Chapter 6
The Reverse Engineering of Emotions – Observers of Others' Emotions as Naïve Personality Psychologists

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When encountering others whom we don't know, we often have very limited information as to their personality or their intentions. One source of information about a person's dispositions and intentions are emotional facial expressions (Hareli and Hess 2010; Hareli et al. 2009; Hess et al. 2000; Knutson 1996; Trope 1986). For example, all else being equal, observers attribute high dominance to a person who expresses happiness, anger or disgust and low dominance to a person who expresses fear or sadness. Likewise, whereas a person expressing happiness is judged to be highly affiliative, a person showing anger or disgust is considered to be low in affiliation (Knutson 1996). Observers also use others' expressions of emotions to infer the competence of the expressers. For example, Tiedens et al. (2000) showed that a person who expresses anger following failure and pride following success, is perceived as more competent than a person expressing sadness or guilt and appreciation, in response to failure and success, respectively.

Interestingly, observers tend to attribute traits associated with particular expressions of emotions to people even when these people do not actually express any emotion. Specifically, neutral facial features often resemble a specific emotion and this information is used to infer dispositions – a process called emotion overgeneralization (Hess et al. 2009; Zebrowitz 2004; Zebrowitz et al. 2003; see also Chap. 3, this book). These impressions then shape subsequent decisions (Bar et al. 2006; Todorov et al. 2013; Willis and Todorov 2006). In fact, first impressions of the likeability of a person based on a photo have been shown to persevere even after a real life encounter 1 month later (Gunaydin et al. 2017).

As such, emotion information, be it in the form of an overt emotion expression or in the form of a facial appearance that bears resemblance to an emotion expression,

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is used by observers to infer the characteristics of people we encounter. However, the emotions shown by others inform us not only about the expresser but also about the situation at hand as well as the relevant norms and standards (Hareli et al. 2019, 2015). In short, emotional expressions are not only a source of information about the state of the expresser, but they are also an important source of social information (Van Kleef 2009). In this chapter, we will focus on the reverse engineering of appraisals model (Hareli and Hess 2010; Hess and Hareli 2016) which aims to explain this process. We will first present a brief discussion of the theoretical background, then describe the model and exemplify its operation by showing how observers use it. Finally, we will consider some significant theoretical issues surrounding this process including its connection to other relevant processes such as social appraisal (Manstead and Fischer 2001) with which it shares similarity (Parkinson 2011).

The Naïve Emotion Theorist

When people navigate social situations they use naïve theories of human behavior. Naïve emotion theories contain information about the type of events that elicit emotions, appropriate ways to express an emotions as well as means to regulate it (Hareli 2014; Hareli and Hess 2010; Hess and Hareli 2017; Weiner 1987). Given this information, people can "fill in the blanks" in a given social situation where limited information is present. For example, (Western) naïve emotion theories tend to agree that anger is typically caused by the misconduct of another person accompanied by the belief that it is in the observer's power to handle the resulting undesirable situation. By contrast, sadness and shame are considered to be reactions to undesirable situations that are beyond the expressers' power. An expresser's shame also suggests that the expressers blame themselves for the undesirable situation. Based on this understanding, observers may infer that the angry person is rather competent (Hess 2014) because they are able to handle an adverse situation (Lerner and Tiedens 2006). However, if the expression is perceived as inappropriate to the context, the opposite may be the case (Lewis 2000).

The notion that people use naïve theories to draw inferences about others' behavior can be traced back to classic work on attribution theory. Attribution theories posit that humans are motivated to understand the causes of specific events (Försterling 2001; Heider 1958; Kelley 1967; Weiner 1985; Wong and Weiner 1981) as such understanding serves a basic motivation to master the world and achieve desired goals (Fiske 2004). The most fundamental focus of attribution theory is on what Heider (1958) has called "naïve psychology." Importantly, the "naïve psychology" suggested by attribution theory relates not only to how individuals explain others' behaviors but also their own.

One of the important mechanism serving the naïve attribution of a cause to an effect is a causal schema. A causal schema can be best conceived of as a belief a person holds about the relation between an observed outcome and the potential

causes for it (Kelley 1972). A causal schema enables a person to predict both an effect from the presence of a cause and a likely cause from the presence of an effect (Kun and Weiner 1973). Weiner (1987) extended this view to specific emotions. The underlying naïve theory is a set of schemata linking specific emotions to their characteristic causes. For example, Weiner et al. (1982) showed that observers inferred that a teacher responding with anger to a student's failure thinks that the student did not expend sufficient effort. By contrast, a failure responded to with pity on the part of the teacher was taken to indicate that the teacher thought the student had low ability. Finally, when the teacher responded with guilt, observers inferred that the teacher accepted responsibility for this failure.

An example of using a naïve emotion theory to control others' emotions, is a study by Folkes (1982) who examined the characteristic reasons that people who have rejected invitations for a romantic date provide to the rejected person. This research demonstrated that both the reasons provided for actual rejections of a date and the reasons that people reported they would be willing to communicate, tended to minimize the insult to the rejected person. This was achieved mainly by providing reasons that were not related to the rejected person, such as having to study for finals. According to Weiner (1987) these types of reasons are chosen because naïve emotion theories consider them to be less likely to be perceived as an insult.

In this context, it is not assumed that people learn the appropriate emotions for a vast array of specific situations but rather that naïve emotion theories describe classes of events. For example, a teacher showing pity towards a student who failed at math is part of the class of events where someone encounters an undesirable event not under their control due to lack of ability and pity would be one possible reaction – contempt might be another. Thus, if a teacher shows pity towards a failing student, observers can deduce that the teacher considers the student to be low in math aptitude. By contrast, anger would be one likely reaction towards someone who fails for lack of trying. Thus, anger on the part of the teacher signals that the teacher considers the student able but lazy.

In other words, naïve theories describe events in relatively abstract form and point to likely reactions to such events. Weiner (1987) described the causes in terms of attribution theory as locus, stability and controllability. Whereas people may differ in terms of how they construe a specific cause, they tend to agree on these causal dimension (Hareli and Weiner 2002).

According to Weiner (1992), people have a naïve understanding of the attribution process since they are reflective witnesses of themselves as well as of others when attempting to make sense of a specific observation. Strictly speaking, naive attribution theory is at least partly the result of an abstraction of observations of the self and of others with the object of this observation being concrete cases of thought–emotion sequences. Accordingly, people's naïve theories about the links between cognitions, emotions, and actions are often, and in many respects, consistent with attribution theory as formulated by psychologists (Weiner 2014). In fact, the tradition of attribution research has acknowledged the important role that knowledge shared by ordinary people can have on the construction of scientific theories (Försterling 2001; Heider 1958; Weiner 1985).

However, this theory has two disadvantages. First, it was intended for the realm of (scholastic) achievement and hence is formulated in terms suitable for that domain. Second, attribution theories generally presume an explicit reasoning process (Kelley 1971). Yet, emotion based first impressions tend to be rapid and are largely formed automatically.

Appraisal theories of emotion share many of the characteristics of attribution theory, in that they posit that an emotional state results from the appraisal of the situation according to the motivations, values and resources of the individual (Scherer 1987). Yet, by contrast appraisals are spontaneous and intuitive (Arnold 1960; Scherer 1987).

Appraisal Theory of Emotions

According to Scherer (1984) a relevant change in the internal or external environment is evaluated according to whether the event is pleasant or unpleasant (pleasantness) as well as whether the change is in line with the motivational state of the individual or obstructs the individual's goals (goal obstruction). Individuals then evaluate their ability to cope with or adjust to the change (coping potential). A further set of evaluations regards the correspondence with the relevant social and personal norms, that is, how the event is to be judged in terms of ethical, moral or social norms (norm incompatibility). Specific emotions are differentiated by the pattern of appraisals they are the result of. Thus, anger is an emotion that is characterized by appraisals of goal obstruction, high coping potential and a perception of norm violation. By contrast, sadness is characterized by appraisals of goal obstruction, but combined with low coping potential, with norms playing less of a role (Scherer 1984). In this sense, one can say that emotions are like short and simple stories. This is what Lazarus (1991) referred to as core relational themes. In this view, sadness tells a story about loss and anger a story about insult to the self.

Importantly, the way a person appraises a given situation is specific to the individual and the individual's current state. Factors such as the personality and skills of the person determine their resources, values and motivations. These in turn define the outcome of their appraisal of an event. Hence, while one individual may evaluate an event as a threat that cannot be coped with due to a lack of skill or due to a submissive personality, another may see a challenge instead. This determines the person's resources. The appraisal pattern in turn entrains the emotional and behavioral reaction to the event (see upper half of Fig. 6.1).

Emotions are responses to major concerns of the individual (Frijda 1986). As such, they prepare the individual to respond appropriately to the emotion eliciting event. This implies that an appraisal pattern associated with a specific emotion is also associated with a specific action tendency or action readiness. These are behaviors that are likely to address the issue that gave rise to the emotion in the first place
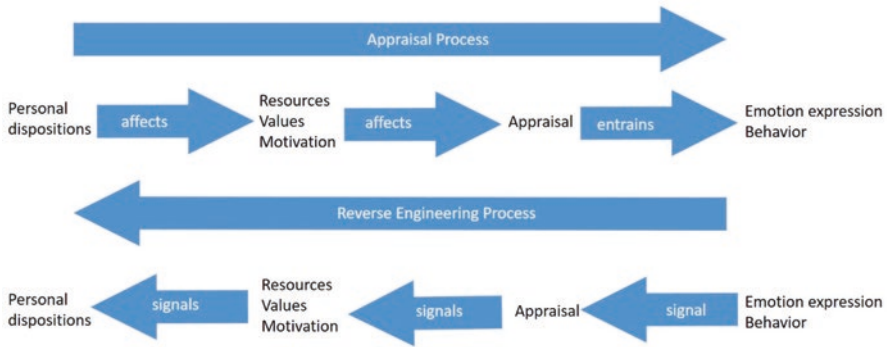
Fig. 6.1 Appraisal and reverse engineering of appraisals processes

(Frijda 1986; Scherer 2005). For example, fear is associated with tendencies to engage in protective behavior, often in flight. By contrast, anger is linked with a tendency to move against; to oppose the source of the anger (Frijda et al. 1989). Thus, specific emotions are associated both with specific appraisals and specific behaviors (Roseman et al. 1994).

Early research on appraisal theory often examined the link between appraisals and action tendencies and emotion words or stories about emotional events (e.g., Fontaine et al. 2007; Frijda et al. 1989; Roseman et al. 1990, 1994). In many such studies, for example, participants were asked to read about an emotional event and then reconstruct the appraisals or action tendencies of the protagonist. This line of research generally confirms predictions of appraisal theory (Roseman 1991, 1994). Even though these studies are not solid evidence for the actual link between emotions, appraisals and action tendencies (Parkinson 1997; Parkinson and Manstead 1993), more recent research using for example, psychophysiological measures rather than self-report confirm these early findings (e.g., Aue et al. 2007; Lanctôt and Hess 2007; Scherer and Grandjean 2008).

Importantly, the early research on appraisal theories provided an insight into participants' naïve emotion theories. These theories tend to be overall in line with appraisal theory (Hareli 2014). In other words, the process described in the upper half of Fig. 6.1 also represents (Western) naïve emotion theories.

It is important to emphasize that appraisals are typically not the product of reasoning processes (Kappas 2006). However, people can and do reconstruct appraisal patterns consciously after the fact (Robinson and Clore 2002) and, based on their naïve emotion theories that represent the appraisal–emotion links as descried above, they can do so for other people's emotions as well (e.g., Hess and Hareli 2017; Manstead and Fischer 2001; Roseman 1991; Scherer and Grandjean 2008). People can use this information to deduce unknown information about the expresser or the situation, based on known information about the expresser's behavior in a process called reverse engineering (Hareli and Hess 2010).

A Model of the Reverse Engineering of Appraisals and Action Tendencies

As depicted in the lower half of Fig. 6.1, knowing how a person reacted to a given event makes it possible to reconstruct that person's likely appraisal of the event. This in turn provides insights into their goals, values and motivations (de Melo et al. 2014; Hareli and Hess 2010). In fact, it has been proposed that facial expressions of emotions are a direct readout of appraisals (Scherer 1992; Scherer et al. 2018; Smith and Scott 1997). That is, specific facial actions (e.g., brow lowering) are related directly to appraisals (e.g., goal obstruction).

Thus, an angry person experiences a motivation incongruent (low goal conduciveness), unpleasant state, but considers the situation to be potentially under their control (high coping potential). An observer, who sees a person react with anger to an injustice can hence conclude that the person has values according to which the event in question appears unjust, perceives this injustice as incongruent with their own motivational state (which would be to see justice done) and also feels endowed with enough resources to act accordingly. Thus, in a very real sense, emotion expression can also provide information about the situational context and not only vice versa.

Another important information that can be derived from the emotional expressions of others, are the behavioral intentions or action tendencies. Appraisal theories of emotion consider emotions as evolutionary problem solving mechanisms (Frijda 1986; Scherer 1987). As such, the function of an emotion is not reduced to signaling a state, but foremost to prepare the organism for suitable action. As such, knowledge about the emotion also includes knowledge about the likely actions of the emoter. In fact, this is one important social function of emotions (Niedenthal and Brauer 2012). These different types of information also interact to build a more complete picture of the emoter.

For example, if someone shows anger at the undesirable act of another person, punishment behavior is a likely action tendency. If the person does not actually act this way, we may surmise that some other value, goal or motivation conflicts with this behavior, maybe the offending person is their boss and they start fearing for their job, or that the situation is already sufficiently addressed by the mere communication of anger (Darwin 1872/1965). Importantly, inferences based on both the expression of the emotion and the resulting actions need not be sequential, rather impressions from both sources may be formed simultaneously. One issue that becomes evident in this context is the difficulty of distinguishing between expressive behavior and behavior that addresses the emotion eliciting event. For example, running away from a threat is both an expression of fear and puts distance between the threat and the person. To avoid confusion, we will confine the term emotion expression to facial and vocal expressions.

In sum, knowing how someone reacts emotionally to an event can provide valuable information on that person's understanding of the event, their resources and goals, their motivations and values relevant to the event, as well as their likely

actions. Importantly however, the information provided by emotional reactions refers not only to the situation at hand but also to relatively stable characteristics of the person.

Specifically, stable traits such as dominance, affiliation, and competence impact the motivational goals, preferences, and resources of a person. Thus, a person who is competent may be expected to have more resources to deal with potential problems than a person who is not. Likewise, an affiliative person can be expected to have affiliative goals. Conversely, seeing a person react with anger in a difficult situation suggests that this person is high in resources in this situation and likely in other situations as well. Thus, emotion expressions provide information that can be used – and is used – to derive stable characteristics of a person (Hareli and Hess 2010). In what follows we will present an example of how reverse engineering is used by observers to make sense of others' personal dispositions.

Expressions of Emotions Inform Inferences of Others' Personal Dispositions

As mentioned above, several studies provide evidence that people use the emotions of others to infer their personal characteristics. Yet, these studies only indirectly addressed the mediation via reverse engineered appraisals. For example, Tiedens et al. (2000) showed that people hold the belief that expressions of anger after failure and pride after success are typical of high status people whereas expressions of sadness or guilt after failure and appreciation after success characterize low status people. Specifically, high status people are perceived as more competent than low status people and the emotions they express are perceived as indication of competence.

Thus, high status people should show anger after a failure, because the failure is to be attributed to external reasons and not lack of competence. Conversely, pride suggests that the expresser takes responsibility for the success. Thus, the link between perceived competence and expressed emotions is assumed to be driven by beliefs about the appraisals associated with each of these emotions. However, this link was not explicitly tested in this study. Relatedly, Greenaway et al. (2018) explicitly assumed that inferences of competence from expressions of positive emotions such as joy and pride by winners, are the result of a reverse engineering of appraisals. Nevertheless, they did not explicitly test for mediation.

A study in which the role of reverse engineering of appraisals for inferences of personal dispositions was explicitly examined is a study by Hareli and Hess (2010). In this study, participants were asked to imagine themselves in the role of a human resource employee who interviews a job candidate. One part of the interview was a description of the candidate's narrative of a failure event in their previous job. Candidates were described as reporting that they reacted with anger, sadness or neutrality to the failure. Participants were then asked to rate the candidate, among

other things, on aggressiveness, self-confidence, masculinity and emotionality, warmth, and gentleness. Participants also rated how they thought the candidate had appraised the event. The results showed that the rated traits were linked to the presumed appraisals in line with appraisal theory.

Specifically, as anger is associated with the appraisal of a situation as unpleasant, norm incongruent and requiring immediate action, an angry person can be expected to react assertively and confidently. Congruent with this notion, appraisals of urgency mediated perceptions of aggressiveness and appraisals of unpleasantness mediated perceptions of self-confidence.

A person who stays neutral in a negative situation can be perceived as "above the situation" and hence unemotional and cold. In fact, an individual who showed a neutral reaction was perceived as less likely to assess the situation as norm incompatible and unpleasant and these appraisals mediated the perception of the person as less emotional/warm/gentle. Overall, this study shows that emotional reactions signal the individual's appraisal of the situation and that these perceived appraisals mediate observers' perceptions of an individual's personality as a function of their emotional reaction to an event.

Reverse Engineering of Appraisals – Theoretical Considerations

Overall, this and related studies and theoretical considerations suggest that reverse engineering of appraisals is used by observers to make sense of the personal dispositions of others as well as of the situation and norms and standards relevant to it (e.g., de Melo et al. 2014; Hareli et al. 2013). As described above, this process is assumed to be based on reconstructing the appraisal-emotion link typical of the observed emotion. Next we will discuss the implications of this process for our understanding of the social functions of emotions.

The Role of Context in Reverse Engineering of Appraisals

Emotions are rarely perceived in a vacuum but rather in a specific context. This context often provides important information that may influence the inferences that are made on the basis of the perceived emotions (Hess and Hareli 2015, 2017). This means, among other things, that reverse engineered appraisals from emotion expressions may not always have the same weight in inferring the personal dispositions of the expresser. For example, when observers know the expresser quite well and/or are biased by stereotypical expectations, the characteristic appraisals associated with the emotional expression may carry very little if any weight at all in inferring the expresser's dispositions. Rather, the perceiver may actively reinterpret the situation by discounting the characteristic meaning of the emotion (Hess and Hareli 2016). In this vein, Brescoll and Uhlmann (2008) found that men who reported

responding with anger to a failure at work were perceived as having a higher status than men who responded with sadness. Yet, this was not the case for women. Anger in women was not attributed to an undesirable external event that can be redressed by the expresser – and hence leads to increased status. Instead, stereotypes of aggressive women were invoked and the anger was attributed to the women's personality and not the circumstances. Consequently, reacting with anger did not raise their status compared to women who reacted with sadness.

Similarly, in the research mentioned above by Greenaway et al. (2018) it was shown that when perceivers had reasons to believe that a winner's expressions of joy and pride were inauthentic, they no longer attributed higher competence to these winners. Taken together, these studies exemplify that observers consider contextual factors, such as the identity of the expresser or the authenticity of the expression, and this determines the extent to which they rely on the appraisals associated with the emotions as such or consider other information as well.

Reverse Engineering of Partial Sets of Appraisals

Each emotion is associated with a set of appraisals. However, inferences drawn from a specific emotion may be based only on a subset of these appraisals and not on the complete set of appraisals associated with the emotion. For example, as mentioned above, a person responding with anger to failure is perceived as competent (Tiedens 2001). This inference is based on the understanding that this person appraises a situation relevant for the self as caused by someone else and views it as something that he/she can handle. The fact that it is likely to be the result of an act which violated social norms is less important for this inference.

The fact that certain inferences are based only on a subset of appraisals associated with a specific emotion suggests that perceivers need not necessarily recognize the specific type of expressed emotion or label it in order to reverse engineer its appraisals and draw inferences from it. Parkinson and Manstead (2015) already suggested that components of emotions can have an impact on its observers without a relation to the categorical meaning of the emotion as a whole. However, they suggested that such effects occur by virtue of processes that do not require explicit inferences. In our view inferences can also be based on reverse engineering of individual appraisals or subsets of these that are not associated with a defined category of an emotion. It suffices that cues for such appraisals are perceived. This can be done also because specific facial cues can be understood to be linked directly to specific appraisals (Scherer 1992; Scherer et al. 2018; Smith and Scott 1997). Thus, the actual labeling of a specific discrete emotion may not always be required. We will discuss this notion below in more detail.

First, quite often emotion expressions are rather ambiguous and not very intense, making them difficult to decode (Motley and Camden 1988). Still, observers may be able to draw inferences from a blend of emotions or the undetermined and less clear nature of the expression. In line with this claim, recently Hareli et al. (2018) showed

that for less intense, more mixed, expressions the perceived intensity of different emotions seen in a facial expression, including secondary emotions (i.e., emotions not actually expressed), was a better predictor of inferences drawn from these expressions than the categorical label of the focal emotion. This, despite the fact that the emotion expressions were overall perceived accurately. The contribution of secondary emotions to inferences about others is a domain that has been very much neglected in research on the social perception of emotions. Given that most spontaneous, real life emotion expressions comprise secondary emotions, this neglect should be redressed by future research.

Further, naïve emotion theories are not restricted to the link between appraisals and expressions but also comprise other aspects of emotion expression that can inform inferences of personal dispositions. For example, observers' judgments of a persons' emotional competence and intelligence are influenced by the degree to which their emotional reaction seemed restrained and as a function of the expressers' gender. Specifically, whereas women who responded with a fast unrestrained expression of anger or sadness to an undesirable situation were perceived to be more emotionally competent as well as more intelligent overall than when they reacted to an emotion elicitor with restraint – operationalized as a delay in responding – for men the opposite was the case (Hess et al. 2016). In this case, inferences were informed by the degree to which the onset timing of the observed emotional reaction matched gender related stereotypical expectations. Reactions that seemed more aligned with gender related expectations made the expresser appear more competent than reactions that deviated from such expectations. This finding has several implications. First, inferences extracted from emotions are not based only on the specific discrete emotions expressed but also on the way they are expressed. Also, as seen above, who expresses the emotion makes a difference with regard to the inferences drawn. This further implies that dispositional inferences based on emotion expressions are not exclusively derived from the reverse engineering of appraisals. Rather, other processes, such as stereotype expectations also play a role in naïve emotion theories.

Not all Inferences Drawn from Emotions are Based on Reverse Engineering of Appraisals

The emotions of others may affect observers in various ways that can result in inferences about the expressers and/or the situation (Parkinson and Manstead 2015; Van Kleef 2010). Indeed, at times inferences about other people may be the result of learned associations between emotions and/or resulting behaviors and personality traits (Hareli and Hess 2010). There are many emotional events in everyday life that reoccur quite regularly. Associations between such events and a person's disposition can therefore be learned over time and be used when a similar event reoccurs.

For example, witnessing a stranger reacting with extreme anger likely leads to the inference that the person is violent, based on many instances in real life and the media where this association has played out. A more explicit inference process is not needed in this case. Thus, if certain sets of appraisals are reversed engineered routinely from a specific emotion it can be assumed that an established schema stored in memory is responsible for the inference rather than an ad-hoc process of reverse engineering of appraisals. Further, there is evidence that people's naïve theory of emotions also includes beliefs about the specific causes of events and emotions. This is most likely the case when a witnessed emotion deviates from normative expectations and hence from a straightforward reverse engineered appraisal set. For example, Hess and Hareli (2017) showed that when observers saw a person expressing fear toward a cute kitten they inferred that the person is a cat phobic. That is, they spontaneously added information to the situation to reconcile the expression and the situation. This inference of a personal disposition based on the emotion expression is a likely result of a naïve theory of who is likely to react in such a deviant way to a cute kitten.

Another process that is related to the reverse engineering of appraisals is social appraisal (Fischer and Manstead 2008). Campos and Stenberg (1981) suggested that individuals may take into account other's people evaluations of a situation along with their own evaluation of it. Manstead and Fischer (2001) have formalized this notion suggesting that people appraise the way other people judge, evaluate or behave in response to an emotional situation and these appraisals shape their own emotional reaction to the situation. For Manstead and Fischer (2001) a social appraisal is an appraisal whose object of evaluation is others' response to an emotion eliciting situation. For example, a person may feel anxious about a coming exam because this person regards the exam as important and feels insufficiently prepared for it. Yet, this person sees a friend who is indifferent about the exam and downplays its importance. The evaluation of the friend's reaction is likely to affect the person's own appraisal of the situation and hence the emotional reaction to it. Accordingly, social appraisals focus on an evaluation of other's judgment of the situation based on their actual or expected reaction to the event with the typical result of an emotional reaction shaped by this social appraisal (Manstead and Fischer 2017). What is the process underlying such appraisals is a debated question and some believe that different processes may be responsible for it (Parkinson and Manstead 2015). Reverse engineering of appraisals is one such process. However, discussions of social appraisals mostly focus on how perceiver's own reaction to a situation is shaped by the emotions of others. By contrast, reverse engineering of appraisals describes how observers draw inferences from others' emotions. Importantly, in many cases these inferences go beyond the here and now of the situation, the typical focus of research and discussions of social appraisals (see e.g., Clément and Dukes 2017; Manstead and Fischer 2001; Walle et al. 2017). Thus, the focus is on what is inferred from the emotion and not on how the person responds emotionally and/or behaviorally to the situation as a function of the now updated

view of the situation thanks to the emotions of the other person. As hinted above, this is not to say that social appraisal cannot be based on reverse engineering of appraisals (see e.g., Walle et al. 2017). All that we say is that it need not be based on it. Clearly, the degree to which these processes overlap depends on how they are defined. For us, reverse engineering describes how people come to understand explicitly the meaning conveyed by another's emotion and what they learn from it.

Summary and Conclusions

The present chapter discussed the reverse engineering of emotions as one process that underlies the use of naïve emotion theories about the causes of specific emotions to draw inferences about the expresser of the emotion. From this perspective, emotions can be seen as messages that provide observers information about the way the expressers evaluate their situation. From these reverse engineered appraisals observers can draw inferences about the person. Yet, as mentioned above, not all inferences extracted from observed emotions are necessarily the result of reverse engineering of appraisals. When it is and when it is not, remains an open question for future research. It is likely that when the situation is more complex, observers may have to engage in a more elaborate explicit reasoning process instead of the automatic reverse engineering of appraisals.

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