

Facial Expression Decoding Deficits in Clinical Populations with Interpersonal Relationship  
Dysfunctions

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To appear in R. Riggio, & R.S. Feldman (Eds.) (2003). Application of Nonverbal Behavior.  
Lawrence Erlbaum Associates.

Authors' notes

The writing of this chapter has been facilitated by grants from the “Fonds National de la Recherche Scientifique de Belgique” 8.4512.98 and 3.4609.01. The authors appreciate the helpful comments of XX on earlier drafts of this paper. Correspondence regarding this chapter should be addressed to Pierre Philippot at Faculté de Psychologie, Université de Louvain, place du Cardinal Mercier, 10, B- 1348 Louvain-la-Neuve, Belgique. Electronic mail may be sent via Internet to “Pierre.Philippot@psp.ucl.ac.be”. Recent updates of our research can be found on the Internet : [www.ecsa.ucl.ac.be/personnel/philippot/](http://www.ecsa.ucl.ac.be/personnel/philippot/).

### Facial Expression Decoding Deficits in Clinical Populations with Interpersonal Relationship Dysfunctions

The existentialist French philosopher, Jean-Paul Sartre is famous for his statement “Hell is other people.” This pessimistic stance is actually an *a contrario* claim that the secret of happiness rests, at least in part, in the way we relate to others. At an even more basic level, in our social species, interaction, adjustment, and coordination of our behavior with respect to others are central to our survival. Successful interaction, adjustment, and coordination with others depend upon many emotional processes, especially on emotional communication and coordination. A failure to adequately communicate one’s emotional and motivational state and/or to accurately perceive the internal state of others is likely to result in interpersonal and in personal problems. This notion is supported by theories and empirical data relating nonverbal social skills to more general social competence and to decreased psychopathology (e.g. Perez & Riggio, 2003).

Indeed, several lines of research have demonstrated that the capacity to accurately decode facial expression is an acquired skill that is not fully developed until adolescence (Gross & Ballif, 1991). Further, this skill is related to more general social skills, in adults (Patterson, 1999) as well as in children (Philippot & Feldman, 1990). Poor skills in decoding emotional facial expression have been related to various clinical conditions, including depression (Bouhuys, 2003), alcohol dependency (Philippot, Kornreich & Blairy, 2003), and schizophrenia (Kring & Earnst, 2003). However, the causal direction of this relation remains an open issue: Are some clinical conditions a consequence of a basic emotional deficit, such as a deficit in decoding nonverbal expression of emotion, or is the deficit a consequence of the clinical condition?

One can speculate that many interpersonal problems might result from a deficit in decoding facial expression, whatever the direction of causality with clinical condition. The most obvious problem is the difficulty in identifying the internal states of others: their desires, emotions, or intentions. Such information is essential for understanding others, whether interpreting the meaning of others’ behavior in general or attempting to make sense social interactions with them. Relating to someone whose intentions and emotions are obscure is almost impossible. Further, such a decoding deficit increases the likelihood of interpretation bias, that is, erroneously attributing a particular emotion to someone. For instance, people fearing social rejection might erroneously attribute contempt to others with whom they are interacting; in this case, a neutral face might be misperceived as expressing non-interest, rejection, or even disdain. Such an interpretation bias would powerfully impact the behavior of socially anxious individuals. Their resulting behavior would likely be perceived as awkward by their interaction partners. A social distance could thus result, ultimately confirming the fear of the socially anxious.

A second, more subtle, problem might result from a deficit in decoding facial expression. According to Bem’s (1972) self perception theory, the way we perceive ourselves depends to a significant extent upon how we imagine that others see us. In other words, our self-perceptions result in part from how others react to us. It follows that misinterpreting others’ behavior and attitudes toward us, including misinterpreting their facial expression when they are interacting with us, might result in the construction of an inaccurate social self and, ultimately, in a biased view of ourselves. For instance, socially anxious individuals who erroneously decode contempt in the faces of people with whom they are interacting may end up believing that they must be deserving of such contempt.

Thus, a deficit or a systematic bias in decoding facial expression might result in personal and interpersonal difficulties. Some clinical populations seem to be particularly vulnerable to such problems. As in the example given above, it appears that social phobics are likely candidates for presenting systematic biases in the way they process others' facial expression. At the opposite end of the continuum, psychopaths, characterized by malicious interpersonal relationships and a lack of empathy (Hare, 1998), might be particularly insensitive to affective signals communicated via nonverbal behaviors. Another clinical population, people suffering from alcohol dependency, are known for presenting major difficulties in their social and intimate relationships, difficulties that are often related to regulation of frustration and anger (Sferrazza, Philippot, Kornreich et al., 2002). Thus, they might also present difficulties in accurately understanding others' desires and intentions toward them. Similarly, individuals suffering from paranoia may be likely to present deficits in the decoding of emotional expression. Indeed, for all these populations, sound theoretical rationales can be constructed to support the notion that a nonverbal deficit might constitute a maintenance factor for their clinical conditions. Moreover, for all the clinical conditions mentioned above, this notion is supported by strong conviction of clinicians working with these populations.

The aim of the present chapter is to examine the empirical evidence for a nonverbal deficit in three clinical populations that are especially characterized by difficulties in interpersonal relationships: social phobia, psychopathy, and alcohol dependence. For each population, we will review experiments from our and others' laboratories with three questions in mind: With respect to potential nonverbal deficits or bias in this population, what do we know that could be useful to practitioners?; What myths need to be dispelled?; What are the current limitations of research in this area?

Before addressing these questions, we need to distinguish among the different types of deficits and biases that might be encountered. First, we should differentiate between deficits in evaluating the intensity of emotions conveyed by others' faces and deficits in identifying the specific emotion being conveyed. For instance, one can over or under-estimate the intensity of an emotion presented on the face of an interaction partner (e.g., the psychopath can underestimate the intensity of the sadness or distress expressed by his/her interaction partner). We will describe such a deficit as an *evaluative deficit in intensity*. On the other hand, in the case of general poor performance in the identification of emotion conveyed by a partners' face, we will speak of an *evaluative deficit in accuracy*. It is important to distinguish this situation from the situation in which one wrongly and *systematically* attributes a specific emotion (e.g., disgust) to a face, while it is actually a different emotion (e.g., sadness) that is expressed. In this latter case, we will speak of an *evaluative bias*. Finally, an *attentional bias* occurs when the perception threshold for certain emotional facial expressions is lower than for others. For example, socially anxious individuals might have their attention more readily attracted to faces expressing rejection than to other faces.

#### Social anxiety

The study of biases and deficits in the processing of interpersonal information has stimulated a wealth of research on anxiety in general (e.g. Williams, Watts, MacLeod & Mathews, 1999) and social anxiety in particular (Clark & McManus, 2002). Most of this research focuses on attentional biases. Surprisingly little research has been devoted to evaluative biases and deficits, despite a strong belief among many clinicians that socially anxious individuals overestimate the intensity of threat in social signals (e.g. Beck, Emery & Greenberg, 1985).

In their cognitive-motivational model of anxiety, Mogg and Bradley (1998) have examined attentional and evaluative biases. Their model relies on two different systems: The Valence Evaluation System and the Goal Engagement System. The Valence Evaluation System assesses the stimulus threat value according to the relevance of the stimulus to the person's current concerns and past learning experiences. The Goal Engagement System allocates attention as a function of the output of the former system. If a stimulus in the environment is evaluated as threatening, the Goal Engagement System interrupts ongoing activities and orients attention toward the threat stimulus. This model postulates that attentional biases in anxious individuals result from a negative and unbalanced appraisal of social situations (Mogg & Bradley, 2002)

#### Attentional biases

A wealth of studies has evidenced an attentional bias in socially anxious individuals' processing of threatening stimuli (see Musa & Lepine, 2000, for review). However, the direction of these attentional biases is the object of a controversy. On one hand, several cognitive models of anxiety (e.g. Mogg & Bradley, 1998; Williams & al., 1999) propose that anxious individuals preferentially attend to threatening information (Beck, Emery & Greenberg, 1985).

Several studies have demonstrated such a bias in vigilance toward threat words by social phobics (Asmundson & Stein, 1994; Maidenberg, Chen, Craske & Bohn, 1996; Mattia, Heimberg & Hope, 1993). Although some authors have argued that responses to words may index worry rather than an actual response to social stimuli (Chen, Elhers, Clark & Mansell, 2002), the same findings have been replicated with more ecological material--faces--in social phobics (Gilboa-Schechtman, Foa & Amir, 1999) and in a non-clinical sample with high fear of negative evaluation (FNE, Watson & Friend, 1969) (Mogg & Bradley, 2002).

On the other hand, some researchers predict the opposite attentional bias. Clark (1999) has proposed that avoidance of threatening information may play an important role in the maintenance of social anxiety. For instance, for social phobics, actively avoiding social stimuli (e.g., faces) constitutes a form of cognitive escape from anxiety-provoking situations (e.g. avoiding looking at others' faces makes conversation less likely; Clark & Wells, 1995). Studies using a probe detection task found that social phobics (Chen et al., 2002) and socially anxious individuals (Mansell, Clark, Ehlers & Chen, 1999) avoid emotional (negative and positive) faces.

In an attempt to reconcile these divergent findings, Amir, Freshman, and Foa (2002) have proposed a two-stage model of information processing. According to this view, anxious individuals should show an initial hypervigilance for threat-relevant stimuli. This hypervigilance would be the consequence of automatic processes, and it could be observed without conscious perception of threat-relevant information (Mogg & Bradley, 1999). However, at further and less automatic stages of information processing, people should actively turn away from threatening information. Thus, this model postulates a dynamic shift of attention allocation from initial threat hypervigilance to later threat avoidance. For instance, while speaking to other people, socially anxious individuals would have their attention automatically attracted to frowns more readily than would non-anxious individuals. Because of this perception bias, socially anxious individuals are likely to automatically over-activate a state of social anxiety. However, as soon as a frown is detected, they would turn their attention away from it--and, more generally, from others' faces--to avoid the threatening stimulus and the discomfort associated with it. Unfortunately, in doing so, they are likely to maintain their anxiety: Not only are they likely to behave socially

inappropriately, but they will also be unable to determine whether the frowns were a sign of actual social threat or, for instance, simply a sign of perplexity.

Two studies (Amir & al, 2002; Amir, Mc Nally, Riemann, Burns, Lorenz & Mullen, 1996) manipulating strategic control in the Stroop task suggested that social phobics are able to use strategic processes to modulate their attention to threat. However, this “vigilance-avoidance” hypothesis was not supported in a sample of individuals with non-clinical anxiety (Mogg, Bradley, de Bono & Painter, 1997).

In an experiment using the “dot prime” paradigm (Mogg, Philippot & Bradley, 2003), we examined the time course of attentional biases for faces in order to evaluate further the vigilance-avoidance hypothesis. Social phobics and matched controls completed a probe detection task with facial expressions as stimuli. In order to observe whether or not the focus of attention changed over time, the stimulus duration was manipulated (either 500 ms or 1250 ms). It was predicted, and observed, that social phobics initially focus their attention on the threatening face, but that this attentional bias rapidly disappears. In contrast, non-phobics showed the opposite pattern. Similar results, using a different paradigm (the “homograph” paradigm), were reported by Amir, Foa & Coles (1998). They fit nicely with the prediction of an initial automatic vigilance for threatening information, followed by a protective voluntary attempt to redirect attention away from the threatening stimulus.

#### Evaluative deficits and biases

In the previous section, we emphasized a strong belief that attentional biases result from evaluative biases. However, few studies have tested this hypothesis. In a study by Merkelbach, Van Hout, van den Hout, & Mersch (1989), social phobics and controls were asked to evaluate angry, neutral, and joyful faces with respect to their pleasantness. Contrary to the cognitive-motivational model’s prediction (Mogg & Bradley, 1998), no differences were observed between the two populations.

We recently replicated this intriguing result (Douilliez & Philippot, 2003): Socially-anxious and control participants were asked to evaluate the degree of threat in fearful, joyful, and neutral faces. In addition, we extended the study to include two other types of stimuli--words and pictures--and manipulated the valence and social relevance for both of these. Our rationale was that faces are potent innate stimuli (Öhman & Soares, 1993), and, as such, the processing of faces should not be influenced by social anxiety. In contrast, words and scenes depicted in the pictures require an interpretation and can therefore be influenced by experience, including social anxiety. As predicted, replicating Merkelbach et al. (1989), no differences between anxious individuals and controls were observed for the evaluation of faces. In contrast, anxious individuals evaluated negative pictures and words as more threatening than did normal controls.

A possible limitation of the study by Merkelbach et al. (1989) and our studies is that prototypical facial expressions were used that displayed full-blown emotions. Not only do these extreme stimuli have little ecological validity, but they are also easy to decode and the use of such a material is likely to produce ceiling effects (Hess, Blairy, & Kleck, 1997). To avoid ceiling effects and to incorporate material reflecting real life expressions, we designed a study in which stimuli varied in emotional intensity (Philippot & Douilliez, in prep.). Specifically, we used a series of emotional facial expressions constructed by Hess and Blairy (1995), in which two actors portray five emotions (happiness, anger, sadness, disgust and fear) at four intensity levels: 0% (i.e., neutral), 30%, 70%, 100%. These stimuli were presented in a random order on a computer

screen. Finally, to increase the sensitivity of our measures, participants rated each facial expression on 7-point scales for a large profile of eight emotions (happiness, sadness, fear, anger, disgust, surprise, shame, and contempt).

This decoding task was completed by 17 out-patients diagnosed with social phobia according to DSM IV criteria, 17 out-patients diagnosed with another anxiety disorder (agoraphobia, general anxiety) according to DSM IV criteria, and 41 controls who were matched for sex, age, and level of education. The analysis of the data revealed no differences among the three groups in terms of intensity ratings, accuracy, or systematic biases, nor did they differ in their estimation of the difficulty of the task.

In conclusion, even if the “vigilance-avoidance” model of anxiety is not fully supported in social anxiety, socially anxious individuals have demonstrated initial attentive biases toward threatening stimuli, including facial expressions, in a number of empirical studies. However, socially anxious individuals don’t seem to over or under-estimate the intensity of an emotion present on the face, and they accurately identify the emotions conveyed by the face. Moreover, the evaluative biases are less likely to generate attentional biases than hypothesized by Mogg & Bradley (1998). Clearly, further research is needed to investigate the possibility of implicit as well as of explicit evaluative biases in socially anxious individuals and to examine the relationship between possible evaluative biases and attentional biases.

#### Alcohol dependence

As suggested in the introduction, in their daily functioning, alcoholics experience severe interpersonal problems (Duberstein, Conwell, & Caine, 1993), including the use of violence (Myers, 1984). Alcoholics seem to have difficulties dealing with negative emotions, especially with anger (Marlatt, 1979). This observation has inspired clinicians to design and evaluate communication training programs in the treatment of alcoholism. For instance, Rohsenow, Monti, Binkoff, et al. (1991) have compared the effectiveness of different treatment groups for alcoholic men. In a Communication Skills Training (CST) condition, participants were taught communication skills and interpersonal problem-solving skills. In a Cognitive Behavioral Mood Management Training (CBMMT) condition, participants were taught how to control their desire to consume alcohol in difficult situations. The results showed that all treatments had a positive impact on social skills and on reducing anxiety in participants. CST was somewhat superior to CBMMT in this respect, attesting to the importance of communication deficit in alcoholics’ problems. Moreover, participants in the CST condition drank less alcohol up to six months after treatment than did participants in the CBMMT condition. In sum, this study suggests that a deficit in communication about interpersonal concerns might play an important role in the problems to which alcoholics are confronted.

We directly addressed the question of communication problems in alcoholism in a study focusing on emotion communication within married couples in which one spouse was an alcoholic (Sferrazza et al., 2002). Both wife and husband independently completed a questionnaire assessing the nature, intensity, rumination about, and control of emotion, first for themselves, then for their spouses, and finally for what they believed their spouses were perceiving about their own (respondent’s) emotion. Both partners from twenty-five alcoholic and twenty-five matched control couples participated in this study. Overall, the results showed marked differences in emotional experiences and expression between alcoholics’ couples and control couples. Very interestingly, there were few differences between the alcoholic member of

the couple and his or her spouse. Specifically, alcoholic couples reported experiencing more intense emotions, both in general and in particular for anger, guilt, sadness, anxiety, shame, and disgust. Interestingly, while alcoholics and their spouses reported feeling more guilt, they attributed more anger to their partner. Alcoholic couples also reported less emotional control. When they spoke about their emotion, they felt more discomfort, they did not know how to react or how to express themselves, and they did not feel understood. They also attributed more negative and fewer positive effects to their emotional expression. Thus, compared to matched controls, both members of couples with an alcoholic member reported more intense and negative emotions, difficulties in expressing and controlling their emotions, and negative consequences of their emotional expression.

These observations are suggestive of an important deficit in emotion communication in alcoholics' families. The importance of the communicative aspect of alcohol problems is further documented by the effectiveness of treatments focusing on communication training. Based on these observations, we developed the hypothesis that alcoholics suffer from deficits in nonverbal communication. There are several empirical arguments suggesting such deficits. Some arguments pertain to the immediate effects of alcohol, while others are related to the effects of alcohol dependency.

With respect to the immediate effects of alcohol, it has been well demonstrated that alcohol impairs higher cognitive functioning and that this impairment impacts several emotional processes (Lang et al., 1999). For instance, emotional appraisal appears to be impaired. This produces consequences both for the type of emotion that is experienced and expressed and for the way nonverbal cues of emotion are decoded. Quite obviously, evaluative deficits in accuracy are expected when under the influence of alcohol. Second, alcohol changes expectations and self perception (Cooper, Frone, Russell, & Mudar, 1995). When intoxicated, men are likely to behave more aggressively (Keane & Lisman, 1980), to express more anger nonverbally, and to interpret others' nonverbal cues as indicating provocation or threat (evaluative bias). Other reasons to suspect a nonverbal deficit are related to consequences of alcohol dependency. Alcoholics have difficulties dealing with negative emotions, especially with anger and frustration (Marlatt, 1996). They report more problems expressing their emotions and more negative consequences of such expression. Because a large part of emotion communication relies on nonverbal cues, and because social competence and harmonious functioning require the mastery of nonverbal communication, alcoholics' problems in solving interpersonal conflicts and in communicating their emotions are suggestive of a nonverbal deficit.

Based on these considerations, we propose that alcoholics are characterized by specific deficits in the decoding of nonverbal cues of emotion: They should over-perceive others' negative displays, especially those related to anger and frustration (evaluative bias). They should also be less accurate in decoding nonverbal signals in general (evaluative deficit in accuracy). We further propose that these nonverbal deficits impair alcoholics' social competence. They would be more likely to find themselves in interpersonal conflicts, and, more importantly, in such situations, they would misattribute anger and hostile feelings to their partners. This would diminish alcoholics' capacities to react efficiently and to find a constructive solution to the conflict, which would remain unresolved. Alcoholics would then turn to alcohol as a coping strategy (albeit a faulty one).

The use of alcohol as an avoidant coping strategy is likely to maintain interpersonal problems and even to increase them. This would create a positive feedback loop: increased interpersonal tension would result in increased alcohol consumption, feeding back into the interpersonal tension. Further, as alcohol intoxication diminishes nonverbal decoding capacity, a second feedback loop would be created: alcohol intoxication would lead to more nonverbal impairments, the latter nourishing interpersonal tension, which then would result in more alcohol consumption. This process is illustrated in Figure 1.

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Insert Figure 1. about here

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We now turn to empirical evidence pertaining to facial expression decoding by alcoholics. Indeed, despite the importance of the question both from a clinical and from a theoretical perspective, few empirical studies have investigated nonverbal decoding skills in alcoholics. To our knowledge, the first experimental investigation of alcoholics' decoding of facial expression was conducted by Oscar-Berman and colleagues (Oscar-Berman et al., 1990). They compared alcoholic Korsakoff patients, non-Korsakoff alcoholics, and non-alcoholic controls with respect to their ability to identify and recognize emotional material, including facial expressions. They observed that alcoholic Korsakoff patients and non-Korsakoff alcoholics attributed more emotional intensity to facial expressions than did controls (evaluative deficit in intensity). Further, the ability to match facial expressions with written labels was determined by an interaction between experimental group and age of the subject. Unfortunately, Oscar-Berman and colleagues neither specified nor interpreted this interaction. Similarly, they did not further explore alcoholics' accuracy in the decoding of facial expression.

In order to further document possible biases or impairments in the way alcoholics interpret emotional facial expression, we started a systematic research program in our laboratories. In the first study (Philippot et al., 1999), we addressed three questions. First, we wondered whether we could replicate the observation of Oscar-Berman et al. (1990) that alcoholics over-attribute emotional intensity to facial stimuli. Second, we examined whether alcoholics are less accurate than non-alcoholics in recognizing the type of emotion portrayed by a facial expression. Third, we assessed whether alcoholics show systematic biases in interpreting facial expression. In other words, do they tend to misattribute some types of emotion more than others?

We used exactly the same procedure as the one described for the study on social phobia in the preceding section (Philippot & Douilliez, in prep.). The decoding task was proposed to 25 inpatients diagnosed with alcohol dependence according to DSM III-R criteria and to 25 controls who were matched for sex, age, and level of education. Inpatients were in their third week of detoxification process and were not receiving any psychotropic drugs at the time of assessment. The results demonstrated that alcoholics suffer from several deficits in the interpretation of emotional facial expressions. First, compared to controls, they overestimated the intensity of the emotion conveyed by facial expressions, thereby replicating Oscar-Berman et al.'s (1990) observation with full-blown expressions and extending it to expressions of moderate and weak intensity and even to neutral faces: Alcoholics tend to perceive more intense emotion in the faces of their interaction partners than do controls, even if no emotion is expressed.

Second, alcoholic participants misinterpreted facial expressions more than did controls: They were more likely to believe that someone presenting a happy face was actually in a negative mood. They further tended to misattribute negative expressions (except for fear). For disgust, they presented a systematic bias, wrongly attributing emotions of anger and contempt, two



emotions typical of interpersonal conflict, to their interaction partners. Finally, despite their poor performance, alcoholics did not report more difficulties with the decoding task than did controls. It is thus likely that they do not perceive their deficit in the decoding of emotional facial expression. In sum, this first study portrays alcoholics as living in a world in which they perceive more intense emotional signals from their interaction partners and tend to misinterpret these signals with a negative and hostile bias, without noticing their deficits in this domain.

Alcoholic participants in this first study were inpatients approaching the end of their detoxification process. We do not know whether they already presented a facial expression decoding deficit before they became dependent on alcohol. Nor do we know whether the deficit is maintained in long-term abstinent alcoholics. Along these lines, two interpretations of the deficits in the decoding of emotional facial expressions observed by Philippot et al. (1999) can be made. On the one hand, the deficits might be the consequence of a general neurocognitive deterioration caused by alcohol, which is known to impair multiple functions in chronic alcoholics. As most of these cognitive impairments remit with long-term abstinence, one would expect the deficits in the decoding of facial expression to decrease with long-term abstinence (Mann, Günther, Selzer, & Ackerman, 1999). On the other hand, emotional decoding deficits in alcoholics might be related to a fundamental impairment that precedes the onset of alcohol dependency. Indeed, social skills deficits in alcoholics seem to be present before the onset of alcoholism (Rosenthal-Gaffney et al., 1998).

To investigate these competing interpretations, we designed a second study (Kornreich et al., 2001b) in which we compared the performance of abstainers (former alcoholics, abstinent for at least several months) with the performance of recently detoxified alcoholics in the facial expression decoding task. If it could be shown that there are no differences between these two populations, such a finding would rule out the possibility that the deficits are a consequence of a general cognitive deterioration, which should alleviate with abstinence. The analysis of the data revealed that, while some nonverbal impairments were no longer present in abstainers, others persisted. Specifically, the over-attribution of emotional intensity to facial expression was not observed in abstainers. Similarly, the misinterpretation of happy and sad face shown by recently detoxified alcoholics was not present in abstainers. However, the decoding accuracy deficit still persisted for anger and disgust facial expressions: For these emotions, there were no differences between recently detoxified and abstinent alcoholics.

Overall, this pattern of results suggests that different facets of alcoholics' nonverbal impairments are determined by different processes. Some decline with time. Others, like the misinterpretation of some negative emotions, seem to persist long after alcohol detoxification. However, it remains to be shown whether these deficits were present *before* the onset of alcohol dependency. Indeed, the fact that they remain, even years after alcohol abuse has ceased, does not establish that they preceded or were independent from alcohol abuse.

Another issue is whether or not the precise nonverbal deficits that we have observed in alcoholics are specific to the alcoholic population (Sher, Trull, Bartholow, & Vieth, 1999). To partially address this topic, we replicated our first study, with two non-alcoholic control groups, one with psychopathology (i.e., obsessive compulsive disorder, OCD) and one with no psychopathology (Kornreich et al., 2001a). We choose an OCD control group because alcoholism and OCD display symptomatic similarities but do not share common etiologies. Indeed, several investigators have noted similarities between urges and desires to drink heavily and obsessive-

compulsive disorders (Anton, Moak, & Latham., 1995; Caetano, 1985; Edwards & Gross, 1976; Modell, Glaser, Cyr, & Montz, 1992). However, the life-time risk for obsessive compulsive disorder among close relatives of alcoholics is 1.4 percent, which does not support the existence of a common genotype for the two disorders (Schuckit et al., 1995). For these reasons, an obsessive-compulsive sample seemed to be a relevant psychopathological control group.

We used the same procedure as in our former studies, but with a restricted set of stimuli, given the (obsessively) long response time of participants with OCD. Twenty-two outpatients suffering from obsessive-compulsive disorder according to the DSM IV were recruited in a general hospital out-patient department. They were matched for age, sex, and educational level with 22 volunteers with no psychiatric record and 22 inpatients diagnosed with alcohol dependence according to DSM IV criteria but who were at the end of their detoxification process. The results of Study 1 were replicated: Recently detoxified alcoholics attributed more emotional intensity to facial stimuli, were less accurate in identifying the emotion portrayed, and did not report more difficulties in the decoding task. The patients with OCD, however, did not differ from the normal controls. This observation supports the conclusions of our study comparing controls, anxious, and socially anxious outpatients—a study that observed no differences among those three groups. Thus, the facial expression decoding deficits observed in alcoholics could not be found in OCD patients or in the other clinically anxious population. The social isolation and stigmatization shared by all of these conditions is therefore unlikely to account for the nonverbal deficits observed in alcoholics.

This procedure was replicated in a study in which we compared post-cure groups presenting opiate dependency, both opiate and alcohol dependencies, and alcohol dependency only, along with a control group. The results indicated that participants who presented alcohol dependency only or both opiate and alcohol dependencies had the worst accuracy scores. Participants presenting only opiate dependence were more accurate than the latter, but still not as accurate as were controls. It thus seems that alcohol dependency has a particularly pronounced effect on the accuracy of facial expression decoding. At the least, these results demonstrate that the deficits we evidenced in alcoholics are not ubiquitous in psychopathological populations. Still, more investigation is needed to establish how specific these deficits are, and how they relate to substance dependencies and to the social exclusion often accompanying these conditions.

Above, we defended the notion that the impairments shown by alcoholics in the recognition of emotion from nonverbal cues might generate interpersonal difficulties. These conflictive social relations might increase the probability of alcohol abuse. Alcohol intoxication might in turn impair an alcoholic's capacity to accurately interpret others' internal state from their nonverbal behavior. The alcoholic would then fall into a vicious cycle, leading to more interpersonal conflict and to more alcohol consumption.

If this hypothesis is correct, the deficit in nonverbal decoding observed in alcoholics should be accounted for by their deficit in interpersonal relations. To examine this possibility, we conducted a fourth study in which we replicated the procedure of Study 3 with 29 recently detoxified alcoholics and 29 controls matched for age, sex and educational level. In addition, all participants completed Horowitz et al.'s (1988) interpersonal problem inventory. This scale comprises 127 items assessing six domains of potential interpersonal difficulties: assertiveness, sociability, submissiveness, intimacy, excessive self-control, and excessive self-responsibility. Once again, the results indicated that alcoholics were less accurate in decoding facial expression,

that they attributed more emotional intensity to the facial stimuli, but that they did not report more difficulties with the task than did the control participants. As expected, alcoholics reported more interpersonal difficulties for all domains (except for self-control). We then examined whether the nonverbal decoding deficits of alcoholics were still statistically observable after partialling out the variance accounted for by their interpersonal difficulties. After this variance was partialled out, the ANCOVAs revealed that alcoholics and controls no longer differed with respect to nonverbal decoding accuracy. This latter observation suggests that the relationship between nonverbal deficits and alcoholism is mediated by interpersonal problems and tension.

In conclusion, it appears that chronic alcoholics present three deficits in the interpretation of facial expression. First, they overestimate the intensity of the emotion felt by their interaction partners. Second, they decode facial expression less accurately than do controls; they might also present a systematic bias in the over-attribution of anger and contempt, but we did not replicate this finding in all our studies. Third, alcoholics are not aware of their nonverbal deficits. This pattern of deficits seems specific to alcoholics, although more research is needed with respect to this point. These deficits are enduring, as abstinent alcoholics present the same pattern of deficits, with the exception that they no longer overestimate emotional intensity. Finally, these nonverbal deficits are related to interpersonal difficulties, which act as a mediator between nonverbal deficits and alcohol abuse.

### Psychopathy

One of the defining characteristics of psychopathy is the lack of empathy. One may thus suspect psychopaths of paying little attention to the emotional state of others, especially to states of distress, fear, or sadness. From this perspective, one might expect a poor performance for psychopaths' decoding of facial expression of emotion, especially for distress, fear, or sadness. On the other hand, psychopaths have also been portrayed as having a "superficial charm" and as being skilled manipulators. From this perspective, one would expect better performance by psychopaths in the decoding of facial expression than by controls. Which of these two plausible but contradictory hypotheses is best supported in the literature?

Several studies have provided consistent evidence of deficits for psychopaths in processing verbal emotional material (Williamson, Harpur, & Hare, 1990, 1991), thereby supporting the former hypothesis. However, evidence is much less consistent with respect to nonverbal material. Actually, most studies that examined the meaning attributed to facial features observed no differences between psychopaths and non-psychopaths. For instance, Day and Wong (1996) observed differences between the two groups' hemispheric asymmetries in a tachistosopic task involving emotional words but not in a similar task involving emotional faces. Likewise, Richell, Mitchell, Newman, Leonard, Baron-Cohen, and Blair (2003) observed no differences between psychopaths and non-psychopaths in a task requiring the identification of mental states from photographs of the eye region alone. In contrast, Stevens, Chapman, and Blair (2001) reported that children with psychopathic tendencies showed impaired recognition of sad and fearful faces, but not of angry and happy faces. However, the samples were small ( $n = 9$  for each group). Further, this observation was not replicated in adult samples by Kosson, Suchy, Mayer, and Libby (2002), who reported that psychopaths' deficits were specific to the classification of disgust faces only when participants were required to use their left hand, that is, in conditions designed to minimize the involvement of left-hemisphere mechanisms. Further, in that study,

psychopaths were unexpectedly observed to be *better* at decoding anger when relying on left-hemisphere resources (when using their right hand).

To account for these discrepancies, authors often invoke the lack of sensitivity of the nonverbal tasks used (relying on full-blown facial expression) as well as the fact that some studies did not distinguish among the emotion tones of facial expressions presented (Kosson et al., 2002). To overcome these weaknesses, we recently conducted a study in which we compared criminal psychopaths and non-psychopaths among inmates of a Belgian state prison and of a high security forensic treatment facility. We used the sensitive nonverbal decoding task described in the preceding sections of this chapter (e.g. Philippot & Douilliez, in prep.; Philippot et al., 1999), and we compared these criminal groups to men with no criminal history and no history of psychiatric disorder. The analyses revealed that there were no differences among groups with respect to the intensity of any emotion they attributed to the facial stimuli (no evaluative deficit in intensity), nor with respect to the type of emotion they attributed to neutral faces. However, both criminal groups were less accurate than were the controls, especially when attempting to identify fearful and disgusted faces. Further, psychopaths were less accurate in attempting to identify angry faces than were controls, and non-psychopathic criminal were less accurate in attempting to identify sad faces than were controls. These effects were not affected when Education was introduced as a covariate, although the controls were significantly more educated than were the criminals. Finally, differences appeared in the difficulty participants reported for the decoding task. Controls tended to report more difficulty than did psychopaths, especially for weak intensity stimuli. Further, both criminal groups reported less difficulty than did controls for decoding angry and sad faces. In sum, although both criminal groups reported less difficulty in decoding facial expression of emotion, they were less accurate, especially for negative emotions. Importantly, no differences were observed between the two criminal groups in any dimensions of the decoding task.

In conclusion, the psychopathic deficit consistently observed in the processing of emotional verbal material is not replicated with nonverbal material. From the available evidence, one can conclude that if such a deficit exists, it must be highly specific and/or of weak intensity. We suggest that faces are basic social stimuli that require little to no reflective processing to be decoded. However, the understanding of verbal material requires more elaborated processing. The latter would be impaired in psychopaths, but not the former. It is intriguing to notice that the same pattern of results and rationale applies also to social phobics, whose social impairment (lack of assertiveness and irrational social fear) is in many respects opposite to the social impairment of psychopaths (narcissism and complete absence of social fear).

#### Conclusions and direction for future research

In this chapter, we have presented several lines of research investigating how the interpretation of facial expression of emotion might be altered by clinical conditions characterized by difficulties in interpersonal regulation. Specifically, we studied social anxiety, alcohol dependency, and psychopathy. For each condition, a logical rationale could be formulated to support the notion that deficits in facial expression decoding were to be expected. Further, for each of these pathologies, there is a strong clinical belief in the existence of bias or of deficit in the interpretation of others' emotional signals, especially of others' facial expression. As we have demonstrated, these beliefs were in some cases myths, but in other cases were reality.

Table 1 summarizes the results of the studies reported in this chapter. As can be seen, while clear deficits and biases have been evidenced for alcoholics, the evidence is scarce for such deficits and biases among incarcerated criminal psychopaths—at least when compared with non-psychopath inmates, the most appropriate control group in our opinion. Likewise, with the exception of attentional biases, there is little evidence for these biases and deficits among social phobics.

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 Insert Table 1. about here  
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The more surprising case is the one of social phobia. For this anxiety disorder, there is strong evidence of attentional biases in general and of evaluative biases for affective words. However, despite a clinical belief and theoretical claim to the opposite, the evaluative bias for facial expression in social phobics turned out to be a myth. Although one should not make too much of the null hypothesis and absence of differences, the lack of any difference between socially anxious and non-anxious individuals in different studies strongly suggests that, if an evaluative bias exists, it should be modest and of very little clinical significance. Similar conclusions could be made with respect to psychopaths. However, studies focusing on possible attentional biases must be done to obtain a fuller picture of how the psychopath population processes nonverbal emotional information.

Finally, the case of alcoholism is much better documented with respect to emotional facial expression recognition. We have reviewed ample and consistent evidence of interpretation biases and of deficits in accuracy and in evaluation of the intensity of facial expression. More research is needed to determine whether this profile of nonverbal decoding deficits is specific to alcoholism or if it might also be found in other conditions involving substance dependence. We also need to investigate the possibility of attentional bias in alcoholics, especially for faces expressing rejection and contempt.

Our knowledge of the processes involved in how these different clinical populations interpret facial expression needs to be developed. Still, the corpus of research presented in this chapter is suggestive of many approaches to treatment that can be directly exploited by clinicians, at least in the case of alcohol dependency and social phobia. (For psychopathy, we believe that the state of the research is still too poor.)

Regarding alcohol dependency, we have demonstrated earlier in this chapter that alcoholics tend to generate tension and conflict when interacting with others, including their close relatives and family members. Furthermore, alcoholics present special difficulties in dealing with anger and frustration, two feelings that are often generated by interpersonal tension and conflicts. Difficulties in dealing with and expressing these feelings are the best predictors of relapse (Marlatt, 1979). In other words, relapse prevention programs should focus on teaching alcoholics appropriate coping strategies and modes of expression in situations in which they feel angry and/or frustrated.

Some research suggests that communication deficits, especially those related to emotion, might play a central role in the deficient coping strategies used by alcoholics. The mechanism that we propose is that, because of their difficulties in correctly reading others' emotional states, alcoholics generate interpersonal tensions and are ill-prepared to solve these tensions constructively. Further, to avoid feelings of helplessness generated by their inability to solve

these situations, alcoholics turn to alcohol consumption as a coping strategy. They thus initiate two positive feedback loops. First, alcohol intoxication aggravates interpersonal tensions and, second, depletes already limited nonverbal skills. This suggests that training programs aimed at developing nonverbal sensitivity in alcoholics should attempt to decrease interpersonal tension, increase appropriate coping skills, and, consequently, decrease alcohol consumption and relapse. Such training programs should focus on the decoding of both emotional intensity and expressions of emotion related to interpersonal tension, such as anger, contempt and disgust.

In contrast, we would not propose similar “re-interpretation” training interventions for socially anxious individuals, although the clinical literature suggests them (Beck, Emery & Greenberg, 1985). Indeed, the evidence reviewed in this chapter suggests that socially anxious individuals do not decode facial expressions of emotion inaccurately. Rather, the way they attend to facial expressions seems to participate in the maintenance of their anxiety. Specifically, socially anxious individuals show no deficits in decoding faces expressing anger, contempt or disgust. However, contrary to controls, they may automatically spot such faces more readily and then turn away from them, failing to further interpret these displays within their context. This suggests that the most appropriate clinical intervention would be to train socially anxious individuals to maintain their attention on threatening faces once they have spotted them and to understand them within this context. This approach actually consists of a form of exposure to threatening nonverbal stimuli, in contrast to the strategy of decoding skill training we suggest for alcoholics.

In closing this chapter, we want to stress that the future of the field depends upon more than just “more research,” a common conclusion in many chapters! In our view, this area suffers from an important limitation of a basic theoretical nature: We urgently need a model specifying the processes involved in the decoding of facial expression of emotion. Indeed, despite three decades of intense empirical research on facial expression decoding, researchers are still uncertain about the processes implicated in the perception of emotional facial expression, and we ignore how affective meaning is attributed to faces. The little theoretical basis we have is that different processes are active in the recognition of faces as compared to those implicated in the interpretation of facial expression. Having a theoretical model of the processes involved in the decoding of facial expression would offer a basis for formulating hypotheses with respect to which processes should be preserved and which processes should be impaired in given pathologies. On this basis, one could predict the profiles of decoding performance for given clinical conditions.

As in many areas of psychology, clinical research may help in the elaboration of such a fundamental model. Indeed, consistencies in the association or dissociation of some performances and deficits in given clinical conditions suggest that similar or different processes underlie these performances and deficits. For instance, we demonstrated that alcoholics’ over-estimation of emotional intensity in faces disappears with long term abstinence, while the interpretation biases remain. This observation is suggestive that these two facets of the interpretation of emotional facial expression are supported by different processes. Similar inferences can be made from the observation that social phobics and psychopaths present biases in the processing of emotional verbal material but not of nonverbal material.

It is our hope that the clinical work presented in this chapter, and the one that is forthcoming, will prove useful in the endeavor of building a basic model of the decoding of facial expression of emotion.

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Table 1.  
Summary of Facial Expression Decoding Deficits and Biases According to Clinical Status.

Facial Expression Decoding Dimension	Clinical Status		
	Social Phobics	Alcoholics	Psychopaths <sup>a</sup>
Evaluative Deficit in Intensity	No deficit	Over-estimation (but disappears with long term abstinence)	No deficit
Evaluative Deficit in Accuracy	No deficit	Less accuracy	Less accuracy
Evaluative Bias	No Bias	Bias for over-attribution of anger and contempt	No Bias
Decoding Difficulty	No difference	No difference	Under-estimation
Attentional Bias	Pattern of vigilance followed by avoidance for threatening faces	No study	No study

Note: <sup>a</sup>This table reports comparisons between incarcerated psychopaths and normal non-incarcerated controls. It should be noted that in the present data set, incarcerated psychopaths did not differ from incarcerated non-psychopaths. Differences observed cannot be attributed to psychopathy per se, but to variables related to having a criminal history.

Figure Caption

Figure 1.:

The cycle of nonverbal deficits, social competence deficits, and alcohol consumption.

