Sex Roles (2011) 65:102–107
DOI 10.1007/s11199-011-9979-3

ORIGINAL ARTICLE

Gender Effects in Information Processing on a Nonverbal Decoding Task

Petra C. Schmid · Marianne Schmid Mast · Dario Bombari · Fred W. Mast

Published online: 14 April 2011

Abstract Women typically outperform men on the ability to assess other people's nonverbal behavior. This difference might occur because women are taught to be more sensitive to emotional and nonverbal cues at a very early age compared to men. As a consequence, women might use a more favorable cognitive processing style than men during nonverbal decoding. The present study investigated whether this gender difference is due to the use of different cognitive information processing styles (global or local). Participants (N=137) were Swiss undergraduate students that were randomly assigned to either a global (focusing on the whole) or a local (focusing on details) priming of information processing style, or to a control group. They then performed a nonverbal decoding task. Results showed that compared to the control group, local priming had beneficial and global priming detrimental effects for nonverbal decoding accuracy. This was due to an improved performance in men after the local priming; women's performance was not significantly affected by the local priming. Global priming increased nonverbal decoding accuracy in men and decreased performance in women. We conclude that women already use the more beneficial local processing style by default and that men's performance can be boosted when providing them a processing strategy.

P. C. Schmid (✉) · M. Schmid Mast
Department of Work and Organizational Psychology,
University of Neuchatel,
Rue Emile-Argand 11,
2000 Neuchatel, Switzerland
e-mail: petra.schmid@unine.ch

D. Bombari · F. W. Mast
Department of Cognitive Psychology, University of Bern,
Muesmattstrasse 45,
3009 Bern, Switzerland

Keywords Nonverbal decoding · Information processing · Gender

Introduction

Being able to correctly interpret other people's nonverbal behavior is important for positive interpersonal interactions (Hall and Bernieri 2001). It enables us to respond appropriately to the displayed behaviors of our social interaction partners and can thus help to prevent social faux-pas. Women typically do a better job than men in correctly judging others' nonverbal behavior (Hall 1978; 1984; for meta-analyses). However, little is known about the mechanisms underlying this gender difference. There is evidence from different cultures (Asia, U.S., Switzerland) that men and women use different processing styles during nonverbal decoding (e.g., Hall et al. 2003; Lee et al. 2002; Schmid et al. 2011). In the present study, we aim to examine the role of information processing style on the gender effect in nonverbal decoding accuracy. Using a Swiss undergraduate student sample, we investigated whether the priming of a global versus a local information processing style moderated the gender effect on a nonverbal decoding task. The *global information processing style* is characterized by the formation of an overall, Gestalt-like impression of others by integrating different pieces of information, and the *local information processing style* is characterized as focusing on details and looking at the pieces separately.

Why do women outperform men on nonverbal decoding tasks? In Switzerland, there is evidence that boys and girls are socialized differently with respect to the emotional and interpersonal domain. Perren et al. (2007) proposed that in Switzerland, girls more than boys might be encouraged by

peers and teachers to care for others by displaying prosocial behavior and found that Swiss kindergarten boys showed less prosocial behavior than girls. Gilligan (1982) showed on a U.S. sample that boys are socialized to focus on achievement-oriented and competitive relationships, while girls are socialized to concentrate on care giving and social relationships. Reber and Flammer (2002) hypothesized that this differentiating applies to Switzerland. Brody and Hall (1993; U.S. researchers) claimed that it might be of advantage not to show emotions in a competitive environment, in order to hide weaknesses from of a competitor. Moreover, Reber and Flammer argue that women might be freer to express and experience their emotions because in the context of social relationships and care giving there are fewer constraints to do so. Reber and Flammer therefore expected that Swiss boys would express fewer emotions than Swiss girls. This was not found for young Swiss children (9 to 10 years) but for Swiss adolescents (15 to 16 years), suggesting that gender differences on emotion expression develops during school years. The gender difference concerning the expression of emotions and prosocial behavior might have consequences for men and women's nonverbal decoding accuracy. McClure (2000) showed in the meta-analysis that the female advantage in nonverbal decoding accuracy can already be observed in children and adolescents. The meta-analysis was done in the U.S. but includes samples of children and adolescents from the U.S. and different European countries.

One might argue that the consequence of this emotion socialization could be that women more so than men gain knowledge and experience concerning the meaning of emotion expressions and of nonverbal cues in particular. The emotion socialization might also have increased women's motivation to be accurate nonverbal decoders because women might identify more with the interpersonal domain than men. The better knowledge or increased motivation might make women better nonverbal decoders. However, U.S. studies do not support these assumptions. Rosip and Hall (2004) showed that the gender difference in nonverbal decoding accuracy remained when controlling for *knowledge* about nonverbal cues (participants were U.S. undergraduate students). Moreover, there is very little empirical support that motivation affects nonverbal decoding accuracy (Hall et al. 2009; U.S. undergraduate student sample). We assume that similar patterns would exist within a Swiss undergraduate sample and we look therefore for an alternative hypothesis for the gender difference. This alternative explanation is that women and men differ in the cognitive strategies they use for the decoding task and that women use a more effective strategy than men. In the present study we will investigate this hypothesis.

There is evidence suggesting that men and women use different information processing styles during nonverbal decoding. For instance, neuroimaging studies in the U. S. and Asia showed that men and women have different brain activation when recognizing emotions (Hall, et al. 2003; Lee, et al. 2002). Moreover, a Swiss study showed that women use a more global eye scan strategy (more saccades between the mouth, the nose and the eyes) and a less local eye scan strategy (shorter total duration of fixations of mouth, nose, and eyes) than men when recognizing emotions (Schmid, et al. 2011). The authors further showed that the global eye scan strategy was positively and the local eye scan strategy negatively correlated with nonverbal decoding accuracy (emotion recognition) for people in a sad mood. These examples suggest that women are better at emotion recognition because they use a global processing strategy which seems to be efficient for the emotion recognition task.

In fact, for many interpersonal judgment tasks that are not primarily emotion judgments, global processing seems indeed to be a successful strategy. Eyal and Epley (2010) found evidence that a more global processing strategy leads to more accurate social judgments in U.S. undergraduates. They showed that participants' accuracy on self-ratings (in general, and specific for attractiveness) can be boosted by forcing the participants to perceive themselves on a more abstract, global level. In comparative samples it has been showed that sad mood elicits deliberate, local processing (Gasper and Clore 2002; Schwarz 1990) and also decreases emotion recognition accuracy (Chepenik et al. 2007). Moreover, Ambady and Gray (2002) showed in a U.S. undergraduate sample, that hindering sad people to process deliberately increased nonverbal decoding accuracy compared to sad participants that were not prevented to deliberate. This is evidence that local, deliberate processing might have detrimental effects on nonverbal decoding accuracy.

Although the existing research points toward a favorable effect of global processing when performing social judgments, there are also arguments for the opposite position. For instance, Fiske et al. (1999) posit in their continuum model that paying attention to individuating details (i.e., local processing) is related to better interpersonal judgments and that a more global or heuristic processing style is at the other end of the continuum and characterizes stereotyping. We assume that the effectiveness of a processing style depends on the task at hand. In other words, when the task requires deliberate processing because the stimulus material is complex, a local information processing style focusing on details should be beneficial.

Research showing that global information processing is favorable (Ambady and Gray 2002; Eyal and Epley 2010; Schmid, et al. 2011) almost exclusively relies on relatively simple tasks for which the answer options were always the same for each test item. In the test used by Schmid et al.,

facial expressions of emotions could be classified as sad, happy, fearful, or angry. Similarly, in the relationship task used by Ambady and Gray, the answer options always required a judgment of being strangers, platonic friends, or having a romantic relationship. Eyal and Epley simply asked participants how attractive they find themselves on a single item (Likert scale 1–9). More complex tasks might require a more deliberate and local information processing style.

We measured nonverbal decoding accuracy with one of the most frequently used nonverbal decoding tests: the Profile of Nonverbal Sensitivity (PONS; Rosenthal et al. 1979). One hundred thirty-three samples in 20 different nations were tested on the PONS, and female superiority effects were common findings among all nations (Rosenthal, et al. 1979). Finding a female superiority in the nonverbal decoding task is a prerequisite for our study so that we can then explore the effect of women and men's processing style on decoding accuracy. The PONS measures accuracy in the assessment of the intentions through nonverbal behavior in the face or body. It consists of 40 two-second film scenes. The PONS has one target person, a 24-year old U.S. citizen woman who acted all the situations. The test includes items that were rated to adequately represent the desired scenes by a small panel of judges. Moreover, it was ensured that overall accuracy score is at about 75%. The content of the situations include something positive (e.g., expressing motherly love) or something negative (e.g., talking about one's divorce). By comparison to the tests used by Ambady and Gray (2002) and Schmid et al. (2011), the PONS is a more complex task because each pair of response alternative is different for each item of the test. Moreover, the scenes on the PONS are very specific as compared to rather general judgments about emotions or type of relationships, as was the case in the other studies. Because of this task characteristics, Rosip and Hall (2004) argue that the PONS might require more deliberation compared to the emotion recognition task used in the Schmid et al. study. Phillips et al. (2007) showed in Scottish undergraduate students that hindering participants to process information deliberately indeed had a negative impact on PONS performance. The authors limited working memory resources in order to prevent participants from doing deliberate processing. For the PONS, the local processing style might therefore be more beneficial for nonverbal decoding accuracy than the global processing style.

We manipulated the information processing style of women and men by priming them with a global, local, or no specific information processing style. This manipulation was achieved by using the Navon letter priming (Navon 1977). Navon letters are big letters that are composed of small letters. Reading the big letter makes participants focusing on the global form and works as a global processing priming, whereas reading the small letters primes participants focusing on the small form and functions as a local processing priming. This method has been previously used to prime local and global information processing styles (Macrae and Lewis 2002; English undergraduate student sample).

In line with previous findings (Rosenthal, et al. 1979), we predict that women are better than men on the PONS (*Hypothesis 1*). The PONS is a more complex task than other nonverbal decoding tasks and requires more deliberation (Phillips, et al. 2007; Rosip and Hall 2004). We therefore expect that for the PONS, the local processing style is more beneficial for nonverbal decoding accuracy than the global processing style (*Hypothesis 2*). Because women are better than men on the PONS and because we think that this is due to them using the more efficient processing style for the task – the local one, we expect that men's nonverbal decoding accuracy can be improved when providing them with the local processing strategy whereas women might not profit from being primed with the local processing strategy because they already use the advantageous strategy. We therefore hypothesize that priming of the local processing style will have a differential effect on women compared to men (*Hypothesis 3*). More specifically, when men are primed to use a local processing style, their nonverbal decoding accuracy will be better than when providing them with no such strategy in the control condition (*Hypothesis 3a*). By the same logic, we expect that when forcing women and men to use the non-efficient strategy for the task, the global processing style, nonverbal decoding accuracy should decrease in both women and men when compared to the control group (*Hypothesis 3b*).

Method

Participants

Participants were 137 Swiss students representing different areas of study, 68 of them were males (average age=21.76, *SD*=2.70), and 69 were females (average age=18.06, *SD*= 2.51). Age range for both, males and females was 15–25. A *t*-test showed that females were significantly younger than men on average, $t(135)=8.33$, $p<.001$ and that men had on average higher education level, $t(135)=7.77$, $p<.001$. Because of the significant gender difference, we controlled for age and education level in our later analyses (see Result section). All women and 36 men were college students (College in Thun). In order to get an equal sample size for men and women, we had to recruit an additional 32 men at the University of Fribourg. Small gifts (pens, chocolates, etc.) were given to the students to thank them for their participation.

Procedure

After completing an informed consent form, participants were randomly assigned to either the global or the local processing condition or to the neutral control group. Global and local processing were primed with the corresponding information processing style of the Navon (1977) figures, explained in more detail below. We then measured the participants' nonverbal decoding accuracy with the PONS (Rosenthal, et al. 1979).

Measures

Information Processing Style Priming

Participants in the global and the local processing condition completed the Navon task (Navon 1977) in which a series of 100 big letters composed of small letters were presented (for example, a big "W" is built of several small sized "A"s). In the global processing condition, participants had to read the big letter aloud as fast as possible. Participants in the local condition had to read the small letter aloud as fast as possible. This task was used as a priming manipulation of either global information processing (read aloud the big letters) or of local information processing (read aloud the small letters) style for the subsequent nonverbal decoding task. The control group had to read aloud 100 letters that were written in different fonts. Note that the letters in the control condition were not composed of many smaller letters. None of the participants guessed the aim of the Navon priming; some participants (60%) reported that they thought that this was an independent task measuring their ability to concentrate and to stay focused.

Nonverbal Decoding Accuracy

We used the short version of the PONS (Rosenthal, et al. 1979) consisting of 40 two-second film scenes without sound. This version of the PONS measures the accuracy of identifying the meaning of nonverbal cues through face and body expressions displayed by a woman. The participants choose between two options describing which intentions the woman was expressing for each film scene (e.g., returning faulty item to a store, or trying to seduce someone). Participants' scores on the PONS represent the proportion of correct answers in the PONS (scale 0–1). Cronbach's Alpha for the PONS was .66.

Results

To test hypotheses 1, 2, and 3 we first computed a 2 (participant gender) X 3 (priming condition: global, local, or control) ANCOVA with the proportion of correct answers on the PONS as the dependent variable and age and education level as covariates (because we found gender differences on these variables). However, because these latter two variables did not affect the results, we excluded the covariates and conducted an ANOVA. Consistent with *Hypothesis 1*, we found a significant participant gender main effect, $F(1,131)=11.65$, $p>.01$, showing that women performed better ($M=.72$) than men ($M=.69$). Also as expected (*Hypothesis 2*), there was a priming condition main effect, $F(2,131)=4.46$, $p=.01$. Participants primed with the local processing strategy performed better ($M=.73$) than the control group ($M=.69$), $p=.01$ and better than the participants primed with the global processing strategy ($M=.70$). The interaction of participant gender and priming condition was also significant, $F(2,131)=4.01$, $p=.02$.

To clarify the gender by priming interaction effect and to test hypotheses 3a and b, contrast analyses were calculated (Rosenthal and Rosnow 1991). Table 1 shows the means and standard errors. In line with *Hypothesis 3a*, men gave more correct answers on the PONS than the male control group after local priming, t contrast $(131)=3.13$, $p>.01$. No significant difference between local

Table 1 Means and SEs (in parenthesis) for men's and women's PONS performance separately for global and local primed participants and the control group

	Information processing priming					
Gender	n	Control	n	Global	n	Local
Women	25	.731 (.012)[a, b]	21	.698 (.013)[b, c]	23	.741 (.012)[c]
Men	20	.656 (.014)[a, d, e]	23	.695 (.013)[d]	25	.713 (.013)[e]

PONS performance was measured by calculating the proportion of correct answers in the PONS. The scale ranges from 0 (no correct answers) to 1 (all answers were correct). The gender by information processing priming was significant, $F(2,131)=4.01$, $p=.020$. Planned contrasts were computed in order to calculate whether there are significant differences between the groups. [a-e] indicate the groups that are significantly different.

[a] $p<.001$

[b-e] $p\leq.005$

priming and the control group was found in women, t contrast (131)=0.59, p=.56.

For women, *Hypothesis 3b* was confirmed; global priming resulted in a performance decrement compared to the control group, t contrast (131)=1.96, p=.05, but in men, contrary to our prediction, the global priming manipulation boosted performance on the PONS, t contrast (131)=2.07, p=.04.

Note that the difference between global and local priming was significant for women, t contrast (131)=2.40, p=.02 (local better than global), but not for men, t contrast (131)=1.06, p=.29. Also, women outperformed men in the control condition, t contrast (131)=4.12, p<.01. No gender difference was found when participants were primed with the local information processing manipulation, t contrast (131)=1.62, p=.11, and when participants were primed with the global information processing manipulation, t contrast (131)=0.17, p=.87.

Discussion

The goal of our study was to investigate whether the gender difference in nonverbal decoding accuracy can be explained by different information processing styles of Swiss women and men.

Consistent with the existing literature (Rosenthal, et al. 1979) and confirming *Hypothesis 1*, women outperformed men in the PONS and this was particularly the case in the control condition which corresponded to how the gender difference in the PONS emerged in the existing literature.

Also, we predicted that because the answer options of the PONS were very specific and changed with every item, people would profit from a local processing strategy for their performance on the PONS (*Hypothesis 2*). As predicted, local processing boosted PONS accuracy. Participants probably had to analyze and think, and the local processing strategy was therefore better for the PONS. Other, less complex nonverbal decoding tasks such as emotion recognition tasks or type of relationship judgment tasks seem to require global processing (Ambady and Gray 2002; Eyal and Epley 2010; Schmid, et al. 2011). This is evidence that task characteristics (e.g., type of answer options) determine which information processing style is more appropriate for the task.

We expected that women and men profit differently from the local and the global processing style. We predicted that local priming would increase men's performance with respect to the control condition but that local priming would not increase women's performance because women were supposed to already use the most effective strategy for the task (*Hypothesis 3a).* The results we found confirmed that local priming increased men's performance but it had no effect on women's performance. If local processing is what makes people accurate in this task, women might already use a local processing style that helps them to perform well so that local priming does not increase women's performance any further (ceiling effect). However, the situation for men is different, as they are more likely than women to profit from a local processing style. Their performance increased and became comparable to that of women (no significant gender difference in nonverbal decoding accuracy in the local priming condition). The present data suggest that people who are using a local information processing style by default (women in the neutral condition) or because they are forced to (men in the local priming condition) are at an advantage for the PONS.

We further predicted that women and men would be hurt in their performance when using the non-efficient, global strategy for the task, as compared to the control group (*Hypothesis 3b*). Confirming our prediction, we found that global priming had detrimental effects on women's nonverbal decoding ability. However, contrary to our expectation, global priming had a positive effect on men's accuracy when compared to the control condition. So, if women already used the correct information processing strategy by default (local), their performance suffered when "forced" to use a global strategy. For men, however, the global strategy seemed to be better than nothing. Whether men were made to process globally or locally did not matter for their decoding accuracy, both increased their performance compared to the control condition. The priming (global and local) provided men with some sort of guideline or strategy to use for the nonverbal decoding task. This guidance boosted their performance compared to the control group. We do not believe that the priming increased task motivation in men and this is why they did better than in the control condition, because previous research has shown that nonverbal decoding accuracy is relatively unaffected by motivation (Hall, et al. 2009). If we take men and women together one could conclude that on the basis of global information processing, people were able to perform reasonably well on the PONS; however, when relying on local information, performance was even better.

Our data suggest that women use by default the better information processing style. This might be a consequence of their gender socialization. Because Swiss women are socialized to focus on social relationships and welfare (Perren, et al. 2007; Reber and Flammer 2002; Schwartz and Rubel 2005) they might have learned more than men to apply the most appropriate information processing style in order to decode nonverbal behaviors better.

Reber and Flammer (2002) hypothesized that Switzerland seems to be comparable to other Western cultures with regard to gender socialization. However, there are cultural differences in information processing (e.g., between European

Americans and East Asians; Nisbett and Miyamoto 2005) and generalization of our results to different cultures should therefore be made with caution. Marsh et al. (2003) suggest that different cultures have nonverbal "accents", meaning that the nonverbal behavior in different cultures is not exactly the same. When comparing Koreans and Americans, cultural differences in accuracy to specific cues were found; and that the same cues were interpreted differently by perceivers of different cultures (Peng et al. 1993). Future research is therefore needed to focus on the role of information processing styles concerning gender differences in nonverbal decoding in other cultures, in order to find out whether the results of the present study can be applied to other cultures.

Although the gender difference in nonverbal decoding is widely documented (Hall 1978, 1984), the reasons for this difference have remained largely unknown. In the present article, we showed that in Switzerland the use of different cognitive information processing strategies might be a reason for this gender difference because men achieved accuracy levels comparable to women when specific information processing strategies were imposed on women and men.

References

Ambady, N., & Gray, H. M. (2002). On being sad and mistaken: Mood effects on the accuracy of thin-slice judgments. *Journal of Personality and Social Psychology, 83*, 947–961. doi:10.1037//0022-3514.83.4.947.

Brody, L. R., & Hall, J. A. (1993). Gender and emotion. In M. Lewis & J. Haviland (Eds.), *Handbook of emotions* (pp. 447–460). New York: Guilford Press.

Chepenik, L. G., Cornew, L. A., & Farah, M. J. (2007). The influence of sad mood on cognition. *Emotion, 7*, 802–811. doi:10.1037/1528-3542.7.4.802.

Eyal, T., & Epley, N. (2010). How to seem telepathic: Enabling ming reading by matching construal. *Psychological Science, 21*, 700–705. doi:10.1177/0956797610367754.

Fiske, S. T., Lin, M., & Neuberg, S. L. (1999). The continuum model: Ten years later. In S. Chaiken & Y. Trope (Eds.), *Dual process theories in social psychology* (pp. 231–254). New York: The Guilford Press.

Gasper, K., & Clore, G. L. (2002). Attending to the big picture: Mood and global versus local processing of visual information. *Psychological Science, 13*, 34–40. doi:10.1111/1467-9280.00406.

Gilligan, C. (1982). *In a different voice*. Cambridge: Harvard University Press.

Hall, J. A. (1978). Gender effects in decoding nonverbal cues. *Psychological Bulletin, 85*, 845–857. doi:10.1037/0033-2909.85.4.845.

Hall, J. A. (1984). *Nonverbal sex differences: Communication accuracy and expressive style*. Baltimore: John Hopkins University Press.

Hall, J. A., & Bernieri, F. J. (Eds.). (2001). *Interpersonal sensitivity: Theory and measurement*. Mahwah: Lawrence Erlbaum Associates.

Hall, G. B. C., Witelson, S. F., Szechtman, H., & Nahmias, C. (2003). Sex differences in functional activation patterns revealed by increased emotion processing demands. *Brain Imaging, 15*, 219–223. doi:10.1097/01.wnr.0000101310.64109.94.

Hall, J. A., Blanch, D. C., Horgan, T. G., Murphy, N. A., Rosip, J. C., & Schmid Mast, M. (2009). Motivation and interpersonal sensitivity: Does it matter how hard you try? *Motivation and Emotion, 33*, 291–302. doi:10.1007/s11031-009-9128-2.

Lee, T. M. C., Liu, H.-L., Hoosain, R., Liao, W.-T., Wu, C.-T., & Yuen, K. S. L. (2002). Gender differences in neural correlates of recognition of happy and sad faces in human assessed by functional magnetic resonance imaging. *Neuroscience Letters, 333*, 13–16. doi:10.1016/S0304-3940(02)00965-5.

Macrae, C. N., & Lewis, H. L. (2002). Do I know you? Processing orientation and face recognition. *Psychological Science, 13*, 194–196. doi:10.1111/1467-9280.00436.

Marsh, A. A., Elfenbein, H. A., & Ambady, N. (2003). Nonverbal "accents": Cultural differences in facial expressions of emotions. *Psychological Science, 14*, 373–376. doi:10.1111/1467-9280.24461.

McClure, E. B. (2000). A meta-analytic review of sex differences in facial expression processing and their development in infants, children, and adolescents. *Psychological Bulletin, 126*, 424–453. doi:10.1037//0033-2909.126.3.424.

Navon, D. (1977). Forest before trees: The precedence of global features in visual perception. *Cognitive Psychology, 9*, 353–383. doi:10.1016/0010-0285(77)90012-3.

Nisbett, R. E., & Miyamoto, Y. (2005). The influence of cultures: holistic versus analytic perception. *Trends in Cognitive Sciences, 9*, 467–473. doi:10.1016/j.tics.2005.08.004.

Peng, Y., Zebrowitz, L. A., & Lee, H. K. (1993). The impact of cultural background and cross-cultural experience on impressions of American and Korean male speakers. *Journal of Cross-Cultural Psychology, 24*, 203–220. doi:10.1177/0022022193242005.

Perren, S., Stadelmann, S., von Wyl, A., & von Klitzing, K. (2007). Pathways of behavioural and emotional symptoms in kindergarten children: What is the role of pro-social behaviour? *European Child & Adolescence Psychiatry, 16*, 209–214.

Phillips, L. H., Tunstall, M., & Channon, S. (2007). Exploring the role of memory in dynamic social cue decoding using dual task methodology. *Journal of Nonverbal Behavior, 31*, 137–152. doi:10.1007/s10919-007-0026-6.

Reber, R., & Flammer, A. (2002). The development of gender differences in affective expression and in the relationship between mood and achievement-related self-judgments. *European Journal of Psychology of Education, 17*, 377–392. doi:10.1007/BF03173592.

Rosenthal, R., & Rosnow, R. L. (1991). *Essentials of behavioral research: Methods and data analysis*. New York: McGraw Hill.

Rosenthal, R., Hall, J. A., DiMatteo, M. R., Rogers, P. L., & Archer, D. (1979). *Sensitivity to nonverbal communication: The PONS test*. Baltimore: John Hopkins University Press.

Rosip, J. C., & Hall, J. A. (2004). Knowledge of nonverbal cues, gender, and nonverbal decoding accuracy. *Journal of Nonverbal Behavior, 28*, 267–286. doi:10.1007/s10919-004-4159-6.

Schmid, P. C., Schmid Mast, M., Bombari, D., Mast, F. W., & Lobmaier, J. S. (2011). *Information processing and gender effects in facial emotion recognition: An eye tracking study*. Manuscript submitted for publication.

Schwartz, S. H., & Rubel, T. (2005). Sex differences in value priorities: Cross-cultural and multimethod studies. *Journal of Personality and Social Psychology, 89*, 1010–1028. doi:10.1037/0022-3514.89.6.1010.

Schwarz, N. (1990). Feelings as information: Informational and motivational functions of affective states. In E. T. Higgins & R. Sorrentino (Eds.), *Handbook of motivation and cognition: Foundations of social behavior* (Vol. 2, pp. 527–561). New York: Guilford Press.