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Scaffoldings of the affective mind

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Abstract

In this paper we adopt Sterelny's (2010) framework of the *scaffolded mind*, and its related dimensional approach, to highlight the many ways in which human affectivity (and not just cognition) is environmentally supported. After discussing the relationship between the scaffolded-mind view and related frameworks, such as the "extended-mind" view, we illustrate the many ways in which our affective states are environmentally supported by items of material culture, other people, and their interplay. To do so, we draw on empirical evidence from various disciplines (sociology, ethnography, developmental psychology), and develop phenomenological considerations to distinguish different ways in which we experience the world in affectivity.

1. Sterelny's Scaffolded Mind

Sterelny (2010) distinguishes various dimensions of what he calls the *scaffolded mind*. This term refers to the idea that the mind is "environmentally supported," more specifically that

cognitive agents engineer their environment to sustain as well as amplify their cognitive abilities. Sterelny in particular draws on the niche-construction model (Odling-Smee et al., 2003) to characterize the scaffolded mind. According to this model, organisms carve out environmental niches to which they then adapt; in this way, processes of manipulation of the environment feed back onto the manipulating organism and transform it, often increasing the organism's chances of survival. A classic example of niche construction is the dam-building activity of the beaver, which changes the environment where the beaver lives, which in turn affects the beaver's behavior and that of its progeny.

Niche construction comes in different varieties (Sterelny, 2003, chapter 8). For example, organisms physically modify their habitat, constructing structures (e.g. shelters, nests, dams) that modify how the environment impacts on them. Social organization is also a form of niche construction, for it creates a certain set of conditions that change the selective landscape. What Sterelny (2010) calls the scaffolded mind refers to processes of *epistemic* niche construction characteristic of human agency, consisting primarily in making cognitive tools and assembling informational resources to scaffold intelligent action: written language, mathematical notations, calendars, watches, telescopes, computers, etc. Moreover, in the human case, environmental scaffolding exerts its influence across generations in a particularly profound way, via the transmission of ecological and technical expertise (what Sterenly calls "intergenerational social learning"; see also Sterelny, 2012).

Sterelny introduces the scaffolded-mind view as an alternative to the *extended*-mind view (ExM henceforth), first formulated by Clark & Chalmers (1998) and further elaborated by Andy Clark and others (e.g., Clark, 2008; Menary, 2010b). According to ExM, sometimes the material vehicles that realize the mind encompass not just neural or even bodily activity, but also that of the material environment. Sterelny does not reject ExM, but he thinks that the niche-constructivist framework is more general, and thus more powerful, than the extended-

mind framework. ExM focuses mainly on how single agents rely on their interactions with informational items to enhance their cognitive capacities. Clark & Chalmers' (1998) central example is that of one person, Otto, who carries a notebook in which he annotates important information he would otherwise forget, and which he consults whenever he needs to. The argument for ExM relies on the observation that the *functional role* of Otto's notebook is the same as the internal neural memory system of someone who does not rely on the notebook and is able to recall relevant information without external aids. Like information in a biological memory system, the information in Otto's notebook is easily and directly accessed, and is generally not doubted or questioned. Just as we regard some internal brain processes as constitutive of memory, the argument goes, we should likewise regard Otto's notebook as part of his memory.

Sterelny's (2010) main criticism of ExM is that it is too narrow, and as such it "obscures rather than highlights" (p. 473) the varieties of ways in which we engineer the environment and rely on external resources to enhance our cognitive competences. In his view, activities that extend the mind are best seen instead as *special cases* of the more general phenomenon of environmentally supported cognition. This more general phenomenon need not always involve the robust use of highly trusted resources, for example; nor does it have to concern the interaction between a resource and a single agent only. Once one acknowledges the widespread presence of "environmental fuels for cognition" (p. 473), the critical task according to Sterelny is to identify functional relationships between agents and environmental resources, and to plot them as dimensions in a multi-dimensional space. He identifies three such dimensions: the extent to which an agent *trusts* a resource; the extent to which a resource is *entrenched* and *individualized*; and the extent to which a resource is *shared* across more than one agent (we illustrate these in more detail in the next section).

Sterelny maintains that this dimensional framework does not force categorical distinctions on nature; thus "the boundary between external components of the agent's mind and mere resources for that mind must be arbitrary" (p. 480). ExM, in this framework, "is one corner in a 3D space of environmental scaffolds of cognitive competence" (*ibid*.); specifically, canonical extended mind cases are those that involve single individuals manipulating highly trusted and entrenched resources. Although "no clear error is made in reserving a special label for this region of space" (*ibid*.), focusing only on that region is not helpful because it obscures many other instantiations and features of the scaffolded mind.

We find Sterelny's approach to ExM particularly appealing for two main reasons. First, it circumvents the frustrating dispute between supporters and detractors of ExM revolving around what is known as the "causal-constitution fallacy." Detractors of ExM have argued that whereas it is certainly important to recognize the role of the environment in enhancing cognitive activities, this role is merely *causal*, not one of *constitution* (e.g., Adams & Aizawa, 2001). Relatedly, others have argued that it is better (because it is more conservative) to claim that cognition is "embedded" rather than extended, that is, causally interacting with the world but still firmly located within the organism (Rupert, 2004).

Clark (2008, p. 138) himself characterizes the "argumentative oscillation" between the theses of the extended and embedded mind as "unproductive." As Sprevak (2010) has pointed out, the explanatory value to cognitive science of the two theses is very similar. Our view is that, because of the different intuitions that individuals have regarding the nature of the mind, this debate cannot progress much beyond the formulation of criteria supporting one intuition over another, and their subsequent rejection by those who do not share the same intuition. We see Sterelny's notion of the scaffolded mind as useful for avoiding this deadlock, and at the same time as providing conceptual tools for productively highlighting the transformative powers of environmental scaffolds. Supporters of both the extended and

embedded thesis can agree with Sterelny that the mind is pervasively scaffolded, and thus that the environment cannot be excluded from our best explanations of cognition. As for the ontological question of when, if ever, the environment comes to be *part* of cognition—this is not something that a supporter of the scaffolded approach needs to provide an answer to. Sterelny (2010) sees the extended mind as a limiting case of the scaffolded mind: "canonical extended mind cases are continuous with other cases, cases in which there is environmental support of cognition, but which are not plausibly treated as constituents of agents' minds" (p. 466). This is an intermediate position along a dimension of other possible stances, all compatible, in our interpretation, with the niche-construction/scaffolded-mind model. At one extreme of this dimension is the internalist position according to which the mind supervenes on the brain only (e.g., Searle, 1992; Adams & Aizawa, 2001); at the other extreme is the externalist view according to which the mind is always necessarily constituted by the environment (Hutto & Myin, 2013).

The second reason why we find Sterelny's framework appealing is that it can be used to highlight the many ways in which the environment scaffolds not just the mind's cognitive capabilities but also its *affective* ones. His framework can thus be used to expand on the recent "situated" approach to emotion, advanced by Griffiths & Scarantino (2009). Drawing on interpersonal accounts of emotion in psychology (esp. Parkinson et al., 2005), Griffiths and Scarantino offer a different perspective from the widespread one according to which emotions are internal states of the organism with the function of providing information about the significance of situations. They argue, rather, that emotions are social signals designed to change the behavior of other organisms. As such, emotions are often non-conceptual skilful engagements with the world that influence other organisms and are influenced by them. Griffiths and Scarantino also mention that emotions are culturally scaffolded, both diachronically by sociocultural norms, and synchronically by the concrete, material context

with which one interacts. In our view, mapping Sterelny's framework onto the affective domain can enrich this account. Our goal in this paper is therefore to undertake this mapping, and in so doing provide further distinctions and detail to the situated view of affectivity.[1] In addition, this exercise will importantly reveal the extent to which affectivity is not just a matter of *passively* undergoing bodily and experiential changes, but also of *actively* modifying one's environment for the sake of one's affective life itself (to sustain, amplify, dampen it, etc.). This active dimension, we think, is an important feature of affectivity that needs emphasizing. Griffiths and Scarantino point out primarily that our emotions depend on the sociocultural context. We will highlight, in addition, that affective states involve the *active manipulation of the world*, and that this process leads to the existence of what we shall call *affective niches*: instances of organism-environment couplings (mutual influences) that enable the realization of specific affective states. This active manipulation need not be the product of a conscious intention, although it can be; it is often just part of our repertoire of habitual dealings with the world. One important implication of our discussion, if we are right, is that understanding and explaining affective phenomena needs to take into consideration the ways in which agents engineer their affective environments (i.e., create affective niches) and in so doing let these environments influence their affective states in an ongoing way.

The rest of this paper is organized as follows. In section 2 we summarize Sterelny's (2010) account of the dimensions of the scaffolded mind. In subsequent sections we apply it to the realm of affectivity, discussing material (section 3) and interpersonal (section 4) scaffoldings, as well as their interaction (section 5).

2. Dimensions of the Scaffolded Mind

Sterelny (2010) identifies three dimensions of the scaffolded mind. These are not meant to be the only dimensions along which the scaffolded mind varies, but they arguably provide a useful initial analytic tool.[2] The first dimension he discusses is *trust* (pp. 473-475). Trust refers to the agent's perception of the reliability of a certain environmental resource and of her access to it. Some resources, and access to them, are regarded as more reliable than others; some are automatically trusted, whereas others are used in a more guarded way. For example, we rely unreflectively on the campus map when we need to get to a lecture room, whereas we are more wary of health advice posted on alternative medicine websites. Generally, Sterelny thinks that resources that involve only one sender and one receiver are (or ought to be) less trusted than publicly displayed resources with a record of reliability.

The second dimension is *individualization* or *entrenchment* (pp. 475-477). Some resources—such as the set of knives of a professional cook—become highly individualized over time and with repeated use. The agent herself changes during the course of this individualization process as she gets attuned to a certain resource, and to the modifications that the resource goes through as a consequence of use. Although Sterelny does not use this term, phenomenologists would talk of the *transparency* of an entrenched or individualized resource (e.g., De Preester, 2011). A certain resource becomes transparent in its use when it is not noted anymore, or when it is noted but not in the same way as objects normally are; rather, it becomes incorporated into one's acting self. Merleau-Ponty (1945/1962) famously talked of the integration of tools (e.g., the blind person's cane) into one's *corporeal schema* (*schéma corporel*)—the set of tacit skills that characterize action in the world, and which structure one's experience—in virtue of the role they play in supporting habitual actions. From a dimensional perspective, it is useful to think of entrenchment in terms of a

continuum, rather than all or nothing. Some resources are more entrenched and transparent than others, depending on degree of expertise—compare how effortlessly a professional tennis player uses her racket, for example, versus an amateur handling it for the first time—and also on whether the resource is a tool or another person (see section 4.2).

The third dimension (Sterelny, 2010, pp. 477-479) refers to the degree to which the resource at stake is employed by an individual, or is, rather, *collective*. ExM focuses primarily on cases of single individuals interacting with informational tools (notebooks, computers, calculators, etc.). Yet as Sterelny notes, one can find many cases of environmentally scaffolded capacities that involve interactions of various individuals with collectively structured environments. Sterelny refers to Tribble's (2005) study of Elizabethan and Jacobean theatre, and in particular the methods actors employed to master, in a short time span, a very large number of parts, typically performed after very little rehearsal. An important element were the plots: two-dimensional maps of the play attached on stage, used in conjunction with the parts. Players did not have the full text, so the plots allowed them to chart the play, and particularly to understand the rhythm of the scenes. Plots and other devices thus enabled the actors to rely on a variety of environmental cues to act out their parts, without the need to memorize details such as entrances, exits, and order of the scene; this in turn freed up cognitive resources for the memorization of lines. This example nicely illustrates what others have called *distributed cognition* (e.g., Hutchins, 1995). What is important for our purposes is that the various environmental items in this example have not been adapted to a single individual (as in the previous example of the professional cook's knives), but to a group.

Let us consider now how these dimensions apply not just to cognitive but also to affective states.

3. Material Scaffoldings of Affectivity

One need not think too hard to come across several examples of how we manipulate the material world to alter our affective condition: we take Prozac for depression, listen to music to relive past emotions, go to the movies to be entertained, indulge in comfort food, move furniture around for novelty, and so on. Sterelny's framework, however, enables us to look at this phenomenon in more detail.

3.1. Trust

Consider first the dimension of trust. Just as in the case of cognitive resources, we also trust some affective resources more than others. However, note that the sense of "trust" at stake here is different from the one at play in the case of cognition. To trust a cognitive resource is mainly to trust that it tells the truth about the world (think of Otto's notebook, or the campus map) and accordingly that, for example, it will get us to where we need to go. Drawing attention to the affective function of environmental resources interestingly brings to light a different sense of "trust": some resources are trusted in the sense that we are confident that they will have a certain effect on our affective state (e.g., make us happy or relaxed).

At one end of this dimension are affective resources that are relied on only occasionally, but are not trusted tools for affective modulation. The occasional vacation may act as an affective scaffold by cheering us up without being regularly relied upon for regulating our mood. At the other end of this dimension are resources to which we are addicted, namely that we regard as indispensable for the realization of specific affective states (typically pleasant ones), and that we regularly employ for that purpose. Between these two poles are resources that are also regularly manipulated and trusted for the achievement of certain affective conditions (the boundary between these cases and cases of addiction is

arguably fuzzy). A prevalent example is provided by increasingly portable technologies for listening to music, which people often rely on to feel more energetic and enthusiastic, to unwind and relax, create a romantic atmosphere, or rekindle past experiences (e.g., DeNora, 2000; Krause & Hargreaves, 2013). Importantly, music does not simply elicit emotions; thanks to its temporal character, music helps *vent* or give voice to emotions, "articulating" them as the music unfolds (DeNora, 2000). It is thus possible to say that we let music take the lead in shaping our affective states; we *delegate* the task of regulating certain features of our emotions to music (Krueger, 2014). How music regulates our affective states is an empirical question. One possibility is that music affects the body (facial expressions, gestures, physiology), which in turn is likely to affect the experience of emotion via bodily feedback. Some also argue that we perceive music as articulating dynamics akin to human expressions, and in so doing involuntarily create a motor representation of the emotion within ourselves, which then leads to a cascade of autonomic and somatic responses generating the associated emotion (see Krueger, 2014, for further references and discussion). In any case, what we want to emphasize here is the phenomenon of widespread reliance (trust) on technologies for music reproduction for the purpose of emotion regulation. Note that this purpose need not always be explicit or deliberate. Many of us have just *got into the habit* of relying on music to affect our moods. Think for example how common it is for many people to switch on the radio as they start the car's engine, and have music in the background for the whole drive; or consider how difficult the prospect of a workout becomes when, after arriving at the gym, we discover that the battery of our mp3 player has died and we no longer have a soundtrack to push us through a workout (Lim et al., 2009).

Consider also the role that other everyday items of material culture play in our lives, by acting on different aspects or "components" of our affective states—such as bodily processes (typically changes in autonomic nervous system activity, expression, and

behavior), action readiness (dispositions or tendencies to act in specific ways), cognitive evaluations or "appraisals," and feelings or phenomenal experiences (e.g., see Scherer, 2009, for a detailed discussion of these components). For example, many people wear brightly colored clothes to contrast the dullness of rainy days, or choose soft items of clothing (e.g., a furry sweater) when they want to feel safe or cozy (see Kwon, 1991, for gender differences in mood-dependent cloth selection). There is indeed evidence that color affects mood (Valdez & Mehrabian, 1994), and the tactile qualities of the furry sweater may contribute to releasing chemicals known to lower stress levels. Consider also the work of the sociologist Jean-Claude Kaufmann (2011), who found that the handbag a woman chooses to carry is neither simply an accessory for expressing individual style nor a utilitarian receptacle for toting around various practical tools (mobile phone, keys, tissues, etc.). A handbag—including its contents—functions as a highly portable, self-styled collection of technologies specifically chosen for regulating affect: charms and tokens for good luck and peace of mind, which influence one's appraisal of, and ability to cope with, specific situations; photos, assorted mementos (such as old theatre tickets and restaurant receipts), snippets of notes and letters from loved ones that bring about fond memories of individuals and elicit specific feelings; also small weapons or tools that affect one's awareness of one's action possibilities, and accordingly generate feelings of confidence, power, and security.

Note that although portability certainly makes it particularly easy for an item to become a trusted source of affective regulation, we do not only trust portable items for this purpose. Material items such as cinemas, concert halls and art galleries are non-portable resources that one can nevertheless regularly exploit to keep oneself interested and stimulated. Similarly, people for whom nature has a reliably calming and invigorating effect can count on the regular practice of outdoor activities to keep themselves in a generally good mood. Unlike playing music or choosing a specific outfit, however, these are cases where

agents do not directly manipulate the environment in order to alter their affective state. Nevertheless, they still *actively select* specific activities and interactions with the material world for precisely that purpose. The main feature of these activities and interactions is not portability but *accessibility*, which is in effect what portability typically enhances.

3.2. Individualization and Entrenchment

The dimension of individualization, we have seen, refers to the degree to which a resource has been adapted to one's purposes and regular activities. As we illustrate now, not just cognitive but also affective states can include highly individualized material resources. These are usually also highly trusted resources, i.e., resources taken to have a reliable effect on one's affective state. This is because the more one trusts, and accordingly relies on, a certain resource, the more individualized it becomes; vice versa, the more individualized and thus entrenched the resource is, the more trusted and relied upon it becomes.

Perhaps the best example of a highly individualized and entrenched affective resource is the way a professional musician relates to her instrument. Learning to play requires years of practice, usually from a very young age, during which one's brain and body gradually adapt to the instrument—its shape, sound, and expressive range. Learning to play thus involves the development of specific bodily skills to achieve a high degree of motoric mastery over the instrument; at the same time, the musician uses her instrument to express and explore a variety of feelings via daily practice sessions. The instrument thus gradually becomes entrenched not just in the musician's motoric repertoire, but also in her repertoire of expression and feeling. Indeed, musicians often experience a strong sense of attachment to their instrument, feeling that the instrument is part of them; losing access to an instrument played from a young age can be a source of deep regret and sadness because one loses the possibility to perform, and thus explore, a rich range of affective states. Note what the pianist

Cristina Ortiz said in an interview at the 2012 Leeds piano competition: "Somebody took a piano from me, it would be my death, because I live through the piano. Whatever happens in my life—depression, pressure, happiness, or the loss of mother or father … I go to the piano, and my soul comes through [the] pieces I choose to portray that emotion."[3] It does not seem exaggerated to say that the regular performance of music can create an addictive relationship. How exactly this happens is, again, an empirical question. The act of playing an instrument affects posture and gestures, autonomic activity, and experience (see, for example, Davidson, 2012; Overy & Molnar-Szakacs, 2009) and influences well-being (Croom, 2012). In addition, the mere *ability* to play an instrument can influence how one chooses to cope with situations. For example, rather than taking a tranquillizer or talking with others, the musician may rather turn to her instrument to regulate her affective state. Knowing that she can do so may affect which situations and challenges she chooses to face, and in which way, and has thus general implications for the kind of person she ends up being.

We can now introduce some phenomenological distinctions that bring to light different varieties of entrenchment. We distinguish three forms of entrenchment: entrenchment into the *corporeal schema*; into the *body image*; and *performative* entrenchment. Let us consider these in turn.

First, something is entrenched into the "corporeal schema" (see section 2) when it is implicitly integrated into one's bodily activities such that it is not experienced as a separate object, but as part of oneself. Like the corporeal schema, the integrated resource is *prereflective*—i.e., not explicitly attended or reflected upon (even though it could become so with a shift of attention). Schull's (2005) ethnographic study of gambling machines illustrates well how this form of entrenchment can characterize not just sensorimotor but also motivational-affective states. The gaming industry designs these machines to accelerate the customers' rate of play and extend its duration as much as possible. Strategies include

making sure that the player is comfortable and can order food and drinks through the gaming system so that she does not need to leave the machine; providing a choice of different activities such as browsing, exploring, and experimenting with selections from a library of games; preventing players from knowing how much they are going to get and when, etc. The more recent machines also adapt to the customer's rate of play, altering the payouts depending on the customer's gambling style. As Schull shows, these machines induce an extreme state of absorption and isolation from the world and other people—commonly referred to by gamblers as "the zone"—in which the boundaries between subject and machine become blurred. One player reports, for example: "I feel connected to the machine when I play, like it's an extension of me, as if physically you couldn't separate me from the machine" (p. 76). Schull identifies an even further level of absorption, characterized by the disappearance of the materiality of the machine altogether. As another gambler says: "the machine isn't even really there. … as you play the machine becomes less and less important; it starts out the machine and then it's the *game*" (p. 77, italics in original). Cases like this seem to involve a total experiential transparency of the machine, where the materiality of both one's body and tools for acting are passed over and forgotten.

Losing or being separated from corporeally entrenched resources makes one's reliance on them apparent. A woman who generally goes out with her handbag reports that on those rare occasions when she leaves it at home, she has "the sensation that something is missing, that I am not complete. It's a bit … like what it is said of amputated people, that they 'feel' the absent limb. Without my bag, it's as if I were amputated" (Kaufmann, 2011, p. 157, our translation). Similarly, some of us realize how dependent our daily mood and energy are on caffeine only when we stop drinking coffee or tea; people trying to stop smoking often become jittery and nervous, revealing the extent to which their normal functioning and

affective condition has come to incorporate specific habits (such as the very gesture of smoking) and chemicals.

Second, a material resource can also be integrated into the "body image," the sense we have of how our body appears to others (Gallagher, 2005). For example, consider how this image can change depending on what we wear: a smart suit can make one feel self-assured and businesslike, a short skirt can make one feel provocative or, depending on the context, exposed and vulnerable (see also, e.g., Woodward, 2006). Again, Kaufmann's (2011) study shows that some women choose their handbag not so much on the basis of how it looks, but how it looks *on them*. The handbag corresponds to, and completes, a certain self-styled body image: "I have chosen [my handbag] as a prolongation of my silhouette for a perfect image" (p. 124).

Third, by "performative entrenchment" we refer to yet a different form of incorporation, where the item in question is neither entirely transparent nor experienced like an external object. This mode of experiencing a material resource best characterizes the case of the professional musician and her relationship to the instrument. This dimension of incorporation can be clarified by contrast with the blind person and his cane. Unlike the cane, the musical instrument is not something *through which* something else (e.g., the surrounding environment) is perceived. Of course, it is likely that with practice the musician will pay less and less attention to the instrument while playing. We do not think it is appropriate to say, however, that the musician at some point comes to play unconsciously, as if she were on automatic pilot (see also Montero, 2010). Certainly she acquires many sensorimotor automatisms. But she needs to remain aware of *how* she is playing—if not of specific motor actions, at least of her expressive gestures, of the expressive character of the music she is producing, and of the actions afforded by the instrument.

Our suggestion, then, is that the instrument in the hands of the skilful musician is not experienced as an external object, but as an integrated part of what Legrand (2007) calls the *performative* body. As Legrand characterizes it, the performative body is neither entirely transparent nor an intentional object of experience. Rather, it is the body as experienced during the skilful performance of a specific activity. In these cases, one need not deliberatively attend to one's body—but one is nevertheless still very much aware of its presence and activity, primarily via prereflective proprioceptive and kinesthetic sensations (i.e., sensations of bodily position and movement that are not, but could become, explicitly attended to). In the case of expert musical performance, we suggest, the instrument becomes entrenched into this performative complex; it is neither entirely transparent nor explicitly attended to, but is nevertheless experienced as a very present instrument of performance and expression.

4. Interpersonal Scaffolds of Affectivity

Like the domain of material objects, the interpersonal domain is a realm that we actively manipulate to alter our affective states. We spend time with partners, family, and friends because we enjoy their company and the pleasant feelings they bring about, and we engage in joint activities that are qualitatively enriched by the presence of others. We now show how the dimensions of trust and individualization/entrenchment can be fruitfully applied to the interpersonal domain.

4.1. Trust

As is the case with material resources, we trust some people more than others; and again, the sense of "trust" we have in mind here refers to the expectation that others will have a certain modulatory impact on our affective life.

Trust in this sense is directly proportional to *familiarity*. If we are uncertain about how certain others might respond to us, we will approach them in a guarded way; as familiarity increases, so do trust and reliance. Part of the reason we experience intimacy with family and friends is because we know what sort of affective feedback we can expect from them. For example, based on previous interactions, we know which member of the family to turn to for the affirmation needed to elevate our mood, or which friend to call if we need a good laugh.

As with material objects, trust in the interpersonal domain need not involve the conscious or reflective expectation of how others will respond. Rather, trust is often a matter of prereflective patterns of reliance**.** People in long-standing relationships, for example, develop habitual patterns of affective responsiveness to one another (for better or for worse). Or consider cases in which the emotions of an individual "come out" only when he is part of a group of a certain kind (Wilson, 2004, calls this phenomenon "social manifestation"). One way this may happen is via "bottom-up" mechanisms of emotional contagion (see discussion in Parkinson et al., 2005, chap. 4), which are largely automatic. In this way, members of a group may provide ongoing resources and feedback that scaffold the experience and expression of emotions unique to a certain context, irrespective of the individual's intentions and deliberations (see Goldstein, 2002, for a relevant study of group aggressiveness). Yet another illustration of the unreflective, non-deliberate social manifestation of emotion are so-called *audience effects*. It has been shown that people's expressions of emotion change significantly depending on whether or not they are facing an audience. For example, people rarely smile when they are alone; rather, they smile almost exclusively when facing others

(Kraut & Johnston, 1979; Fernández-Dols & Ruiz-Belda, 1997). This is even the case for young infants (Jones et al., 1991). As Griffiths & Scarantino (2009) point out, this evidence supports the view that smiles are not simply individual responses to a positively evaluated situation, but social signals aimed to have an effect on the audience (see also Parkinson et al., 2005). Expressive behavior such as smiling, crying, or blushing are thus ways of manipulating others—manipulations which require a degree of trust in the predictability of their responses.

Note also that these interpersonal manipulations are not only present in adulthood. Similar patterns are already evident in how infants interact with their caregivers. There is ample empirical evidence from developmental psychology that newborns and young infants require organized patterns of auditory, visual, and tactile information (exaggerated facial expressions, gestures, sing-song speech, manipulation of interpersonal space, etc.) to regulate their attention and emotion (Beebe & Gerstman, 1984; Posner & Rothbart, 1998). Young infants lack the endogenous resources needed to control attention and cultivate positive affect voluntarily; the regulation of their emotion is thus delegated to the caregiver, who redirects attention by stimulating, soothing, restraining, and so on. Mothers, for example, jiggle the baby while breastfeeding to scaffold their attention and motivation. As the baby grows, caregivers discourage inappropriate behavior, and encourage appropriate behavior, by redirecting attention with bodily and vocal gestures (see Krueger, 2013). Importantly, however, it is not just the caregiver who manipulates the infant's affective state; the infant also plays an active role in shaping the interaction and thus can also be said to participate in the construction of a specific infant-caregiver affective niche. For example, in the first weeks and months of life, infants are already perceptually sensitive and responsive to the contingencies and temporal patterns of face-to-face social interactions (Tronick et al., 1979). From birth, infants seem to trust familiar caregivers to respond to them in predictable ways;

they recognize them as reliable sources of affectively salient feedback, much in the way that we gravitate toward our own trustworthy resources as adults. Infants selectively imitate faces, but not objects such as puppets (Legerstee, 1991); they only give full greeting responses to people, not inanimate objects (Tronick, 1989).[4] Preverbal infants as young as three months appear capable of assessing social behavior, showing a preference for individuals who reliably help others (i.e., trustworthy individuals) versus those who hinder others' behavior and are thus less predictable (e.g., Hamlin et al., 2010). From a very early age, infants are thus differentially sensitive to affective resources. They exhibit different degrees of trust to different kinds of stimuli and tailor their patterns of interaction accordingly.

This sensitivity is particularly manifest when infant-caregiver interactions go awry. Consider cases where infants temporarily lose trust in their caregivers as reliable and predictable sources of affective modulation. For example, when the temporal structure and predictability of infant-caregiver interactions are disrupted—e.g., when caregivers fail to respond to the infant's solicitations and instead present an inexpressive "still face" (Tronick, 2003); or when the timing of the exchange is artificially disrupted, such as when caregiver and infant are interacting over an intentionally delayed closed-circuit video system (Murray & Trevarthen, 1985)—infants indicate that they no longer trust the regulatory feedback from these external sources. They disengage, become distressed, and turn to self-stimulation strategies to try and manage their own affective states (Manian & Bornstein, 2009). Once the caregiver reengages with the infant, however, the bond of trust is quickly repaired and the infant continues to approach the caregiver as a reliable and predictable source of affective modulation.

Sometimes, however, loss of trust is long-lasting. An enduring loss of trust and its impact on infants' selection of affective scaffolding can be observed in longer-term studies of infants of clinically depressed mothers (see Varga & Krueger, 2013). Due to their depression,

the clinically depressed mothers typically provide diminished affective feedback via facial expression, posture, and tone of voice compared to their non-depressed counterparts. Evidence shows that their infants are less responsive to faces and voices generally (Field et al., 2009); their infants quickly learn that faces are not reliable sources of affective feedback, and they begin to look elsewhere for the stimulation they crave. In addition, at 3-6 months, infants of depressed mothers show less *negative* responding to their mothers' non-contingent and still-face behaviors than do infants of non-depressed mothers (*op. cit.*). By now they seem to have become accustomed to diminished maternal feedback—they are accustomed to their particular impoverished affective niche such that it no longer bothers them as much as it once did—but they still also exhibit a more general deficit in discriminating fine facial expressions in others (e.g., neutral versus smiling) (Bornstein et al., 2011). In other words, the infants have learned not only to distrust their mother's face but also the faces of others, and their ability to read facial expressions of emotion has suffered accordingly. The point of this work, we propose, is that, much the same way that adults often abandon untrustworthy affective scaffolding that does not provide reliable feedback (e.g., unpredictable friends with wild mood swings, uncomfortable environments we cannot control), so, too, do infants already from an early age abandon unreliable resources and look elsewhere for affective modulation—such as turning to various self-soothing strategies (Manian & Bornstein, 2009) when their primary source of interpersonal scaffolding proves to be untrustworthy.

Taken together, this evidence in our view indicates that infants' affective responsiveness to human adults has an element of active selection. Infants pick out and respond to signals from agents whom they trust, and they are likely to keep providing sustained and varied feedback motivating the interaction as long as their expectations are met. When they no longer trust their sources of feedback (i.e., infants of depressed mothers),

however, they actively look elsewhere for stimulation. In this sense, infants—like adults—can also be said to manipulate their interpersonal environment to scaffold their affective life.

4.2. Individualization and Entrenchment

Recall that Sterelny's (2010) second dimension refers to resources that are individualized so significantly that they become entrenched within the individual's cognitive repertoire, whereas others are interchangeable and thus less deeply entrenched. This dimension also applies to the affective realm in the interpersonal domain. As noted in section 3.2, individualization is closely related to trust. The more one trusts, and accordingly relies on, a certain resource, the more individualized it becomes; vice versa, the more individualized and thus entrenched the resource is, the more trusted and relied upon it becomes. We also saw in the previous section that we tend to trust familiar people more than less familiar ones, and we therefore allow the former to regulate our emotional responses more immediately than we do the latter.

We now suggest that the dimension of individualization and entrenchment also applies to the degree to which a certain "style" of affective interaction comes to characterize specific interpersonal relations. We have in mind what both Husserl (1912/1989) and Merleau-Ponty (1945/1962) identify as an individual's *bodily-affective* style: their overall characteristic manner of comportment, including distinctive ways of speaking, gesturing, moving, etc. (Meacham, 2013). Important for our purposes is the fact that one's style is not fixed; rather, we exhibit different styles in different niches. For example, contrast how one's style transforms when teaching a classroom full of undergraduates, say, versus interacting with one's partner or children, meeting professional colleagues for the first time, or going out for the evening with a group of old friends. Certain styles only seem to manifest—to use Wilson's (2004) term again—when scaffolded by the presence of specific social groups.

In adopting (both voluntarily and involuntarily) distinctive styles, we contribute to the construction and maintenance of different affective niches. Consider the role that humor, as an aspect of one's style, plays in establishing relationships. Humor is a tool for interpersonal niche construction. We adapt our humor (the content of our jokes, comments, level of irony and sarcasm, extravagance of our facial and gestural displays, etc.) to different interpersonal contexts. Importantly, we do this not only to accommodate social and cultural norms, such as expectations about what constitutes appropriate behavior at work versus a more casual context. We also regulate our humor-related style to carve out a specific niche *within* these contexts—that is, to establish certain patterned interactions with others that will in turn shape the ongoing affective character of our future engagements with them. So, with long-term (i.e., familiar and trusted) friends, for example, we gradually generate a rich repertoire of shared jokes, anecdotes, and experiences. Thanks to our interactive history, we easily slip into familiar sequences of humorous expressions that prompt predictable responses from our friends, which shape our subsequent response, which in turn shapes theirs, and so on. We know how to "get a rise" out of our friends, and they us; and crucially, we also know how their responses will impact *our* responses and affective experiences. Over time, then, this familiarity breeds the trust, intimacy, and openness that are the affective hallmarks of a strong friendship. We feel at home in these relationships because we have, to a certain extent, *individualized* them. By adopting particular styles—which may transform and adapt over time as other members, each with their own style, enter or leave the group and change its dynamic—we thus play an active role in shaping the way that our interpersonal relationships function as reliable affective scaffoldings.

To clarify further how we individualize and become entrenched in different affective niches within the interpersonal domain, we can return to a previous point and speak here of degrees of phenomenological *transparency*. Most of the time we navigate different aspects of

the social world (our face-to-face encounters with others, as well as the various norms, expectations, and patterned practices that constitute the backdrop against which these encounters unfold) in a skillful and unreflective way. We inhabit and relate to the social world transparently (see also Merleau-Ponty, 1945/1962). This transparency is further highlighted by the ways our bodily-affective style emerges spontaneously as we move through different interpersonal contexts (e.g., speaking to the boss at work, eating lunch with colleagues, having a friendly chat with a stranger in the neighborhood market). Much like an experienced carpenter uses his tools in a skillful way without reflective deliberation, so, too, we exhibit a practical understanding of how to negotiate different social contexts. Of course, we may in some cases need to reflect on, and intentionally calibrate, our affective displays to others, such as when we are with a group of strangers. However, with those we know best, in the interpersonal niches we have most fully individualized, we tacitly negotiate different affective styles without reflective deliberation.

Again, the fact that our social interactions are ordinarily transparent can be made apparent by considering when that transparency is compromised or missing altogether. This is the case, for example, of individuals with schizophrenia. Among other things, they often find other people puzzling and unpredictable (Lysaker et al., 2005). They say things like: "I simply cannot grasp what the others do"; "When I am with others … I cannot express myself. I don't lack the words: I lack something else… a piece of the situation" (Stanghellini & Ballerini, 2011, p. 187). Individuals with schizophrenia cannot interact smoothly with others, either; social movements like gestures and facial expressions lose their fluidity and spontaneity, taking on an unnaturally stiff and calculated character (e.g., de Haan & Fuchs, 2010). Disorders of bodily self-awareness further impact their ability to express a consistent bodily-affective style, which in turn influences how other people relate to them. It is thus

difficult for people with schizophrenia to individualize interpersonal relationships and become entrenched within them.

Finally, as with trust, we do not think that only adults individualize their interactions. To return to developmental studies, we can see that instances of affective individualization and entrenchment are already apparent in the first few months of life. For example, the shape and form of infants' affective displays differ relative to the interpersonal scaffolding available in different contexts. Different interactive contexts have distinct (i.e., individualized) features: specific dynamics, lengths, patterns of temporal coordination, peaks of high arousal and neutral states, etc. Five month-olds infants' interactions with their mother, for instance, usually contain one peak high arousal and several neutral states, while interactions with their father contain several peaks but are of shorter duration (Feldman, 2007). Six- to twelve month-olds display mostly Duchenne smiles (raised lip corners and raised cheeks) when greeting their mother after a short separation, and non-Duchenne smiles (including e.g. dropped jaws) when greeting strangers (Fogel et al., 2006). These studies suggest that infants quickly learn that different people will provide distinct forms of affectively salient feedback, and they adapt their responses accordingly. Even very young infants thus play a role in shaping the individual dynamics of different affective niches; they develop bodily-affective styles unique to these distinct encounters—e.g., more extravagant displays with mom, more subdued with dad—and thus contribute to the gradual individualization of certain patterns of interactivity (i.e., the construction of specific interpersonal affective niches). When interacting with trusted caregivers who exhibit predictable patterns of touch, familiar sounds, smells, vocalizations, etc., it is plausible that infants will allow themselves to "settle into" this affective scaffolding even more and, in so doing, individualize it to a greater degree. Think about how quickly a fussy infant allows herself to be calmed once she is back in the familiar

scaffolding of her mother's arms, as opposed to the "interchangeable" (to use Sterelny's term) scaffolding of an unfamiliar stranger.

5. The Interplay of Material and Interpersonal Affective Scaffoldings

To conclude, we now briefly discuss how material and interpersonal scaffoldings can constrain one another, and in particular how items of material culture can scaffold the affective states not only of individuals but of social groups as well (recall, by comparison in the cognitive domain, the example of the role of plots in Elizabethan theatre discussed in section 2). The topic of how material culture contributes to shaping people is of course central to sociology, and one that has been highlighted in several contexts (consumer societies, the military, mental institutions, etc.). As we do not have room to address this whole area of inquiry here, we offer only one example that illustrates the point nicely and is specific to affectivity: religious and spiritual contexts. These contexts harbor spaces that are often designed to induce a variety of feelings—faith, hope, awe, love, compassion, guilt, etc.—with the aid of disparate material objects and practices. Thus consider, for example, the transformations that some churches have recently undergone to adapt to the changing affective needs of worshippers. In the early 1960s, the Roman Catholic Church changed the practice of celebrating the Eucharist. Traditionally, the priest had his back to the congregation, appearing to lead the people; after the change he moved behind the altar and faced the congregation, appearing to be in dialogue with the people. Furthermore, in some churches, the altar (often made of wood rather than stone, thus signifying a table for a communal meal rather than a sacrificial table) has migrated from the distant and elevated area of the chancel, to the middle of the nave at the same level of the congregation, where it is often surrounded on all sides by pews (Taylor, 2004, p. 52). This new arrangement answers

the communal need for a more direct and equal relationship with the priest and God; at the same time, it also strengthens the sense of sharing and community among worshippers. Or consider the church of KingsGate, which opened in the UK in 2010, in a modern building that looks like a shopping center. Inside, the church looks like a theatre, with comfortable chairs on a slope, facing a stage, and no religious symbols. On Sundays, mass is celebrated with live rock music, and worshippers stand and sing along; the only traditional icon on display is a cross on stage. This church thus appears to have adapted to the desires and preferences of a certain group of 21st-century Catholics, organizing spaces and rituals to answer their affective needs, and to kindle and support their feelings of faith, devotion, and togetherness.

Importantly, these examples do not only show how material items and other people can interact to construct specific affective niches; they also point to the "intergenerational" character of (affective) niche construction (see section 1). The manipulation of the physical layout of the church accommodates a collective desire for, e.g., heightened intimacy and a personalized form of worship in a certain group of people, and also influences the experience and expectations of subsequent generations of worshippers inhabiting that space. Some affective niches are thus built gradually over time, and their material and social dimensions slowly constrain one another over generations, leading to culturally and socially different affective experiences and modalities of conduct.

6. Conclusion

We have applied Sterelny's (2010) dimensional analysis of the scaffolded mind to the realm of affectivity, showing the many ways in which our affective states are environmentally scaffolded by items of material culture, other people, and their interplay. Our main goal has been to describe these scaffoldings in some detail, illustrating them with examples from

empirical work in different disciplines, and also developing phenomenological considerations to distinguish various ways in which we experience the world in affectivity. Our analysis is meant to: (i) extend the debate on the "extended" and/or "scaffolded" mind from its almost exclusive focus on cognition to the domain of affectivity; and (ii) rejoin and further develop the "situated" approach to emotion (Parkinson et al., 2005; Griffiths & Scarantino, 2009) by emphasizing the process of active manipulation of the material and social world for the purposes of regulating one's affective condition (what we have referred to as the construction of affective niches).

Ultimately, the goal of a situated and scaffolded approach to affectivity is to move away from the widespread tendency of mainstream affective science to provide internalist explanations of how emotional states occur: namely, explanations that refer primarily, or even exclusively, to mechanisms located inside individual organisms (affect programs, cognitive appraisals, etc.). These accounts usually reduce the world to a causal background that is not factored in when it comes to explaining how emotions come about. Recognizing the scaffolded nature of affectivity thus ought to redirect attention to its material and interpersonal contexts, and in so doing shift the explanatory emphasis from exclusively internal processes to external ones as well. We think that such an explanatory shift should involve an interdisciplinary approach that gives a more prominent role, in affective science, to social sciences such as sociology and anthropology. Certainly more needs to be done to show how sociology and anthropology can impact explanatory frameworks and methods in affective science. For now, however, our hope is that the discussion in this paper has provided one step in this direction, even if only a limited and preliminary one.

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Notes

[1] Aside from Griffiths & Scarantino (2009), there is little work in the philosophy of situated cognition that addresses affectivity. Of the 26 chapters of *The Cambridge Handbook of Situated Cognition* (Robbins & Aydede, 2009), Griffiths & Scarantino's is the only one that does so. The literature on ExM has also been concerned primarily with cognition (see, e.g., Clark, 2008; Rowlands, 2008; Menary, 2010b), with some recent exceptions (Stephan et al., 2013; Colombetti & Roberts, 2014; Krueger 2014; Slaby 2014).

[2] Sutton (2006), Wilson & Clark (2010), and Menary (2010a) identify further dimensions of situated cognition that could also be applied to affectivity. Sutton (2006) provides an especially helpful high-level taxonomy of resources that scaffold cognitive but also potentially affective processes—e.g., external cultural tools, artefacts, and symbols systems; natural environmental resources; interpersonal scaffolding; embodied skills and capacities—as well as a consideration of various dimensions and times-scales along which these resources vary (enduring versus one-off scaffoldings, etc.). Here we focus only on Sterelny's account, mainly for reasons of space, and we do not claim that our dimensional analysis of scaffolded affectivity is exhaustive.

[3] http://www.youtube.com/watch?v=HQurNBRu9m4&list=PL2kzIPyOVx7BCXM_rG_zy1HQPQEIVDlV8 (accessed November 7, 2013).

[4] There is evidence that older children are responsive to "socially intelligent robots" (e.g., Dautenhahn, 2007). Yet this evidence does not undermine our point, as these robots reproduce important features of human agency, which can explain why children trust and engage with them (socially intelligent robots can express and/or perceive emotions, distinguish agents from objects, and reliably use natural cues—gaze, facial expressions, gestures, etc.—to exhibit distinctive personalities and evoke social responses from others).

REFERENCES

Adams, F., & Aizawa, K. (2001). The bounds of cognition. *Philosophical Psychology*, *14*, 43–64.

Beebe, B., & Gerstman, L. (1984). A method of defining "packages" of maternal stimulation and their functional significance for the infant with mother and stranger. *International Journal of Behavioral Development*, *7*(4), 423–440.

Bornstein, M. H., Arterberry, M., Mash, C., & Manian, N. (2011). Discrimination of facial expression by 5-month-old infants of nondepressed and clinically depressed mothers. *Infant Behavior & Development*, *34*(1), 100–106.

Clark, A. (2008). *Supersizing the mind: Embodiment, action, and cognitive extension*. Oxford: Oxford University Press.

Clark, A., & Chalmers, D. (1998). The extended mind. *Analysis*, *58*, 7–19.

Colombetti, G., & Roberts, T. (2014). Extending the extended mind: The case for extended affectivity. *Philosophical Studies*, online first.

Croom, A. M. (2012). Music, neuroscience, and the psychology of well-being: A précis. *Frontiers in Psychology*, *2: 393*.

Dautenhahn, K. (2007). Socially intelligent robots: Dimensions of human–robot interaction. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *362*(1480), 679–704.

Davidson, J. W. (2012). Bodily movement and facial actions in expressive musical performance by solo and duo instrumentalists: Two distinctive case studies. *Psychology of Music*, *40*(5), 595–633.

De Haan, S., & Fuchs, T. (2010). The ghost in the machine: Disembodiment in schizophrenia – Two case studies. *Psychopathology*, *43*(5), 327–333.

De Preester, H. (2011). Technology and the body: The (im)possibilities of re-embodiment.

Foundations of Science, *16*(2-3), 119–137.

DeNora, T. (2000). *Music in everyday life*. Cambridge: Cambridge University Press.

Feldman, R. (2007). On the origins of background emotions: From affect synchrony to symbolic expression. *Emotion*, *7*(3), 601–611.

Fernández-Dols, J.-M., & Ruiz-Belda, M.-A. (1997). Spontaneous facial behavior during intense emotional episodes: Artistic truth and optical truth. In J. A. Russell & J.-M. Fernández-Dols (Eds.), *The psychology of facial expression* (pp. 255–294). Cambridge: Cambridge University Press.

Field, T., Diego, M., & Hernandez-Reif, M. (2009). Infants of depressed mothers are less responsive to faces and voices: A review. *Infant Behavior & Development*, *32*(3), 239–244.

Fogel, A., Hsu, H.-C., Shapiro, A. F., Nelson-Goens, G. C., & Secrist, C. (2006). Effects of normal and perturbed social play on the duration and amplitude of different types of infant smiles. *Developmental Psychology*, *42*(3), 459–473.

Gallagher, S. (2005). *How the body shapes the mind*. Oxford; New York: Clarendon Press.

Goldstein, A. P. (2002). *The psychology of group aggression*. Chichester, West Sussex; New York: J. Wiley.

Griffiths, P., & Scarantino, A. (2009). Emotions in the wild: The situated perspective on emotion. In M. Aydede & P. Robbins (Eds.), *The Cambridge handbook of situated cognition* (pp. 437–453). Cambridge: Cambridge University Press.

Hamlin, J. K., Wynn, K., & Bloom, P. (2010). 3-month-olds show a negativity bias in their social evaluations. *Developmental Science*, *13*(6), 923–929.

Husserl, E. (1912/1989). *Ideas pertaining to a pure phenomenology and to a phenomenological philosophy—second book: Studies in the phenomenology of constitution*. (R. Rojcewicz & A. Schuwer, Trans.). Dordrecht: Kluwer.

Hutchins, E. (1995). How a cockpit remembers its speeds. *Cognitive Science*, *19*(3), 265–288.

Hutto, D. D., & Myin, E. (2013). *Radicalizing enactivism: Basic minds without content*. Cambridge, Mass.: MIT Press.

Jones, S. S., Collins, K., & Hong, H.-W. (1991). An audience effect on smile production in 10-month-old infants. *Psychological Science*, *2*(1), 45–49.

Kaufmann, J.-C. (2011). *Le sac. Un petit monde d'amour*. Paris: J. C. Lattès.

Krause, A. E., & Hargreaves, D. J. (2013). myTunes: Digital music library users and their self-images. *Psychology of Music*, *41*(5), 531–544.

Kraut, R. E., & Johnston, R. E. (1979). Social and emotional messages of smiling: An ethological approach. *Journal of Personality and Social Psychology*, *37*(9), 1539–1553.

Krueger, J. (2013). Ontogenesis of the socially extended mind. *Cognitive Systems Research*, *25-26*, 40–46.

Krueger, J. (2014). Affordances and the musically extended mind. *Frontiers in Theoretical and Philosophical Psychology*, *4*(1003), 1–13.

Kwon, Y.-H. (1991). The influence of the perception of mood and self-consciousness on the selection of clothing. *Clothing and Textiles Research Journal*, *9*(4), 41–46.

Legerstee, M. (1991). The role of person and object in eliciting early imitation. *Journal of Experimental Child Psychology*, *51*(3), 423–433.

Legrand, D. P. M. (2007). Pre-reflective self-consciousness: On being bodily in the world. *Janus Head*, *9*(2), 493–519.

Lim, H. B. T., Atkinson, G., Karageorghis, C. I., Eubank, M. R., & Eubank, M. M. (2009). Effects of differentiated music on cycling time trial. *International Journal of Sports Medicine*, *30*(6), 435–442.

Lysaker, P., Johannesen, J., & Lysaker, J. (2005). Schizophrenia and the experience of intersubjectivity as threat. *Phenomenology and the Cognitive Sciences*, *4*(3), 335–352.

Manian, N., & Bornstein, M. H. (2009). Dynamics of emotion regulation in infants of clinically depressed and nondepressed mothers. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *50*(11), 1410–1418.

Meacham, D. (2013). What goes without saying: Husserl's concept of style. *Research in Phenomenology*, *43*(1), 3–26.

Menary, R. (2010a). Dimensions of mind. *Phenomenology and the Cognitive Sciences*, *9*(4), 561–578.

Menary, R. (Ed.). (2010b). *The extended mind*. Cambridge, MA: MIT Press.

Merleau-Ponty, M. (1945/1962). *Phenomenology of perception*. (C. Smith, Trans.). London; New York: Routledge.

Montero, B. (2010). Does bodily awareness interfere with highly skilled movement? *Inquiry*, *53*(2), 105–122.

Murray, L., & Trevarthen, C. (1985). Emotional regulation of interactions between two month-olds and their mothers. In T. M. Field & N. Fox (Eds.), *Social perception in infants* (pp. 101–125). Norwood, NJ: Ablex.

Odling-Smee, J., Laland, K. N., & Feldman, M. W. (2003). *Niche construction: The neglected process in evolution*. Princeton: Princeton University Press.

Overy, K., & Molnar-Szakacs, I. (2009). Being together in time: Musical experience and the mirror neuron system. *Music Perception: An Interdisciplinary Journal*, *26*(5), 489–504.

Parkinson, B., Fischer, A. H., & Manstead, A. S. R. (2005). *Emotions in social relations*. New York: Psychology Press.

Posner, M., & Rothbart, M. K. (1998). Attention, self-regulation, and consciousness.

Philosophical Transactions of the Royal Society B: Biological Sciences, *353*, 1915–1927.

Robbins, P., & Aydede, M. (Eds.). (2009). *The Cambridge handbook of situated cognition*. Cambridge: Cambridge University Press.

Rowlands, M. (2008). *The new science of the mind: From extended mind to embodied phenomenology*. Cambridge, MA: MIT Press.

Rupert, R. D. (2004). Challenges to the hypothesis of extended cognition. *Journal of Philosophy*, *101*, 389–428.

Scherer, K. R. (2009). The dynamic architecture of emotion: Evidence for the component process model. *Cognition and Emotion*, *23*(7), 1307–1351.

Schull, N. D. (2005). Digital gambling: The coincidence of desire and design. *The ANNALS of the American Academy of Political and Social Science*, *597*(1), 65–81.

Searle, J. R. (1992). *The rediscovery of the mind*. Cambridge, MA: MIT Press.

Slaby, J. (2014). Emotions and the extended mind. In M. Salmela & C. von Scheve (Eds.), *Collective emotions* (pp. 31-46). Oxford: Oxford University Press.

Sprevak, M. (2010). Inference to the hypothesis of extended cognition. *Studies in History and Philosophy of Science Part A*, *41*(4), 353–362.

Stanghellini, G., & Ballerini, M. (2011). What is it like to be a person with schizophrenia in the social world? A first-person perspective study on schizophrenic dissociality – Part 2: Methodological issues and empirical findings. *Psychopathology*, *44*(3), 183–192.

Stephan, A., Walter, S., & Wilutzky, W. (2013). Emotions beyond brain and body. *Philosophical Psychology*, 1–17.

Sterelny, K. (2003). *Thought in a hostile world: The evolution of human cognition*. Malden, MA: Blackwell.

Sterelny, K. (2010). Minds: Extended or scaffolded? *Phenomenology and the Cognitive*

Sciences, *9*(4), 465–481.

Sterelny, K. (2012). *The evolved apprentice: How evolution made humans unique*. Cambridge, MA; London, England: MIT Press.

Sutton, J. (2006). Distributed cognition: Domains and dimensions. *Pragmatics & Cognition*, *14*(2), 235–247.

Taylor, R. (2004). *How to read a church: An illustrated guide to images, symbols and meanings in churches and cathedrals*. London: Ryder.

Tribble, E. B. (2005). Distributing cognition in the globe. *Shakespeare Quarterly*, *56*(2), 135–155.

Tronick, E. (2003). Things still to be done on the still-face effect. *Infancy*, *4*(4), 475–482.

Tronick, E. Z. (1989). Emotions and emotional communication in infants. *The American Psychologist*, *44*(2), 112–119.

Tronick, E. Z., Als, H., & Adamson, L. (1979). Structure of early face-to-face communicative interactions. In M. Bullowa (Ed.), *Before speech: The beginning of interpersonal communication* (pp. 349–370). Cambridge: Cambridge University Press.

Valdez, P., & Mehrabian, A. (1994). Effects of color on emotions. *Journal of Experimental Psychology: General*, *123*(4), 394–409.

Varga, S., & Krueger, J. (2013). Background emotions, proximity and distributed emotion regulation. *Review of Philosophy and Psychology*, *4*(2), 271–292.

Wilson, R. A. (2004). *Boundaries of the mind: The individual in the fragile sciences*. Cambridge: Cambridge University Press.

Wilson, R. A., & Clark, A. (2009). How to situate cognition: Letting nature take its course. In P. Robbins & M. Aydede (Eds.), *The Cambridge handbook of situated cognition* (pp. 55–77). New York: Cambridge University Press.

Woodward, S. (2006). Looking good: feeling right - aesthetics of the self. In S. Kuehler & D.

Miller (Eds.), *Clothing as material culture* (pp. 21–39). Oxford: Berg.