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Fischer, A.

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CHAPTER 7

Learning from others' emotions

Agneta Fischer

By the time you read this chapter, you have probably learned that affective social learning (ASL) is not about learning maths, or learning to skate, but about learning what is important and meaningful, thus about the transmission of values in the broadest sense of the word. In today's society, values have become less and less determined by where one is born, who one's parents are and what they value, and increasingly more by one's own deliberate choices and one's social, emotional and cognitive abilities. In our current networked society, ASL is thus more important than ever, and this volume is therefore very timely.

The concept of ASL was introduced in a paper in *Emotion Review* (Clément & Dukes, 2017) on the role of others in appraising an emotional event, a phenomenon referred to as social appraisal (Bruder, Fischer, & Manstead, 2014; Manstead & Fischer, 2001, 2017) or social referencing (Klinnert, Campos, Sorce, Emde, & Svejda, 1983; Klinnert, Emde, Butterfield, & Campos, 1986). The basic idea is that others' emotional expressions can influence the way in which we value the world, or in other words, how we appraise emotional stimuli. ASL thus minimally implies three elements: a source expressing emotions, a target or learner observing the emotion and the object of the emotion expression (what the emotion is about). The source's emotional expression implies the signalling of a meaning about the object, such as 'this is threatening, disgusting, frustrating, painful, lovely, moving or amusing'. Whether the emotional expression thereby reflects a value about a specific object is not necessarily obvious, given the discussion about the definition of values. Rohan (2000), for example, refers to values as reflecting a more abstract system, rather than a specific evaluation or meaning of one object. Value systems can be organized at a personal level (self-schemata) or at a social (social value systems) or at a world-view level (Christian values), but in ASL they would become apparent through the specific expression of an emotion and can thus be regarded as an emotional evaluation of the object.

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Prototypical evidence for ASL comes from research on social referencing and social appraisal, in which researchers have provided empirical support for the idea that others' facial expressions lead to different inferences of stimuli. For example, Mumenthaler and Sander (2012) showed that people are more likely to perceive a neutral face as fearful if another face shows anger towards this face. A more classic paradigm is the visual cliff, where babies who are faced with an anxious mother when approaching a 'visual cliff' seem to be re-appraising the cliff that initially did not seem scary (Bertenthal & Campos, 1984; Witherington, Campos, Anderson, Lejeune, & Seah, 2005), stop crawling, watch their mother's face and turn back. All though this has never been reported, to my knowledge, these children not only crawl back but also seem to have a change of emotion, from happy, or at least neutral, to anxious, which makes them turn around.

This could mean that others' emotional displays may not only affect the interpretation of the environment, but also their own emotions and related behaviours. This has been demonstrated in studies on emotional transfer (Parkinson, 2011; Parkinson & Simons, 2012). Parkinson, Phiri, and Simons (2012), for example, showed that the social appraisal of a source's anxiety increases the target's anxious expression as well. Social appraisals may thus influence one's emotions and/or emotion regulation. Another example is that the social appraisal of another's anger is more likely to lead to anger suppression (at least in women), if the target expects to meet the angry source than when she does not (Evers, Fischer, Rodriguez Mosquera, & Manstead, 2005). In other words, this research shows that others' visible emotions have an impact not only on how we appraise an external object, person or event, but also on how we appraise, label and regulate our own emotions and behaviours. Whether this change of emotion is the result or cause of a change in appraisal remains to be answered, but it is highly likely that this relation is bi-directional (see also Parkinson, 1997). In my view, the object of ASL is thus not only the transmissions of values about the world, but also values about our emotions and how to socially manage these emotions appropriately.

The question I want to focus on in this chapter is not on the fact that we *are* influenced by others' emotions, but on the conditions in which we actually learn from others' emotions and the processes underlying ASL. In other words, *how* we learn from others' emotions. The chapter will first discuss minimal requirements and then review different theoretical approaches to learning that may lead to a better conceptual understanding of the type of learning involved in ASL. I will finally relate this to the four components of ASL that are mentioned in the introductory chapter to this volume: emotional contagion, affective observation and social referencing (together social appraisal) and natural pedagogy.

7.1 Minimal requirements for ASL

ASL has two key elements that distinguish it from non-social and non-affective learning. The first is the *object* of ASL: ASL is about the transmission of values, not skills or non-social knowledge. This criterion does not necessarily distinguish ASL from other forms of social learning (e.g. observational learning or vicarious learning) or from conditioning, though it does raise the question whether the values can only be about the world and not about the target's own emotions. A second key criterion is *how* values are transmitted, namely by the perception of, or minimally, the awareness of, others' emotional reactions. This criterion is the most unique that distinguishes ASL from any other form of learning, and therefore I will focus on this second criterion.

There are three conditions that I think should be a minimal requirement for others' emotional reactions to have an initial impact on an individual (see also Clément & Dukes, Introduction, this volume). First, the source (displaying the emotion and from whom the target learns) needs to show some emotional appreciation. This may be with minimal cues, such as a short nod, or with full-blown emotions, like screaming to stay away from the stove. This does not necessarily need to be a deliberate attempt to teach the target (e.g. showing a fear face and instructing a child: 'watch out, this is a dangerous animal'). Emotional expressions or behaviours can have an effect without the explicit intentions of the source, because they operate as social signals, for example when the parent is afraid himself and shows fear when looking at the barking dog (Hareli & Hess, 2012; Hess & Fischer, 2014). The latter situation is typically the case in research on emotional contagion (Hatfield, Cacioppo, & Rapson, 1994; Hess & Blairy, 2001), or research using the social referencing paradigm. The stronger and more frequent the emotion expression, the larger the impact is assumed to be and the more the target learns an emotional response toward a certain object, person or event.

Second, the target pays attention to the source and is aware of the source's focus of attention and the relevance of the emotion expression for him or her. This can imply that the target and source are in the same location (physically or virtually). In addition, the target not only needs to be aware of the other's emotion, but also of the relation between the other's emotion and the object of the emotion display. Hence, it should be evident for the target *why* the source displays this emotion. This contingency relation is crucial for ASL to occur. For example, a child is not likely to learn from a parent's anxiety about the fact that he is riding his bicycle too quickly, because he is enjoying himself, does not pay attention and does not see any threat. In contrast, this may lead to a reversal role of target and source, with the target reassuring or encouraging the source not to be afraid.

Third, the source needs to put some trust in the source's judgement or evaluation of the world (Kret, Fischer, & de Dreu, 2015). Though the source and target need not know each other, for example, in the case of a flight attendant who shows fear when the plane is seriously bumping, ASL will generally be stronger if the source is an identification or attachment figure in whom the target has confidence. This is because we are more likely to trust the emotions of sources we trust, admire or identify with, rather than of persons we do not know.

7.2 When are we motivated to learn from others?

7.2.1 Uncertainty and ambiguity

Based on these minimal requirements, the next question is in which situations ASL will most likely occur, or in other words, what are the most likely contexts in which we are motivated to learn from others' emotions? In previous writings on social appraisal and social referencing, it has been suggested that the impact of others' emotions may be largest when the target is in a situation that is uncertain or ambiguous or in which he or she needs guidance on how to act. This is, for example, the case in research settings with babies who are innocently crawling towards a cliff, or with patients in a waiting room, anxious to know the doctor's conclusion about a physical test, or with the observation of faces presented without context. It is most likely that uncertain or ambiguous situations occur more often with children than with adults, but adults can also find themselves in situations where they are uncertain, anxious or ambivalent (see also Bruder et al., 2014; Parkinson et al., 2012). This may be due to the nature of the situation (sudden threat, novel situation or ambiguity about what to do) and its consequences for one's own behaviour. When one is uncertain about a situation, others' emotions are more likely to be guidance for one's own appraisal of the situation. This is nicely illustrated by research on the bystander effect (Darley & Latané, 1970; Latané & Darley, 1970). These studies have shown that when something unexpected happens that is not directly interpreted as an emergency situation (e.g. smoke coming from under a door), one is likely to take action if others do, and not, if, for example, others ignore the smoke. Similarly, when one is faced with a person in distress, the likelihood that one will help is reduced when there are passive bystanders in the critical situation. Importantly, the emotional information displayed by either the victims or the bystanders seems crucial, although this has never been directly examined. In a meta-analysis on the bystander effect (Fischer et al., 2011), the effect was shown to be reduced when the situation was urgent, or, in other words, when the emotional signals in the situation were clear.

In addition, the bystander effect increased when the emotional displays of the bystanders were neutral, suggesting that the situation was re-appraised as less urgent. This evidence seems to suggest that the (neutral) emotional displays may have resulted in a change in appraisal of the situation.

The reason why uncertainty, anxiety or ambiguity may be the typical situations in which others' emotions are impactful, is because these are negative feelings that individuals want to suppress or avoid. This category of negative feelings is not only characterized by appraisals of negative valence, but more importantly by appraisals of uncertainty. Uncertainty, ambiguity or ambivalence have been shown to induce negative affect, which people try to solve in various ways (van Harreveld, Nohlen, & Schneider, 2015). In addition, uncertainty elicits social comparison processes, as demonstrated in Schachter's (1959) experiments showing that participants who were anxious at the prospect of being administered electric shocks expressed an overwhelming preference for waiting in the company of other persons rather than alone. When the level of threat was low, the majority of participants preferred to wait alone. One of the motives for wanting to be with others, is that under uncertainty, affiliation with others who share the same fate may provide the best way of evaluating the intensity, nature or appropriateness of one's emotional state (see also Mann, Feddes, Doosje, & Fischer, 2016; Rimé, 2007). This social comparison process was the explanation favoured by Schachter (1959). The motive to regulate appraisals of uncertainty may lead people to socially compare their own emotional responses to those of similar others (see also Festinger, 1954; Suls & Wheeler, 2012) and to seek for social information that can help them to reduce these negative and uncertain feelings. Others' emotional displays may thus be one important source of input that people search for in those situations, because it provides certainty about how others interpret a situation and thus reduces one's own uncertainty.

7.2.2 *Emotional situations*

But does ASL only occur in situations that evoke uncertainty and ambivalence, or can it also occur in emotional situations? Imagine a child is crying because he lost something valuable. Would the calm or upset reaction of a parent not teach the child how to evaluate the situation? In the latter case, the salience and nature of the others' emotion expression may make one re-evaluate the situation or make the child learn how to regulate his own feelings. An example can be found in similar situations as the visual cliff, for example when a child has to swim alone for the first time, or when she has to do an important test.

The social support that the child receives is not only valuable in that particular moment, but may also teach the child how to regulate strong emotions. This may be the case for anxiety, but also for sadness or anger. For example, a source's emotional display in response to a target's anger may also lead him to regulate this anger. An angry response may teach the child to suppress his anger, while an understanding or calm response may lead the child to think about this anger. Parents' reactions to children's behaviour in emotional situations also provide examples of how to deal with an emotional situation and hence set the norms of what an appropriate response is. We learn from others, either implicitly or explicitly ('be quiet', 'try to calm down') what the correct emotion in that situation is. Individual differences in emotion-regulation strategies (Gross & John, 2003; Gross, Richards, & John, 2006), such as differences in preferences to re-appraise or suppress one's emotions, for example, may be the result of how our parents deal with emotions. Indeed, there is abundant literature on the role of the family context in (dys)regulating one's emotions (e.g. Eisenberg, Cumberland, & Spinrad, 1998; Eisenberg & Valiente, 2004). For example, parents' negative or punitive responses in reaction to children's negative emotions are related to more escape or revenge-seeking strategies in reaction to anger-inducing situations (Eisenberg & Fabes, 1994). In addition, parental minimization of children's emotions is associated with avoidant emotion-regulation strategies, and parents' dismissive responses have been associated with increased anger displays by children. Parents' calm or neutral reactions towards their child's anger have been found to be associated with lower levels of expressed anger in other situations (Denham & Grout, 1993).

In sum, ASL does not only occur in situations where the target feels uncertain, either about themselves or about how to interpret the situation, but also in highly emotional situations. Indeed, systematic emotional reactions by parents to a child's display of emotions also provide the child with information on what is an appropriate emotional response in such a situation. The question is then whether others' (non-) emotional displays in reaction to an emotional reaction of a target, should be considered as a form of ASL. I would argue that it should. Such reactions not only teach an individual that their emotions are not encouraged or shared, but it also tells them something about how to appraise the object of the emotion. It could tell them how to deal with frustration, how to manage loss or that the expression of pride is not so appropriate in this context. These are social values, and in my view should be included as a form of ASL. Another question is whether neutral displays of others can be included in ASL. Again, I think it should. Neutral displays in an emotional situation can teach the child about the values of an object or a person, but only if the child reacts emotionally.

7.3 What type of learning is involved in ASL?

This leads us to another question that relates to the 'learning' aspect of ASL. It is important to distinguish between others' emotions having a temporary impact (van Kleef, 2009) and actually learning from others' emotions. In the latter case, the exposure to others' emotions and their subsequent influence is more likely to result in a permanent change in appraisal, emotions or behaviours if the exposure is not incidental, but recurring. An incidental emotional reaction by another can have an immediate short-term impact, for example, backing off when someone is angry with you or starting to cry when someone else is really sad. However, in order to qualify as learning, ASL should include a relatively permanent change (which, by the way, can also be unlearned again). This can be the consequence of multiple exposure to others' emotional reactions, though sometimes one exposure could be even sufficient if it is strong or unique enough to adjust one's future emotional reactions. For example, if parents tell their child he should be very aware of black children because they cannot be trusted, the encounter of a new black child in the classroom the following week is likely to have a more permanent effect on this child's perception of his new classmate. So multiple or significant exposures to others' emotions can lead to a more permanent association between a certain event or stimulus and another's emotional reaction, leading to an emotional response that is based on this emotional reaction.

Obviously, these and other examples raise the question of the processes underlying ASL: is ASL simply a question of observational learning, where we learn by seeing others' emotions? Is it then a specific form of imitation, as in emotional contagion (the first of the four stages in the Clément and Dukes model) or mimicry, where we are affected by merely watching others' emotions in certain situations? Or do we need more specific pairings between the target's behaviour and the source's emotion expressions, as in operant or evaluative conditioning? Or can ASL be regarded as a form of classical conditioning where unconditioned stimuli are coupled with positive or negative stimuli in order to create a conditioned response, as demonstrated in research on fear conditioning? In the following sections, we will compare the assumptions of ASL with three other forms of learning in order to gain more understanding of the processes underlying ASL: social learning, conditioning (classical and operant) and cognitive learning.

7.3.1 Social learning versus ASL

Social learning theory as developed by Bandura (Bandura, 1971) states that learning can occur without explicit instruction or tuition, but simply by watching others (see also Clément & Dukes, Introduction, this volume).

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If ASL is indeed a form of social learning (SL), this would imply that the emotional expressions of others would be observed and imitated. Social learning, also referred to as vicarious or observational learning, does not need reward or punishment: the simple identification with a social model is sufficient to result in the learning of new social behaviours, customs or cultural practices. Identification here refers to the degree of similarity between the target and source, and the similarity can be imagined or real. Still, research does suggest that a rewarding (warm and nurturant) parent elicits more imitative behaviour than a cold and distant parent (Bandura, 1969), suggesting that emotional learning would also occur more in the case of sources with whom one holds warm relationships.

The learning of aggressive behaviour has been studied as one prominent example of social learning, exemplified by the classic Bobo doll experiments by Bandura and colleagues (Bandura, Ross, & Ross, 1961, 1963). In these experiments, children watched models being aggressive or passive towards a doll and found that children who were simply observing the aggressive model, also imitated the aggressive acts of the adult. In addition, children showed more aggression when the aggressive behaviour was rewarded versus punished, and the effect was present independent of whether the aggression was displayed by a live adult, a filmed adult or a cartoon figure. Since then, various research lines have provided support for observational learning, which has mainly been studied in children or adolescents.

One question concerns the role of emotion in observational learning. In the Bobo doll experiments, the imitated behaviour was emotional in nature (aggression), but this has never been explicitly debated as a crucial element, nor has it been tested against more neutral behaviours (e.g. eating with a knife and fork). According to social learning theories, any behaviour could be learned through observation and the only important requirement is some form of identification with the model. The explicit discussion of 'emotion' is sparse, but Bandura (1971) definitely assumes that emotions are part of observational learning: 'Similarly, emotional responses can be developed observationally by witnessing the affective reactions of others undergoing painful or pleasurable experiences. Fearful and defensive behavior [*sic*] can be extinguished vicariously by observing others engage in the feared activities without any adverse consequences' (Bandura, 1971, p. 2). This formulation may seem a conceptualization of ASL *avant-la-lettre*, but what are the similarities and differences between the two forms of learning?

ASL and SL are similar in assigning a crucial role to social models, but different in the role of the *emotion* display of the model. In ASL, this role is crucial because it helps the target in (re-)appraising the world or regulating one's own emotion. SL theory emphasizes the role of others as models or identification figures that children observe and imitate,

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but ASL is more specific and argues that learning primarily takes place because the others' emotions are the driving force in the learning process. One could argue that the main differences in the two theories are the motives that instigate the learning. In SL children learn through imitation because they identify with a model, and implicitly want to behave like their models. In ASL, on the other hand, children learn because they are in an uncertain emotional state, and they infer the 'normal', 'appropriate' or 'desired' emotional response from their parents' or peers' reactions. This may refer to an interpretation of a situation (e.g. a threat) or to their own emotional reaction, and its expression and regulation. Applying this, for example, to gender differences in emotional reactions, boys and girls are not only exposed to different parental and peer emotion displays (e.g. Brody & Hall, 2010; Fischer, 1993; Shields, 2013), but they may also receive different emotional reactions from others. Girls, for example, meet positive and reassuring reactions when they express female appropriate emotions, such as sadness, empathy or anxiety, whereas boys receive more negative, disappointing or contemptuous reactions when they cry or show fear (Brody, 2000).

A recent line of research that seems relevant in the discussion about observational learning of emotions is emotional contagion and mimicry. Emotional contagion has been defined as reacting with the same emotion as the one observed, or 'catching' another person's emotions (Hatfield et al., 1994). One route to emotional contagion is 'primitive emotional contagion', suggesting that when people perceive an emotion in others, they automatically mimic this emotion, and the bodily feedback derived from this mimicry also leads them to feel that emotion (Flack, 2006). Emotional mimicry is the imitation of the emotional expression of another person (Hess & Fischer, 2013) and both emotional mimicry and contagion result from observing others' emotions. In a review of research on emotional mimicry, Hess and Fischer (2013) concluded that there is robust evidence for the mimicry of smiles, but less for the mimicry of negative facial expressions. Often, studies have found mimicry of frowns, yet the nature of the paradigm in which mimicry has been studied, i.e. individuals watching photos with facial displays, does not lead to a clear conclusion of whether people mimicked, or simply were puzzled or concentrated. In addition, other negative emotion displays, such as fear or disgust, showed inconsistent evidence. What the research shows, however, is that mimicry is selective: we mimic more if the relationships with others are positive (among friends, or individuals one identifies with or feels connected to), and we also mimic more if the emotional signals that are displayed by the source are not antagonistic in nature. For example, we are less likely to mimic anger or disgust faces that are directed at us (e.g. signalling 'you are stupid' or 'you are smelly'), because it does not help to build an affiliative bond with others. In other words, research on

emotional mimicry shows that people do imitate others, and probably catch others' emotions, even automatically, but the response is selective and does not occur if it is negative and directed at us.

7.3.2 Classical conditioning

Learning has been most frequently studied from a conditioning paradigm, based on the behaviourist theories of Pavlov, Watson, and Skinner. Pavlov's theory of classical conditioning states that an unconditional stimulus (UCS) elicits an unconditional response (UCR), but after repeated pairings between the old UCS and a new, conditional stimulus (CS), the UCR becomes a conditional response (CR). Fear conditioning is a well-known example of classical conditioning, where an aversive, unconditioned stimulus (an electric shock) elicits a UCR, in this case, a reflexive avoidance behaviour such as an eye-blink or eyelid closure. By repeatedly associating the UCS with the CS, such as a tone and a shock, this reflex behaviour is spontaneously elicited by the CS. Importantly, the CS and UCS must occur closely after each other, that is, be 'temporally contiguous', but the relation must also be contingent, such that the CS is always present when the UCS is, so that it has predictive value. A random association between CS and UCS does not lead to fear conditioning. Other research has shown that individuals not only learn a specific fear response but show a generalized fear reaction as well, as the withdrawal response is accompanied by reactions of the parasympathetic nervous system, showing changes in heart rate, respiration and GSR.

A famous example of fear conditioning is described by Watson and Rayner (1920), who examined whether it is possible to condition fear in a young child. Little Albert was 9 months old and showed no fear for live animals and various objects, but he was frightened when hearing a claw hammer strike a long steel bar behind his back. The researchers then aimed to condition him to fear a white rat. They showed Albert a white rat and banged the hammer on the steel bar behind his back, whenever Albert tried touching the white rat. After seven pairings of the rat and the bang, Albert started crying and withdrawing when he saw the rat, without any sound. Even worse, Albert also showed fear reactions to other objects with similar features as the rat: a rabbit, a dog and a sealskin coat, but he did not show fear response to wooden blocks or the hair of Watson' assistants (Harris, 1979). For Watson, fear was one of the basic human emotions that could be conditioned and transformed and transferred to many objects. The other two fundamental human emotions were rage and love (Watson & Morgan, 1917). Although this theory has not lasted, and his experiment has failed to replicate (Harris, 1979), fear conditioning has remained an important principle to explain pathological fear reactions, which can even be the result of one pairing of a

highly traumatic event and another event, having nothing to do with the trauma, but still eliciting a fear response. The conditioning paradigm has also been used to study how fear can be successfully extinguished, which we now know is very difficult.

7.3.3 Indirect or social conditioning

Interestingly, whereas classical conditioning is based on first-hand experience, recent research on fear conditioning has suggested that emotions, such as pain (Vaughan & Lanzetta, 1980) and fear (Gerull & Rapee, 2002; Olsson & Phelps, 2004), can be conditioned by observing another person who is submitted to a conditioning paradigm. In this paradigm, participants watch a film in which another person is submitted to the same procedure as the participant expects to be submitted, and thus the (negative) facial expression of the other person serves as UCS. The participants are informed about the shock treatment in both the observation and test phase. The findings indicate that skin conductance rises after the conditioned stimulus (i.e. the fear face) and the shock. Olsson, Nearing, and Phelps (2007) further showed that the brain activity of participants in a social fear paradigm is similar to the brain activity in a normal fear-conditioning paradigm, where the amygdala in particular plays a crucial role.

Do the requirements of ASL fit the assumptions and evidence from the classical conditioning paradigm? Seeing adults react with fear towards certain objects (e.g. in the case of the visual cliff) can be considered as a fear-conditioning paradigm, because there is a systematic pairing between a certain object (US) and a negative reaction of a parent, leading to a conditioned response. One requirement for ASL is that the target is aware of the object of the source's emotional reaction and has a basic understanding that this object causes the emotion. Whether or not explicit awareness of the contingency relation is necessary for fear conditioning has been a source of debate, as some have proposed that there are distinct learning systems that operate independently of each other and are influenced by different factors. In order to gain insight in whether emotional awareness would be differentially required in different forms of learning, Olsson and Phelps (2004) compared Pavlovian, social and instructive learning, and additionally manipulated the explicit awareness of the reinforced conditioned (CS+), by masking the stimuli in one condition and presenting them unmasked in the other condition. This study, in which angry faces served as CS+, happy faces as CS– (unreinforced conditioned stimulus) and a neutral face as a mask, showed first of all that the conditioned response to the unmasked angry faces was significantly lower in all three learning groups than to the unmasked happy faces. Second, skin conductance level was also lower between the angry

and happy faces in the masked condition, at least for the social learning, and marginally for the Pavlovian learning group. Thus, there need not be explicit awareness of the CS in order to learn fear, although the learning was much stronger in the unmasked conditions than in the masked conditions. In the case of the explicit instruction, this does seem to be necessary, based on this study, however. Learning a fear response by providing expectations and instructions only occurs if the CS can be seen.

The use of angry and happy faces as unconditioned stimuli also raises the question whether some classes of stimuli are more effective because they can be more easily paired with the to-be-conditioned emotional response. For example, snakes or spiders can be more easily conditioned with a fear response than chairs and bicycles. If this prepared learning (e.g. Öhman, Fredrikson, Hugdahl, & Rimmo, 1976) occurs for environmental stimuli, it can also be extended to social groups. Indeed Olsson, Ebert, Banaji, and Phelps (2005) argued that aversive learning can also be modelled in a sociocultural context. They designed a study where out-group members' black, neutral faces serve as the CS+ and in-group members' neutral faces as the CS–. During the fear acquisition phase, either the out-group or in-group faces were systematically paired with a mild electric shock; no shocks were given during the extinction phase. The results showed that the skin conductance response (difference between CSR to CS+ minus CS–) was higher for the CS+ stimuli (for both in-group and out-group faces), and thus participants learned a fear response towards black or white faces. More interesting, however, is that during the extinction phase, the conditioned skin conductance response towards the black faces was not fully extinguished, whereas it was for the white faces. This was a similar pattern to the first experiment where conditioned fear responses to snakes and spiders were not fully extinguished, whereas it was for butterflies and birds. This result suggests that some social categories are more easily associated with certain emotional responses, and that we may be biologically prepared to associate unfamiliar out-group faces with danger.

7.3.4 Evaluative conditioning

Evaluative conditioning is about changing likes and dislikes, which most theorists consider something that is learned rather than innate. It has been examined in an experimental paradigm in which people's preferences for neutral stimuli are paired with a positive or negative stimulus, resulting in a change of preference (see de Houwer, Thomas, & Baeyens, 2001, for a review). Many different types of stimuli have been used as conditioned stimuli, such as pictures, words, gustatory and haptic stimuli, as well as faces. Electric shocks have often been used as unconditioned stimuli, as in classical conditioning paradigms, but in the affective priming task, stimuli

with mere positive or negative valence have been used. Evaluative conditioning has been considered a form of classical conditioning, although some important differences have been noted as well (de Houwer et al., 2001). For example, evaluative conditioning seems more resistant to extinction, contrary to classical conditioning (Baeyens, Crombez, van den Bergh, & Eelen, 1988), and the awareness of the relation between the CS and US seems more important than in classical conditioning.

In a meta-analysis with 214 studies, Hoffman and colleagues (Hofmann, de Houwer, Perugini, Baeyens, & Crombez, 2010) showed that evaluative conditioning is a robust phenomenon that occurs in a wide variety of circumstances. However, given the fact that the change in preferences does not always occur under all circumstances, Hoffman and colleagues (2010) evaluated various theoretical explanations of evaluative conditioning that especially differ in the role of higher-order processes. Whereas some accounts assume that EC is based on the automatic formation of associations in memory, namely the pairing of the UCS and CS, other accounts identify a role for more complex cognitive processes. The meta-analysis supports the idea that there is a role for higher-order mental processes because there are several important moderators of the effect. For example, evaluative conditioning effects are smaller in children than in adults, which suggests that it is not a mere automatic process but rather some form of consciously identifying the relation between the conditioned and unconditioned stimulus. This contingency awareness is also one of the largest moderators in the meta-analysis, and together with the effects of other moderators, suggest that the awareness of a link between conditioned and unconditioned stimulus increases the effect.

When applying the distinction between these two general theoretical models (association formation models versus higher-order cognitive models) on ASL, one could argue that ASL is based primarily on the latter models. This is related to the first requirement of ASL, namely that the target needs to perceive a connection between the emotion and the object of the emotion expression in the first place. Thus, when learning associations between others' emotional responses and an event, or one's own behaviour, the person should be aware of the association. ASL could thus be considered as a form of evaluative conditioning, with the presumption that the source's emotional expression is the positive or negative stimulus that is paired with one's own behaviour or preferences. Consistent anger, or consistent sadness towards what one does may lead to an increase of one's own anger or depressed reactions, simply because it is frequently paired.

7.3.5 *Cognitive learning*

In cognitive learning theories, it is assumed that knowledge and insight are the crucial elements in learning and that a mere behavioural change is

not necessarily an indication of learning. More knowledge does not necessarily lead to a change of behaviour, what matters is whether the target has gained more insight. Jean Piaget is the pioneer of this approach and he argued that we build representations of the external world through two processes: assimilation and accommodation. Assimilation refers to the inclusion of new information into existing schemes, whereas accommodation requires a change of scheme because the new information does not fit the current scheme. ASL very likely entails cognitive learning, especially in the latter stages of the ASL scheme in which social referencing and natural pedagogy suggest that emotion expressions are used as powerful tools to teach children their perspectives on the world with the help of emotions.

7.4 ASL in the family

There are dramatic illustrations of ASL in the context of research on the origins of emotional psychopathology. Evidence of long-term effects of children's early experiences of maltreatment is abundant. Various studies have shown, for example, that children of depressed or anxious parents run a much higher risk of being diagnosed with depression or anxiety disorders (Beardslee, Gladstone, & O'Connor, 2011). This is partly due to biological predispositions and genetic influences, but also to being actually exposed to parents behaving in this way, as reflected in the fact that daily interactions between parents and children contribute to the intergenerational transmission of depression and anxiety (e.g. Murray et al., 2008). Indeed, parents' anxiety and depression have been shown to affect face-to-face interactions with their children, for example, because they show less positive affect, and thus smile less, or because they have less clear and more obscured emotional expressions (e.g. Nicol-Harper, Harvey, & Stein, 2007; Weinberg & Tronick, 1998).

In addition to the variety of factors that may be different when children are raised by anxious or depressed parents, the role of actual emotional expressions in interaction with their children seems important. For example, in a study on the role of parental anxiety on children's avoidant behaviour towards a stranger and a mechanical dinosaur, Aktar, Majdandžić, de Vente, and Bögels (2013) show that rather than the parent's level of anxiety state (obtained through a standardized interview protocol), it is the actual expression of fear during the interaction with the child that predicts the child's avoidant behaviour. Moreover, the interaction was only significant if the expressed parental fear was moderate to high (as scored from facial, vocal and verbal behaviour) and when the child's disposition to behavioural inhibition (fear, distress and avoidant responses averaged across different tasks) was also

high. Thus, children must be receptive to the fear of their parents and the fear should be clearly expressed. These results suggest that fear can be learned by parents' actual emotional displays. In another study, Aktar, Majdandžić, de Vente, and Bögels (2014) showed that parents' expressed anxiety at 12 months (time 1), also had long term effects at 30 months (time 2). Children's avoidant behaviour towards a stranger and a robot was not predicted by parents' expressed anxiety at time 2, but only by their expressed anxiety at time 1.

We may conclude that parents' negative states of minds, whether based on anxiety or depression disorders or negative family circumstances, are likely to result in negative behaviour towards their children, such as rejection, or ignoring or expressing negative emotions, such as frustration, nervousness or anxiety. Although this type of ASL does not seem intentional, as the parents suffer from negative moods and thus do not deliberately transfer their negative moods on to others, this unintentional learning does illustrate the effects of continuous emotional reactions from caregivers. From the perspective of ASL, one would predict that children from parents who express negative emotions are also more likely to raise children with high negative emotionality, and that these children have similar tendencies to appraise certain objects or events negatively. In other words, these parents transfer negative values about important aspects of the (social) world. Such conditions thus fulfil the minimal requirements of ASL in my view: the source is an attachment figure, the children often find themselves in ambiguous or negative situations where they are looking for guidance and there is long-term exposure towards these parental emotions.

Although we have focused on the effects of parents' negative emotion expression, there is also much evidence for the effects of positive emotion expression and of the stimulation to talk about emotions (Zech & Rimé, 2005). Children who have learned to talk about their emotions, for example, as reflected in a larger emotion vocabulary, are also better at emotion recognition at a later age (Dunn, Brown, & Beardsall, 1991). In addition, emotion regulation is also learned in the family context from a young age onwards. Morris, Silk, Steinberg, Myers, and Robinson (2007) distinguish learning about emotion regulation in three ways: through observation, through parenting practices (learning about display rules) and through the emotional climate in the family (i.e. attachment relations, emotional quality of the marital relationship, parenting style). In their review, they suggest that parent's own emotion-regulation practices are likely to form the example of how children learn to regulate their emotions. In addition, the way parents react to their children's emotions also affects children's regulation strategies. For example, children who are punished for their emotion expression are more likely to learn ineffective emotion-regulation strategies (Eisenberg & Fabes, 1992) and are

less emotionally and socially competent (Jones, Eisenberg, Fabes, & MacKinnon, 2002).

7.5 Conclusion: how we learn from others' emotions

In this chapter, I have tried to further clarify the types of processes involved in ASL, trying to answer the question of *how* we would learn from others. There are various types of learning that may be involved in ASL, and I think it is important to discuss which learning processes are involved when we learn from others' emotions. I would argue that ASL can involve direct as well as indirect or social conditioning, but also cognitive learning. What is crucial in my view is that individuals are aware of the contingency relation between the emotional expression and its object. The conditions under which individuals learn from the emotion expression is still to be determined, and I do not think the contexts should be restricted to ambiguous or uncertain situations. Although these types of situation have been shown to elicit the need for social information, there are also emotional situations that give rise to anger, fear or sadness where the emotional displays of others may teach us something about the world. This is why I believe that ASL should not only involve learning about the world, in terms of objects and events, but also about the self and one's relations with others. I would argue that the transmission of values can be about re-appraising the world, but also about re-appraising oneself, and one's own emotions.

In the Introduction to this volume, Clément and Dukes argue that ASL can be characterized by two dimensions: intentionality of the source and the extent to which there is social orientation involved. In the four stages of ASL that they identify (emotional contagion, affective observation and social referencing, natural pedagogics) there is an increasing intentionality as well as social orientation. It may well be that these different stages imply different types of learning, where the first stages involve more automatic learning and the latter stages more social cognitive learning. However, all learning is selective at all stages and the fact that it is often automatic does not mean that it cannot be selective. Children do not imitate or observe all parents under all circumstances, and not all of the parents' expressions have a long-term impact. So, the first question then is why a child would pay attention and take over their parents' emotional perspective on the world. I would argue when they are at loss, either because they do not know, or because they have strong undesirable emotions themselves. The second question is when the impact of an expression would be strong enough to generalize to future encounters with similar objects or events. Only then, has ASL taken place.

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