

Chapter 11

Perceiving Affordances and Social Cognition

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Navigating successfully through the environment requires perceiving what action possibilities the environment affords to us. Basically, we can distinguish between ecological affordances and interpersonal affordances. ‘Ecological affordances’ are action possibilities we perceive whilst navigating through the ecological environment. ‘Interpersonal affordances’, in contrast, are action possibilities we perceive whilst navigating through the interpersonal environment, for example, what interactive responses another person affords to us. As a bodily being, another person also provides us ecological affordances. When you are standing as stiff as a statue in front of a cupboard, I may perceive the ecological affordance to climb onto your shoulder in order to get the pan from the top shelf. In this sense, interpersonal affordances might be regarded as a sub-category of ecological affordances. That is, the interpersonal environment is a part of the ecological environment. However, the distinctive feature of persons who offer not only ecological but also interpersonal affordances to other people is that the other person’s body is typically not static but animate and in motion. I perceive your physical aspects, such as your body scale, in relation to mine when interacting with you and I coordinate my bodily movements accordingly. For example, kissing you, I bend down slightly, because you are smaller than me. Interpersonal affordances are, in contrast to ecological affordances, perceived within interactive *reciprocal* processes; the behavior of the other person affords behavioral responses to me. Furthermore, social-cognitive skills come into play in order to grasp the meaning of the other person’s bodily expressions.

But also the perception of ecological affordances might require social-cognitive skills. Although ecological affordances have been discussed intensively in the Gibsonian tradition, little attention has been paid to the role that social cognition plays for the perception of ecological affordances. The present paper aims to fill this gap in the debate. I provide a relational approach to affordances and analyze the role of social cognition for the perception of ecological affordances in social and institutional contexts.

11.1 Towards a relational account of affordances

The term ‘affordance’ goes back to James Gibson ([1979] 1986, p. 127) who defines it as follows:

The affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or ill. The verb is found in the dictionary, but the noun affordance is not. I have made it up. I mean by it something that refers to both the environment and the animal in a way that no existing term does. It implies the complementarity of the animal and the environment.

Gibson describes affordances as animal-related properties of the ecological environment. He considers the body scale of the animal as the essential aspect of the animal and affordances are relative to the body scale; for example, a surface that is horizontal, flat, extended, rigid and knee-high relative to the perceiver affords the possibility to sit upon it. Notably, 'knee-high' for a child is not the same as 'knee-high' for an adult; that is, perceived affordances are relative to the body scale of the individual perceiver. Gibson distinguishes between different kinds of affordances of the terrestrial environment (such as medium, substance, surface, person, and place) and highlights that some affordances are positive and beneficial whereas others are negative and injurious. For example, some substances that afford ingestion afford also nutrition for the animal, others in turn afford poisoning, and some are neutral. Of course, the benefits and injuries an object affords to an animal may be misperceived by the animal; for example, poison ivy may be mistaken for ivy that affords nutrition. According to Gibson, affordances exist prior to and independently of the perception of single individuals.

Reed (1996) as well as Heft (1989; 2001) follow Gibson's approach to conceive affordances as properties of the environment, which are relative to the animal's body scale. Warren's (1984) classical study of stair-climbing affordances has shown that although the ruler measured riser of a stairway as climbable differ across participants, the ratio of riser height to leg length remains common to all observers. Thus, people observe affordances (such as climbable stairs) in their own spatial dimensions.

A recent study of Cesari et al. (2003) has shown, however, that it is not just their own body scale upon which participants base their perception of stairs as climbable but also their own climbing competencies in terms of energy and motor flexibility; thus, older adults who have different stair-climbing abilities than young adults used the ratio differently and perceive climbing-affordances in terms of ability. The evidence indicates that there are affordances as Chemero (2003) defines them. Chemero's (2003) definition of affordances takes not just the environment's properties but also the animal's ability into account. More precisely, Chemero argues for affordances as relations between the abilities of an animal and some feature of the situation (see also Stoffregen 2003 for a similar approach to affordances).

Following Chemero, I defend a relational approach to ecological affordances. To perceive affordances is to perceive one's own action possibilities that depend on one's own action capabilities (the 'animal relatum') in relation to particular aspects of the ecological environment (the 'environment relatum'), including physical, intentional, and institutional aspects. This account also includes the perception of negative affordances in the sense that I may perceive my inability to meet particular challenges.¹ Notably, I remain neutral to the

¹ Other approaches to affordances deny the notion of negative affordances. Michaels (2003, p. 137), for example, defends the view that affordances need to be action related. Basically, Michaels distinguishes between two categories of 'affordances'; (1) action related affordances such as stairs that afford climbing, and (2) affordances in which actions are conspicuously absent such as a cliff or a snake that might afford danger or particular substances that afford nutrition. Since danger or nutrition are not actions in the sense of movements that are coordinated in order to achieve some goal, Michaels does not rank them among affordances.

question of whether perception should be regarded as being enactive or representational and do not defend any specific approach to perception in this article.

In the following, I will outline the peculiarities of these relata as well as their interrelations (see section 2 and 3). Furthermore, I discuss the role of social cognition for perceiving affordances. On my account, social cognition plays two roles for the perception of ecological affordances. First, social cognition plays a role in social learning which is often required for understanding what action possibilities particular aspects of the ecological environment afford (see section 2.1). Second, social cognition may shape an individual's perception of ecological affordances in a way that it determines whether or not an individual perceives himself or herself as being capable of making use of the affordances that he or she perceives. Here we can distinguish between 'social cognition in a narrow sense' that is required to understand the attitudes and intentions of a particular person in a given situation (see section 4.1), and 'social cognition in a broad sense' that is required to understand the shared intention of social group members who constitute a particular institution (see section 4.2).

11.2 The environment relatum: physical, intentional, and institutional aspects

I distinguish between three aspects that an individual may perceive in an ecological object: 'physical aspects', 'intentional aspects', and 'institutional aspects'. The 'physical aspects' of an object include its physical features such as size, weight, shape, etc. Sensorimotor knowledge is acquired by sensory-motor exploration of the physical aspects of an object. Perceiving the physical aspects of an object involves so-called *sensorimotor knowledge* for which purpose² these aspects can (reasonably) serve. For example, when aiming to destroy a window to break into your house, I may make use of the heavy secateurs I found in your garden by throwing it at the window considering the weight and size of the secateurs as being suited for that purpose. Considering the leaves on the earth for this purpose, in contrast, would not be sensible.

Obviously, the secateurs have not been designed to serve the purpose of breaking windows. They have been designed to cut the plants. When you are gardening, you typically focus on those physical aspects that can serve the purpose for which the secateurs have been designed (that is, the scissors blades that are suitable to cut the plants when pressing the handle); call those aspects 'intentional aspects' (Tomasello 1999a). To perceive the purpose for which an object has been designed is to perceive the purpose for which an object has been designed *for us*, that is, the *conventional* use of the object; call this *conventional knowledge*. Furthermore, the knowledge of this conventionality may be implicit in the sense of being non-conscious but accessible. For example, you may not be consciously aware of the conventionality of a fork when you perceive its intentional affordance to use it as a tool for eating your dish. But when you are asked about it, you are well capable of indicating that using a fork for eating is a conventional use, and you may also be capable of indicating the society in which this use is conventional (for example, Western but not Eastern cultures).

² Of course, the perceived 'flexibility' of the use of an object's physical aspects 'for whatever purpose' is relative to the perceiving system. That is, although the secateurs may, in general, be perceived as being heavy and big enough to be a tool for breaking the window, I may not perceive this sensorimotor affordance because I do not think I am strong enough to pick up and throw the secateurs.

Finally, you may focus on the ‘institutional aspects’ of an ecological object. Imagine, for example, that the *secateurs* (being a special kind of scissors) are part of a modified version of the game *Paper, Scissors, Stone* in which gamblers choose among these three options not by making manual gestures. Instead, each gambler has one box containing a paper, a scissor, and a stone and has to choose one item. Within this game, the *secateurs* have what Searle (2011) calls a ‘status function’ (that is, the scissors win over the paper but lose against the stone) and to perceive this function is to perceive the ‘institutional aspects’ that this object affords within an institutional context, that is, the game.

The crucial difference between perceiving what the ‘intentional aspects’ of an object afford in a conventional context and perceiving what the ‘institutional aspects’ of an object afford in an institutional context is that the latter, though not the former, presupposes the existence of an institution involving other agents. In line with Kono (2009, p. 357), I propose that social institutions produce and maintain the institutional aspects of the ecological environment and construct the ‘niche’ for human beings. Without explicit reference, Kono seems to adopt Gibson’s ([1979] 1986, p. 128) conception of ‘niche’, according to which “a niche refers more to *how* an animal lives than to *where* it lives. I suggest that a niche is a set of affordances”. Gibson provides the example of a postbox that affords letter-mailing to a person living in a community with a postal system. Thus, by the postal system the letter-mailing affordance of the postbox is produced and maintained.

I perceive the intentional aspect of an object, that is, the purpose for which it has been designed, without taking into account the institutional context (in which it may have been designed). When perceiving institutional affordances, in contrast, I perceive the institutional aspect of an object always by taking the institutional system into account. An institutional system typically involves a set of social rules and roles which I need to know (call this *institutional knowledge*) and to follow in order to actualize the perceived affordance; I need to affix the appropriate postage stamp on the letter to perceive that the postbox in which I throw the letter affords transferring my letter. Furthermore, the postal system involves a number of agents who contribute to actualizing my perceived affordance whereas I do not need any other agent within an institutional system to actualize the intentional aspects I perceive of an object; for example, I may use an alarm clock to wake up even if I am on a desert island, far away from any institutional systems whereas I don’t perceive the post box I brought with me on my stranded ship as affording letter-mailing anymore. That is, perceiving institutional affordances presupposes the *belief* in the existence of a particular institution such as the post (which is not given on a desert island).

One and the same object can have (in principle) a variety of affordances for the perceiver. Depending on which perceived aspect is of significance to the animal in a given situation, the animal perceives what I call ‘sensorimotor affordances’ (when the physical aspects are significant), ‘intentional affordances’ (when the intentional aspects are significant) or ‘institutional affordances’ (when the institutional aspects are significant) of the ecological environment. Following Fröse and Di Paolo (2011), I propose that “significance [...] constitutes a concern which is relative to the current situation of the system and its needs” (p. 7). For example, the physical aspects of an object (say, a post box) may be of significance to me in a given situation (for example, when I aim to pick an apple from a tree by climbing on the post box) whereas in other situations, different aspects of that very object may be significant (such as the institutional aspect of the post box that affords mail lettering).

11.2.1 The Role of Social Learning

An individual's understanding of what the various aspects of the ecological environment may afford develops throughout ontogeny via individual exploration or social learning.

Infants acquire sensorimotor knowledge of the physical aspects of objects by individual exploration at the very beginning of ontogeny. From birth onwards infants are engaged in touching and sucking at objects. Within the first weeks of life, they are able to modify their sucking behavior in a fitting manner to the object they are sucking at (Piaget [1970] 2003). Three-month-olds reach for objects not just on the basis of visual stimuli but also auditory ones (Clifton et al. 1993). From the fifth month onwards, infants are even capable of accounting for the object's distance in their grasping behavior (Field 1976) indicating a first implicit awareness of their own body scale and grasping abilities in relation to another physical object or person.

At about age 1, infants acquire social-cognitive competencies that enable them to learn about the physical aspects of the environment in situations of so-called 'social referencing'. In social referencing infants refer to an adult in ambiguous situations and adopt the emotional attitude of the adult towards a particular situation or an (inanimate or animate) object in order to determine whether the situation or object in question is 'safe' or 'unsafe' to approach, or (more basically) 'good' or 'bad' (Striano and Rochat 2000; Moses et al. 2001). Via social referencing, infants may get a grasp, for example, of whether surfaces are 'crawl-able'. In the so-called 'visual cliff' paradigm, 1-year-old infants were put on the covered part of a glass table and they saw their mothers at the far end of the table. The mother either smiled at the infant or showed him or her fearful facial expressions. Infants, unsure whether or not it is safe to crawl over the glass table to get to their mothers, mostly crossed the 'visual cliff' when their mothers smiled at them whereas none of the infants ventured over the visual cliff when they saw their mothers' fearful expressions (Gibson and Walk 1960).

To be engaged in social referencing, infants need to have a grasp of another person's emotional attitudes and attention to entities in the ecological environment, and they need to be capable of joint attention. Joint attention can be defined as the awareness that oneself and another agent are attentive towards the same ecological entity and that this awareness is mutually shared or is mutual common knowledge among the agents (see Triesch et al. for a discussion). Joint attention has been found to be developed at the same age in infants from different cultures (Tomasello 1999b), suggesting that it relies on a cognitive module that is innate but emerges in the course of development which is determined by its own developmental timetable rather than interaction with the culture-specific social environment (Baron-Cohen 1995). Furthermore, infants need to account for another person's emotional attitude towards objects or other people in situations of social referencing.

By social referencing infants enter the conventional world in which they grow up. Though an infant might not fully understand the complex set of conventional beliefs that underlie the adult's emotional attitude towards particular entities (for example, an infant growing up in a Muslim family may not understand initially that her mother shows a facial expression of disgust towards pork due to religious reasons), she simply adopts that negative attitude and integrates it into her behavioral repertoire by avoiding eating pork henceforward³. Infants

³ This does not necessarily presuppose the possession of a linguistic concept of PORK, but only the capability to categorize pork according to specific physical aspects (color, consistency etc.). Already 11-month-olds have been found to be able to categorize ecological objects (Pauen 2002).

adopt the emotional attitudes of close adults, mostly their parents, independently of whether that attitude is shaped by the conventional or personal beliefs of the adults; in either way, the infants become a social being and part of the social group she lives in (the family in a narrow and the society in a broader sense). By the adoption of emotional attitudes towards situations and objects, the perception of these entities gains a normative connotation and in this way modulates what we perceive as affordances. As recent studies have shown, a communicative setting is required to yield this effect (see Csibra 2010 for a review). Communicative settings are established by ostensive cues such as waving to the observer, calling him or her by name or simply looking at him or her.

An understanding of the ‘intentional aspects’ or ‘institutional aspects’ of objects is typically acquired via different forms of social learning. Many objects infants deal with are artificial and designed for specific purposes. I agree with Tomasello (1999a, p. 154) that “in many instances, the purpose of an artifact can only be discerned through adult demonstration or instruction that establishes what ‘we’ do with it, after which the artifact possesses intentional affordances – that is, in addition to the natural affordances for sensory-motor action that have so occupied Gibsonians.” One glance is sufficient to find Tomasello’s claim supported that most (or at least many) of the ecological objects we are surrounded by are artificial. Tomasello makes a distinction between natural objects such as rocks and material artifacts such as tools that are designed for a specific purpose. Although I follow Tomasello in calling those affordances that a material artifact affords to fulfill the purpose for which it has been designed ‘intentional affordances’, I do not only use the term ‘sensorimotor affordances’ for the affordances of natural objects. On my account, perceiving different affordances is dependent on perceiving different *aspects* of an ecological object, independent of whether this object is artificial or not.

Infants may, for example, discover that drapes afford help in pulling themselves up in their first attempts to standing upright (‘sensorimotor affordances’) without knowing about the intentional affordances of drapes to darken the room. Likewise an infant may explore that a chair is sit-able without understanding that it has been designed for precisely this purpose. Of course, infants may explore accidentally that drapes can be used to darken the room but as long as they are not aware of this as an intentional rather than a physical aspect, they do not perceive the intentional affordances of drapes. Perceiving the ‘intentional affordances’ of an object requires one to perceive the purpose an object has been designed for *as* the purpose an object has been designed *for us*; perceiving the intentional aspects of an object is to perceive aspects that are designed for a conventional use. That is, it involves conventional knowledge.

Following Tomasello (1999a), I distinguish between two kinds of social learning: emulation learning and imitative learning. In emulation learning, we learn something about the intrinsic physical features of an object by observing another conspecific dealing with that object. This kind of learning is also observable in non-human primates; for example, observing a conspecific’s cracking open a nut might lead the observer to use this information to crack open the nut. The observer solves the problem not by using the own strategy but rather by emulating the other’s problem-solving strategy (p. 156). In emulation learning, we learn about the *physical aspects* of an object, that is, what the object affords to us sensory-motorically. In imitative learning, in contrast, we learn about the *intentional aspects* of an object, that is, the conventional use for which a particular object has been designed, or the *institutional aspects* of an object, that is, the use of a particular object in an institutional context. We imitate actual behavioral strategies of another person due to our attribution of normativity to the other’s action, which is human-specific and needs to be distinguished from a blind mimicry of the

other's sensory-motor actions such as when a parrot mimics human speech or a human or non-human primate newborn mimics the adult poking out his tongue.

In general, imitating how another person deals with an object to achieve a specific goal, presupposes an understanding of another person as an intentional agent who represents a particular means-end relation in order to achieve that goal. Of course, another person's action plan might not always be the best to achieve a particular goal. As a result of understanding this, 18-month-olds imitate not the specific movements they observe an actor performing who is unsuccessfully attaining a specific goal but rather novel actions that lead to the actor's desired result (Meltzoff 1995). Carpenter et al. (1998) have found that 14- to 18-month-old infants imitate twice as many purposeful rather than accidental actions they observe. In line with this research, 15-month-olds have been found to choose that out of two artifacts that they have observed to be more efficient for a specific purpose than the other one (Elsner and Pauen 2007). Whereas children acquire an understanding of how to make use of tools via imitation early in ontogeny, children's tool innovation is developed much later. For example, Beck et al. (2011) have found that children do not choose a hook tool to retrieve a bucket from a tube until age 7.

2-year-olds exhibit an understanding of the intentional aspects of ecological objects also by being engaged in so-called 'pretend plays' in which they make use of the physical and intentional aspects of objects playfully (Rakoczy 2008). According to Tomasello (1999a), infants being engaged in pretend play must be able to (1) understand and adopt the adult's conventional use of objects and artifacts, and (2) 'decouple' the intentional affordances from the objects playfully; for example, the infant might use a banana as a telephone.

The ability to make use of the various aspects of an object playfully may be required for perceiving the institutional aspects of an object. In the institutional context of playing games, for example, gamblers may 'decouple' the intentional affordances of an object playfully and assign a particular 'status function' to it. On my account, the status function of an object is determined by its relation to other objects within the institutional system and the relations among these objects are typically specified by a set of rules. In chess, for example, the rook has a status function which is determined by the rules of chess that assign different status functions to the different pawns in the game. Perceiving the institutional aspects of a rook in the context of playing chess is to perceive the institutional affordances of the rook as a particular pawn in the game. Children may acquire (institutional) knowledge of a set of (institutional) rules by imitating another person's demonstration (Rakoczy et al. 2009; Williamson et al. 2010). As pointed out by Rakoczy et al. (2009), when children learn rules in an institutional context such as a game, they preferentially imitate the demonstrations of particular rules of familiar persons who have previously appeared to the children as being reliable.

In general, perceiving institutional affordances involves perceiving an institutional context. Perceiving an institutional context, in turn, involves being aware not just of oneself but also of other (maybe currently non-present) agents as part of that institution. As I will argue later, this awareness involves what I call 'broad social cognition' (see section 4.2).

If agents are engaged in an institutional context that involves social rules and norms, commitments to obey these rules come into play. When playing chess, for example, you would protest if I used the tower like the queen. Developmental studies have shown that 2-year-old children can learn about the institutional affordances of the pawns in a particular game and the conventional rules of that game via demonstration and explanation of their interaction partner. At this age, children are well aware of the joint commitments that exist in

institutional contexts. When playing a particular game entailing a specific set of rules, they protest if their interaction partner breaks the joint commitment to obey these rules (Rakoczy et al. 2008).

11.3 The animal relatum: body default, and deviant body percept

When perceiving different kinds of ecological affordances, we do not only focus on particular aspects of the ecological environment (environment relatum) but also take into account our ability to make use of the action possibilities those aspects afford to us (animal relatum).

On my account, what I call a ‘body default’ and a ‘body percept’ may play a role in the perception of any kind of affordances insofar as sensorimotoric actions are required to use them. In perceiving our own action abilities in terms of what the environment affords us, one needs to take into account one’s own body scale, as it has been demonstrated, for example, nicely by Warren’s (1984) stair climbing experiment. Furthermore, our general physical capability (in terms of energy and motor flexibility) and skills to perform a particular action need to be taken into account. When individuals perceive affordances, they do so by taking into account their ‘body default’ that is uninfluenced by their deviant body percept and the given social context in which they perceive the affordances.

The individual’s ‘body default’ involves the unity of (i) body features of his or her body scale (properties such as body height, weight, shape, etc.), (ii) general physical action capabilities in terms of energy and motor flexibility, and (iii) general action skills (that is, simple skills such as walking as well as sophisticated skills such as playing the piano).

Moreover, the body scale does not just involve the body height of a given individual but also other bodily properties such as weight or muscularity. Even pieces of clothing that I wear regularly such as my watch may be part of my body scale. My default body scale (which is part of my body default) might be shaped by the clothes I wear in a particular situation and that influence my perception of affordances in a crucial way; how deep I feel capable of diving into a 15 meter deep lagoon may depend on whether I wear a snorkel or a diving bell. It may also depend on my general diving skills. Our more or less general skills to perform particular actions may impact our (unconscious as well as conscious) perception of ecological affordances. As a professional swimmer, diving as deep as 15 meters is no problem at all for me, and I perceive the lagoon affording me diving to the bottom with ease. As a non-swimmer, in contrast, I perceive the lagoon affording the possibility of rather drowning than swimming in it and even less of diving in it.

As pointed out by Cesari’s et al. (2003) follow-up study of Warren’s (1984) experiment, our general physical action capabilities might change with age in terms of motor flexibility and/or energy; the latter involves a perceptual aspect, that is, how I perceive my body perceptually. Let’s call this, following Gallagher (2005), ‘body percept’. This is part of what Gallagher calls ‘body image’ that involves attitudes and beliefs about our body. According to Gallagher (2005, p. 25), the body image entails three different sorts of intentional contents: (1) a ‘body percept’ that involves our perceptual experience of our own body, (2) a ‘body concept’ that involves a conceptual folk and/or scientific knowledge about our body in general, and (3) a ‘body affect’ that involves our subjective emotional attitude towards our own body.

In the present investigation, I focus on the body percept (even though the body concept and body affect may also play a role in the perception of affordances). In general, the body percept is crucial in order to judge whether we are in a good physical condition to perform a

certain action such as climbing a hill. The body percept is always experienced in the present. I distinguish between a ‘deviant body percept’ and a ‘general body percept’. The general body percept is characterized by how we *typically* experience our body. For example, it is defined by a specific level of energy/tiredness that we typically experience in everyday life. On my account, the general body percept is part of the body default. The deviant body percept, in contrast, is characterized by a phenomenal bodily experience that deviates from the default; for example, when a person feels tired or excited.

Crucially, if you experience your body consistently over time in a particular way, it may become part of your body default, for example, if you have recurring back pain. That is, I account for the general body percept as being part of the body default that we typically take into account when we perceive our action abilities in relation to aspects of the environment. Growing older, I may perceive my body’s physical fitness as restricted consistently over time so that this constraint becomes part of my general body percept and my sense of my body default which influences my perception of affordances. As pointed out by Bhalla and Proffitt (1999), judging hill slants and walking distances is indeed influenced by the perceiver’s age and physical condition.

The deviant body percept deviates *by definition* from the general body percept. Judging hill slants and walking distances maybe influenced by our deviant body percept when we are fatigued (Proffitt et al. 1995) or wearing a heavy backpack (Proffitt et al. 2003). Furthermore, we are able to manipulate our deviant body percept and thereby the perception of affordances; Schnall et al. (2010) have shown that those participants who had consumed a glucose drink perceived the slant of a hill to be less steep than participants who had consumed a drink containing non-caloric sweetener. In general, these studies indicate that the deviant body percept only comes into play if we are more fatigued or excited than usual or if we feel bodily impaired in terms of energy and motor flexibility because of wearing a heavy backpack. If our bodily experiences do not deviate from the standard, the body default is taken into account whilst navigating through the environment.

11.4 The Role of Social and Institutional Contexts

Living in a society, we often perceive ecological affordances in a socio-situational context. Broadly, I distinguish between perceiving affordances in a *social context*, that is, in the (imagined or actual) presence of other people, or in an *institutional context*, that is, in the presence of an institution in which other people are involved. Social cognition may shape the perceived action abilities in both contexts; whereas what I call ‘social cognition in narrow sense’ may come into play in social contexts, ‘social cognition in a broad sense’ plays a central role in the perception of affordances in institutional contexts.

11.4.1 Social contexts and social cognition in a narrow sense

Our perception of affordances may be modulated by the social context in which we perceive the affordances in a given situation. Karmack et al. (1990) have shown that cardiac stress reactions are reduced in task situations if the participant is accompanied by a supportive other person rather than alone. Similarly, Schnall et al. (2008) pointed out that participants accompanied by a friend perceived a hill as less steep compared to perceiving the hill alone. Furthermore, the quality of the social relationship to the person who accompanies us in perceiving affordances plays a crucial role, even if this person accompanies us just in

imagination: participants who thought of a supportive friend whilst perceiving a hill perceived it as less steep than those participants who thought of a neutral or disliked person.

On my account, ‘social cognition in a narrow sense’ is required to understand the attitudes and intentions of a particular person in a given situation. ‘Social cognition in a broad sense’, in contrast, is not tied to understanding the individual attitudes and intentions of particular persons in a specific context but to the shared attitude and intention of social group members who constitute a particular institution (see section 4.2).

Which cognitive procedure people use when attributing mental states to other people has been discussed in the so-called ‘theory of mind debate’. There are two main schools in this debate: (i) Theory Theory (TT), and (ii) Simulation Theory (ST). According to theory theorists (Perner 1999; Gopnik 2003), we understand other minds by means of folk psychological rules such as “if A wants p and believes that doing q will bring about p, then *ceteris paribus*, A will do q” (Borg 2007, p.6). Proponents of so-called ‘Simulation Theory’, in contrast, claim that we put ourselves imaginatively ‘into the shoes’ of another person and simulate the thoughts and feelings we would experience in her situation (Goldman 2006).

Rather than there being a single default procedure that people use whenever attempts are being made to explain an agent’s behavior I defend a pluralistic approach to social understanding and propose that it is more likely that individuals use different procedures to achieve such understanding dependent on the particular situation of social understanding and cognitive effort. There are some indicators that might help to determine which procedure has been used in predicting or explaining another person’s behavior. Individuals make use of a folk psychological theory, for example, in situations that allow for psychological generalizations. Theory theorists propose that a folk psychological theory involves a conceptual understanding of mental states such as beliefs and desires, how they interrelate and motivate agents to act. In line with what Saxe (2005) has called ‘the argument from error’, I propose that in tasks that presuppose a conceptual understanding of mental states, errors that hinge on a congruency between the observer’s failure or success in behavior prediction and her theory about how minds work may serve as an indicator of theory use. Simulation processes, in contrast, are not proposed to rely on psychological generalizations. Rather, simulation theorists argue that individuals are engaged in running simulation routines each time anew when it comes to understanding other minds in a given situation. As pointed out by Goldman (2006), egocentric biases in the domains of knowledge, evaluation, and feeling may serve as an indicator of simulation.

However, I propose that social understanding can not only be achieved by theory or simulation. Studies on so-called ‘stereotype activation’ have shown that people automatically associate particular attitudes and character traits with members of social groups that are categorized along for example, gender or race (Eagly and Steffen 1984; Lin et al. 2005). Notably, the stereotyping process often occurs automatically without the perceiver’s intention or awareness (Macrae and Bodenhausen 2000), and may even diverge from the perceiver’s intention. Empirical studies suggest that associations only become integrated in mental state or character trait attribution when they do not diverge from the perceiver’s intention. If the perceiver becomes aware of that divergence, he may be able to override undesirable implicit processes (Cunningham et al. 2004).

Analogous to associations that become automatically activated when people face members of social groups, I propose that people associate also specific peculiarities (attitudes, character traits, habits, etc.) with a familiar person on the basis of their interactive or observational experiences with the person in the past or due to what a third party has told them about this

person (call this ‘associations with person identity’). I propose that an individual associates a friend typically with a positive attitude towards himself or herself, and that it is precisely this association that comes into play when an individual’s perception of ecological affordances (for example, the climb-ability of hills) is supported by the presence of a friend (see above). Even though this has not been tested empirically yet, I assume that also the presence of a foreign person may yield a supportive or inhibitive effect on the perceived action possibilities by impacting the body percept in situations in which the attitude of this person is derivable by either theory or simulation or experientially accessible by means of lower-cognitive empathetic processes.

11.4.2 Institutional contexts and social cognition in a broad sense

Following Searle (2011), I propose that the *creation* of the institutional aspects of an object presupposes an awareness of the object being part of an institutional context in which other people are involved and agree upon and recognize the status function of the object in question (call this ‘constitutive condition’). For example, the existence and validity of a social fact such as money is created by a group of agents who collectively recognize a wad of notes *as* money. Notably, once a social fact is in place, the agents may forget about its social origin and treat it as a natural fact. Searle (2011, p. 58) writes:

Cooperation requires the collective intention to cooperate. But collective recognition need not be a form of cooperation and thus does not require a collective intention to cooperate. [...] Rather, what it requires is that each participant accepts the existence and validity of money in the belief that there is mutual acceptance on the part of the others. So we have an interesting result; namely, that the existence of an institution does not require cooperation but simply collective acceptance or recognition. Particular acts within the institution such as buying or selling or getting married or participating in an election require cooperation.

Thus, collective recognition but not collective intentionality is required for the *creation* of the institutional aspects of an object (constitutive condition). The status function Y of an object X in an institutional context C is defined by what Searle (2011) calls the constitutive rule ‘X counts as Y in C’. Insofar as X *represents* Y in C, I agree with Searle that for perceiving institutional facts as such linguistic skills “or at least some form of symbolism” (p. 95) are required.

Institutional aspects of ecological objects are status functions that are created only in virtue of the collective acceptance and recognition of that very status by a group of people who constitute the institution. Tuomela (2010, p.202 ff.) provides the medieval case of squirrel pelt taken as money and introduces a useful distinction between what he calls the ‘generic institution’ of money that refers to the institutional predicate of ‘money’ generally understood (such as that money involves exchanging activities etc.) and ‘tokens’ of money such as squirrel pelts. For a squirrel pelt to have the institutional aspect or status function of money, a social group (for example, a particular society who lived in the Middle Ages) needs to accept this status function under conditions of mutual common knowledge and needs to collectively recognize that status function in a context in which this institutional aspect becomes relevant (for example, on a market where exchanging activities come into play). Insofar as these requirements presuppose an understanding of the psychological states of the other group

members, what I call ‘social cognition in the broad sense’ is involved. I call it social cognition in the *broad sense*, because the social-cognitive processes being involved are not devoted to a particular person in a specific context (as it is the case in social cognition in the narrow sense, see previous section) but to any member of the group in a stereotypical institutional context.

Social cognition in a broad sense is not only involved in the collective recognition of a status function but also the collective intention to cooperate. To perceive which actions the institutional aspects of an object afford within an institutional context requires the collective intention to cooperate insofar as *making use* of these aspects is part of a cooperative action among a number of agents (call this ‘executive condition’). A particular act within an institution such as the post requires the collective intention to cooperate which might be structured by a set of rules and roles. For example, when I make use of the institutional aspect of a post box, namely mail-lettering, I need to affix the appropriate postage stamp on the letter. In addition, I need to believe in the existence of the postal system that involves a number of agents who contribute to actualizing my perceived affordance which is not given on a desert island (see section 2 for a discussion).

The psychological states of the members of an institution like the post have been discussed in framework of so-called shared or collective intentionality (Searle 1990; Bratman 1993; Tuomela 2010). Bratman (1993), for example, defines a ‘shared intention’ as “a state of affairs consisting primarily of appropriate attitudes of each individual participant and their interrelation” (p. 99) in which each participant represents his or her contribution (*as* contribution) to the group activity being performed. Perceiving institutional affordances requires an awareness of the shared intention the cooperating agents of the institution have even if these agents are not present in a given context of perceiving the institutional affordances; such awareness also amounts to ‘social cognition in a broad sense’. Notably, shared intention and cooperation are not only involved in institutional frameworks but also in basic joint actions such as intentional joint attention (Fiebich and Gallagher 2012).⁴

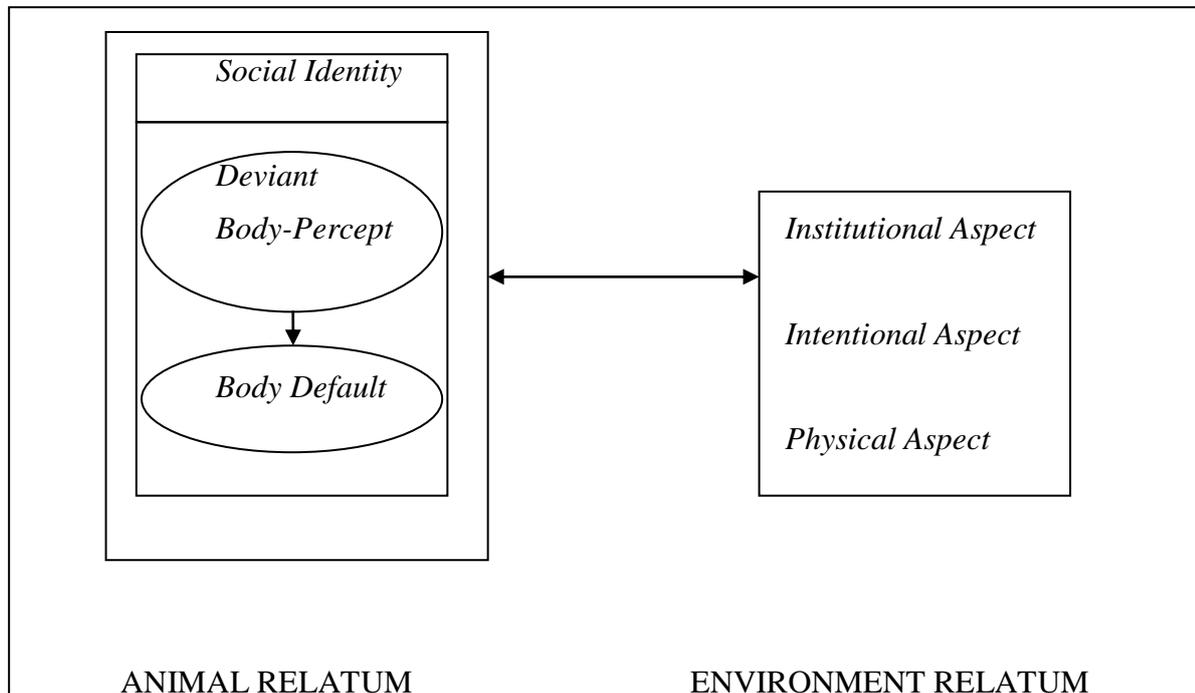
Finally, an awareness of being a member of a social group (‘social identity’) who is engaged in an institutional context is required to perceive one’s own socio-normative ability to make use of institutional affordances. For example, I may perceive a particular stone as a boundary and negative affordance to cross the landscapes when I perceive myself as a member of a particular tribe. Perceived social identity may also involve perceiving one’s status or role within the group. Imagine, for example, that only the two chiefs of the tribes are allowed to cross the stone that functions as a border for the other tribe members. Being a chief, the stone might then afford crossing the boundary of the landscapes whereas it does not so for the other members of the tribe.

11.5 Summary

To sum up, in the perception of ecological affordances, we perceive the environment in terms of the relation between, on the one hand, our own abilities (the animal relatum) based upon our body default which might be shaped by our deviant body percept (perceived bodily abilities) and based upon our social identity (socio-normative abilities), and, on the other hand, the physical, intentional and institutional aspects of the ecological environment (the ecological environment relatum).

⁴ That is, social cognition in a broad sense also comes into play when the interacting agents form a shared intention outside of an institutional setting. This, however, is not the focus of the present investigation.

Fig. 1: Perceiving ecological affordances



Furthermore, perceiving ecological affordances may take place in social contexts, that is, in the (imagined or actual) presence of other people, or institutional contexts, that is, in the presence of an institution in which other people are involved. If so, social cognition may shape the perceived action abilities. ‘Social cognition in a narrow sense’ is understanding the intentions, feelings and attitudes of a particular person that may support the perceived bodily abilities in a given social context. ‘Social cognition in a broad sense’, in contrast, is not tied to understanding the individual attitudes and intentions of particular persons in a specific context but to the shared intention of social group members who constitute a particular institution. It is a presupposition for the perception of socio-normative abilities in institutional contexts.

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11.6 References

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