Making and breaking our shared world:
A phenomenological analysis of disorientation as a way of understanding collective emotions in distributed cognition

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Studying disorientation is studying how, through our bodies, culture and technology, we humans are connected to our environment, and what happens when this connection is weakened or severed. What happens, of course, depends again on our environment, bodies, culture and technology: the world around us becomes at times uncanny, unfamiliar or dangerous when we get disoriented and, at times, disorientation is exciting and refreshing — an invitation to explore, to leave behind nagging desires for control and certainty, and to embrace instead a more spontaneous relationship with our surroundings. Getting lost shapes our consciousness, not only by transforming our perception of the world around us, but by transforming our sense of who we are in that world and what possibilities are open to us within it.

In this paper, we analyse the phenomenology of disorientation to elucidate the role that emotions play in distributed cognitive processes that involve multiple agents and cognitive artefacts. The feeling of disorientation destabilises our horizon of experience and turns the world around us unfamiliar or alien. This feeling embodies our disconnection to the agents (e.g. walking companions), the cognitive artefacts (e.g. maps) and the environment around us. A proper analysis of the phenomenology of both orientation and disorientation uncovers the role that feelings play in distributed cognitive processes: emotions serve as a form of evaluative regulation that contributes to, on the one hand, the syncing of the different elements of a distributed cognitive process, and on the other, the eventual disengagement of the agent from an unreliable distributed cognitive process.

1. Distributed Cognition and Situated Approaches to Emotion

Distributed cognition is a theoretical framework developed under the idea that all instances of cognition can be understood as emerging from distributed processes (Hutchins, 1995, 2001). Distributed cognitive processes may include elements at many spatial and temporal scales (Hutchins, 2014). In a liberal construal, both the brain in itself (e.g. the interaction of different brain areas) and the interactions of the brain and the body can be seen as distributed cognitive processes. On a larger scale, the interactions of humans with cognitive artefacts (e.g. in the use of a calculator) constitute an instance of distributed cognition, and, last but not least, a distributed cognitive process may also emerge from the interaction of several human agents. At an even larger scale, cultural practices within a given cognitive ecosystem (e.g. the emergence of language, as in Hutchins and Johnson, 2009) can also be explored through the lens of distributed cognition.

A paradigmatic example of a distributed cognitive process is the cultural practice of queuing, in which the emergent spatial arrangement of the agents' bodies maps the order of arrival to the queue. This involves a cooperative social practice and often also a practice involving material objects, such as the presence of ropes indicating how the queue should form or a line on the floor indicating the appropriate distance between the first and the second person on the queue. What is particularly interesting in the case of queuing is the mental practice of seeing a physical structure (the linear arrangement of bodies) as a conceptual structure (the order of arrival), which affords certain cognitive inferences (e.g. order of arrival, estimated waiting time…). Seen in the light of distributed cognition, cultural practices such as queuing are forms of dimensionality reduction (i.e. a two-dimensional array of people on a surface is constrained into the approximation of a one-dimensional line) that increase the predictability of the situation (e.g. computing who will be next in accessing a service). Importantly, as Edwin Hutchins points out, this dimensionality reduction does not take place inside any one individual's mind, but in the space shared by the participants of the practice (Hutchins, 2005).

Queueing is an example of how humans turn material patterns into representations by enacting their meanings (Hutchins, 2010). By enacting the cultural practice of queuing within the appropriate cultural context (i.e. a situation involving waiting within a society in which queuing is common), the people in line produce the phenomenal vehicle of interest and the queue's physical array becomes an *enacted representation* of the order of arrival. Hutchins claims that enacted representations are dynamic (involving both memory and anticipation), multimodal (e.g. combining visual perception and bodily action), and "saturated with affect" (Hutchins, 2010: 434). To see what Hutchins has in mind, it is useful to look at the example he provides from the use of manual plotting tools during ship navigation in a U.S. Navy ship in the early 1980s (Hutchins, 1995). In normal conditions, fixing the ship's position requires measuring the bearing from the ship to at least three landmarks. The navigators plot a line of position (LOP) with respect to each landmark using a special tool called "hoey". The intersection of three LOP's on a chart forms a triangle within which the ship is assumed to be located. A large triangle indicates that there are problems with the plotting process, and a small triangle indicates that the process is reliable.

On one occasion, the main gyrocompass of the ship failed, and the crew became unable to follow the practice described above. They were required instead to calculate the true bearing of a landmark, which equals compass heading plus magnetic deviation (the errors of the compass due to the local magnetic environment) plus magnetic variation (the difference between the direction of the earth's magnetic field and true north from a given point) plus the relative bearing of the landmark with respect to the ship's heading. The crew had to try to figure out how to calculate true bearing while plotting thirty-eight lines of position. They were missing the deviation term from their calculations and the three lines of position resulted in unusually large triangles. Eventually, the plotter realised what was missing, and once he

included the deviation term, the crew gradually became able to fix the position of the ship again.

What is interesting about the failing gyrocompass incident is the process through which the plotter realised that the deviation term was missing. The discovery came through an "Aha!" insight obtained from the plotter's bodily engagement with the tools through enacted representations. As mentioned earlier, the resulting triangles were at first unacceptably large. The plotters exclamation "I keep getting these monstrous frigging god-damned triangles!" gives us an impression of how emotional the process was. During the whole process, the plotter shifted his own body around (e.g. placing his index finger on the location of the landmark) and moved the chart and the hoey to imagine LOPs that would make the fix triangle smaller. This continued until the elements of the involved enacted representations combined so that the plotter was able to imagine a small clockwise rotation superimposed on his visual experience of the protractor scale, leading to the realisation that adding a small number to the bearing for LOP3 would reduce the fix triangle. After this moment of "Aha!" insight, the plotter understood that what had been missing from the calculations was magnetic deviation (3º), which would improve not only LOP3, but all the LOPs, resulting in the desired small triangle (Hutchins, 2010).

The above is an excellent example of distributed cognition because the necessary calculations to fix the ship's position did not take place solely inside the plotter's head through internal mental representations, but instead took place through enacted representations within a cognitive ecosystem. Such enacted representations are embedded in durable material media —what Hutchins refers to as "material anchors for conceptual blends" (Hutchins, 2005)— and in bodily processes (somatic anchors), producing a multimodal integration that, if congruent, leads stability to the enacted representations employed in a distributed cognitive process. It is important to note that for a distributed cognitive process to emerge, the necessary multimodal

integration of different elements often involves more than one agent. And as Hutchins points out, affective states[i] thereby play an important role in distributed cognitive processes, but what this role is precisely is yet to be clarified in the literature. Our claim in this chapter is that the main role of emotion lies in the regulatory tracking of the congruence of the different elements within a distributed cognitive process. In what follows, we will introduce situated approaches to emotion and then use navigation as a case study to clarify the role of emotion in distributed cognitive processes.

Situated approaches to emotion offer an alternative to a long tradition of considering emotions as purely internal states or processes. In contrast to such a tradition, situated approaches consider emotions as forms of skilful engagement with the world that are both scaffolded by and dynamically coupled to the environment (Griffiths and Scarantino, 2005). A tenet coming from this perspective is that emotion is designed to function in a social context and "is often an act of relationship reconfiguration brought about by delivering a social signal" (Griffiths and Scarantino, 2005: 2).

To illustrate the degree to which emotion is designed to function in a social context, Griffiths and Scarantino draw on paradigmatic cases of situated emotion such as social appraisal (Sorce, Emde, Campos, & Klinnert, 1985) or audience effects (Fernández-Dols & Ruiz-Belda, 1997). Social appraisal cases are those in which an individual's appraisal of a situation relies on that of others. Social appraisal is especially interesting for our study of distributed cognition because it shows how the appraisal of a situation is often distributed beyond the individual. Emotions play an important role in these distributed cognitive processes. A well-known example is an experiment showing that the willingness of infants to crawl over a visual cliff was influenced by the negative or positive facial expressions of their mothers (Sorce, Emde, Campos, & Klinnert, 1985). Instances of social appraisal are very common, ranging from judging if a situation is dangerous to judging if a joke is funny or offensive.

'Duchenne smiles' (involving both the movement of the mouth and of the eyes — generally interpreted as a display of happiness) provide a good example of audience effects. When bowling, whether bowlers smile or not after knocking down some pins depends much more on whether or not they are facing their companions than on the actual number of pins they knock down, so that they will often smile a Duchenne smile after knocking a few pins while facing their companions, but not smile after a full strike while facing away (Kraut & Johnston, 1979). Similar effects are found in football fans and even in Olympic medallists (Fernández-Dols & Ruiz-Belda, 1997). Audience effects point to emotions being used in a transactional way, rather than being primarily internal states. The understanding of embarrassment as a sign of acceptance of social norms one just infringed upon (Leary, Landel and Patton, 1996) or the interpretation of sulking as a strategy of relationship reconfiguration (Parkinson, 1995) also point to the transactional nature of emotions. In turn, emotional management (which, as with social appraisal, is often distributed beyond the individual) influences the unfolding of the emotion itself, which sustains the situationist idea that emotions are *dynamically* coupled to the environment, insofar as they work in "a feedback mechanism which involves the reciprocal exchange of signals delivered by expressions and other behaviour in the course of time." (Griffiths and Scarantino 2005: 19).

An important distinction to be made when considering the environmental scaffolding of emotions is that this scaffolding happens both synchronically (in the unfolding of the emotion itself) and diachronically (in the process of acquiring an emotional repertoire). In any given society, the environment scaffolds the development of the appropriate emotional repertoire diachronically through ideational factors such as normative standards, shared expectations (about the unfolding of emotions) or belief systems (about the nature of emotions) and material factors such as venues with specific emotional affordances (e.g. a theatre favours displays of elation and a bar favours displays of joy) or emotional technologies ranging from

depression medication to stress balls (Parkinson, Fischer and Manstead, 2005). Synchronically, the environment scaffolds the unfolding of different emotions through material elements (e.g. a confessionary box), rituals (e.g. the different stages of a wedding and the corresponding expected emotions) and social processes such as the afore-mentioned social appraisal. Through the lens of distributed cognition, emotions can be understood as cultural practices unfolding (i.e. synchronically scaffolded) within a particular cognitive ecosystem (i.e. diachronically scaffolded)[ii]. Let us call this subset of cultural practices (i.e. practices in which emotions play a paradigmatic central role) *emotion practices*.

2. The Phenomenology of Disorientation

From fixing the position of a Navy ship to following a well-marked trail, wayfinding offers some of the best examples of cognition 'in the wild'. It often involves cultural practices such as collective decision-making (e.g. chart plotting), social appraisal (e.g. relying on a guide or a group), environmental scaffolding (e.g. trail signage, cairns…) or the use of cognitive artefacts (e.g. compass, GPS devices), all of which need to take place within the appropriate cognitive ecosystem.

So far, we have seen how a given cognitive ecosystem provides the scaffolding for emotion practices. Now we turn our focus to the other side of the coin. The question at hand is how emotions provide the scaffolding for broader cultural practices, such as navigation. Here again, the scaffolding can happen both diachronically and synchronically. Diachronically, emotion practices work as ideational factors that promote and facilitate the appropriate cultural practices within a cognitive ecosystem. In his longitudinal study of the social dimensions of geographic disorientation in Arctic Alaska, Sonnenfeld highlights the disappearance of the practice of shaming as one of the causes underlying the increase in disorientation episodes among the Inupiat residing in Wainwright (Sonnenfeld, 2002). It turns out that in the 1960s

there was a widespread practice of shaming the individuals who happened to get lost in the wild. The emotion practice of shaming involves the shaming of the individual on the part of the community, the embarrassment of the individuals who get lost and, most importantly, the fear of such potential embarrassment, which incentivises the learning and application of the appropriate navigational practices: "Fear of such ridicule forces the Eskimo to learn his navigation skills well and to exercise caution whenever he travels" (Nelson 1969: 386). By setting the normative standards, the emotion practice of shaming contributed to the diachronic scaffolding necessary for the development of the appropriate cultural practices (e.g. navigational skills) of the Inupiat cognitive ecosystem in Arctic Alaska. Consequently, the disappearance of this emotion practice after the 1960s resulted in a degradation of the broader cultural practices of navigation and in the subsequent increase of disorientation episodes that Sonnenfeld witnessed in the early 2000s.

Sonnenfeld's study can also offer us an insight into how emotion practices can provide scaffolding for navigational practices synchronically. Travel among the Inupiat is often group travel, which involves a great deal of relationship reconfiguration. An advantage of traveling as a group is that it allows for the distribution of cognitive tasks. When hunting, one of the members of the group can follow an animal trail while another member focuses on staying oriented, so that the group as a whole is not lost after the hunt. Even without a clear division of tasks, traveling in a group can facilitate orientation because if one of the members fails to orient correctly, there is a chance that another member of the group has maintained the correct orientation. Nevertheless, this can only work if the group can determine whose orientation is correct when there is a conflict. When two members of a group disagree on the direction that the group should follow, relationship reconfiguration is needed, and this is a highly affective process involving confidence, doubt, trust, mistrust, anger, pride and even fear.

During navigational group conflict, emotion practices provide the synchronic scaffolding to evaluate and regulate distributed cognitive processes. Confidence and doubt arise to evaluate the ongoing distributed cognitive process of orientation (both one's own and that of one's companions) and to regulate it as well (by continuing the process, adjusting or terminating it). Feelings such as anger can be used to reconfigure the existing relationship by trying to force the group to follow one's sense of orientation rather than that of another member. And mistrust can even force the dissolution of the group, so that each member can follow the way they see fit. The example of Inuit group travel brings to the fore a picture in which the synchronic scaffolding of emotion practices works as a way of evaluating and regulating a distributed cognitive system. In what follows, a phenomenological analysis of disorientation will clarify this picture.

At the end of the 19th century, the psychologist Alfred Binet collected reports for his study of what was back then called "vertigo of direction" and that is nowadays commonly known as "getting turned around" (Binet, 1885). Getting turned around is a rather common occurrence and one of the most interesting forms of spatial disorientation. It often happens when one is distracted and turns on the wrong direction when coming out of a building, and after walking for a while realises that what one thought to be ahead is behind one and vice versa. This sudden realisation makes the space around one appear to switch 180º, as if clicking back into the correct position, and it often produces a strong if brief sense of dizziness and confusion in the disoriented subject. Another common event that produces this effect is taking the mistaken exit out of the metro and finding oneself on the opposite side of the street than expected and facing the things that one anticipated would be behind one. Below is another example from Binet's corpus, in which the subject takes the wrong turn after exiting a building and suddenly realises that he is looking at Hôtel de Ville and not Place de la Republique as he had expected:

> Instead of taking the right to return to the Place de la Republique, I took the left toward the Hotel de Ville…While on my way I felt sure of meeting the Place de la Republique. Thus my confusion was extreme on coming to the Hôtel de Ville… I was some moments in recognizing it. Then I recognized the Hôtel de Ville, without destroying the illusion. It disappeared, however, very quickly… when I understood the cause of my mistake.
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> -report in Binet, 1885: 341

There are two interesting elements in the reported episode. The first one is that the mistake in orientation prevents the subject from recognising a familiar building. Disorientation impairs recognition, and it is recognition that triggers the reorientation. Large scale spatial representations contribute to visual identification and visual identification contributes to large scale spatial representations. The other interesting element is that the subject refers to being turned around as an *illusion*. This is something that is recurrent in the disorientation literature. A good example is Visual Reorientation Illusions (VRIs), an effect that occurs to astronauts in micro-gravity environments and that is akin to being turned around. Gravity stops being a cue for what is up and what is down in free-falling environments and the space around the astronaut often does not offer exploitable visual cues either (e.g. tubular corridors). It is a common occurrence for astronauts to suddenly realise that they are mistaken by 180º about their vertical orientation. Then, the space around them switches, as with illusions of being turned around, but on the vertical instead of the horizontal axis. Charles Oman compares these VRIs with figure-ground illusions, although the simile can be extended to the case of bi-stable figures in general (e.g. Necker cube, Rubin's face-vase…): "VRIs typically occur spontaneously, but as with figure ground illusions, onset depends on visual attention and is therefore under cognitive control. One astronaut commented: 'If you really want a surface to be "down", you can just look at it and decide that it is'" (Oman 2007: 213). This is something that is also the case with being turned around. By directing attention in particular ways, one can delay the onset of the horizontal 180º switch.

The reason that we are bringing the illusive aspect of being turned around to the fore is that it points to large scale spatial representations somehow influencing our conscious

experience of the navigational space. Here, Edmund Husserl's concept of the horizon of experience can be usefully leveraged. Husserl argued that all of our conscious experience happens within the context of expectation and anticipation. We expect cylindrical objects to have a backside even if we cannot see it, and we anticipate the downward movement of falling objects. In familiar spaces and familiar cultures (what Husserl calls "homeworlds"), there are many more expectations (cultural, social, spatial…) that are framing our conscious experience. When one is navigating an environment, there are expectations of the place that different large-scale spatial elements occupy (e.g. Hôtel de Ville, Place de la République) with respect to oneself (in an egocentric frame of reference) and with respect to each other (in an allocentric frame of reference) (Klatzky, 1998). The expected locations of these elements hover around one, as it were, and they frame one's experience of the surrounding environment. When one gets turned around, the horizon of experience gets destabilised and rearranged as the large-scale spatial representations switch around us. This often results in confusion and uneasiness — being turned around can transform a familiar world into an unfamiliar and alien world ("Fremdwelt" in Husserl's original German), a common aspect of many disorienting experiences (Fernández Velasco, 2020). Under the effect of disorientation, once familiar buildings become unfamiliar and unwelcoming (e.g. the Hôtel de Ville that Binet's subject fails to recognise) and the streets and paths around us stop being the way to a familiar location. When disoriented, one's surroundings appear uninviting and alien.

For the last two years, we have been collecting reports of disorientation episodes in order to build a corpus of experiences of disorientation that can help us better understand the phenomenon. 66% of subjects agreed (from *somewhat agree* to *strongly agree* in a Likert scale) that the experience of disorientation made the environment feel unfamiliar. This unfamiliarity of spatial disorientation is not just visual. A central element of disorientation is that one's experienced possibilities suffer a degradation. Having a correct representation of large-scale

environment makes navigation possible; reaching a set of locations is possible thanks to this spatial representation. These experienced possibilities disappear when one is disoriented. Accordingly, helplessness is one of the most common elements in the disorientation reports we have collected. For instance, one subject reports the following: "I felt unsafe and anxious because no one was with me, and the environment was not familiar to me". Another subject reports: "I just felt confused and helpless — I didn't know what to do".

The different aspects of the phenomenology of disorientation outlined above support the claim that during spatial disorientation, the subject undergoes a reduction "of its possibility space within an unfamiliar environment framed by an uncertain horizon of experience." (Fernández Velasco, 2020: 17). To fully make sense of the phenomenology of spatial disorientation, a proper characterisation of the phenomenon is needed. In a previous paper, we showed the shortfalls of characterising disorientation as a belief or as a breakdown in a cognitive process and argued that we should characterise disorientation instead as an affective state (Fernández and Casati, 2019). An upshot of this characterisation is that it helps us make sense of the afore-mentioned phenomenology.

Furthermore, via affordances, we can understand the link between this regulative-evaluative process and the degradation of possibility that subjects undergo during spatial disorientation. Affordances are sensed possibilities for action in the environment (Gibson 1966, 1979). According to recent versions of the control-process view, feelings (by regulating and evaluating changes in the relation between an organism and its environment) serve to monitor affordances, making them more or less salient (Proust, 2015)[iii]. Disorientation, by evaluating orientation, transforms the saliency of the surrounding affordances, which is subjectively experienced as a diminished sense of possibility, and induces the corresponding alienation from the immediate environment.

While disorientation dims down certain affordances, it makes other affordances more salient, many of which are mental affordances (McClelland, 2019). Disorientation pushes the subject, for instance, to reconsider their mode of orientation and the spatial representation of the environment around them. In other words, when we are disoriented, we tend to re-evaluate if we have achieved the "reconciliation between the features we see in our world and a representation of that world" (Hutchins, 1995: 13). In navigation contexts, this process of re-evaluation is often distributed beyond the individual and involves the use of maps, compass, navigation instruments, GPS technology or environmental cues. If the source of the error is resolved (like Binet's subject realising that he had turned on the wrong direction), the effect is often an "aha moment" (as in Hutchins's case of the plotter finding the correct deviation) and a sudden phenomenal realignment follows (e.g. the allocentric frame of reference of a turned-around subject switching 180º to the correct orientation).

Reconsidering one's orientation is not the only action that is prompted by disorientation. A common reaction of people who get lost in the wilderness is exploration. Kenneth Hill conducted over a hundred interviews with subjects who had become lost in the wilderness and identified a series of common strategies in lost person behaviour. Some of these strategies were driven by a desire to reach civilisation as quickly as possible (e.g. following a single route for as long as it takes), but many of them were based on exploring the surroundings to facilitate reorientation. Three clear examples of disorientation-induced exploration are route sampling, direction sampling and route enhancing. Route sampling consists in using an intersection as a base for exploring different routes. Direction sampling consists in using a visible landmark as a base for exploring different directions. View enhancing consists in aiming for a high position in order to gain visibility. Additionally, disorientation can be highly arousing, and it is known to push subjects into panic, which results in suboptimal behaviours such as random walking (Hill, 1998).

Now, disorientation is not a discrete, on-or-off affective state. It comes in degrees, and it sometimes nudges navigational behaviour rather than prompting a complete reassessment of the subject's orientation. When one gets turned around, disorientation is a very sudden, arousing and salient feeling. However, when one is following a map through a city, a slight feeling of disorientation might simply prompt one to double-check that we are still on the street we are supposed to be following. Another thing to note is that orientation itself is also an affective state. This becomes clear when we look at the being-turned-around cases: once one understands what's going on and the spatial representation switches 180º to its correct position, one feels oriented. Of course, orientation does not often come to the fore because most of the time it is a background feeling. Still, we should consider the affective dimension of navigation as a continuum between orientation and disorientation, helping us guide our navigational activities in an evaluative-regulative fashion.

3. Conclusion

If all instances of cognition can be understood as emerging from processes distributed at many spatial and temporal scales, navigation is no exception. Navigation is performed in a particular cognitive ecosystem (e.g. involving signage codes, trail conventions, adapted navigational skills…) and is distributed within individuals (involving processes of attention, memory and decision-making) and beyond individuals (involving several group members and cognitive artefacts such as compasses and maps). Consequently, when disorientation evaluates and regulates navigation, it is evaluating and regulating a distributed cognitive process. If a map is indicating a route that no longer exists, if a malfunctioning GPS is misrepresenting one's heading or if a demagnetised compass is failing to point north, and one becomes disoriented as a result, the affective state of disorientation is not simply evaluating an internal process, it is evaluating a distributed cognitive process that extends beyond the individual. Inseparable from

this evaluative aspect is the regulative aspect of disorientation, which can range from modulation (e.g. turning the map around in an effort to elicit alternative interpretations; or restarting the GPS) to disengagement (e.g. pocketing the compass and trying to infer north from the position of the sun)[iv].

With this, we already have all of the elements of our present account. According to our account, affective states evaluate and regulate distributed cognitive processes. Diachronically, this can lead to the promotion of certain cognitive processes (e.g. shame promoting the learning of navigational skills). Synchronically, the evaluation of different modes of cognition distributed at different scales can lead to modulation (within one cognitive process) or disengagement (i.e. switching between cognitive processes).

We expect that in certain situations, mild affective states (e.g. of disorientation or orientation) lead to different levels of engagement rather than to on-off disengagement (e.g. double-checking street names if we are not that confident of our GPS system, rather than turning off our GPS), and that in most cases mild affective states lead to the modulation of distributed cognitive processes in ways that might not be very apparent. Most of the time, when navigating in a group, if a member of the group feels disoriented, this does not lead to a burst of anger that breaks the group apart, but to shows of doubt (e.g. forms of emotional negotiation such as unsure smiles or raised eyebrows) that make the expedition leader double-check that the expedition is well-oriented.

The way that affective states evaluate and regulates distributed cognitive processes brings us back to the phenomenology of disorientation, namely to the sinking away of affordances and the ensuing alienation. We have already mentioned that affective states serve to monitor affordances and that they become more or less salient as a result (Proust, 2015). It is easy to see how disorientation, *qua* affective state, results in the sinking away of affordances (in particular, navigation-related affordances). What is interesting here about the novel account

introduced in this chapter is that we can extend this understanding of disorientation to distributed cognitive processes. When a subject is engaged in a distributed cognitive process involving either other subjects or cognitive artefacts, the disengagement following from disorientation affects the affordances that were facilitated by the particular distributed cognitive process. If the different elements of the cognitive process (e.g. material media and somatic anchors) required to produce enacted representations fail in their multimodal integration, the enacted representations disintegrate as a consequence, and with them the corresponding affordances. If we realise that the map that we have been following has led us to the wrong trail, in our disorientation we become alienated from both the map, which stops representing our surrounding space, and the trail, which is no longer a meaningful trail to our destination. If we become disoriented after following our GPS, the GPS becomes conspicuous, as the navigational potential it afforded sinks away. Equally, we become alienated from the other members of a group if we stop feeling like a member of that group. Multimodal integration within a distributed cognitive process leads to the emergence of (often interpersonal) phenomenal objects. Consequently, when a negative affective state triggers the disengagement from that distributed cognitive process, the affordances sustained by it sink away and the subject becomes alienated.

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[i] In this paper, we are using the term "affective" as a reference to to emotions. This is the use of the term in, for instance, "affective neuroscience" to mean the study of the neural mechanisms of emotion or the "affective turn" to mean. Here, by the expression "affective state" we mean an emotional state, and by "affective experience" we mean an emotional experience.

[ii] The situated approach to emotions stays neutral about the stronger ontological claim that emotions extend onto the environment. The situated approach to emotions does not necessarily imply that the environment is a constituent part of an emotion; the claim is simply that the environment has a casual contribution to emotion. What the approach offers is a methodological alternative to traditional emotion accounts, just like distributed cognition offers an alternative to traditional accounts of cognition without making ontological claims about the extension of the mind.

[iii] For a detailed computational account of how such regulatory and evaluative role might be implemented see Joffily and Coricelli 2013.

[iv] Another variation of disengagement is the initiation of contingency measures, such as the co-pilot starting to double-check the route on their own phone once they feel that the driver has lost the way.