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Ambiguity in the sense of agency

Abstract

In a variety of recent studies the concept of the sense of agency has been shown to be phenomenologically complex, involving different levels of experience, from the basic aspects of sensory-motor processing (e.g., Farrer et al. 2003; Tsakiris and Haggard 2005; Tsakiris, Bosbach, and Gallagher 2007) to the higher levels of intention formation and retrospective judgment (e.g., Pacherie 2006, 2007; Stephens and Graham 2000; Synofzik, Vosgerau, and Newen 2008; Gallagher 2007, 2010). After summarizing this complexity, I will argue, first, that the way that these various contributory elements manifest themselves in the actual phenomenology of agency remains ambiguous, and that this ambiguity is in fact part of the phenomenology. That is, although there surely is some degree of ambiguity in the analysis of this concept, perhaps because many of the theoretical and empirical studies cut across disciplinary lines, there is also a genuine ambiguity in the very experience of agency. Second, most studies of the sense of agency fail to take into consideration that it involves more than simply something that happens in the head (mind or brain), and specifically that it has a social dimension.

Keywords

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Ambiguity in the sense of agency

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In a variety of recent studies the concept of the sense of agency has been shown to be phenomenologically complex, involving different levels of experience, from the basic aspects of sensory-motor processing (e.g., Farrer et al. 2003; Tsakiris and Haggard 2005; Tsakiris, Bosbach, and Gallagher 2007) to the higher levels of intention formation and retrospective judgment (e.g., Pacherie 2006; 2007; Stephens and Graham 2000; Synofzik, Vosgerau and Newen 2008; Gallagher 2010). After summarizing this complexity, I will argue, first, that the way that these various contributory elements manifest themselves in the actual phenomenology of agency remains ambiguous, and that this ambiguity is in fact part of the phenomenology. That is, although there surely is some degree of ambiguity in the analysis of this concept, perhaps because many of the theoretical and empirical studies cut across disciplinary lines, there is also a genuine ambiguity in the very experience of agency. Second, most studies of the sense of agency fail to take into consideration that it involves more than simply something that happens in the head (mind or brain), and specifically that it has a social dimension.

Complexities¹

Normally when I engage in action I have a sense of agency for that action. How is that sense or experience of agency generated? It turns out that there are a number of things that can contribute to this experience. Some, but not all of these things do contribute to the experience of agency in all cases. I'll start with the most basic – those aspects that seem to be always involved – and then move those that are only sometimes involved.

Motor control processes

If we think of the sense of self-agency (SA) as the experience that I am the one who is causing or generating the movement, then we can distinguish SA from the sense of ownership (SO) for movement, which is the sense that I am the one who is undergoing the movement – that it is my body moving, whether the movement is voluntary or involuntary (Gallagher 2000a&b). In the case of involuntary movement, SA is missing, but I still have SO. If I'm pushed, I still have the sense that I am the one moving, even if

¹ This and the following section summarizes some of the material discussed in Gallagher (2010).

I did not cause the movement. These experiences are pre-reflective, which means that they neither are equivalent to nor depend on the subject taking an introspective reflective attitude. Nor do they require that the subject engages in an explicit perceptual monitoring of bodily movements. Just as I do not attend to the details of my own bodily movements as I am engaged in action, my sense of agency is not normally something that I attend to or something of which I am explicitly aware. As such, SA is phenomenologically recessive.

If we are thinking of action as physical, embodied action that involves self-generated movement, then motor control processes are necessarily involved. The most basic of these are efferent brain processes that are involved in issuing a motor command. Let's think again about involuntary movement. In the case of involuntary movement there is a sense of ownership (SO) for the movement but no sense of self-agency. Awareness of my involuntary movement comes from reafferent sensory-feedback (visual and proprioceptive/kinaesthetic information that tells me that I'm moving). There are no initial motor commands (no efferent signals) that I issue to generate the movement. It seems possible that in both involuntary and voluntary movement SO is generated by sensory feedback, and that in the case of voluntary movement a basic, pre-reflective SA is generated by efferent signals. Tsakiris and Haggard (2005; also see Tsakiris 2005) review empirical evidence to support this division of labor. They suggest that efferent processes underlying SA modulate sensory feedback resulting from movement. Sensory suppression experiments (Tsakiris and Haggard 2003) suggest that SA arises at an early efferent stage in the initiation of action and that awareness of the initiation of my own action depends on central signals, which precede actual bodily movement. Experiments with subjects who lack proprioception but still experience a sense of effort reinforce this conclusion (Lafargue, Paillard, Lamarre, & Sirigu 2003; see Marcel 2003). As Tsakiris and Haggard put it,

the sense of agency involves a strong *efferent* component, because actions are centrally generated. The sense of ownership involves a strong *afferent* component, because the content of body awareness originates mostly by the plurality of multisensory peripheral signals. We do not normally experience the efferent and afferent components separately. Instead, we have a general awareness of our body that involves both components. (Tsakiris and Haggard 2005, 387).

This pre-reflective SA does not arise simply when I initiate an action; as I continue to control my action, continuing efferent signals, and the kind of afferent feedback that I get from my movement, contribute to an ongoing SA.² To the extent that I am aware of

² It is important to distinguish SA, as related to motor control processes, from what Fabio Paglieri (this volume) calls the experience of freedom, which, he argues, has no positive pre-reflective phenomenology. Paglieri distinguishes the question of an experience of freedom from other aspects that may be involved in SA, e.g., the experience of action control, and leaves the phenomenological status of such aspects an open question. This is consistent with my own view about the distinction between issues pertaining to motor control (as in the Libet experiments) and anything like an experience of freedom, which I understand not to be reducible to motor control (Gallagher 2006). Paglieri nonetheless expresses a skepticism about the sense of agency and suggests that "it rests on an invalid inference from sub-personal hypotheses to phenomenological conclusions" (p. ?). In fact, however, the inference validly goes in the other direction.

my action, however, I tend to be aware of what I am doing rather than the details of how I am doing it, e.g., what muscles I am using. Even my recessive awareness of my action is struck at the most pragmatic level of description (“I’m getting a drink”) rather than at a level of motor control mechanisms. That is, the phenomenal experience of my action already involves an intentional aspect. What I am trying to accomplish in the way of basic movements (e.g., moving out of the way, walking to open the door, reaching for a drink) informs my body-schematic processes, which are intentional (and reflect what Merleau-Ponty calls a motor intentionality) just because they are constrained by what I am trying to do.

Intentional aspects in SA

Several brain imaging experiments have shown that the intentional aspects of what I am trying to do and what actually I accomplish in the world enter into our sense of agency. These experiments help us to distinguish between the purely motor control contributories (the sense that I am moving my body) and the most immediate and perceptually-based intentional aspects (the sense that I am having an effect on my immediate environment) of action (Chaminade and Decety 2002; Farrer and Frith 2002). These experiments, however, already introduce a certain theoretical ambiguity into the study of SA, since they fail to clearly distinguish between motor control aspects and intentional aspects.

For example, in their fMRI experiment, Farrer and Frith (2002), designed to find the neural correlates of SA, subjects are asked to manipulate a joystick to drive a colored circle moving on a screen to specific locations on the screen. In some instances the subject causes this movement and in others the experimenter or computer does. The subject has to discriminate self-agency and other-agency. Farrer and Frith cite the distinction between SA and SO (from Gallagher 2000a), but associate SA with the intentional aspect of action, i.e., whether I am having some kind of effect with respect to the goal or intentional task (or what happens on the computer screen). Accordingly, their claim is that SO (“my hand is moving the joystick”) remains constant while SA (“I’m manipulating the circle”) changes. When subjects feel that they are not controlling the events on the screen, there is activation in the right inferior parietal cortex and supposedly no SA for the intentional aspect of the action. When the subject does have SA for what happens on the screen, the anterior insula is activated bilaterally.

Although Farrer and Frith clearly think of SA as something tied to the intentional aspect of action and not to mere bodily movement or motor control, when it comes to *explaining why* the anterior insula should be involved in generating SA, they frame the explanation in terms of motor control and bodily movement.

Why should the parietal lobe have a special role in attributing actions to others while the anterior insula is concerned with attributing actions to the self? The sense of agency (i.e., being aware of causing an action) occurs in the context of a body moving in time and space ... [and] critically depends upon the experience of such a body. There is evidence that the anterior insula, in interaction with limbic structures, is also involved in the

It starts from the phenomenological distinction between SA and SO, originally worked out in the context of the schizophrenic delusions of control, and then asks what the neurological underpinnings of SA might be (see, e.g., Farrer and Frith 2002; Tsakiris and Haggard 2005).

representation of body schema One aspect of the experience of agency that we feel when we move our bodies through space is the close correspondence between many different sensory signals. In particular there will be a correspondence between three kinds of signal: somatosensory signals directly consequent upon our movements, visual and auditory signals that may result indirectly from our movements, and last, the corollary discharge [efferent signal] associated with motor commands that generated the movements. A close correspondence between all these signals helps to give us a sense of agency. (Farrer and Frith 2002, 601-02).

In a separate study Farrer et al. (2003) have the same goal of discovering the neural correlates of SA. In this experiment subjects provide a report on their experience; however, all questions about agency were focused on bodily movement rather than intentional aspect. In fact, subjects were not given an intentional task to carry out other than making random movements using a joystick, and the focus of their attention was directed towards a virtual (computer image) hand that either did or did not represent their own hand movements, although at varying degrees of rotation relative to true position of the subject's hand. That is, they moved their own hand, but saw a virtual hand projected on screen at veridical or non-veridical angles to their own hand; the virtual hand was either under their control, or not. Subjects were asked about their experience of agency for control of the virtual hand movements. The less the subject felt in control, the higher the level of activation in the right inferior parietal cortex, consistent with Farrer and Frith (2002). The more the subject felt in control, the higher the level of activation in the right *posterior* insula. This result is in contrast with the previous study where SA was associated with activation of the right *anterior* insula. Referencing this difference, Farrer et al. state: "We have no explanation as to why the localization of the activated areas differ in these studies, except that we know that these two regions are densely and reciprocally connected" (2003, p. 331). One clear explanation, however, is that the shift of focus from the intentional aspect (accomplishing a computer screen task in Farrer and Frith) to simple control of bodily movement (in Farrer et al.) changes the aspect of SA that is being studied. It would be helpful in these experiments to clearly distinguish between the intentional aspect and the motor (efferent) aspect of agency, and to say that there are at least these two contributories to SA.

Intention formation

Over and above the sensory-motor processes that involve motor control and the perceptual processes that allow us to monitor the intentional aspects of our actions, there are higher-order cognitive components involving intention formation that contribute to SA. Pacherie (2007; and others like Bratman 1987 and Searle 1983) distinguish between future or distal intentions and present intentions. Future or "F"-intentions relate to prior deliberation processes that allow us to formulate our relatively long-term goals. For example, I may decide to purchase a car tomorrow (or next week, or next month, or at some undetermined time when there is a good rebate available), and then at the appropriate time go out and engage in that action. Not all actions involve prior intention formation. For example, I may decide right now to get a drink from the kitchen and find myself already moving in that direction. In that case I have not formed an F-intention,

although my action is certainly intentional. In that case, I may have a present or P-intention (or what Searle calls and 'intention-in-action'). My intention to get a drink from the kitchen may involve an actual decision to get up and to move in the direction of the kitchen – and in doing so I may be monitoring what I am doing in an explicitly conscious way. It may be a rather complex action. At my university office the kitchen is located down the hall and it is locked in the evening. If I want to get a drink I have to walk up the hall, retrieve the key for the kitchen from a common room, and then proceed back down to the kitchen, unlock the door, retrieve the drink, relock the door, return the key and return to my office. Although I may be thinking of other things as I do this, I am also monitoring a set of steps that are not automatic.

In other cases I may be so immersed in my work that I don't even notice that I'm reaching for the glass of water on the table next to me. Here my intentional action may be closer to habitual and there is no P- or F-intention involved. In such cases, I would still have a minimal SA, connected with what Pacherie (2007) calls a motor or M-intention, and consisting of the pre-reflective sense generated in motor control processes and a rather recessive intentional aspect (which I may only notice if I knock over the glass or spill the drink).

It is likely that when there is an F- and/or P-intention involved, such intentions generate a stronger SA. Certainly, if I form an F-intention to buy a new car tomorrow, and tomorrow I go to the car dealership and purchase a car, I will feel more in charge of my life than if, without prior intention I simply find myself lured into a car dealership, purchasing a car without prior planning. In the latter case, even if I do not deny that I am the agent of my action, I might feel a bit out of control. So it seems clear that part of the phenomenology of agency may be tied, in some cases, to the formation of a prior intention. It's important here to distinguish between the cognitive level of intention formation – which may involve making judgments and decisions based on beliefs, desires, or evaluations – and a first-order level of experience where we find SA. SA is not itself a judgment, although I may judge that I am the agent of a certain action based on my sense of agency for it. But what is clear is that intention formation may generate a stronger SA than would exist without the formation of F- or P-intentions.

Retrospective attribution

The effect of the formation of a prior intention is clearly prospective. But there are post-action processes that can have a retrospective effect on the sense of agency. Graham and Stephens (1994; Stephens and Graham 2000) provide an account of introspective alienation in schizophrenic symptoms of delusions of control and thought insertion in terms of two kinds of self-attribution.

- *Attributions of subjectivity*: the subject reflectively realizes and is able to report that he is moving. For example, he can say, "This is my body that is moving."
- *Attributions of agency*: the subject reflectively realizes and is able to report that he is the cause or author of his movement. For example, he can say "I am causing this action."

According to Graham and Stephens the sense of agency originates at this higher-order level of attribution. They propose an explanation of SA in terms of “our proclivity for constructing self-referential narratives” which allow us to explain our behavior retrospectively: “such explanations amount to a sort of theory of the person’s agency or intentional psychology” (1994, 101; Stephens and Graham, 2000, 161). If we take thinking itself to be a kind of action on our part, then our sense of agency for that thinking action derives from a reflective attitude toward it.

[W]hether I take myself to be the agent of a mental episode depends upon whether I take the occurrence of this episode to be explicable in terms of my underlying intentional states (1994, 93).

On this view our sense of agency for a particular action depends on whether we can reflectively explain our action in terms of our beliefs, desires, and intentions. Accordingly, if a subject does or thinks something for which she has no intentions, and her action fails to accord with her beliefs and desires – mental states that would normally explain or rationalize the action – then the action or thought would not appear as something she intentionally does or thinks. Whether I count something as my action thus

depends upon whether I take myself to have beliefs and desires of the sort that would rationalize its occurrence in me. If my theory of myself ascribes to me the relevant intentional states, I unproblematically regard this episode as my action. If not, then I must either revise my picture of my intentional states or refuse to acknowledge the episode as my doing. (1994, 102).

On this approach, I have a sense of agency, and specifically for my actions because I have a properly ordered set of second-order retrospective interpretations (see Graham and Stephens 1994, 102; Stephens and Graham 2000, 162ff).

Pacherie indicates that F-intentions are subject to normative pressures for consistency and coherence relative to the agent's beliefs and other intentions. This would also seem to be the case with Graham and Stephens retrospective attributions. But in either case, the fact that I may fail to justify my actions or think that my actions fail to fit with my theory or narrative about myself retrospectively, does not necessarily remove my sense of agency for the action, although it may diminish it. That is, it seems wrong to think, as Graham and Stephens suggest, that retrospective attribution actually constitutes my sense of agency; but one should acknowledge that it can have an effect on SA, either strengthening it or weakening it.

Within the realm of the normal, we can have two extremes. In one case I may generally feel that I am in control of my life because I usually follow through and act on my intentions. I think and deliberate about an action, and form an F-intention to do it. When the time comes I remember my F-intention and I see that it is the appropriate time and situation to begin acting to fulfill that intention. My P-intentions coincide with the successful guidance of the action; my motor control is good and all of the intentional factors line up. Subsequently, as I reflect on my action, it seems to me to be a good fit with how I think of myself and I can fully attribute responsibility for that action to myself. It seems that in this case I would feel a very strong sense of agency for the

action, all contributing aspects – prospective intention formation, contemporary control factors, and retrospective attribution – giving me a coherent experience of that action. In another case, however, I may have a minimal SA – no F- or P-intention and no retrospective attribution or evaluation. My SA for the action may just be my thin experience of having motor control over something that I just did. (See Figure 1).

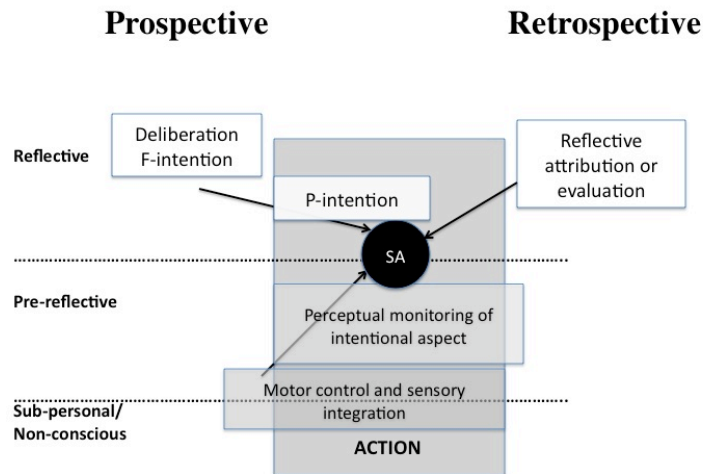


Figure 1: Complexities in SA

Ambiguities

Pacherie suggests that mechanisms analogous to motor control mechanisms can explain the formation of F- and P-intentions.

The contents represented at the level of F-intentions as well as the format in which these contents are represented and the computational processes that operate on them are obviously rather different from the contents, representational formats and computational processes operating at the level of M-intentions. Yet, the general idea that internal models divide into inverse models which compute the means towards a given goal and forward models which compute the consequences of implementing these means retains its validity at the level of F-intentions. ... Similarly, it is highly plausible that action-specification at the level of P-intentions makes use of internal models (2007, 4).

That our deliberation about future actions involves thinking about the means and ends of our actions seems uncontroversial. Pacherie's proposal does raise one question, however. If we regard thinking, such as the deliberative process that may be involved in intention formation, itself as a kind of action, then do we also have a sense of agency for the

thinking or deliberation involved in the formation of F-intentions? It seems right to suggest that if I engage in a reflectively conscious process of deliberating about my future actions and make some decisions on this basis, I would have a sense of agency for (or from) this deliberation.³ You could interrupt me during this process and ask what I am doing, and I could say: “I’m sitting here deliberating about buying a car.” The sense of agency that I feel for my ongoing deliberation process may be based on my sense of control over it; my response to your question is a retrospective attribution that may confirm this sense of agency. It’s also possible that my SA for my deliberation derives in part from a previous deliberation process (I may have formed the F-intention yesterday to do my deliberations (i.e., to form my F-intentions) about car buying today). It is clearly the case, however, that not all forming of F-intentions require a prior intention to do so, otherwise we would have an infinite regress. We would have to deliberate about deliberating about deliberating, etc. Furthermore, it is possible to have P-intentions for the action of forming F-intentions, where P-intentions in this case may be a form of metacognition where we are conscious of our cognitive strategies as we form our F-intentions. Certainly, however, it is not always the case that we engage in this kind of metacognition as we formulate our F-intentions. It seems, then, that we can have a minimal first-order sense of agency for our deliberations without prior deliberation or occurrent metacognitive monitoring.

On the one hand, the sense of agency for a particular action (X) is different from the sense of agency for the intention formation to do X. They are obviously not equivalent since there are two different actions involved, X, and the act of deliberation about X. On the other hand, it seems likely that SA for my deliberation may contribute to my reflective sense (and my retrospective attribution) that I am the agent of my own actions. Pacherie refers to this as the long-term sense of agency:

a sense of oneself as an agent apart from any particular action, i.e. a sense of one's capacity for action over time, and a form of self-narrative where one's

³ This may be part of “what it’s like” or the phenomenal feel of such cognitive processes. Of course there is an ongoing debate about whether higher-order cognitive activities such as evaluating or judging come with a phenomenal or qualitative feel to them. There are three possibilities here. (1) Cognitive states simply have no phenomenal feel to them. But if such states have no qualitative feel to them, it shouldn’t feel like anything to make a judgment or solve a math problem, and we would have to say that we do not experience such things, since on standard definitions phenomenal consciousness is experiential (e.g., Block 1995, 230). If you do the phenomenology when you do the math, this doesn’t seem correct; but let’s allow it as a possibility. (2) Cognitive states do have a phenomenal feel to them, but different cognitive states have no distinguishable phenomenal feels to them so that deciding to propose marriage and solving a math problem feel the same. Perhaps they do for some people. (3) Different cognitive states do have distinguishable phenomenal feels to them – deciding to propose marriage does feel different from solving a math problem. On this view, which is the one I would defend (see Gallagher and Zahavi 2008, 49ff.), in forming our intentions we sometimes find it easy and sometimes difficult, sometimes with much uncertainty or much effort, and accordingly one process of intention formation might feel different from the other. In either case (2) or (3) there would be room for SA as an experiential component. E.g., part of what it feels like for me to solve a math problem is that I am the one going through the steps; I am the one finding it difficult or easy, as I solve the problem. But even if there were no phenomenal feel to such cognitive processes, it may still be the case that having gone through the process, the result itself, e.g., that I have a plan, or that my mind is made up, may have a certain feel that contributes to a stronger experience of agency for the action in question. Acting on a prior plan, for example, feels differently from acting spontaneously.

past actions and projected future actions are given a general coherence and unified through a set of overarching goals, motivations, projects and general lines of conduct. (2007, 6)

As such it may enter into the occurrent sense of agency for any particular action. Furthermore, if I lacked SA for my deliberation process, it might feel more like an intuition or unbidden thought, or indeed, if I were schizophrenic, it might feel like an inserted thought. In any case, it might feel less than integrated with what Graham and Stephens call the “theory or story of [the subject’s] own underlying intentional states,” something that itself contributes to SA for the action. So it seems that SA for the deliberation process itself may contribute to SA for the action X in two indirect ways. First, by contributing to my long-term sense of agency, and second, by contributing to the effect of any retrospective attribution I may engage in. Still, as I indicated, there need not be (and, under threat of infinite regress, there can not be) a deliberation process for every action that I engage in.

Similarly for P-intentions. If action monitoring, at the level of P-intentions, is itself a kind of action (if, for example, it involves making judgments about certain environmental factors), there may be a sense of agency for that action monitoring? The processes that make up a P-intention are much closer to the intended action itself and may not feel like an additional or separate action. I can imagine a very explicit kind of P-intention in the form of a conscious monitoring of what I am doing. For example, I may be putting together a piece of furniture by following a set of instructions. In that case I could have a sense of agency for following the instructions and closely monitoring my actions in terms of means-ends. Certainly doing it that way would feel very different from doing it without following the set of instructions. But the SA for following the instructions would really go hand in glove with SA for the action of assembling the furniture. How we distinguish such things would really depend on how we define the action.

In the process of assembling the furniture, I may start by reading instruction #1; I then turn to the pieces of wood in front of me and join two of them together. I can distinguish the act of reading from the act of joining and define SA for each of them. In that case, however, one can ask whether SA for the act of reading doesn’t contribute to SA for the act of joining. I might, however, think of the reading and the joining as one larger action of assembling the furniture, and SA might be defined broadly to incorporate all aspects of that assembling. It might also be the case that when I put together a second piece of furniture, I don’t consult the instructions at all, in which case SA is more concentrated in the joining. In most practiced actions a P-intention is really unnecessary because motor control processes and perceptual monitoring of the intentional aspect can do the job, i.e., can keep my action on track. I might simply make up my mind (an F-intention) to do this task, and I go and immediately start to do the task without further monitoring in terms of means-ends. All of this suggests that how we experience agency is relative to the way we define specific actions, and how practiced those actions are.

This means that there is some serious ambiguity, not simply in the way we define the sense of agency, but in the sense – the experience – of agency itself. This phenomenological ambiguity – the very ambiguity of our experience of agency – should be included in our considerations about the sense of agency. Clear-cut and unambiguous

definitions may create a neat conceptual map; but the landscape itself may not be so neat. It is not always the case, as Pacherie sometimes suggests, that P-intentions serve to implement action plans inherited from F-intentions, since there are not always F-intentions. It is not always the case that “the final stage in action specification involves the transformation of the perceptual-actional contents of P-intentions into sensorimotor representations (M-intentions) through a precise specification of the spatial and temporal characteristics of the constituent elements of the selected motor program” (Pacherie 2007, 3), since there are not always P-intentions. Pacherie also suggests that a sense of action initiation and a sense of control are “crucial” components in the sense of agency (2007, 17-18) and that in both components the P-intention plays a large role. But the fact that some actions for which we have SA take place without P-intentions puts this idea in question.

The *sense of action initiation*, Pacherie suggests, is based on the binding of P-intention and awareness of movement onset in the very small timeframe of 80-200 ms prior to actual movement onset corresponding to the time of the lateralized readiness potential, a signal that corresponds to selection of a specific motor program (Libet 1985; Haggard 2003). She associates the P-intention with what Haggard distinguishes as urge to move and reference forward to the goal of the action. But these aspects of action experience can be purely pre-reflective, generated by motor-control processes, and form part of the M-intention (see Desmurget et al. 2009 for relevant data). In this regard it is important to distinguish P-intention from the pre-reflective perceptual monitoring of the intentional aspects of the action that can occur without a formed P-intention, as in practiced action. Whereas monitoring of the intentional aspects can contribute to SA whether we have a conscious intention in terms of specific goals or not (Aartsa, Custersa, and Wegner 2005), the P-intention does not seem crucial for SA.

Pacherie further suggests that the *sense of control* has three dimensions corresponding to F-intentions, P-intentions, and M-intentions. Again, however, the sense of control may be reflectively conscious for F- and P-intentions, but, as generated in motor-control mechanisms it may remain pre-reflectively conscious as long as the action is going well, e.g., as long as I don’t stumble over or knock into something. A conscious judgment or conscious sense of control associated with the P-intention may in fact be absent until that point when something starts to go wrong at the motor-control level, and it may be motivated by what I experience in the pre-reflective monitoring of the intentional aspect of action.

What seem legitimate conceptual distinctions on the theoretical level – “awareness of a goal, awareness of an intention to act, awareness of initiation of action, awareness of movements, sense of activity, sense of mental effort, sense of physical effort, sense of control, experience of authorship, experience of intentionality, experience of purposiveness, experience of freedom, and experience of mental causation” (Pacherie 2007, 6) – may not show up as such in the actual first-order phenomenology. They may be the product of theoretical reflection on the first-order phenomenology. As I engage in action, for example, I may not experience a difference between my sense of effort and my sense of control, although I can certainly make that distinction in my reflective (prospective or retrospective) consideration of my action. That distinction may show up clearly at the level of my retrospective attribution, but may be entirely lost in my immersed SA. My awareness of what I am doing and that I am doing it is usually struck

at the most pragmatic level of description (“I’m getting a drink”) rather than at a level that distinguishes between the action and my agency, or within the action between the goal and the means, or within agency between intentional causation, initiation, and control – distinctions that Pacherie suggests can be found in the phenomenology.

Phenomenologically, however, there is no such thing as a “naked intention” – the awareness of an action without an awareness of who the agent is (Jeannerod and Pacherie 2004) – or “agent-neutral” action experience (Pacherie 2007, 16). The awareness that I am the agent of an action is implicit in the pre-reflective awareness of acting, which does not contain an awareness of causation separate from awareness of control. Pacherie is thus absolutely right to note that a conceptual analysis cannot “preempt the question whether these various aspects are dissociable or not, for instance whether we can be aware of what we are doing independently of an awareness of how we’re doing it or whether we can be aware of what we are doing without at the same time experiencing this action as ours” (2007, 7). What can decide the issue, however, is agreement on where to draw the lines between *phenomenological* analysis (i.e., of what we actually experience), *neuroscientific* analysis (which may find a much finer grain of articulations at the neuronal level than show up in phenomenology), and *conceptual* analysis (which may introduce distinctions that are in neither the phenomenology nor the neurology, but may have a productive role to play in constructing cognitive models or, in regard to the individual, explaining psychological motivations, etc.).

Pushing this analysis into the world

The sense of agency is both complex and ambiguous. It has multiple contributories, some of which are reflectively conscious, some of which are pre-reflectively conscious, and some of which are non-conscious. Consistent with phenomenological theories of embodiment, in everyday engaged action reafferent or sensory-feedback signals are attenuated, implying a recessive consciousness of the body in action (see e.g., Gallagher 2005; Tsakiris and Haggard 2005). We do not attend to the details of our bodily movements in most actions. We do not stare at our own hands as we decide to use them; we do not look at our feet as we walk, we do not attend to our arm movements as we engage the joystick. Most efferent, motor-control and body-schematic processes are non-conscious and automatic. Just such processes nonetheless contribute to a conscious sense of agency by generating a pre-reflective awareness of our actions. In most normal actions the sense of agency runs along with and is experientially indistinguishable from a basic sense of ownership; likely efferent and reafferent signals are integrated in the insula. SA is part of our basic feeling of embodiment without which our actions would feel very different. In addition, we also experience, pre-reflectively, a form of *intentional feedback*, which is not afferent feedback about our bodily movements, but a perceptual sense that my action is having an effect in the world. This effect is not something that we reflectively dwell on, or even retain in memory. A good example of this is our usual perceptual awareness while driving a car.

The sense of agency for some actions may amount to nothing more than this. For other actions, however, the sense of agency is not reducible to just these embodied and pre-reflective processes. In addition, in many cases we may be reflectively conscious of

and concerned about what we are doing. For such actions the sense of agency will be tied to a more reflective sense of intention, involving attention directed toward the project or task that we are engaged in, or toward the means and/or end that we aim for.

Conceptually we can identify at least five different contributories to the sense of agency that may be connected with a particular action.

- Formation of F-intentions, often involving the prospective reflective deliberation or planning that precedes action
- Formation of P-intentions, that is, the conscious monitoring of action in terms of specific means-ends relations
- Basic efferent motor-control processes generate a first-order experience linked to bodily movement in and towards an environment
- Pre-reflective perceptual monitoring of the effect of my action in the world
- The retrospective attribution of agency that follows action

We could add to this the long-term sense of one's capacity for action over time, which Pacherie identifies as related to self-narrative “where one's past actions and projected future actions are given a general coherence and unified through a set of overarching goals, motivations, projects and general lines of conduct” (2007, 6).

Although conceptually we may distinguish between different levels (first-order, higher-order), and aspects, and neuroscientifically we may be able to identify different brain processes responsible for these different contributories, in action, and in our everyday phenomenology we tend to experience agency in a more holistic, qualitative, and ambiguous way which may be open to a description in terms of degree.

The conceptual articulation of the different aspects of the sense of agency suggests that the loss or disruption of SA in different pathologies may be varied. In schizophrenic delusions of control the motor-control aspects may be disrupted. In other cases the attribution of self-agency may be disrupted by problems with retrospective higher-order cognition or the prospective formation of F-intentions. A good example of this is the case of narcotic addiction, as discussed by Frankfurt (1988). If a drug addict invests himself in resisting drugs he may feel that something other than himself is compelling him to drug use. If he withdraws from taking the drug, when he starts using again he may not conceive of himself as the agent.

It is in virtue of this identification and withdrawal, accomplished through the formation of second-order volition, that the unwilling addict may meaningfully make the analytically puzzling statements that the force moving him to take the drug is a force other than his own, and that it is not of his own free will but rather against his will that this force moves him to take it (Frankfurt 1988, 18; see Grünbaum 2009, for discussion).

The sense of agency may be present or absent, diminished or increased depending on processes or disruptions of processes at different levels. Thus, the loss of the sense of agency in various pathologies – including schizophrenia, anarchic hand syndrome, obsessive-compulsive behavior, narcotic addiction, etc. – may in fact involve different sorts of loss and very different experiences.

Everything that we have said so far, however, if rich in details, is still narrow in the scope of what should be included in such an analysis. Although what we have said so far acknowledges a role for the body and the environment in action – many of the pre-reflective aspects being generated in motor control and the intentional aspect of what we are doing – almost all of the processes described remain “in the head,” insofar as they are either mental processes – deliberation, intention formation, judgment, evaluation, perceptual monitoring – or brain processes – efferent commands, integration of afferent signals, premotor processes and motor control. It almost seems as if all of the action, all of the important processes concerning intention and action, take place in the narrow confines of the mind-brain, even though we know that action takes place in the world, and most often in social interactions.

One simple way to ask the question is: How do other people and social forces affect the sense of agency? On the very basic pre-reflective level, the presence of others has an effect on what my possibilities for action are, and the way that I perceive the world in action contexts.

Jean-Paul Sartre points in this direction, in a very dramatic way. In his example he is sitting alone in a park. Suddenly, someone else enters the park.

Suddenly an object has appeared which has stolen the world from me. Everything [remains] in place; everything still exists for me; but everything is traversed by an invisible flight and fixed in the direction of a new object. The appearance of the Other in the world corresponds therefore to a fixed sliding of the whole universe, to a decentralization of the world which undermines the centralization which I am simultaneously effecting. (1969, p. 255)

This overly dramatic philosophical description, however, is supported by some interesting science. Consider what we might term the Social Simon Effect. The Simon Effect is found in a traditional stimulus-response task. Participants respond to different colors, pressing a button to their left with their left hand for blue and a button to their right with their right hand for red. They are asked to ignore the location of the color (which may be displayed either in their right or left visual field). An incongruence (mismatch) of right vs left between the color location and hand used to respond results in increased reaction times (Simon, 1969). When a subject is asked to respond to just one color with one hand, as you might expect, there is no conflict and no effect on reaction time. The surprising thing is that when the subject has exactly the same task (pushing one button for one color) but is seated next to another person who is responding to a different color -- each person responding to one color – each acting as if one of the fingers in the original experiment – reaction times increased for the incongruent trials. (Takahama 2005). Similar results are found in trials using a go-nogo task where reaction times slowed when another person sitting next to the subject also engaged in the task, but not when that person was simply present and not engaged. Thus, “the same go-nogo task is performed differently depending on whether one acts alone or alongside another agent performing a complementary action” (Sebanz et al. 2003; see Sebanz et al. 2006).

These kinds of things happen on the non-conscious level and likely have an effect on one’s pre-reflective sense of agency. But they may become much more explicitly self-

conscious. Consider instances where you are quite capable of and perhaps even proficient at doing action A, e.g., successfully throwing a basketball through the hoop. Your performance may be affected simply by the fact of having an audience of very tall basketball superstars. You might in fact feel a degree of inadequacy in such a circumstance, simply because certain people are present.

More generally, the prospective and retrospective dimensions of intention formation and action interpretation, which affect SA, are often shaped by others, and by the situations in which we encounter others. Deciding to buy a certain kind of car (or any other commodity) may be influenced by what your friends consider to be an appropriate choice. In contrast to internalist views – e.g., where simply having a belief about A encompasses the motivation to A (e.g., Nagel 1970) – and in contrast to many analyses of agency in philosophy of mind and action theory, deliberations, intentions and motivations to act are not simply mental states (propositional attitudes), or causal brain states – they are often co-constituted with others. Phenomena such as peer pressure, social referencing, which may be implicit or explicit, or our habitual behavior when in the presence of others – these phenomena may detract from or increase one’s feeling of agency.

In this regard, there are extreme cases, like compulsive or addictive situations, Hysteria or Conversion Disorder. In addictive behavior, for example, there is a loss of the sense of agency for one’s actions – but this is not just the result of chemically induced dependency. Compulsive drug-related behaviors correlate neither with the degree of pleasure reported by users nor with reductions in withdrawal symptoms as measured in placebo studies and the subjective reports of users. Robinson and Berridge (1993; 2000) propose a “incentive-sensitization” model: pathological addiction correlates highly with the *salience* of *socially situated* drug related behaviors and stimuli. For example, specific situations (including the agent’s perception of his social world) are altered, and become increasingly hedonically significant to the agent. Brain regions mediating incentive-sensitization are inscribed within the same areas that process action specification, motor control, and social cognition -- regions of the brain thought to code for intentional deliberation, social navigation, and action (Allen 2009). This reinforces the idea that situational salience – including perceptual salience of the social situation – contributes to intention formation and the sense of agency – sometimes enhancing, but also (as in extreme addictive behavior) sometimes subverting SA. Intentions can be dynamically shaped in relation to how others are behaving, and by what is deemed acceptable behavior within specific sub-cultures.

In the case of Hysteria or Conversion Disorder, there is also a loss of the sense of agency over bodily action. But, as Spence (2009, 276) states: “All hysterical phenomena arise within social milieus” The presence or absence of specific others (sometimes the medical personnel) has an effect on the symptom, so that there is symptomatic inconsistency from one social setting to another. Spence points to the particular social milieu of Charcot’s practice in Paris, Freud’s practice in Vienna, and the First World War battlefield – social arrangements that seemed to encourage the development of hysterical symptoms. As he indicates, “There is clearly a need for further work in this area” (Spence 2009).

Let me conclude with one further example. In 2009 my daughter Laura volunteered with the Peace Corps in South Africa, focusing her efforts on HIV education.

She recounts that her attempts to motivate residents in a small village outside of Pretoria to help themselves by engaging in particular activities were met by a certain sardonic attitude and even polite laughter. They explained that they were unable to help themselves simply because, as everyone knew, they were lazy. That's "the way they were," they explained, and they knew this because all their life they had been told so by various educational and governmental institutions, especially under the apartheid regime. In effect, because of the contingencies of certain long-standing social arrangements, with prolonged effects, they had no long-term sense of agency, and this robbed them of possibilities for action.

It certainly seems possible that an individual could convince himself of his laziness, without the effects of external forces playing such a causal role. But it is difficult to conceive of what would motivate such a normative judgment, or even that there could be such a normative judgment outside of a social environment. Could there be a form of self-observation that would lead to a self-ascription of laziness that would not involve a comparison with what others do or do not do, or with certain expectations set by others? It seems quite possible that some people, or social arrangements, more than others may make me feel less in charge of my life, or more empowered; and it seems quite possible that I can allow (or cannot prevent) others, or some social arrangements, to make me feel more or less empowered. There are certain ways of raising children, and certain ways of treating others that lead them to feeling empowered, with a more expansive sense of agency than one finds in other cases where it goes the other way. None of these possible adumbrations in an individual's sense of agency – from the Peace Corp volunteer who, at least at the beginning, feels empowered enough to risk the effort, to the victim of apartheid, who in the end has very little sense of agency – happen in social isolation.

If, in thinking about action and agency, we need to look at the most relevant pragmatic level, that level is not the level of mental or brain states. We shouldn't be looking exclusively inside the head. Rather, embodied action happens in a world that is physical and social and that often reflects perceptual and affective valiances, and the effects of forces and affordances that are both physical and social. Notions of agency and intention, as well as autonomy and responsibility, are best conceived in terms that include social effects. Intentions often get co-constituted in interactions with others – indeed, some kinds of intentions may not be reducible to processes that are contained exclusively within one individual. In such cases, the sense of agency is a matter of degree – it can be enhanced or reduced by physical, social, economic, and cultural factors – sometimes working through our own narrative practices, but also by loss of motor control or disruptions in pre-reflective action-consciousness.

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