

# Social Appraisal and Social Referencing: Two Components of Affective Social Learning

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## Abstract

Social learning is likely to include affective processes: it is necessary for newcomers to discover what value to attach to objects, persons, and events in a given social environment. This learning relies largely on the evaluation of others' emotional expressions. This study has two objectives. Firstly, we compare two closely related concepts that are employed to describe the use of another person's appraisal to make sense of a given situation: social appraisal and social referencing. We contend that social referencing constitutes a type of social appraisal. Secondly, we introduce the concept of *affective social learning* with the hope that it may help to discriminate the different ways in which emotions play a critical role in the processes of socialization.

## Keywords

affective social learning, social appraisal, social referencing, socialization

## The Importance of Social Learning for Humans

Although Jean Piaget insisted on the personal acquisition of knowledge (e.g., Piaget, 1937/1954), it is increasingly accepted that a considerable amount of what we believe to be true is acquired via others' testimony (for a synthesis, see P. L. Harris, 2012). By interacting with other people (our teachers, parents, friends, etc.), we are able to substantially enrich our knowledge and even to learn new things that would be impossible to discover on our own, like our past history, how the brain functions, or which gods to worship (P. L. Harris & Koenig, 2006). Current research on testimony measures the impact of attachment style on such informational exchanges (Corriveau et al., 2009) and provides insights into how children apply with increasing efficiency their "epistemic vigilance" in order to filter

the reliability of their sources of information (Clément, 2010; Sperber et al., 2010).

Research by Csibra and Gergely (2006) highlights the fine-tuning that exists between young children and those who would like to communicate knowledge to them. Both parties seem primed for this interactive process. For example, parents use "motherese," taking care to clearly articulate while using a certain tone of voice to communicate with their offspring (Fernald, 1985), and have also been shown to use "motionese" by moving in a particular way that makes their intentions more predictable and understandable to the baby (Brand, Baldwin, & Ashburn, 2002). Indeed, whether using "motherese" or "motionese," the parents employ a number of behaviours to

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facilitate communication and even very young children seem to be attuned to such facilitators.

But what is it that is communicated here? It has been argued that when we try to signal something to someone, for example, how to eat by using a spoon, we aim not only to communicate the information itself (the action), but also to communicate the very fact that we are communicating something (the intention), thereby readying the intended receiver for the content of the message (Sperber & Wilson, 1986). Thus by adjusting how we speak and how we move for example, we can communicate *ostensively*—signalling simultaneously to the baby that we intend to show them something, and that that something is “how to use a spoon.”

From one side then, adults seem to be naturally predisposed to giving information. From the other side, children are predisposed to receiving information, as they are extremely sensitive to such ostensive communication. This natural receptiveness allows them to develop referential expectations and subsequently to generalize the newly acquired knowledge to similar objects or events (Csibra & Gergely, 2009). This concept, that Gergely and Csibra (2009) call “natural pedagogy,” highlights the sensitivity to the transmission of information of both the child and the adult.

However, newcomers to any social group have not only to learn semantic knowledge—what the components of their environment are—and procedural knowledge, that is, how to use those components, but they also have to appreciate their relevance—what value to attach to those components. Children, for example, often have to observe their caregivers’ affective reaction to learn the value of an object, a person, or event—in other words, to learn how to feel about them (Clément & Dukes, 2013). For example, a wrench could be a highly relevant object in a social milieu where manual work is positively evaluated. In such an environment, a young child using tools appropriately may trigger proud nods from his caregivers, whereas in a different family, such ability may be met with a raised and slightly disapproving eyebrow. In other words, we are not simply surrounded by neutral phenomena; we develop positive or negative attitudes toward the objects in our environment (Schwarz & Clore, 1983). Sociologists have even demonstrated that apparently individual judgements of taste, such as preferring sushi to meatloaf, entail an important social dimension: what appears to be very personal is in fact—statistically—dependent on your social background and socialization (Bourdieu, 1984).

The first objective of this article is to examine two closely related concepts often used by different groups of researchers to explain an individual’s sensitivity to others’ emotional reactions: social appraisal and social referencing. It is hoped that such an analysis will lead to a greater understanding of the underlying processes in the social acquisition of knowledge about how to feel and act in new situations. In fact, we will argue that although there are similarities between the two terms, they are sufficiently different for both terms to be useful and necessary (but see Walle, Reschke, & Knothe, XXXX, for the opposite view). Indeed, we will argue that social referencing is a type of social appraisal.

The second objective of this article is to place both these concepts within a new framework of *affective social learning*. It is hoped that the introduction of this framework will help to discriminate different ways in which emotions play a critical role in socialization, and ultimately, that the framework will provide structure and new impetus for research into the role that affect plays in social learning.

In the first part of this article, we will begin by considering what is meant by *social appraisal* before giving a more detailed interpretation on how the term *social referencing* is understood today.

## Social Appraisal

Appraisal theorists have justifiably insisted on the role played by emotions in guiding how our brains scrutinize our surroundings for what is relevant for our well-being, and to prepare our organisms for appropriate action (Leventhal & Scherer, 1987): emotions play the role of “radar antennae scanning the environment” (Scherer, 1994, p. 230). However, it could be argued that appraisal theorists have tended to focus on relatively socially isolated individuals, and on values that are essentially independent from the sociocultural environment—such as stimuli with high biological significance (e.g., Brosch, Sander, & Scherer, 2007).

Campos and Stenberg (1981) first talked about social appraisal when they described the possibility of an “intrinsic appraisal” by an individual of events in their environment, and a “social appraisal” of how others react to those events (Campos & Stenberg, 1981, p. 275). However, it took another 20 years until the term was formalized. Manstead and Fischer (2001) developed the concept in a bid to alert affective scientists to the fact that there was too much focus on the individual “intrinsic appraisal” and not enough on the “social” aspects of affect in appraisal theory. They stated that “the behaviors, thoughts or feelings of one or more other persons are often appraised in addition to the appraisal of the event *per se*” (Manstead & Fischer, 2001, p. 222).

There are, of course, many occasions when we learn through observing the affective expressions of others: the history of social psychology is not short of examples of experiments that have highlighted the fact that the value of events or objects can be modified by the observation of other people’s emotional reactions. And although much experimental work has been carried out on social appraisal since then (e.g., Evers, Fischer, Rodriguez Mosquera, & Manstead, 2005; Mumenthaler & Sander, 2012, 2015; Parkinson & Simons, 2009; van der Schalk, Kuppens, Bruder, & Manstead, 2015), the definition has hardly needed refining at all.

Naturally, the phenomenon predates the definition. One classic study that exemplifies *social appraisal* was conducted by Latane and Darley (1968) long before the term was even coined. In the experiment, participants were seated in a small waiting room when smoke began to puff through a vent. In some cases, subjects were not alone but rather with two confederates acting as naïve subjects who did not communicate with the participant.

Interestingly, when the confederates shrugged their shoulders as a reaction to the smoke being introduced, participants were much less likely to report the potential danger than the participants who had been alone. The way the participants appraised the situation was regulated by the others' appraisal. Thus the appraisal of the way that others evaluate a situation can play a crucial role in our own appraisal of many emotional events (Manstead & Fischer, 2001).

Social appraisal can happen when someone else's emotion triggers or modifies our appraisal of what is happening (Parkinson & Simons, 2009), and not just when we have a specific goal in mind. Interestingly, this form of evaluation can be rather subtle. For instance, Bayliss and his collaborators found that an object was more likely to be preferred when participants were able to see that someone was looking at it, compared to objects that were ignored (Bayliss, Paul, Cannon, & Tipper, 2006). Furthermore, they showed that subjects also appraised the emotion expressed by the gazing face; objects were liked more when the face looking at them was smiling than when disgust was expressed (Bayliss, Frischen, Fenske, & Tipper, 2007).

The use of someone else's emotional expression to appraise a given stimulus can also be fast and unconscious. Mumenthaler and Sander (2012, 2015) have shown for instance that emotion recognition could be facilitated when another face in the background displays specific emotional expressions (e.g., participants were better at recognizing fear on a face when the background character looked at the targeted face with an expression of anger).

For the purposes of this article, it is important to note from these examples that social appraisal is not limited to cases where an *intentional object is manifest*. As shown in the studies by Bayliss and colleagues (2007; Bayliss et al., 2006) our attention could be initially drawn to a given stimulus by another person's gaze. The learner's attention is neither directed towards the object or the facial expression of the other person, but rather to the relationship between the expression and the object. In any case, either the witness may change their appraisal of an object given the other's expression, or sense will be given to the expression of the person by the object of their attention.

Social appraisal then, is a rather general term for instances where other people's (perceived or predicted) affective responses are used as part of the basis for making one's own judgment about an event. (For an interesting review of current emotion research in social psychology, including social appraisal, see Parkinson & Manstead, 2015). We will now give an interpretation of how social referencing is understood today, before comparing the two terms. We will argue that social referencing constitutes a type of social appraisal, although see Walle, Reschke, and Knothe (XXXX), for an alternative view.

## Social Referencing

A series of very influential experiments conducted by a team of researchers, in which Joseph Campos played a major role, provide the basis for what is generally understood today by the term *social referencing*. In fact, *social referencing* is closely

linked to one of those studies in particular: the "visual cliff" experiment. As the philosopher and historian of science Thomas Kuhn (1962) highlighted, it is often in these ground-breaking experiments that a certain vision of *how things are* originates: indeed the *paradigms* not only define specific methods that are recruited to obtain a certain result, but also provide a conceptual perspective on the analysed phenomenon.

The "visual cliff" experiment was originally designed by Gibson and Walk (1960) with a view to better understanding how young animals (notably crawling babies) perceive depth. Campos and his colleagues developed this study by constructing an apparent cliff with Plexiglas that appeared neither too deep nor too shallow, but at a height necessary to provoke a feeling of uncertainty in the babies (30 cm). While the baby started on the shallow side, the mothers, facing their children during the whole process, were instructed to place a toy on the other side of the cliff while smiling towards their children to encourage them to approach. The mothers were then asked to express either a particular positive or negative emotion that they had been trained to give, once the baby had moved within a certain range. In this context, infants as young as 12 months old crossed the cliff when their mothers facially expressed a positive emotion but stayed on the other side when their mothers expressed a negative emotion. Strikingly, for example, not one of the 17 babies crossed the cliff when the mothers expressed fear, while 14 out of 19 babies crossed when their mothers expressed happiness. The authors described the tendency for the infants to look at their mothers for guidance as "social referencing": "Social referencing, as we have defined it, is a process whereby an individual seeks out emotional information in order to make sense of an event that is otherwise ambiguous or beyond that individual's own intrinsic appraisal capabilities" (Sorce, Emde, Campos, & Klinnert, 1985, p. 199).

Three principal features of this cardinal study are worth underlining here, given the objectives of this article. Firstly, from the viewpoint of the children, it is important to highlight the fact that the cliff became a point of attention for them independently of any information communicated by their mother—they were on their way to the attractive toy on the other side of the apparent cliff when they met the potential obstacle of the cliff face (Sorce et al., 1985, p. 196). In other words, it is as if they were asking, "Is it dangerous, or not, to cross the cliff?" The identity of the referential object (the cliff) was not determined by the mother, but the qualification or evaluation of this referential object is (in this case, "can it be overcome?").

Secondly, from the viewpoint of the mother, the nature of the social interaction in which the experiment took place is important: the mothers were at their children's "informational disposal" for the entire duration of the experiment, providing affective testimony about the potential dangerousness of the cliff through the use of maintained visual contact and facial expression. In other words, the mothers were *ostensively* communicating with their children from the moment that the toy was placed on the deep side of the cliff.

Thirdly, focusing on the relationship between mother and child, it must be assumed not only that both mother and child

are aware of the cliff but also that they both assume that the other is attending to the same object. Consequently, social referencing is a case of what Michael Tomasello called “joint attentional scenes,” that is, “social interactions in which the child and the adult are jointly attending to that third thing, for some reasonably extended length of time” (Tomasello, 1999, p. 97). Furthermore, it is interesting to note that the mother is providing an evaluation *on behalf of the child*—the information that they are communicating is specifically for that child for that particular localized context.

Klinnert first described the term “social referencing” in her unpublished doctoral dissertation in 1978 (cited in Klinnert, Campos, Sorce, Emde, & Svejda, 1983). Since then, experiments on social referencing have been widely used and to great effect, adding a tremendous amount to our understanding of social and affective development. For example, between 6 months and 2 years old, children seem to reference their parents with increasing frequency (Klinnert, 1984; Walden & Ogan, 1988) although interestingly, there is also some age-sensitivity about what kind of affective expression (positive or negative) is referenced more often (Walden & Baxter, 1989). There is also evidence that children may socially reference not just their mothers but also familiarized strangers (Klinnert, Emde, Butterfield, & Campos, 1986), and that social referencing may be selective—children appear to reference differently depending on their relationship with the adult (Klinnert et al., 1986; Zabatany & Lamb, 1985). Social referencing has also been shown to work with facial expressions alone (Boccia & Campos, 1989), vocal expressions alone (Mumme, Fernald, & Herrera, 1996), and with facial and vocal expressions (Hirshberg & Svejda, 1990). Social referencing has more recently been shown to be used successfully by adults (Parkinson, Phiri, & Simons, 2012). While these experiments have used a variety of stimuli, settings, emotions, age groups, modalities, and more, they are all examples of the large number of studies on social referencing that meet the three criteria that we have underlined as necessary to describe an event as such.

## Comparing Social Appraisal to Social Referencing

It has been shown that a lot of what people find worthy of attention depends on their culture (Kaufmann & Clément, 2014; Nisbett, 2003). It seems likely that both social referencing and social appraisal play a major role in the socialization process. The ability to detect what is interesting, worthwhile, pleasant, or vile by reading others’ affective reactions, even when these reactions are not explicitly communicated, is crucial for “new entrants” in any given community, be they strangers or infants (Clément & Dukes, 2013).

But comparing the terms social referencing and social appraisal directly is a difficult task for a number of reasons. Firstly, contrary to the cliff experiment that has proved so determinant of how social referencing is understood and defined, the term social appraisal is less strongly connected to a specific study. Indeed, some “classic cases” of social appraisal that do

not meet the criteria for social referencing were not even described by those who designed the studies as involving social appraisal at all. Secondly, while most experimentation in social referencing has been conducted on children (although see Parkinson et al., 2012, for a notable exception), studies illustrating the process of social appraisal have largely been conducted on adults.

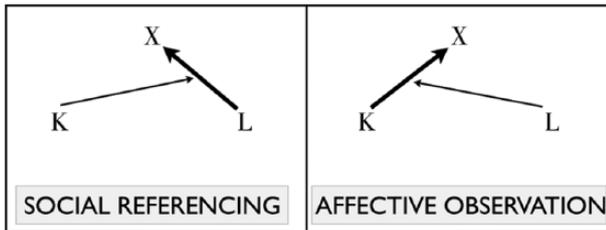
To summarize, as demonstrated in the earlier examples and as depicted in Figure 1, in social referencing, the learner’s principal point of attention remains the referential object throughout, while the knower attends to the affective relationship between learner and object, regulating their own expression to influence the learner’s feelings towards the object. However, not all cases of social appraisal meet these criteria. In what we propose to call *affective observation*, the knower remains attentive to the object, while the learner is attentive to the relationship between the knower and object, learning how to feel about, or value, the object itself.

Given our perspective, even some studies that have been classically labelled as examples of “social referencing” should be relabelled as more general examples of social appraisal. The first example comes from an experiment by Feinman and Lewis (1983). Feinman originally described social referencing as follows:

[A] process characterised by the use of one’s perception of other persons’ interpretations of the situation to form one’s own understanding of that situation. Such interpretations may be explicitly requested, or they may be offered, received, and used although not actually solicited. (Feinman, 1983, p. 446)

This definition is clearly much broader than what is understood by the term today and includes both affective and nonaffective information, as well as both directly and indirectly acquired information, or in other words, ostensibly communicated and observed information. However, it seems important to point out that given their own definition of social referencing at the time, they were justified in describing their experiment as an example of it.

Thus, Feinman and Lewis (1983) present two different experimental conditions as examples of social referencing, one of which does not meet our proposed criteria. In this so-called “indirect influence” condition, 10-month-old children were sat at a short distance from their mother. A stranger entered the room, and, after a short period, sat down on an empty chair near the child and read a magazine for 1 minute. While ignoring the child, the mother was then instructed to interact with the stranger either in a positive or negative tone. Thus, any affective information that the child could get about how her mother felt about the stranger would only be indirectly available. The stranger then approached the child, and measures of affective reaction of the child were taken. This condition does not meet the criteria for social referencing that we have pointed out since there is no ostensive communication. However, the second condition featured in their article—the direct influence condition—does. In this second condition, the mother was able to provide direct affective information to their children about the stranger,



**Figure 1.** The two types of social appraisal: In social referencing, an object (X) is the learner’s (L) principal source of attention, while the knower (K) attends principally to the relationship between the learner and the object. In affective observation, the object is the knower’s principal source of attention while the learner attends principally to the relationship between the knower and object. The arrows depict the principal sources of attention.

while the stranger was present. In fact, the results showed that children were only friendlier to the stranger when their mothers had spoken directly to them about the stranger in positive terms, that is, in the direct (social referencing) condition but not the indirect (observational) condition.

More recently, a similar study has been conducted by de Rosnay, Cooper, Tsigaras, and Murray (2006), although this time, the children do appear to regulate their emotions from observing their mother’s reactions alone. Mother and child (12–14 months old) sat 3 metres apart. A male stranger entered the room and talked directly to the mother for 90 seconds, not engaging at all with the child. Depending on the experimental condition, the mother was instructed to react either anxiously or not to the stranger. The results showed that children were significantly more fearful and avoidant of the stranger to whom their mother had reacted anxiously. There is clearly no ostension from their mothers: indeed there is not joint attention nor affective communication directed to the children at all. In other words, any affective information had to be actively collected by the child. This experiment does not then meet the criteria for social referencing but is a good example of affective observational learning: the knower’s emotional reactions were appraised by the child in addition to their appraisal of the stranger himself.

### Social Appraisal Cannot Be Reduced to Social Referencing

Conceptual economy is an important aspect of scientific research. While Occam’s razor calls for a strict limitation on the number of concepts aimed at explaining a certain phenomenon, precision and specificity are often required for analysing relevant aspects of what we are trying to describe and understand. With these contradictory demands in mind, we ask whether social appraisal and social referencing occupy exactly the same conceptual space and whether it would be better to unite the two phenomena described before under a single concept (as in Walle et al., XXXX).

Both terms, *social appraisal* and *social referencing*, were intended to describe sensitivity to the use of another person’s

appraisal of a situation to evaluate an event or an object. However, as we have seen, there are important constraints on defining an exchange as social referencing that are not implied for other examples of affective social learning. In 1983, Campos stated: “The crucial aspect of social referencing is that it is one—but only one—instance illustrating the importance of emotional communication” (1983, p. 85). We are inclined to agree, and furthermore, we believe that the original framing of the term social appraisal was intended not only to include occasions when emotion is intentionally communicated by someone as in social referencing, but also when affective expressions are simply observed. Indeed, our position merely makes explicit a position that already exists in the affective literature—the visual cliff experiment has already been used on several occasions as an example of social appraisal (e.g., Bruder, Fischer, & Manstead, 2014; Parkinson, 2011).

We believe that Occam would be sympathetic to our proposal to keep two separate terms for the described phenomena, given the points we have made (but see Walle et al., XXXX, for an alternative argument). In our opinion, keeping them apart has at least one advantage: not reducing social learning to intersubjective relationships. This is not to deny that we learn a lot by being involved in deep affective communicative relationships, notably with our parents and caregivers. But such ostensive communications are clearly not the only way to learn about our social environment (see e.g., “emotional eavesdropping” in Repacholi & Meltzoff, 2007), notably in most nonwestern societies (Rogoff, 2003). Young humans are extremely good at learning what they are supposed to like, how they are supposed to behave or feel in a community where they want/need to be included. For example, Judith Harris has shown how young immigrants are able to “forget” their parent’s way of life in order to adopt that of their new peers (J. R. Harris, 2009).

### The Ontogeny of Social Appraisal

One line of argument against our proposal could be to argue that what is known as social referencing in children develops into what is known as social appraisal in adults. However, this seems unlikely as detecting others’ appraisals and subsequently regulating behaviour as a consequence also appears possible in young infants.

For example, Egyed, Kiraly, and Gergely (2013) recently carried out a study in which 18-month-old children were presented with an experimenter nonostensively expressing a preference by looking at one object with a positive affect (joy/interest) and at another object with a negative affect (dislike/disgust). When solicited, the children then gave the “preferred” object to the experimenter. Presumably the infant made their choice of object entirely on the basis of the experimenter’s appraisal of the object: they used the other person’s appraisal to regulate their own behaviour. The child has no obvious prior intention in relation to either of the objects, but even if they did, there is no ostensive communication.<sup>1</sup>

Both the abilities to socially reference and to socially appraise through observation alone appear to develop throughout

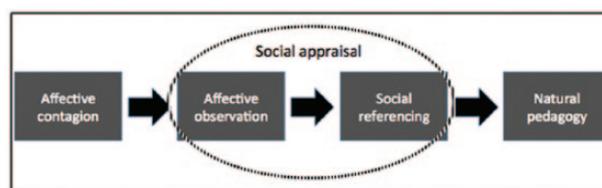
childhood. While the previous example indicates that children as young as 18 months old can understand preference through an affective expression solely by observation, adults can even appraise events taking into account how people who are not actually present might appraise that same object (Evers et al., 2005)—they are taking into account the “preference” of someone who is not in the process of communicating directly with them (i.e., nonostensively). As for social referencing in adults, Parkinson and colleagues have argued that “some forms of social referencing also characterize many adult–adult interactions, especially when the emotional meaning of the situation is ambiguous” (Parkinson et al., 2012, p. 817). Indeed, social referencing is very common in adults: for example, whenever we ask someone to taste the sauce that we are cooking, whenever we ask someone’s opinion about the film we want to watch that evening, in fact, whenever we simply ask someone how they feel about something that we intended to do/make, if we can gauge how they feel from their affective reaction, we are socially referencing. Notice that in each of those cases, the person we are referencing will answer *to* you and *for* you. The response might be verbal or it might not be, but either way, their expression could mean for example, “I think that sauce is too hot *for you*,” or “I liked the film, but I don’t think you would.” Just as in the visual cliff experiment then, it is the contextually appropriate information that is given.

Further experimental research will be necessary to determine whether children are able to either socially reference or learn through observation earlier. We feel that the more likely case is that social referencing is possible earlier in development because the learning environment is more structured in a teacher–student relationship, rather than in a nonostensive learner–knower relationship. Baldwin and Moses (1996) for example, argue that while 12-month-old children may be able to interpret and appreciate some very clear messages, they do not yet understand that other people can be good sources of information: they describe these children as good information *consumers* but not good information *seekers* (Baldwin & Moses, 1996, p. 1931). However, it may be the case that some rudimentary learning through observation alone is possible even earlier. In any case, it is clear that both are possible for very young infants and that they are both common in adulthood.

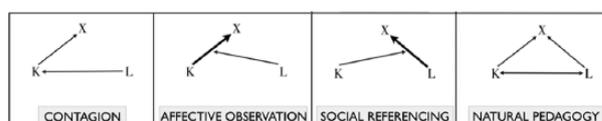
## Conclusion: The “Pedagogical Line” of Affective Social Learning

In order to elucidate the relationship between social referencing and a more observational form of social appraisal, we propose to place them within a new framework of affective social learning. Figure 2 depicts the four principal forms of affective social learning as we see them, while Figure 3 illustrates them in terms of attention.

The least “pedagogical” situation is a form of minimal transfer of affective information where neither the learner nor the knower is intentionally involved in social transmission: *emotional contagion*. A mother, seeing her baby approaching a hot oven, for instance, will automatically scream out of fear, triggering a



**Figure 2.** The pedagogical line: This line represents four stages of affective social learning in terms of the necessary level of intentionality from the “knower” for affective information to pass to the “learner.”



**Figure 3.** Affective social learning: The four main types of affective social learning are depicted here. Both types of social appraisal (affective observation and social referencing) are reproduced from Figure 1. Here, the knower (K) in contagion has the object (X) as the principal source of attention, while the learner (L) is principally attentive to the knower’s reaction. They have no knowledge of the object. In natural pedagogy, the knower shares their attention between the object (the learning material) and the learner, while the learner shares their attention between the object and the knower. The arrows show the direction of attention.

similar emotion in the child. Both the mother and the child “converge emotionally” (Hatfield, Cacioppo, & Rapson, 1993, p. 5) and it is very likely that a new appraisal will result from this very affective episode. As an indirect consequence of the mother’s scream, the child learns that there is danger, but learns nothing about the object itself. Parkinson (2011) correctly points out that the main difference between contagion and social appraisal is that a particular object is manifest to both parties in social appraisal, but not necessarily for contagion.

In fact, in general terms, all that is required from the learner in affective observation is a basic motivation to learn without any prior focal attention (something akin to Izard’s “interest,” Izard, 2009; or Panksepp’s “seeking” system, e.g., Panksepp & Biven, 2012). The information is not necessarily transmitted intentionally by the knower. In other words, the information is not provided explicitly for the learner; the learner can observe an affective reaction and be informed by the other person’s appraisal. For instance, parents can take their child for a visit to a museum. The child, sitting in her stroller and not being explicitly told about what hangs on the walls, can observe that her parents—and a lot of other visitors—are moved by the painting of the young woman with the mysterious smile. The child learns that certain two dimensional coloured objects are especially relevant for people and that they are associated with very positive appraisals.

In *social referencing* episodes, the learner is confronted by an ambiguous situation and turns to a reference person for guidance. This person of reference, by intentionally expressing an appropriate appraisal with ostention, will enable the learner to evaluate the situation she is facing. For example, we can imagine a young boy in a toy shop with his older brother, wondering

whether he should spend his birthday money on a little green car. Turning his gaze to his brother, this latter expresses a disdainful face for his brother's benefit. Quickly, the little brother puts the car back on the shelves. The child learns what value to give the object, and as a consequence, what action to take.

Finally, *natural pedagogy* has been described conceptually without much explicit mention of affect, although affect seems nonetheless to have a very important role, particularly in ostensive signalling (Csibra, 2010). The teacher, who can answer a request from a student but who most often initiates the learning process, explicitly addresses the student in order to turn her attention to a specific object. According to Csibra and Gergely's (2009) natural pedagogy hypothesis, this transmission is facilitated because the knower has a propensity to communicate the information in a particular format. To be able to do this properly, he should be aware of the level of understanding of the learner and modulate his message appropriately. When this intentional process is effective, not only does the object become relevant for the learner, but she can also better use or understand it. However, affect can also clearly play an important role here, as positive emotions such as interest or curiosity may encourage while disinterest or contempt may discourage learning. The learner, for his part, is particularly sensitive to such episodes of transmission, and tends to generalize whatever information is transmitted to similar contexts. The brother of the boy in the toy store for example, can see a remote control 4x4 car and demonstrates and explains its possibilities to his younger brother. The boy would be very sensitive to the level of enthusiasm and positive effect with which his brother expresses the detailed information about how best to make the car function, thus becoming encouraged to spend his birthday money on it.

This example illustrates a substantive difference between social referencing and natural pedagogy: whereas in natural pedagogy the learner is understood to be receptive to the transmission of information, in social referencing the learner has a more ambitious role—seeking out information for themselves. If our criteria for social referencing are to be accepted, then it must be the case that the child initiates the learning process. While it may be possible to imagine cases of natural pedagogy whereby the infant asks for information, this would become close to what we consider here as social referencing. To summarize then, contrary to social referencing, which is based on emotional signals sought out by the learner, natural pedagogy is not necessarily affective and entails the knower being precise about what he wants to transmit: in this sense, while the affective information in social appraisal can be transmitted quickly and unconsciously (Mumenthaler & Sander, 2012, 2015), the information in natural pedagogy probably needs to be transmitted deliberately and explicitly.

Socialization will of course include all of these different social learning processes. Our bet is that such finely tuned distinctions could help researchers better understand what is learned, by whom, at what moment, and with which results. Further research could for instance highlight the different emotions that can be involved in the learning of what is relevant in any given community. The role of emotions like interest, pride,

shame, or contempt in the making of social identities is a fascinating subject. It could also be asked whether certain affective social learning processes are more adapted for transmitting certain kinds of knowledge or attitudes toward the social environment: is it ever better to lead by example rather than to explicitly teach someone? From a developmental perspective, it is important to study the emergence of these abilities and to measure the extent to which young children can rely on each of them to improve their knowledge. It would also be very interesting to compare these abilities with the learning abilities of nonhuman primates. Apparently, natural pedagogy seems to be absent in nonhuman primates (Csibra & Gergely, 2011). However, social referencing that meets our criteria has been found in human-raised young chimpanzees (Russell, Bard, & Adamson, 1997) and it is very likely that chimpanzees use social appraisal to detect what is relevant in their environment given that they can read attention and intention in third parties (Suddendorf & Whiten, 2001) and that both chimpanzees and bonobos have affective and emotional reactions to their decisional outcome (Rosati & Hare, 2013). Last but not least, the role that the teacher's identity and her specific emotional involvement (or detachment) with the child, has also to be better understood. Different sources of appraisal may compete with each other, giving rise to affective and epistemic tension. Whose judgement should you trust when your own personal happiness is in doubt? Our future often lies in the eyes of the beholder, and others' appraisals can pave the way to heaven. . . or hell.

### Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### Note

- 1 While this study provides an excellent example of young infants regulating their behaviour as a function of other people's appraisals, it should be noted that what is learned here is how other people (should) value an object, and does not, *per se*, constitute proof that the participants would value the object for themselves in the future.

### References

- Baldwin, D. A., & Moses, L. J. (1996). The ontogeny of social information gathering. *Child Development, 67*(5), 1915–1939.
- Bayliss, A. P., Frischen, A., Fenske, M. J., & Tipper, S. P. (2007). Affective evaluations of objects are influenced by observed gaze direction and emotional expression. *Cognition, 104*(3), 644–653.
- Bayliss, A. P., Paul, M. A., Cannon, P. R., & Tipper, S. P. (2006). Gaze cuing and affective judgments of objects: I like what you look at. *Psychonomic Bulletin & Review, 13*(6), 1061–1066.
- Boccia, M., & Campos, J. J. (1989). Maternal emotional signals, social referencing, and infants' reactions to strangers. *New Directions for Child and Adolescent Development, 1989*(44), 25–49.
- Bourdieu, P. (1984). *Distinction: A social critique of the judgement of taste*. Cambridge, MA: Harvard University Press.
- Brand, R. J., Baldwin, D. A., & Ashburn, L. A. (2002). Evidence for "motionese": Modifications in mothers' infant directed action. *Developmental Science, 5*(1), 72–83.

- Brosch, T., Sander, D., & Scherer, K. R. (2007). That baby caught my eye. . . Attention capture by infant faces. *Emotion*, 7(3), 685–689.
- Bruder, M., Fischer, A., & Manstead, A. S. R. (2014). Social appraisal as a cause of collective emotions. In C. von Scheve & M. Salmela (Eds.), *Collective emotions: Perspectives from psychology, philosophy and sociology* (pp. 141–155). Oxford, UK: Oxford University Press.
- Campos, J. J. (1983). The importance of affective communication in social referencing: A commentary on Feinman. *Merrill-Palmer Quarterly*, 29(1), 83–87.
- Campos, J. J., & Stenberg, C. (1981). Perception, appraisal, and emotion: The onset of social referencing. In M. E. Lamb & L. R. Sherrod (Eds.), *Infant social cognition: Empirical and theoretical contributions* (pp. 217–314). Hillsdale, NJ: Erlbaum.
- Clément, F. (2010). To trust or not to trust? Children's social epistemology. *Review of Philosophy and Psychology*, 1(4), 531–549.
- Clément, F., & Dukes, D. (2013). The role of interest in the transmission of social values. *Frontiers in Psychology*, 4, 349. doi:10.3389/fpsyg.2013.00349
- Corriveau, K. H., Harris, P. L., Meins, E., Fernyhough, C., Arnott, B., Elliott, L., . . . De Rosnay, M. (2009). Young children's trust in their mother's claims: Longitudinal links with attachment security in infancy. *Child Development*, 80(3), 750–761.
- Csibra, G. (2010). Recognizing communicative intentions in infancy. *Mind & Language*, 25, 141–168.
- Csibra, G., & Gergely, G. (2006). Social learning and social cognition: The case for pedagogy. In Y. Munakata & M. Johnson (Eds.), *Processes of change in brain and cognitive development* (pp. 249–274). Oxford, UK: Oxford University Press.
- Csibra, G., & Gergely, G. (2009). Natural pedagogy. *Trends in Cognitive Science*, 13(4), 148–153.
- Csibra, G., & Gergely, G. (2011). Natural pedagogy as evolutionary adaptation. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*, 366, 1149–1157.
- De Rosnay, M., Cooper, P. J., Tsigaras, N., & Murray, L. (2006). Transmission of social anxiety from mother to infant: An experimental study using a social referencing paradigm. *Behaviour Research and Therapy*, 44(8), 1165–1175.
- Egyed, K., Kiraly, I., & Gergely, G. (2013). Communicating shared knowledge in infancy. *Psychological Science*, 27(4), 1348–1353.
- Evers, C., Fischer, A. H., Rodriguez Mosquera, P. M., & Manstead, A. S. R. (2005). Anger and social appraisal: A “spicy” sex difference? *Emotion*, 5(3), 258–266.
- Feinman, S. (1983). How does baby socially refer? Two views of social referencing: A reply to Campos. *Merrill-Palmer Quarterly*, 29(4), 467–471.
- Feinman, S., & Lewis, M. (1983). Social referencing at ten months: A second-order effect on infants' responses to strangers. *Child Development*, 54, 878–887.
- Fernald, A. (1985). Four-month-old infants prefer to listen to motherese. *Infant Behavior and Development*, 8(2), 181–195.
- Gibson, E. J., & Walk, R. D. (1960). The “visual cliff.” *Scientific American*, 202, 67–71.
- Harris, J. R. (2009). *The nurture assumption: Why children turn out the way they do* (Rev. ed.). New York, NY: Free Press.
- Harris, P. L. (2012). *Trusting what you're told: How children learn from others*. Cambridge, MA: Harvard University Press.
- Harris, P. L., & Koenig, M. A. (2006). Trust in testimony: How children learn about science and religion. *Child Development*, 77(3), 505–524.
- Hatfield, E., Cacioppo, J. T., & Rapson, R. L. (1993). *Emotional contagion*. New York, NY: Cambridge University Press.
- Hirshberg, L. M., & Svejda, M. (1990). When infants look to their parents: I. Infants' social referencing of mothers compared to fathers. *Child Development*, 61(4), 1175–1186.
- Izard, C. E. (2009). Emotion theory and research: Highlights, unanswered questions, and emerging issues. *Annual Review of Psychology*, 60, 1–25.
- Kaufmann, L., & Clément, F. (2014). Wired for society: Cognizing pathways to society and culture. *Topoi*, 33(2), 459–475.
- Klinnert, M. D. (1984). The regulation of infant behavior by maternal facial expression. *Infant Behavior and Development*, 7(4), 447–465.
- Klinnert, M. D., Campos, J., Sorce, J. F., Emde, R. N., & Svejda, M. J. (1983). Social referencing: Emotional expressions as behavior regulators. *Emotion: Theory, Research and Experience*, 2, 57–86.
- Klinnert, M. D., Emde, R. N., Butterfield, P., & Campos, J. J. (1986). Social referencing: The infant's use of emotional signals from a friendly adult with mother present. *Developmental Psychology*, 22(4), 427–432.
- Kuhn, T. S. (1962). *The structure of scientific revolutions*. Chicago, IL: The University of Chicago Press.
- Latane, B., & Darley, J. M. (1968). Group inhibition of bystander intervention in emergencies. *Journal of Personality and Social Psychology*, 10(3), 215–221.
- Leventhal, H., & Scherer, K. (1987). The relationship of emotion to cognition: A functional approach to a semantic controversy. *Cognition & Emotion*, 1(1), 3–28.
- Manstead, A. S. R., & Fischer, A. H. (2001). Social appraisal: The social world as object of and influence on appraisal processes. In K. R. Scherer, A. Schorr, & T. Johnstone (Eds.), *Appraisal processes in emotion: Theory, methods, research* (pp. 221–232). New York, NY: Oxford University Press.
- Mumenthaler, C., & Sander, D. (2012). Social appraisal influences recognition of emotions. *Journal of Personality and Social Psychology*, 102(6), 1118–1135.
- Mumenthaler, C., & Sander, D. (2015). Automatic integration of social information in emotion recognition. *Journal of Experimental Psychology: General*, 144(2), 392–399.
- Mumme, D. L., Fernald, A., & Herrera, C. (1996). Infants' responses to facial and vocal emotional signals in a social referencing paradigm. *Child Development*, 67(6), 3219–3237.
- Nisbett, R. E. (2003). *The geography of thought. How Asians and westerners think differently. . . and why*. New York, NY: Free Press.
- Panksepp, J., & Biven, L. (2012). *The archaeology of mind: Neuroevolutionary origins of human emotions*. New York: W.W. Norton & Company.
- Parkinson, B. (2011). Interpersonal emotion transfer: Contagion and social appraisal. *Social and Personality Psychology Compass*, 5(7), 428–439.
- Parkinson, B., & Manstead, A. S. R. (2015). Current emotion research in social psychology: Thinking about emotions and other people. *Emotion Review*, 7, 371–380.
- Parkinson, B., Phiri, N., & Simons, G. (2012). Bursting with anxiety: Adult social referencing in an interpersonal Balloon Analogue Risk Task (BART). *Emotion*, 12(4), 817–826.
- Parkinson, B., & Simons, G. (2009). Affecting others: Social appraisal and emotion contagion in everyday decision making. *Personality and Social Psychology Bulletin*, 35(8), 1071–1084.
- Piaget, J. (1954). *The construction of reality in the child*. New York, NY: Basic Books. (Original work published 1937)
- Repacholi, B. M., & Meltzoff, A. N. (2007). Emotional eavesdropping: Infants selectively respond to indirect emotional signals. *Child Development*, 78(2), 503–521.
- Rogoff, B. (2003). *The cultural nature of human development*. Oxford, UK: Oxford University Press.
- Rosati, A. G., & Hare, B. (2013). Chimpanzees and bonobos exhibit emotional responses to decision outcomes. *PLoS ONE*, 8(5), e63058.
- Russell, C. L., Bard, K. A., & Adamson, L. B. (1997). Social referencing by young chimpanzees (*pan troglodytes*). *Journal of Comparative Psychology*, 111(2), 185–193.
- Scherer, K. (1994). An emotion's occurrence depends on the relevance of an event to the organism's goal/need hierarchy. In P. Ekman & R.

- Davidson (Eds.), *The nature of emotion: Fundamental questions* (pp. 227–231). New York, NY: Oxford University Press.
- Schwarz, N., & Clore, G. L. (1983). Mood, misattribution, and judgments of well-being: Informative and directive functions of affective states. *Journal of Personality and Social Psychology*, *45*(3), 513–523.
- Sorce, J. F., Emde, R. N., Campos, J. J., & Klinnert, M. D. (1985). Maternal emotional signaling: Its effect on the visual cliff behavior of 1-year-olds. *Developmental Psychology*, *21*(1), 195–200.
- Sperber, D., Clément, F., Heintz, C., Mascaro, O., Mercier, H., Origg, G., & Wilson, D. (2010). Epistemic vigilance. *Mind & Language*, *25*(4), 359–393.
- Sperber, D., & Wilson, D. (1986). *Relevance: Communication and cognition* (Vol. 1). Cambridge, MA: Harvard University Press.
- Suddendorf, T., & Whiten, A. (2001). Mental evolution and development: Evidence for secondary representation in children, great apes and other animals. *Psychological Bulletin*, *127*(5), 629–650.
- Tomasello, M. (1999). The human adaptation for culture. *Annual Review of Anthropology*, *28*, 509–529.
- Van der Schalk, J., Kuppens, T., Bruder, M., & Manstead, A. S. (2015). The social power of regret: The effect of social appraisal and anticipated emotions on fair and unfair allocations in resource dilemmas. *Journal of Experimental Psychology: General*, *144*(1), 151–157.
- Walden, T. A., & Baxter, A. (1989). The effect of context and age on social referencing. *Child Development*, *60*, 1511–1518.
- Walden, T. A., & Ogan, T. A. (1988). The development of social referencing. *Child Development*, *59*, 1230–1240.
- Walle, E. A., Reschke, P. J., & Knothe, J. M. (XXXX) Social referencing: Defining and delineating a basic process of emotion. *Emotion Review*, *X*, XXX–XXX.
- Zarbatany, L., & Lamb, M. E. (1985). Social referencing as a function of information source: Mothers versus strangers. *Infant Behavior and Development*, *8*(1), 25–33.