



example the body (Aviezer et al. 2008). Finally, additional information such as a niqab may be added to the facial information (Kret and de Gelder 2012). However, it can be argued that the latter two are not pure tests of the impact of context information as the first is better conceptualized as the presentation of incongruent emotion information—since after all the body provides *prima facie* emotion information as well—and the latter comprises a manipulation of social group rather than of social context *per se*. By contrast, the former is an extreme manipulation and in fact, people react strongly to a person who shows a completely inadequate—i.e., deviant—emotion expression as shown in fact nicely by Szczurek et al. (2012).

The goal of the present study was to assess the impact of context information on the identification of emotions and on the inferences about a person in an ecologically plausible educational setting. This setting was chosen as this context is familiar to all and easy to describe.

### The role of context for emotion identification

As mentioned above, the successful identification of ambiguous facial expressions may crucially depend on context (Kirouac and Hess 1999). Yet, even when observers encounter a clear expression that is easily identified when presented in isolation, additional information may change that perception. For example, Aviezer et al. (2008) found that a facial expression of disgust tends to be perceived as anger if the body posture of the expresser reflects anger. Further, observers tend to see multiple emotions even when judging emotional expressions considered to be “pure” (Russell and Fehr 1987; Russell et al. 1993; Yrizarry et al. 1998). That is, even when shown a “pure” expression of, for example, anger, that is an expression that does indeed show anger and only anger, participants may in addition perceive sadness or fear or another emotion. This may be due to morphological features of the face such as wrinkles (Hess et al. 2012), but also be due to the expectations observers have about another person’s likely emotions. For example, people tend to think that women who are angry also experience sadness at the same time (Hess et al. 2000). Thus, for example, two boys fighting are perceived as less aggressive than two girls fighting, due to the beliefs about the emotionality of boys and girls (Condry and Ross 1985).

Thus, information that is presented in addition to the expression, such as gender information, but also other context information, such as, for example the expressions of other individuals standing next to the target individual (Masuda et al. 2008), can induce people to perceive emotions that are not actually expressed. Importantly, people even see emotions in neutral faces (Hess et al. 2007, 2012, *in press*). One source for the imputation of emotions in such cases is again context information. In fact, we would

expect the effect of context to be higher for neutral faces than for faces showing clearly detectable emotions as the clarity of the signal plays an important role. If a signal is very clear, then context information should be recruited to a lesser degree than for an emotionally ambiguous signal (Hess and Kirouac 2000). Hence the neutral face allows for more projection of emotions based on additional situational information than a highly prototypical facial expression.

As mentioned above, observers rarely stop at simply identifying the emotions but rather use this information to draw inferences about the expresser and these inferences are generally influenced by available context information as well (Hareli and Hess 2012; Trope 1986). Thus, Szczurek et al. (2012) found that individuals who showed clearly deviant emotional reactions to slides (for example, smiling when seeing an injured person) were judged more negatively than those who showed non-deviant reactions. Overall, this suggests that the context in which an emotion is perceived may bias the way it is understood by observers such that the same expression signals something different about the person depending on the context information.

We predicted that participants would use the information provided by the face as well as the applicable norms provided by the context in combination with naïve emotion theories on the elicitation of emotions (Hareli and Hess 2010) to both label the emotion and to draw conclusions from it. In contrast to previous research we did not compare expected with deviant reactions or combined incongruent emotion information but rather presented expressions, which were plausible in the context, but the evaluation of which would depend on the applicable norms.

Specifically, we presented participants with the photo of a male or a female high school student showing either a sad, happy or a neutral facial expression in response to receiving a grade in an exam. We chose this specific setting because it allowed us to assess the impact of both an arbitrary norm created by us and of implicit norms prevalent in society. The latter is the norm that one goal in school is to obtain good grades. Based on this norm, a student should be expected to be happy or proud when obtaining a good grade and sad, embarrassed or angry when obtaining a bad grade. Hence we manipulated the grade to be either an A or a C. This norm however, should be modifiable by the school context. Hence we described one school as heavily emphasizing good grades and hard work and another as focusing more on personal development and artistic skills. This second norm should moderate the general norm to obtain good grades by making good grades even more relevant in one context and somewhat less relevant in the other. Additional context information was provided by the gender of the student, which is obvious from the photo. Gender can be expected to impact on emotion perception, because norms with regard to

emotional reactions are well established and ubiquitous. Thus, women are generally expected to be more expressive of emotions in general and especially with regard to happiness and sadness, but less expressive of agentive emotions such as anger, disgust and contempt (Fischer 1993; Hess et al. 2000). Also, women are generally perceived as less dominant and more affiliative (e.g., Hess et al. 2005), which should be reflected in the ratings of liking and competence which are semantically closely related.

#### Hypotheses and research questions

Participants were asked to rate the extent to which the student expressed the “focal” emotion associated with the expression (sadness or happiness) as well as other emotions. In addition, participants rated how competent and likeable the student seemed to be. In line with our discussion above, we expected that both the emotion expression ratings and the person perception ratings would be influenced by context. Specifically, we expected an impact of the norm that students should aim towards a high grade such that students who receive an A will be rated higher on positive emotions (H1: happiness and pride) and lower on negative emotions (H2: embarrassment, shame, anger, sadness, contempt) than students who receive a low grade. This effect should be moderated by school norm (H3) such that the difference will be larger for the school, which emphasizes achievement. Further, the effects of grade norm and school norm should be larger for the neutral expression than for expressions of sadness and happiness since the impact of context on emotion ratings should be larger when signal clarity is weaker (Hess and Kirouac 2000). That is, we expected an emotion by grade/school norm (H4/H5) interaction for all dependent variables, such that the difference in ratings as a function of grade should be larger for neutral than for emotional faces. Finally, we expected female students to be rated as sadder and happier respectively than male students (H6).

Further, we expected that students who received a higher grade would be rated as more competent (H7). In line with research showing that happiness signals affiliative intent (Hess et al. 2000; Knutson 1996) we expected smiling students to be rated as more likable (H8a). Based on the notion that neutral facial expressions elicit negative affect in observers (Hess et al. 2007) we expected students who show neutral expressions to be rated as less likable (H8b). We further expected female students to be rated as more likable (H9) and less competent (H10) than male students. We had no a priori hypotheses regarding the effect of school norm on likability and competence nor regarding the interaction of context factors on person perception ratings. However, we again expected that the effect of context should be stronger for neutral expressions (H11).

## Method

### Participants

A total of 633 (50.4 % male) participants with a mean age of 32 years ( $SD = 6.5$ , range 20–45) completed a web-based questionnaire. Participants all had completed high school and 76 % had some level of university education. They were recruited from the subject panel of a private company specializing in web-based surveys and were paid 5 Shekel. Participants were required to be competent speakers of the Hebrew language.

### Procedure

The study was presented as a study on student experience. Participants saw a page showing the face of one male or female student with a sad, happy or neutral expression who was described as attending a high school in a small town. To manipulate norms, the school was described as the only one in town and as either emphasizing good grades and hard work or personal development and artistic skills. The reason for describing the school as the only one in town was to avoid any assumed connection between the choice of the school and the student’s aptitude. The student was said to endorse these demands. The participants were told that the student just received his/her grade in an exam. The grade was either 90 % or a 60 %, which in Israel corresponds to an A and C respectively. The photo was said to reflect his/her reaction to this news. Each participant saw one photo in one condition for a complete between-subjects design. The photo was shown until all ratings were completed.

The photos of two male and two female stimulus persons were counterbalanced across participants. The exam was said to be either on geography or biology. The two subject matters were counterbalanced across participants to assure that reactions would not be due to some norms associated with a specific topic.

Facial stimuli were facial expressions of happiness, sadness and neutrality taken from the Montreal Set of Facial Displays of Emotion (MSFDE; Beaupré and Hess 2005). The MSFDE was created by instructing participants via a directed facial action task to contract specific muscles so as to create a specific expressive pattern based on prototypes proposed by Ekman and Friesen (1978) and Wiggers (1982). FACS coding confirmed that the appearance of the facial expressions in these photographs is standardized across expressers. Neutral expressions did not show any facial activity. The average decoding accuracy rate for these expressions is about 60 % and they are therefore suitable for studies in which the effect of context on decoding is assessed as ceiling effects in ratings are avoided (Beaupré and Hess 2005).

Dependent measures

To assess the influence of facial expressions and context information on perceptions, participants were asked to rate “to what degree the person expressed” each of seven emotions (happiness and sadness, as well as pride, embarrassment, shame, anger, and contempt) on 11-point Likert scales anchored with 0—not at all and 11—very intensely. Likability was assessed using the mean of three 11-point bi-polar scales tapping the dimensions of likeable, warm/cold and sociable (Cronbach’s  $\alpha = .80$ ). Competence was assessed using the mean of three 11-point bi-polar scales tapping the dimensions of ability, intelligence and knowledge (Cronbach’s  $\alpha = .86$ ). In addition, a number of questions about the students’ personality and general standing in the school were asked, but will not be discussed in the context of the present paper.

Results and discussion

Initial analyses did not reveal any significant main effect or interaction for sex of participant. This factor was therefore dropped from all analyses reported below.

We predicted that students who received an A will be rated higher on positive emotions (H1: happiness and pride) and lower on negative emotions (H2: embarrassment, shame, anger, sadness, contempt) than students who received a low grade. This effect should be moderated by school norm (H3) such that the difference will be larger for the school, which emphasizes achievement as well as an emotion by grade/school norm (H4/H5) interaction for all dependent variables, such that the difference in ratings as a function of grade should be larger for neutral than for emotional faces. Finally, we expected female students to be rated as sadder and happier respectively than male students (H6).

To assess these predictions we conducted univariate analyses of variance with the factors emotion expression (sad, happy, neutral), school norm (grade emphasis vs. social and artistic skill emphasis), grade received: (90 vs. 60 %) 9 gender of target on all emotion scales. We will present the data separately for positive and negative emotions.

Positive emotions

A significant main effect of emotion expression emerged for both happiness,  $F(2, 592) = 302.19$ ,  $MSE = 1,385.64$ ,  $p < .001$ ,  $g_p^2 = .51$  and pride,  $F(2, 592) = 228.50$ ,  $MSE = 1,109.21$ ,  $p < .001$ ,  $g_p^2 = .44$ , such that as expected, students were rated most happy and proud when they showed happiness, followed by the neutral expression and finally least happy and proud when showing sadness (see

**Table 1** Main effect of emotion expression

Perception	Neutrality		Happiness		Sadness	
	M	SD	M	SD	M	SD
Positive emotions						
Happiness	3.20 <sub>a</sub>	2.43	6.22 <sub>b</sub>	2.63	.91 <sub>c</sub>	1.59
Pride	3.25 <sub>a</sub>	2.60	5.75 <sub>b</sub>	2.81	1.05 <sub>c</sub>	1.78
Negative emotions						
Sadness	5.97 <sub>a</sub>	2.77	2.17 <sub>b</sub>	2.48	7.90 <sub>c</sub>	2.44
Embarrassment	4.68 <sub>a</sub>	2.96	3.78 <sub>b</sub>	2.87	4.74 <sub>a</sub>	2.94
Shame	4.24 <sub>a</sub>	2.89	2.62 <sub>b</sub>	2.58	5.11 <sub>c</sub>	2.83
Anger	4.02 <sub>a</sub>	2.81	1.54 <sub>b</sub>	2.02	3.90 <sub>a</sub>	2.79
Contempt	3.79 <sub>a</sub>	2.78	1.96 <sub>b</sub>	2.37	3.45 <sub>a</sub>	2.86
Inferences						
Competence	2.16 <sub>a</sub>	1.61	1.71 <sub>b</sub>	1.76	1.88 <sub>b</sub>	1.80
Likeability	.68 <sub>a</sub>	1.69	1.41 <sub>b</sub>	1.70	.79 <sub>a</sub>	1.51

N.B. Subscripts based on LSD tests at  $p < .05$ . Higher numbers represent greater level of this variable

Numbers with different subscripts differ at \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

**Table 2** Main effect of grade

Perception	Grade			
	60		90	
	M	SD	M	SD
Positive emotions				
Happiness	2.88	2.88	4.15	3.22
Pride	2.50	2.64	4.36	3.24
Negative emotions				
Sadness	5.76	3.23	4.85	3.67
Embarrassment	4.89	2.97	3.87	2.84
Shame	4.59	2.89	3.87	2.84
Anger	3.36	2.72	2.99	2.90
Contempt	3.35	2.74	2.80	2.82
Inferences				
Competence	1.30	1.60	2.61	1.60
Likeability	1.13	1.59	.75	1.73

Table 1). The predicted main effect of grade also emerged significantly for happiness  $F(2,592) = 65.66$ ,  $MSE = 301.09$ ,  $p < .001$ ,  $g_p^2 = .10$ , and pride  $F(2,592) = 121.59$ ,  $MSE = 590.24$ ,  $p < .001$ ,  $g_p^2 = .17$ , such that across emotion expressions students were rated as happier as well as prouder when receiving a higher rather than a lower grade (see Table 2). These effects were moderated by the predicted emotion x grade interaction (happiness:  $F(2, 592) = 6.49$ ,  $MSE = 29.74$ ,  $p = .002$ ,  $g_p^2 = .02$ , pride:  $F(2, 592) = 12.66$ ,  $MSE = 61.47$ ,  $p < .001$ ,  $g_p^2 = .04$ ). Specifically, when showing happiness or neutrality

**Table 3** Interaction between emotion expression and grade

Perception	Grade	Emotion expression					
		Neutrality		Happiness		Sadness	
		M	SD	M	SD	M	SD
<b>Focal emotions</b>							
Happiness	60	2.34 <sub>a</sub>	2.21	5.30 <sub>a</sub>	2.66	.68 <sub>a</sub>	1.36
	90	4.10 <sub>b</sub>	2.32	7.38 <sub>b</sub>	2.08	1.15 <sub>b</sub>	1.7
Sadness	60	6.54 <sub>a</sub>	2.49	2.99 <sub>a</sub>	2.50	8.06 <sub>a</sub>	2.35
	90	5.37 <sub>b</sub>	2.93	1.12 <sub>b</sub>	2.04	7.73 <sub>a</sub>	2.53
<b>Non-focal emotions</b>							
Pride	60	2.14 <sub>a</sub>	2.15	4.41 <sub>a</sub>	2.67	.71 <sub>a</sub>	1.44
	90	4.39 <sub>b</sub>	2.53	7.45 <sub>b</sub>	1.94	1.40 <sub>b</sub>	2.01
Embarrassment	60	4.97 <sub>a</sub>	3.01	4.63 <sub>a</sub>	2.84	5.11 <sub>a</sub>	3.06
	90	4.38 <sub>a</sub>	2.88	2.70 <sub>b</sub>	2.53	4.37 <sub>a</sub>	2.78
Shame	60	4.77 <sub>a</sub>	2.89	3.54 <sub>a</sub>	2.70	5.61 <sub>a</sub>	2.73
	90	3.69 <sub>b</sub>	2.80	1.44 <sub>b</sub>	1.86	4.59 <sub>b</sub>	2.86
Anger	60	4.00 <sub>a</sub>	2.82	2.11 <sub>a</sub>	2.10	4.05 <sub>a</sub>	2.75
	90	4.60 <sub>a</sub>	2.81	.83 <sub>b</sub>	1.67	3.75 <sub>a</sub>	2.84
Contempt	60	3.90 <sub>a</sub>	2.84	2.78 <sub>a</sub>	2.50	3.36 <sub>a</sub>	2.79
	90	3.68 <sub>a</sub>	2.72	.91 <sub>b</sub>	1.70	3.54 <sub>a</sub>	2.95
<b>Inferences</b>							
Competence	60	1.58 <sub>a</sub>	1.49	.91 <sub>a</sub>	1.48	1.44 <sub>a</sub>	1.76
	90	2.76 <sub>b</sub>	1.51	2.73 <sub>b</sub>	1.57	2.33 <sub>b</sub>	1.73
Likability	60	.46 <sub>a</sub>	1.68	1.48 <sub>b</sub>	1.64	1.00 <sub>a</sub>	1.33
	90	.90 <sub>b</sub>	1.68	1.31 <sub>b</sub>	1.77	.57 <sub>b</sub>	1.64

N.B. Subscripts based on LSD tests at  $p \leq .05$ . Higher numbers represent greater level of this variable. Contrasts compare grades within emotions. Numbers with different subscripts differ at  $p \leq .05$ . \*\*\*  $p \leq .001$ ; \*  $p \leq .05$

students were rated as significantly happier (Diff = 2.08 and 1.76 respectively) as well as prouder (Diff = 3.04 and 2.25 respectively) after receiving a high grade compared to a low grade. Students showing a sad expression but receiving a high grade were also rated as happier (Diff = .47; see Table 3), and prouder (Diff = .69) but the difference was much smaller and for happiness not significant. No main effects of student gender (H6) or norm (H3) or interactions involving these factors emerged significantly. In sum, H1 was confirmed such that across emotion expressions, grade had the expected effect on the ratings of positive emotions. However, this effect was found not only for neutrality as specified by H4 but also for happiness.

#### Negative emotions

The expected main effect of emotion expression emerged for sadness,  $F(2, 592) = 274.04$ ,  $MSE = 1,715.43$ ,  $p \leq$

.001,  $g_p^2 = .48$ , embarrassment,  $F(2, 592) = 8.64$ ,  $MSE = 71.42$ ,  $p \leq .001$ ,  $g_p^2 = .03$ , shame,  $F(2, 592) = 43.81$ ,  $MSE = 314.63$ ,  $p \leq .001$ ,  $g_p^2 = .13$ , anger,  $F(2, 592) = 63.52$ ,  $MSE = 407.21$ ,  $p \leq .001$ ,  $g_p^2 = .18$ , contempt,  $F(2, 592) = 31.97$ ,  $MSE = 220.04$ ,  $p \leq .001$ ,  $g_p^2 = .10$ . Overall, students were rated as least sad and ashamed when they showed happiness, followed by neutrality and most sad, and ashamed when they showed sadness. For embarrassment, anger and contempt, neutrality did not differ significantly from sadness expressions and both were rated as more intense in these emotions than happiness expressions (see Table 1).

Also as expected a main effect of grade emerged for sadness,  $F(2, 592) = 25.97$ ,  $MSE = 162.54$ ,  $p \leq .001$ ,  $g_p^2 = .04$ , embarrassment,  $F(2, 592) = 20.13$ ,  $MSE = 166.42$ ,  $p \leq .001$ ,  $g_p^2 = .03$ , shame,  $F(2, 592) = 42.56$ ,  $MSE = 305.64$ ,  $p \leq .001$ ,  $g_p^2 = .07$ , anger  $F(2, 592) = 6.57$ ,  $MSE = 42.13$ ,  $p = .011$ ,  $g_p^2 = .01$ , contempt,  $F(2, 592) = 10.39$ ,  $MSE = 71.50$ ,  $p = .001$ ,  $g_p^2 = .02$ , such that participants rated the person as experiencing less negative emotions when receiving a higher grade compared to a lower grade (see Table 2), confirming H1.

As predicted these effects were moderated by an emotion expression by grade interaction for sadness,  $F(2, 592) = 4.91$ ,  $MSE = 30.75$ ,  $p = .008$ ,  $g_p^2 = .02$ , embarrassment,  $F(2, 592) = 3.08$ ,  $MSE = 25.44$ ,  $p = .047$ ,  $g_p^2 = .01$ , anger,  $F(2, 592) = 3.92$ ,  $MSE = 25.11$ ,  $p = .020$ ,  $g_p^2 = .01$ , contempt,  $F(2, 592) = 6.67$ ,  $MSE = 45.90$ ,  $p = .001$ ,  $g_p^2 = .02$ . Specifically, when students showed happiness, the predicted difference in ratings of negative emotions as a function of grade emerged for all negative emotions. For neutrality and sadness expressions, participants rated the student as experiencing less negative emotion when receiving a higher grade only for shame. That is, the predicted moderating effect of grade (H4) was found but only for happiness expressions.

A main effect of school norm emerged for anger only,  $F(2, 592) = 4.61$ ,  $MSE = 29.55$ ,  $p = .032$ ,  $g_p^2 = .01$ , such that students in the school with the grade emphasis norm were expected to experience more anger ( $M = 3.39$ ,  $SD = 2.87$ ) than those in the school with the personal development emphasis ( $M = 2.97$ ,  $SD = 2.73$ ). This may reflect stereotype beliefs about “Type A” personalities who work hard for grades.

Further, a grade by student gender interaction emerged for contempt only,  $F(2, 592) = 3.99$ ,  $MSE = 27.47$ ,  $p = .046$ ,  $g_p^2 = .01$ , such that male students were expected to experience more contempt when receiving a low grade ( $M = 3.66$ ,  $SD = 2.64$ ) than a high grade ( $M = 2.56$ ,  $SD = 2.95$ ), whereas no difference was expected for women (low grade:  $M = 3.02$ ,  $SD = 2.83$ ; high grade:  $M = 3.00$ ,  $SD = 2.95$ ).

## Person perception inferences

As regards inferences drawn about the personality of the students, we expected that students who received a higher grade would be rated as more competent (H7). In line with research showing that happiness signals affiliative intent (Hess et al. 2000; Knutson 1996) we expected smiling students to be rated as more likable (H8a). Based on the notion that neutral facial expressions elicit negative affect in observers (Hess et al. 2007) we expected students who show neutral expressions to be rated as less likable (H8b). We further expected female students to be rated as more likable (H9) and less competent (H10) than male students. We again expected that the effect of context should be stronger for neutral expressions (H11).

To assess these predictions we conducted univariate analyses of variance with the factors emotion expression (sad, happy, neutral), school norm (grade emphasis vs. social and artistic skill emphasis), grade received: (90 vs. 60 %) 9 gender of target on the likability and competence composite scales.

## Competence

Significant main effects of emotion,  $F(2, 592) = 3.07$ ,  $MSE = 7.36$ ,  $p = .047$ ,  $g_p^2 = .01$ , grade,  $F(2, 592) = 101.30$ ,  $MSE = 242.64$ ,  $p < .001$ ,  $g_p^2 = .15$ , and school norm  $F(2, 592) = 6.60$ ,  $MSE = 15.83$ ,  $p = .010$ ,  $g_p^2 = .01$ , emerged. Specifically, students who showed neutrality were rated as more competent than students who showed happiness or sadness, who did not differ (see Table 1). This is in line with findings by Warner and Shields (2007) suggesting that under some circumstances ‘keeping cool’ can be a sign of competence. Further as expected (H7), across emotion expressions, students who received a higher grade were perceived as more competent than those who received a lower grade (see Table 2). Also, students who attended the school with an emphasis on achievement were assumed to be more competent ( $M = 2.12$ ,  $SD = 1.71$ ) than those who attended the school with an emphasis on personal development ( $M = 1.72$ ,  $SD = 1.72$ ).

These effects were moderated by the expected emotion by grade interaction,  $F(2, 592) = 3.30$ ,  $MSE = 7.92$ ,  $p = .037$ ,  $g_p^2 = .01$ , as well as an emotion by student gender interaction,  $F(2, 592) = 10.90$ ,  $MSE = 26.12$ ,  $p < .001$ ,  $g_p^2 = .04$ . Specifically, the impact of grade on perceived competence was significant for all emotions but varied in size, such that the impact was smaller for students who showed sadness (Diff: .89) and neutrality (Diff: 1.18) and larger for those who showed happiness (Diff: 1.82). Finally, whereas female students who showed sadness were rated as competent ( $M = 1.69$ ,  $SD = 1.92$ ) as male

students ( $M = 2.14$ ,  $SD = 1.58$ ), and women expressing happiness were seen as competent as men expressing happiness ( $M = 1.95$ ,  $SD = 1.69$  vs.  $M = 1.50$ ,  $SD = 1.80$ , for females and males, respectively) in the case of neutrality women were rated as more competent than men ( $M = 2.59$ ,  $SD = 1.64$  vs.  $M = 1.72$ ,  $SD = 1.47$ , for females and males, respectively).

## Likeability

Significant main effects of emotion,  $F(2, 592) = 11.95$ ,  $MSE = 31.71$ ,  $p < .001$ ,  $g_p^2 = .04$ , and grade  $F(2, 592) = 6.83$ ,  $MSE = 18.11$ ,  $p = .009$ ,  $g_p^2 = .01$ , emerged. Specifically, as expected (H8a) students who showed happiness were rated as more likable than students who showed sadness or neutrality, who were rated as least likable (H8b) (see Table 1). Also, students who received a higher grade were rated as less likable than those who received a lower grade (see Table 2). This may reflect a stereotype notion about “eager beavers” at school who receive good grades.

This interpretation is supported by the significant grade by norm interaction,  $F(2, 592) = 4.80$ ,  $MSE = 12.75$ ,  $p = .029$ ,  $g_p^2 = .01$ , such that in the school where the school norm supports academic achievement and emphasizes good grades, there is no difference in likability between students who received a low grade ( $M = .96$ ,  $SD = 1.95$ ) and those who received a high grade ( $M = .86$ ,  $SD = 1.69$ ), whereas in the school where the school norms emphasizes personal development, the student who received a low grade is rated as more likable ( $M = 1.29$ ,  $SD = 1.61$ ) than the one who received the high grade ( $M = .62$ ,  $SD = 1.77$ ), which is in liking comparable to both students from the other school.

## Discussion

In sum, we found that perceived positive and negative emotions as well as inference about the students’ competence and likability were all influenced by context information, in particular by information about the grade achieved. As regards the emotion ratings, this effect was found both for the emotions actually shown—the focal emotions of happiness and sadness, and for non-focal emotions such as pride, shame, embarrassment, anger, and contempt, which were not in fact shown. That is, participants imputed these emotions to students on the basis of their context knowledge alone. As regards the focal emotions, we expected that participants would use context to a larger extent to attribute emotions to students who showed a neutral facial expression. However, we found that this was done to an even larger degree for happiness

expressions as well, especially for the non-focal emotions. By contrast, when a student showed sadness, the knowledge of the grade achieved hardly impacted on that perception at all.

Thus, it seems that happy expressions were perceived as considerably less informative about the students' actual feelings than were sad expressions and with regard to non-focal emotions, neutrality as well. This suggests that observers "trusted" these expressions more to accurately reflect how the student really felt. Given the many social demands on smiling (Hess et al. 2002; Niedenthal et al. 2010) it seems plausible that smiling faces are trusted less and context is consulted to evaluate the actual state of the person.

However, a strong effect of context on emotion ratings for neutral expressions was nonetheless evident. Specifically, when showing a neutral expression, students were not rated as unemotional (that is, as low on all available emotion scales, as is usually found for emotion ratings of neutral faces, see below) but rather as expressing an intermediate level of both happiness and sadness compared to the happy and sad expressions. That is, even in the absence of any emotion information, students were still rated as expressing emotions. As FACS (Ekman and Friesen 1978) ratings had confirmed that the neutral expressions we employed did not show any discernible facial action, participants must have rated what they thought the students felt and should consequently have expressed, rather than what was actually expressed. In studies using comparable neutral expressions without context information (Hess et al. 2007, 2012) neutral expressions are usually rated as just slightly emotional with means in the lower third of the rating scale. The means for sadness in particular in the present study were above the midpoint suggesting that participants used the available context information to impute emotional meaning.

As regards inferences about the students' competence and likability, emotion expressions, grade and norms all had an impact. Further, gender interacted with emotion expression to modulate the perceived competence of students showing a neutral or happy expression. It is noteworthy that in the present high school context, facial expressions and the grade received seemed to be more informative for likability than gender, which is often found to moderate effects of competence and norm expectations on likability (e.g., Hess et al. 2005). Gender, however, interacted with emotion expression to inform ratings of competence. Overall, inferences were strongly influenced by context information with grade having the largest effect size.

An interesting effect was observed with regard to competence ratings. Specifically, students showing neutral expressions were rated as more competent than students showing happiness or sadness. Further, women were rated as higher in competence than men when showing neutral

expressions, but equal in competence when showing happiness or sadness. In fact, this finding is congruent with the notion that restraint emotion, in a context that plausibly elicits emotion, is indicative of competence (Warner and Shields 2007) and this especially for women (Lewis 2000). Shields (2002) proposes that restraint emotion expressions, what she calls "manly emotions," are a sign of self-control and hence viewed positively. More generally neutral expressions shown in the absence of context, signal dominance (Hareli et al. 2009), which in turn is conceptually linked to competence (Tiedens 2001).

#### Limitations and future research

The present study provides evidence for the impact of context on ratings of plausible emotion expressions. Nonetheless, the study suffers some limitations. First, we manipulated several aspects of context including gender and school norm. However, only grade was found to impact on perceptions of emotions, gender and school norm impacted only on the inferences drawn from these expressions. However, this later finding shows that the information on gender and school norms was processed and used. This may have been due to the fact, that the emotion expressions we used, even though by no means extreme prototypes, were still not ambiguous enough. Yet, grade still had an influence, hence it is possible that participants focused on situational context information when evaluating emotion expressions, which are fleeting in nature, and used stable context information (such as gender and school norm which do not change rapidly or at all) only when inferring stable personality characteristics. This notion, that rapidly changing element of the situation are more relevant to the assessment of emotions and stable context elements more pertinent of personality inferences should be considered in future research.

Also, we used only a restricted set of possible emotional reaction and this limits our conclusions only to the types of emotions expressed. One of our conclusions, for example, was that sad expressions are overall less susceptible to context effects than happy expressions. We argued that due to the ambiguous nature of happy expressions (Niedenthal et al. 2010) happiness may be trusted less and sadness and neutrality more. Hence we would expect expressions of pride for example to be less affected than expressions of happiness.

#### Implications for future research

The present research aimed to show that even very simple and clear emotion expressions as well as the inferences drawn from them are evaluated in line with context information. One notable result was that this effect was larger

for neutrality and happiness than for sadness. As mentioned above, this may be due to the more ambiguous nature of the smiling face. In line with the notion that smiling is a polyvalent expression (Niedenthal et al. 2010) this suggests the importance of considering different smile types when studying smiling in context.

The present research also demonstrated the importance of context information in general. Much of the research on context summarized above, has focused on contrasting emotion information with incongruent context information. In the present study, context information was always plausibly related to the emotion information and was nonetheless found to substantially inform emotion attributions as well as the inferences drawn from them. The findings suggest that participants use normative knowledge to “fine tune” their understanding of an observed expression. Research on emotion norms however, has largely focused on cultural display rules or on the learning of display rules by children and less on their subtle but pervasive influence on everyday emotion judgments within a culture. More research on emotion norms would help us to better understand how context impacts on our understanding of the emotions of others.

## Conclusions

In sum, both the identification of emotions as well as the inferences about the person based on them were influenced not only by the actual emotions expressed but also by the context information provided. Perceivers used context information in order to make sense of what was perceived to the extent that in the case of the neutral expressions and for non-focal emotions, they “see” things that do not actually exist. This recreation of emotion information is not arbitrary, but was based on participants’ general knowledge of the world and the expectations that this gives rise to.

## References

- Aviezer, H., Hassin, R., Ryan, J., Grady, C., Susskind, J., Anderson, A., et al. (2008). Angry, disgusted, or afraid? Studies on the malleability of emotion perception. *Psychological Science*, 19, 724–732.
- 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.
- Clark, M. S., & Taraban, C. (1991). Reactions to and willingness to express emotion in communal and exchange relationships. *Journal of Experimental Social Psychology*, 27, 324–336.
- Condry, J. C., & Ross, D. F. (1985). Sex and aggression: The influence of gender label on the perception of aggression in children. *Child Development*, 56, 225–233.
- Ekman, P., & Friesen, W. V. (1978). The facial action coding system: A technique for the measurement of facial movement. Palo Alto, CA: Consulting Psychologists Press.
- Ekman, P., Friesen, W. V., & Ellsworth, P. (1972). Emotion in the human face: Guidelines for research and an integration of findings. New York, NY: Pergamon Press.
- Fernandez-Dols, J. M., & Ruiz-Belda, M. A. (1997). Spontaneous facial behavior during intense emotional episodes: Artistic truth and optical truth. In J. A. Russell & J. M. Fernandez-Dols (Eds.), *The psychology of facial expression*. Cambridge: Cambridge University Press.
- Fischer, A. H. (1993). Sex differences in emotionality: Fact or stereotype? *Feminism & Psychology*, 3, 303–318.
- 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.
- Hareli, S., & Hess, U. (2012). The social signal value of emotion. *Cognition and Emotion*, 26, 385–389.
- Hareli, S., & Rafaeli, A. (2008). Emotion cycles: On the social influence of emotions in organizations. *Research in Organizational Behavior*, 28, 35–59.
- Hareli, S., Shomrat, N., & Hess, U. (2009). Emotional versus neutral expressions and perceptions of social dominance and submissiveness. *Emotion*, 9, 378–384.
- Hess, U., Adams, R. B., Jr, & Kleck, R. E. (2005). Who may frown and who should smile? Dominance, affiliation, and the display of happiness and anger. *Cognition and Emotion*, 19, 515–536.
- 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., Beaupré, M. G., & Cheung, N. (2002). Who to whom and why—Cultural differences and similarities in the function of smiles. In M. Abel & C. H. Ceia (Eds.), *An empirical reflection on the smile* (pp. 187–216). New York: The Edwin Mellen Press.
- Hess, U., Blairy, S., & Kleck, R. E. (2000a). The influence of expression intensity, gender, and ethnicity on judgments of dominance and affiliation. *Journal of Nonverbal Behavior*, 24, 265–283.
- Hess, U., Houde, S., & Fischer, A. (in press). Do we mimic what we see or what we know? In C. von Scheve & M. Salmela (Eds.), *Collective emotions*. Oxford, UK: Oxford University Press.
- Hess, U., & Kirouac, G. (2000). Emotion expression in groups. In M. Lewis & J. Haviland-Jones (Eds.), *Handbook of emotion* (2nd ed., pp. 368–381). New York: Guilford Press.
- Hess, U., Sénécal, S., Kirouac, G., Herrera, P., Philippot, P., & Kleck, R. E. (2000b). Emotional expressivity in men and women: Stereotypes and self-perceptions. *Cognition and Emotion*, 14, 609–642.
- Hess, U., & Thibault, P. (2009). Darwin and emotion expression. *American Psychologist*, 64, 120–128.
- Karniol, R. (1990). Reading people’s minds: A transformation rule model for predicting others’ thoughts and feelings. *Advances in Experimental Social Psychology*, 23, 211–247.
- Kirouac, G., & Hess, U. (1999). Group membership and the decoding of nonverbal behavior. In P. Philippot, R. Feldman, & E. Coats (Eds.), *The social context of nonverbal behavior* (pp. 182–210). Cambridge: Cambridge University Press.

- Knutson, B. (1996). Facial expressions of emotion influence interpersonal trait inferences. *Journal of Nonverbal Behavior*, 20, 165–182.
- Kret, M. E., & de Gelder, B. (2012). Islamic headdress influences how emotion is recognized from the eyes. *Frontiers in Psychology*, 3.
- Lewis, K. M. (2000). When leaders display emotion: How followers respond to negative emotional expression of male and female leaders. *Journal of Organizational Behavior*, 21, 221–234.
- 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.
- Motley, M. T., & Camden, C. T. (1988). Facial expression of emotion: A comparison of posed expressions versus spontaneous expressions in an interpersonal communications setting. *Western Journal of Speech Communication*, 52, 1–22.
- Niedenthal, P. M., Mermillod, M., Maringer, M., & Hess, U. (2010). The Simulation of Smiles (SIMS) model: Embodied simulation and the meaning of facial expression. *Behavioral and Brain Sciences*, 33, 417–433.
- Noh, S. R., & Isaacowitz, D. M. (2013). Emotional faces in context: Age differences in recognition accuracy and scanning patterns. *Emotion*, 13, 238–249.
- Russell, J. A., & Fehr, B. (1987). Relativity in the perception of emotion in facial expressions. *Journal of Experimental Psychology: General*, 116, 223–237.
- Russell, J. A., Suzuki, N., & Ishida, N. (1993). Canadian, Greek, and Japanese freely produced emotion labels for facial expressions. *Motivation and Emotion*, 17, 337–351.
- Shields, S. A. (2002). *Speaking from the heart*. Cambridge: Cambridge University Press.
- Szczurek, L., Monin, B., & Gross, J. J. (2012). The stranger effect: The rejection of affective deviants. *Psychological Science*, 23, 1105–1111.
- Tiedens, L. Z. (2000). Powerful emotions: The vicious cycle of social status positions and emotions. In N. M. Ashkanasy, C. E. J. Hartel, & W. J. Zerbe (Eds.), *Emotions in the workplace: Research, theory, and practice* (pp. 72–81). Westport, CT: Quorum Books.
- Tiedens, L. Z. (2001). Anger and advancement versus sadness and subjugation: The effect of negative emotion expressions on social status conferral. *Journal of Personality and Social Psychology*, 80, 86–94.
- Trope, Y. (1986). Identification and inferential processes in dispositional attribution. *Psychological Review*, 93, 239–257.
- Van Kleef, G. A. (2009). How emotions regulate social life. *Current Directions in Psychological Science*, 18, 184–188.
- Warner, L. A., & Shields, S. A. (2007). The perception of crying in women and men: Angry tears, sad tears, and the “right way” to cry. In U. Hess & P. Philippot (Eds.), *Group dynamics and emotional expression* (pp. 92–117). New York, NY: Cambridge University Press.
- Wiggers, M. (1982). Judgements of facial expressions of emotions predicted from facial behavior. *Journal of Nonverbal Behavior*, 7, 101–116.
- Yrizarry, N., Matsumoto, D., & Wilson-Cohn, C. (1998). American-Japanese differences in multiscale intensity ratings of universal facial expressions of emotion. *Motivation and Emotion*, 22, 315–327.