Brown 1995). Equally, several studies have shown the SCS distinguishes between independent and interdependent self-construal at the individual level (Singelis 1994).

Following that and prior to the priming manipulation participants completed a mood check (four negative and four positive feeling states).

Priming Task

We used the similarities and differences with family and friends task (Trafimow et al. 1991, Experiment 1). This is one of three widely utilized procedures for temporarily raising the salience of cultural self-orientation focus (Oyserman 2011). The focus is on persons that one maintains relationships with.

In the independent self priming condition, participants read the following instructions: “For the next 2 min you will not need to write down something. However, please think of self-characteristics that make you differ from friends and members of the family. Which of your behaviors associated with those characteristics make you different from them?”

In the interdependent self priming condition they read: “For the next 2 min you will not need to write down something. However, please think of self-characteristics that make you similar to members of the family and friends. Which of your behaviors reflect the things you have in common?”

Following the instructions above, in a following page participants were required to write down five characteristics in keeping with instructions.

For manipulation check, we adapted the Twenty Statements Test (TST) (Kuhn and McPartland 1954) with the use of 10 adjectives. The instructions were as follows:

“There are 10 numbered blanks on the page below. Please write 10 answers to the simple question “Who am I?” in the blanks. Just give 10 different answers to this question. Answer as if you were giving the answers to yourself and not to somebody else. Write the answers in the order that they occur to you. Do not worry about logic or importance. Go along fairly fast because time is limited.”

Two research assistants rated the number of adjectives that express internal or external self descriptions; we analyzed the percentage of idiocentric adjectives contained in the descriptions.

Emotion Perception Task—ACE

The assessment of contextualized emotions (ACE) consists of a series of cartoons where a target figure is shown within a group of people (see Fig. 1). The cartoons were created by an experienced computer artist based on the facial emotion expression stimuli from the Montreal Set of Facial Displays of Emotion (MSFDE, Beaupré and Hess 2005). The MSFDE contains prototypical facial expressions that have been shown to be well recognized (Beaupré and Hess 2005) and which are highly controlled across groups, thus minimizing expressive differences between encoders. The facial expressions of target and group were manipulated so that target and group express one of three emotions (happy, angry, sad) and a neutral expression. Group figures surrounding the target person always expressed the same emotion. All possible combinations of group versus target emotion expressions between the three emotions and neutral were included. The task also manipulates facial orientation of the group towards the target or towards the perceiver and within each presentation version the cartoons were presented in a random order.

The perceivers' (participants') task was to rate the central character's emotion expressions (happiness, anger, sadness, or neutral) on *each* of the following 7-point scales anchored with *not at all* and *very much*: calm, fear, anger, surprise, disgust, sad, and happy. The rating on the scale corresponding to the emotion shown by the central character (i.e., anger for a character showing an angry expression) was considered accurate. The mean of the ratings on all other emotion scales (representing emotions not shown by the central character) represented the level of inaccurately perceived secondary emotions. In this study the four emotion perception indices had satisfactory internal consistency (accuracy happy $\alpha = .84$, accuracy negative $\alpha = .87$, inaccuracy happy $\alpha = .90$, inaccuracy negative $\alpha = .91$). Tests of normality on the four indices found the two happiness indices

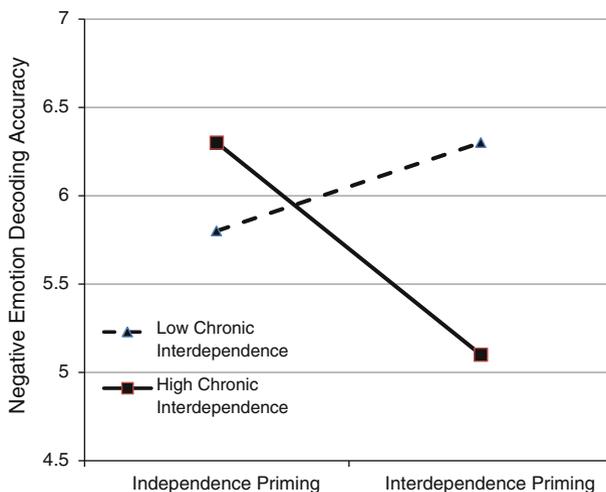


Fig. 1 Priming and chronic interdependent self-construal interaction effects on negative emotion decoding accuracy

significantly deviated from normality (Accuracy happy $K-S_z = 1.37$, $p = .04$, Inaccuracy happy $K-S_z = 2.43$, $p < .001$) leading to logarithmic and square root transformations respectively. The construct validity for emotion perception accuracy and inaccuracy assessment and the predictive validity for emotion perception in everyday social interactions are presented elsewhere (Hess and Kafetsios 2013).

Results

Assessment of Contextualised Emotions Task Construct Validity

To assess whether the central individual's emotion expression was correctly identified, we conducted a series of one way repeated measures analyses of variance on the emotion ratings of happiness, anger, and sadness. Significant main effects of emotion emerged for all target emotions. Ratings of happiness were significantly higher when central character expressed happiness ($F(3, 65) = 365.144$, $p < .001$ $M = 6.05$, $SD = .13$), compared to ratings of happiness in expressions of anger ($M = 1.19$, $SD = .07$), sadness ($M = 1.14$, $SD = .05$), or neutral ($M = 1.31$, $SD = .08$). Ratings of sadness were significantly higher when the central character was expressing sadness ($F(3, 65) = 195.25$, $p < .001$, $M = 6.19$, $SD = .15$), compared to ratings of sadness in expressions of happiness ($M = 1.54$, $SD = .11$), anger ($M = 3.19$, $SD = .21$), or neutral ($M = 4.14$, $SD = .20$). Finally, ratings of anger were significantly higher when the central character was expressing anger ($F(3, 65) = 226.03$, $p < .001$ $M = 6.10$, $SD = .14$), compared to ratings of anger in expressions of happiness ($M = 1.33$, $SD = .08$), sadness ($M = 2.17$, $SD = .16$), or neutral ($M = 3.69$, $SD = .17$). Post-hoc tests confirmed that the individual showing a happy, sad, or angry expression respectively was rated as showing this expression significantly more intensely than anyone else.

As can be observed above, the individual showing a neutral expression was rated lowest on happiness and somewhat higher on anger and sadness. However, these ratings were significantly lower than the ratings for the sad and angry individual. Overall these findings confirm that the target person showed the intended emotion and that emotions were similar in strength across target emotions and face orientations.

Table 1 shows the mean ratings for accurately perceived target emotions and the inaccurately perceived secondary emotions for each of the three types of emotional expressions across all presentation conditions. For all three expressions, the emotion corresponding to the target expression was rated with higher intensity than the secondary emotions, showing that participants recognized the expressions as intended. However, as expected, participants perceived, to a lesser extent, other emotions as well (i.e., emotions that were not manipulated to be expressed by the target). The levels of overall accuracy

Table 1 Means and standard deviations for the accuracy and inaccuracy measures as a function of positive or negative emotion

Expression	Positive		Negative		Overall	
	Mean	SD	Mean	SD	Mean	SD
Accurate	5.98	1.01	6.14	.81	6.09	.76
Inaccurate	1.21	.39	2.72	.72	2.21	.53

($M = 6.09, SD = .76$) and inaccuracy ($M = 2.21, SD = .53$) were negatively associated at non-significant levels ($r = -.19, p = .11$).

Priming Manipulation Check

Prior to priming, the two groups did not differ significantly in their levels of independent and interdependent self-construal, $F(1, 68) = .13$ and $F(1, 68) = 2.21$ respectively, $p > .15$ nor with regard to positive and negative mood, $F(1, 68) = .003$ and $F(1, 68) = 1.30$ respectively, $p > .25$. The priming procedure was successful as indicated by a significant difference in the reported percentage of idiocentric self-ratings $F(1, 68) = 15.37, p < .001$ ($M_{independent} = 63.3\%, SD = 21.80, M_{interdependent} = 45.09\%, SD = 16.70$). We further regressed the individual self-rating percentage on gender ($\beta = -.07, n.s.$), priming ($\beta = -.38, p < .001$), independent self-construal ($\beta = .27, p < .05$), and interdependent self-construal ($\beta = -.21, p = .069$). The model was significant $F(5, 69) = 6.11, p < .001$. The interactive terms of priming by chronic independent and interdependent self-construal were not significant predictors in this model. These results suggest that the priming task resulted in a shift towards the independent and the interdependent self, regardless of any chronic differences in self construal or interactions between activated and chronic self-construal.

Activated and Chronic Self-construal Effects on Emotion Perception

Zero-order correlations among the variables are presented in Table 2. Notably, primed self-construal was associated with decoding accuracy scores for negative emotion expressions. We conducted hierarchical regression analyses to predict the four emotion decoding accuracy indices (emotion decoding accuracy and inaccuracy for negative emotion expressions, decoding accuracy and inaccuracy for happy emotion expressions) from the set of variables of interest in two steps. All variables were centered (Aiken and West 1991) and priming was effect coded, tolerance was above .70 for all variables.

As can be seen in Table 3, chronic or temporarily activated self-construal were not significantly associated with either accuracy or inaccuracy in decoding happy facial expressions or inaccuracy in decoding negative facial expressions. However, accuracy in

Table 2 Zero order correlations between study variables

	1	2	3	4	5	6	7	8	9
1. Priming	1	.01	.08	-.23	.02	.03	.16	-.04	.17
2. Gender		1	-.02	.49**	-.08	.38**	-.42**	.01	-.08
3. Age			1	-.21	.05	-.09	.13	-.26*	-.09
4. Accuracy negative				1	6.14 (.80)	-.04	.50**	-.61**	.28*
5. Inaccuracy negative					1	2.72 (.72)	-.02	.24*	.12
6. Accuracy happy						1	5.98 (1)	-.53**	.11
7. Inaccuracy happy							1	1.21 (.39)	-.13
8. Chronic independence								1	4.79 (.67)
9. Chronic interdependence									1

* $p < .05$; ** $p < .01$; *** $p < .001$

decoding negative emotion expressions was predicted by priming ($\beta = -.24, p < .05$), indicating lower accuracy for persons with an activated interdependent schema than for persons with an activated independent schema. Additionally, in the second step, chronic independence ($\beta = .33, p < .05$), and the priming by chronic interdependent self-construal interaction ($\beta = -.37, p < .05$) were significant predictors of negative emotion decoding accuracy. Individuals with higher chronic interdependent self-construal, who were primed with an interdependent schema, were less accurate in perceiving negative facial emotion expressions. Probing the interaction effect with an online simple slopes calculator (Preacher et al. 2006) found that negative emotion accuracy scores were significantly lower for highly interdependent participants in the interdependence priming condition (simple slope $z = -.27 (.11), t = -2.41, p = 0.018$) but not for highly interdependent participants in the independence priming condition (simple slope $z = .12 (.14), t = .86, p = 0.39$). The interaction is graphically depicted in Fig. 2.

Notably, in the second step chronic self-construal did not mediate the effect of priming, suggesting that the effects of chronic interdependence by priming interaction were in addition to the self-construal activation effects. Controlling for mood prior to priming did not alter the above significant effects.

Discussion

The present study examined how perceivers' temporarily activated and chronic views of the self as independent from or interdependent to others (self-construal) can influence performance in an emotion perception decoding accuracy task. The study provided the first evidence, to our knowledge, that cognitive salience, and individual differences in self-construal are associated with accurately perceiving facial emotion expressions, in line with expectations deriving from the "culture as situated cognition" model (Oyserman 2011).

Table 3 Relationships between primed and chronic self-construal and four indices of emotion decoding accuracy

	Accuracy happy		Inaccuracy happy		Accuracy negative		Inaccuracy negative	
	Step 1 β^i	Step 2 β^f						
Gender	.38**	.38**	-.42***	-.42***	.49***	.46***	-.08	-.17
Priming (PRM)	.005	-.02	.17	.15	-.24*	-.23*	.01	-.01
Chronic independence		.19		.03		.33*		.05
Chronic interdependence		.08		-.02		.16		.28
PRM \times chronic independence		-.15		-.18		-.15		.02
PRM \times chronic interdependence		.06		.12		-.37*		-.22
R^2	.15	.20	.21	.32	.29	.46	.01	.07
$F(6, 65)$		2.10		3.82**		7.06***		.61

β^i standardized beta when variables entered in first step

β^f final beta. Gender males = 1, females = 2, priming (PRM) 0 = independence, 1 = interdependence

* $p < .05$; ** $p < .01$; *** $p < .001$



Fig. 2 Example of pictorial (cartoon) stimuli: Target expresses sadness and happiness, group express sad and neutral emotions

The research involved a behavioral measure of emotion perception that emulated “on-line” emotion perception and distinguished between accuracy and inaccuracy.

As predicted, an experimentally manipulated temporarily active focus of the self as different from others or similar to others had a significant effect on emotion decoding accuracy, especially for target’s negative facial emotion expressions; compared to priming independent self construal, interdependence priming (asking participants to think themselves in relation to close others) entrained lower accuracy in perceiving target’s negative emotions in a group setting. We understand this effect primarily in social-cognitive terms, namely that independent or interdependent self cognitions are associated with less or more attention to context (respectively) and therefore more accuracy in the focal task (Kitayama et al. 2003; Kühnen and Oyserman 2002; Nisbett 2003). This effect may have become evident in the current research because we used an emotion recognition task that provided a salient social context for the expressions. If no social context is provided, then it may be difficult to test the relevance of context and focal task.

This is an important finding, suggesting that even within a single culture, minimally shifting attention to or away from the self can have potentially important consequences for facial emotion recognition accuracy. These results directly relate to previous research that cultural differences in the cognitive mode of attending to context or to the person can influence the emotion perception process (Masuda et al. 2008) and the motivation to attend to emotion overall (Konrath et al. 2011). Further research is needed to exactly document

the processes that link accuracy outcomes with the suggested differences in attention to context or to the focal target also in keeping with recent calls to combine social cognition with accuracy research (Zaki and Ochsner 2011).

Effects of temporarily active self-construal on emotion decoding accuracy were also reflected in relationships between participants' chronic independent self-construal and emotion decoding accuracy. Notwithstanding self-construal salience effects, higher chronic independence was associated with higher accuracy in decoding facial expressions of negative emotion. These findings extend existing research on relationships between independent self-construal and self-reported identification of emotion (Konrath et al. 2011) to behavioral assessments of emotion decoding accuracy. One way to understand this relationship is that persons with higher chronic independence are generally more attentive to emotion (Dion 1996; Van Hemert et al. 2007) and hence should be generally more capable to accurately decode others' emotions. The fact that chronic independent self-construal had unique positive effects on negative emotion decoding accuracy regardless of primed self-construal points to different processes that may be associated with trait and temporarily activated self-construal with regards to decoding accuracy.

Suggestive of the important effects of situational salience on shifting attention to the group rather than the self was the significant interaction between chronic and temporarily active self-construal. Priming independent and interdependent self-construal interacted with chronic interdependence to predict negative emotion decoding accuracy so that interdependence priming resulted in lower decoding accuracy rates for participants with higher chronic interdependent self-construal than those with lower chronic interdependence. This pattern of results suggests that situational factors (e.g., contextual cues or the social situation) may interact with dispositional self-construal to influence emotion perception accuracy (e.g., Miyamoto et al. 2006). Interestingly, only chronic interdependent self-construal interacted with primed self-construal suggesting that at least for this culture, the perceptual effects of an interdependent self may be more contextually variable than that of independent self-construal. Future research could put this assumption to test in a more independent culture and using other perceptual tasks, while also testing for the suggested perceptual and motivational processes.

Taken together, the results regarding relationships between chronic and temporarily salient self-construal with respect to emotion decoding accuracy lend strong support to the "culture as situated cognition" model (Oyserman 2011), extending this model to "on-line" emotion perception processes. Specifically, the results suggest that situational affordances (independence or interdependence primes) can impact on decoders' mind set and the emotion perception processes and outcomes (accuracy) and that chronic and temporarily salient self-construal are related as expected; finally, that independent and interdependent styles or views of the self co-exist and can be experimentally activated (Kühnen and Oyserman 2002).

The emotion recognition task employed in this study allowed the distinction between the decoding of positive and negative facial emotion expressions. There are at least two additional reasons as to why effects were limited to negative emotion expression decoding accuracy: (a) seeing facial expressions of positive emotion elicits positive affect, which broadens cognition (Johnson et al. 2010) and may palliate the negative effects of self-construal activation, (b) happy emotions are easier to decode and therefore they may be less amenable to decoding biases.

Limitations of this study were the non-inclusion of a control condition; hence we do not know whether it was independence priming that resulted in more accuracy or interdependence priming that resulted in less accuracy or whether both had effects on accuracy.

Moreover, we do not know whether the results generalize to other cultures and cultural groups (i.e., older, non-student populations). In the current study we considered within-culture variation in self-construal as analogous to between cultures variation, in line with the “culture as situated cognition” model. Yet, differences in emotion decoding accuracy may also relate to processes that are less directly associated with independent and interdependent self-construal and this could be a topic for future research.

Conclusion

Limitations notwithstanding, the results from this study provide important initial evidence that culture-related self cognitions (chronic and temporarily salient self-construal), impact accuracy in facial emotion perception recognition. These findings have implications for understanding individual differences in emotion decoding accuracy within and possibly between cultures in line with the “culture as situated cognition” perspective and for dynamic social interactions and effective communication between people from different cultural groups and statuses. Finally, the results lend support to emerging theoretical (Hareli and Hess 2010) and empirical (Barrett and Kensinger 2010) arguments on the importance of social and contextual factors that influence the perception of emotional facial expressions.

Acknowledgments We would like to thank G. Dimitraki, C. Tsiligiri, Th. Theodosiou, S. Chalaris for help with collecting the data. The research was supported by a joint Grant to Prof. K. Kafetsios and Prof. U. Hess by the Hellenic Scholarships Foundation and DAAD [IKYDA No168].

References

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage Publications.
- Barrett, L. F., & Kensinger, E. A. (2010). Context is routinely encoded during emotion perception. *Psychological Science, 21*, 595–599.
- Beaupré, M. G., & Hess, U. (2005). Cross-cultural emotion recognition among Canadian ethnic groups. *Journal of Cross-Cultural Psychology, 36*, 355–370.
- Biehl, M., Matsumoto, D., Ekman, P., Hearn, V., Heider, K., Kudoh, T., et al. (1997). Matsumoto and Ekman’s Japanese and Caucasian facial expressions of emotion (JACFEE): Reliability data and cross-national differences. *Journal of Nonverbal Behavior, 21*(1), 3–21.
- Cross, S. E., Hardin, E. E., & Gercek-Swing, B. (2011). The what, how, why, and where of self-construal. *Personality and Social Psychology Review, 15*, 142–179.
- Dion, K. L. (1996). Ethnolinguistic correlates of alexithymia: Toward a cultural perspective. *Journal of Psychosomatic Research, 41*, 531–539.
- Ekman, P., & Friesen, W. V. (1971). Constants across cultures in the face and emotion. *Journal of Personality and Social Psychology, 17*, 124–129.
- Elfenbein, H. A., Beaupré, M. G., Levesque, M., & Hess, U. (2007). Toward a dialect theory: Cultural differences in the expression and recognition of posed facial expressions. *Emotion, 7*, 131–146.
- Hall, J. A., Andrzejewski, S. A., & Yopchick, J. E. (2009). Psychosocial correlates of interpersonal sensitivity: A meta-analysis. *Journal of Nonverbal Behavior, 33*, 149–180.
- Hareli, S., & Hess, U. (2010). What emotional reactions can tell us about the nature of others: An appraisal perspective on person perception. *Cognition and Emotion, 24*, 128–140.
- Hess, U., Adams, R. B., Jr, & Kleck, R. E. (2007). Looking at you or looking elsewhere: The influence of head orientation on the signal value of emotional facial expressions. *Motivation and Emotion, 31*, 137–144.
- Hess, U., Adams, R. B., Simard, A., Stevenson, M. T., & Kleck, R. E. (2012). Smiling and sad wrinkles: Age-related changes in the face and the perception of emotions and intentions. *Journal of Experimental Social Psychology, 48*, 1377–1380.

- Hess, U. & Kafetsios, K. (2013). *Accuracy and bias in emotion perception: From labs to life*. (Manuscript under review).
- Hess, U., & Thibault, P. (2009). Darwin and emotion expression. *American Psychologist*, *64*, 120–128.
- Johnson, K. J., Waugh, C. E., & Fredrickson, B. L. (2010). Smile to see the forest: Facially expressed positive emotions broaden cognition. *Cognition and Emotion*, *24*, 299–321.
- Kafetsios, K., & Hess, U. (2013). *Are you looking at me? The influence of facial orientation and self-construal activation on the perception of emotion expressions*. (Manuscript under review).
- Kitayama, S., Duffy, S., Kawamura, T., & Larsen, J. T. (2003). Perceiving an object and its context in different cultures: A cultural look at new look. *Psychological Science*, *14*, 201–206.
- Konrath, S., Grynberg, D., Corneille, O., Hammig, S., & Luminet, O. (2011). On the social cost of interdependence: Alexithymia is enhanced among socially interdependent people. *Personality and Individual Differences*, *50*, 135–141.
- Kuhn, M. H., & McPartland, T. (1954). An empirical investigation of self-attitudes. *American Sociological Review*, *19*, 58–76.
- Kühnen, U., & Hannover, B. (2000). Assimilation and contrast in social comparisons as a consequence of self-construal activation. *European Journal of Social Psychology*, *30*, 799–811.
- Kühnen, U., & Oyserman, D. (2002). Thinking about the self influences thinking in general: Cognitive consequences of salient self-concept. *Journal of Experimental Social Psychology*, *38*, 492–499.
- Kwan, V. S. Y., Bond, M. H., & Singelis, T. M. (1997). Pancultural explanations for life satisfaction: Adding relationship harmony to self-esteem. *Journal of Personality and Social Psychology*, *73*, 1038–1051.
- Lau, A. S., Fung, J., Wang, S.-W., & Kang, S.-M. (2009). Explaining elevated social anxiety among Asian Americans: Emotional attunement and a cultural double bind. *Cultural Diversity and Ethnic Minority Psychology*, *15*, 77–85.
- Markus, H., & Kitayama, S. (1991). Culture and self: Implications for cognition, emotion and motivation. *Psychological Review*, *98*, 224–253.
- Masuda, T., Ellsworth, P. C., Mesquita, B., Leu, J., Tanida, S., & Van de Veerdonk, E. (2008). Placing the face in context: Cultural differences in the perception of facial emotion. *Journal of Personality and Social Psychology*, *94*, 365–381.
- Matsumoto, D. (2005). Scalar ratings of contempt expressions. *Journal of Nonverbal Behavior*, *29*, 91–104.
- Matsumoto, D., Hwang, H. S., & Yamada, H. (2012). Cultural differences in the relative contributions of face and context to judgments of emotions. *Journal of Cross-Cultural Psychology*, *43*, 198–218.
- Mesquita, B., & Karasawa, M. (2002). Different emotional lives. *Cognition and Emotion*, *16*, 127–141.
- Miyamoto, Y., Nisbett, R. E., & Masuda, T. (2006). Culture and the physical environment: Holistic versus analytic perceptual affordances. *Psychological Science*, *17*, 113–119.
- Nisbett, R. E. (2003). *The geography of thought: How Asians and Westerners think differently and why*. New York: Free Press.
- Nowicki, S., Jr, & Duke, M. P. (1994). Individual differences in the nonverbal communication of affect: The diagnostic analysis of nonverbal accuracy scale. *Journal of Nonverbal Behavior*, *18*, 9–35.
- Oyserman, D. (2011). Culture as situated cognition: Cultural mindsets, cultural fluency, and meaning making. *European Review of Social Psychology*, *22*, 164–214.
- Oyserman, D., & Lee, S. W. S. (2008). Does culture influence what and how we think? Effects of priming individualism and collectivism. *Psychological Bulletin*, *134*, 311–342.
- Oyserman, D., & Sorensen, N. (2009). Understanding cultural syndrome effects on what and how we think: A situated cognition model. In R. Wyer, Y. Y. Hong, & C. Y. Chiu (Eds.), *Understanding culture: Theory, research and application* (pp. 25–52). New York: Psychology Press.
- Oyserman, D., Sorensen, N., Reber, R., & Chen, S. (2009). Connecting and separating mindsets: Culture as situated cognition. *Journal of Personality and Social Psychology*, *97*, 217–235.
- Oysermann, D., Coon, H. M., & Kemmelmeier, M. (2002). Rethinking individualism and collectivism: Evaluation of theoretical assumptions and meta-analysis. *Psychological Bulletin*, *128*, 3–73.
- Preacher, K. J., Curran, P. J., & Bauer, D. J. (2006). Computational tools for probing interactions in multiple linear regression, multilevel modeling, and latent curve analysis. *Journal of Educational and Behavioral Statistics*, *31*, 437–448.
- Singelis, T. M. (1994). The measurement of independent and interdependent self-construals. *Personality and Social Psychology Bulletin*, *20*, 580–591.
- Singelis, T. M., & Brown, W. J. (1995). Culture, self, and collectivist communication: Linking culture to individual behavior. *Human Communication Research*, *21*, 354–389.
- Trafimow, D., Triandis, H., & Goto, S. (1991). Some tests of the distinction between the private self and the collective self. *Journal of Personality and Social Psychology*, *60*, 649–655.

- Van Hemert, D. A., Poortinga, Y. H., & Van de Vijver, F. J. R. (2007). Emotion and culture: A meta-analysis. *Cognition and Emotion*, *21*, 913–943.
- Zaki, J., & Ochsner, K. (2011). Reintegrating the study of accuracy into social cognition research. *Psychological Inquiry*, *22*(3), 159–182.