**Social phenomena as a challenge to the scaling-up problem**

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The “scaling-up” problem concerns radical embodied cognition’s (REC) supposed inability to extend its explanatory reach beyond simple cognitive phenomena. This paper questions the problem’s main assumption, that is, the possibility of sorting phenomena according to their inherent cognitive complexity or representation-hunger. To do so, I focus on a class of phenomena whose degree of representation-hunger has been much debated: social phenomena (and their cognitive requirements). Some, like Clark and Toribio (1994), consider social phenomena the absolute top of representation-hunger, while others, like radical enactivists, conceive of sociality as a non-representational resource; two opposite views which demonstrate how hard it is to place sociality somewhere in a representational hierarchy. An exploration into two social disciplines provides reasons to question the tenability of the scaling-up problem in the case of social phenomena and hence in general. The long debate in social psychology over dual-process models of cognition suggests distinguishing between the complexity of a task and its putative cognitive requirements, therefore rejecting that form of cognitive-task essentialism inherent in the idea of representation-hunger. The recent encounter of radical enactivism with social theory provides, on the other hand, a non-representational explanation of institutional phenomena. In the end, the paper suggests that one of the following must hold: either the scaling-up problem is untenable in its traditional (hierarchical) understanding or radical enactivism has already scaled up to social phenomena, understood as the pinnacle of representation-hunger.

**Keywords:** scaling-up problem; radical enactivism; representation-hunger; social phenomena; dual-process theory; institutions.

**1. Introduction**

The future of radical embodied cognition (REC) is seen by many as closely related to the resolution of the “scaling-up” problem, which concerns the extension of REC’s non-representational framework to increasingly complex cognitive phenomena. Since Clark & Toribio’s (1994) formulation,[[1]](#footnote-1) REC opponents have not hesitated to wield the *problem* as an *objection* against REC’s claims of cognitive generality. The pattern is familiar: upon accepting the radical explanation of a “lower” cognitive phenomenon, the doubt suddenly creeps in about whether the framework could really scale up to “higher” phenomena (e.g. Edelman, 2003). The problem has become so ingrained in the REC debate because it has been embraced by REC supporters, who have taken it up as a *challenge* to demonstrate non-representationalism’s wide reach. At least two positions can be identified on the REC front. On the one hand, the scaling up is read in light of a structural difference between “basic” and “contentful” cognition (Hutto & Myin, 2013), where REC’s ability to address the latter, usually denoted as the “tip of the cognitive iceberg” (p. 46), is seen conditional to the deployment of increasingly powerful non-representational resources. On the other hand, no principled difference between kinds of cognition is posited, and REC’s ability to scale up is mostly considered an empirical matter (see, e.g., Chemero, 2011, pp. 42-43). Following one or the other logic, characteristic forms of (alleged) higher cognition such as imagination (Rucińska & Gallagher, 2021), psychiatric disorders (Downey, 2020), counterfactual thinking and planning (Sanches de Oliveira et al., 2021), and linguistic intentionality (Kiverstein, & Rietveld, 2021) have received full-fledged non-representational explanations.

Although framing the radical debate in terms of scaling up brings undeniable advantages (for instance, it provides a clear way to measure advances in the field), some REC supporters have started to voice dissatisfaction about even accepting this as a problem (e.g., Gallagher, 2017, p. 25). This paper follows up on such increasing dissatisfaction and spells out some reasons why the scaling-up problem, at least when conceived of as an ascent toward abstraction and complexity, may be ill-posed. By introducing the influential concept of “representation-hunger,” Clark & Toribio (1994) associated it with a “problem domain” (p. 418), a “problem type” (p. 421), or more simply with some “problems” (p. 426). More broadly in the literature, it has been common to associate representation-hunger with *tasks*, only adding to the ambiguity that motivates this paper. Focusing on problems and tasks, in fact, it is unclear whether representation-hunger is associated with the inherent complexity of the task (according to some measure of complexity) or with the cognitive processes recruited to carry out the task, two quite different things although they are often conflated. Doing math, playing chess, or designing rockets, all instances of typically complex tasks, are in the literature seen as *inherently* related to the deployment of “higher” cognition, a conflation that implies holding a view that I will call *cognitive-task* *essentialism*.

I don’t mean to reinvent the wheel here. The entire Dreyfus-McDowell debate is about cognitive-task essentialism (although it is not identified in this way), as are other related criticisms of intellectualism (see Gallagher & Zahavi, 2020). More limited in scope, this paper is about the implications of questioning cognitive-task essentialism for the tenability of the hierarchical understanding of scaling up. Since hierarchical and cognitive-essentialist scaling up requires sorting tasks monotonically from the least to the most cognitively abstract/complex, it will be useful to focus the discussion on a class of phenomena considered by many to be on top of cognitive complexity: social phenomena.[[2]](#footnote-2) The idea is to show that REC’s painless scaling up to the level of social complexity can have significant consequences for the scaling-up debate. If phenomena deemed to be on top of cognitive complexity like social phenomena are shown to be largely non-representational, and for the sake of the argument we accept that representations may be involved in less complex phenomena,[[3]](#footnote-3) we must therefore recognize that a task’s complexity is *non-linearly* related to representation-hunger. In brief, what is generally considered the tip of the complexity iceberg may not be the most representation-hungry. More broadly, this paper intends to demonstrate that non-linearity is ubiquitous once a task’s complexity is disentangled from its (putative) cognitive requirements.

Most of the problem, of course, is related to what one means by a task’s complexity, what this notion exactly refers to. To address this point, Section 2 traces the origins of cognitive-task essentialism to Clark and Toribio (1994), showing how they deal with social phenomena as primary examples of representation-hunger. Immediately after, I set off on an exploration into the social disciplines. Section 3 shows how the debate in social psychology over “dual-process” models of cognition has already dealt with, and overcome, the idea of cognitive-task essentialism, which will allow us to draw some lessons for scaling up in REC. Then, Section 4 discusses the growing closeness between radical enactivism and the social sciences, focusing on radical enactivism’s explanation of institutional phenomena, especially in the economic domain. This foray into the social disciplines will aim to offer evidence of REC’s successful scaling up to the social domain and, at the same time, raise some doubts about the hierarchical understanding of scaling up.

**2. At the origin of cognitive-task essentialism: Task complexity and cognitive decomposition**

The origin of what this paper names cognitive-task essentialism can be traced back to the definition of representation-hunger offered by Clark and Toribio.

By a 'representation-hungry' problem domain we mean any domain in which one or both of the following conditions apply:

(1) The problem involves reasoning about absent, non-existent, or counterfactual states of affairs.

(2) The problem requires the agent to be selectively sensitive to parameters whose ambient physical manifestations are complex and unruly (for example, open-endedly disjunctive). (Clark & Toribio, 1994, p. 419)

Let’s focus for a moment on the first condition. It suggests that *any* problem involving reasoning about “non-existent” states of affairs, which include reasoning about non-existent entities like “unicorns” (p. 426), requires the use of mental representations. If the problem were to figure out how many footprints a unicorn or a (similarly non-existent) pink horse would leave on the ground, however, it would be hard to think of it as more representation-hungry than if one reasoned about a white horse. And it is equally hard to think that the problem would change in terms of representation-hunger if the image of a unicorn or a horse were “absent” from sight, as this condition also states. Leaving these issues aside, cognitive-task essentialism is most easily detectable in the case of counterfactual states of affairs. While absence or non-existence refer to problems and tasks directly, to their let’s say objective conditions (that an entity exists or not is presumably a verifiable fact), the same is not generally true for the counterfactual condition. The production of counterfactuals may well be related to objective conditions such as an explicit task request (e.g., the task could demand: “think of a unicorn’s behavior in scenario A and scenario B”), but it might also refer to counterfactual production as a cognitive process (deemed) necessary to carry out the task. No necessary correspondence between the task and cognitive requirements exists, though. The task might just demand that we think of two potential behaviors of a unicorn, which may or *may not* require the cognitive production of counterfactuals, or, although formulated in strict counterfactual terms, the task might be accomplished without producing counterfactuals (one may just think of a unicorn in two scenarios, A and B, and merely compare the two). These considerations serve to emphasize that in Clark and Toribio’s definition of representation-hunger, the two descriptions, of the task and of the underlying cognitive processes, get unwarrantedly conflated, risking to turn representation-hunger into a tautological notion, something like: *a task deemed to be carried out through representations requires representations*. A tautology that would be averted if tasks and cognitive processes were conceptually separated, a point Zahnoun (2021) has recently made clear pointing to Clark and Toribio’s conflation between *explanans* (cognitive processes) and *explanandum* (task behavior).

In their paper, Clark and Toribio aimed to refute the skepticism toward representations by two early REC scholars, Rodney Brooks and Randall Beer. To Brooks (1991), Clark and Toribio ascribe the “deep scepticism concerning our current abilities to find the right decomposition of human-level intelligence into sub-tasks/modules, etc.” (Clark & Toribio, 1994, p. 405), to which they rebut: cognitive decomposition need not be understood in symbolic terms as Brooks’ skepticism implied, but could be carried out in representational degrees. This plausible response, however, seems to sidestep the perhaps truer object of Brooks’s skepticism which concerned cognitive-task essentialism, that is, the alleged necessary correspondence between a given (intelligent) behavior and some specific cognitive processes. An “activity-based decomposition” implemented through “behavior producing-subsystems” (p. 406) is the way Brooks proposed for modeling problem-solving directly at the level of task behavior, not at the level of cognitive processes one assumes a task consists of (and is decomposed into). Beer’s (1995) position is similarly seen as a criticism of the assumption that “the agent’s internal organization mirrors the structure of a computational story and it is in virtue of this mirroring that the system ‘*behaves* the way it does’” (p. 414, emphasis added). Clark and Toribio oppose also this argument with their deflated notion of representation, perhaps once again leaving unaddressed the real issue: representations might be necessary for producing a representational cognitive process but not for performing the task itself.

The second condition in Clark and Toribio’s definition of representation-hunger leads to another consideration. Putting the condition a bit differently from above, it states that representation-hunger is directly related to the need “to *compress* or *dilate* an input space” (p. 420) or, more simply, to the degree of input processing.[[4]](#footnote-4) Interesting for us are the examples Clark and Toribio offer of problems requiring high input processing. One concerns “valuableness,” that is, “the ability to respond selectively to all and only the valuable items in an array” (pp. 419-420), which I’ll discuss later. All the other examples have instead an unmistakably social nature, such as the “ability to respond selectively to all and only […] items which belong to the Pope” (ibid.). Clark and Toribio argue that seemingly simple tasks like ascribing certain items to someone, require a prior representation of the social structure in which that someone is embedded: identifying certain items as belonging to the Pope, the example implies, requires a prior representation of the Vatican hierarchy. Another example deemed to require considerable representation is the social behavior of rhesus macaques:

In combat situations, support from a high ranking female is often decisive. Monkeys who groom such females tend to receive such support. Hence, it is wise to avoid contests with macaques who have been seen grooming these females. Such avoidance behavior is indeed often found, and persists long after the visual stimulus (witnessing the grooming event) has ceased. Knowledge of the likely behavior of the high-ranking female in combat situations that have not yet arisen thus seems essential to the social organization of the group […]. Yet *a good explanation of such behaviors will prima facie need to acknowledge some kind of internal representation of positions in the social hierarchy*, and storage in memory of knowledge concerning past grooming events. (Clark & Toribio, 1994, p. 419, emphasis added)

This way of explaining social phenomena is particularly interesting for our discourse as it seems to attest to social phenomena’s status as peaks of representation-hunger. Clark and Toribio’s explanatory argument sees *any* social phenomenon as inherently more representational than a non-social one for the mere fact of requiring, in addition to any other task-specific representation, a background representation of the social structure. Sociality, the argument boils down to, requires a *representational surplus*. If we were able to question this view, that is if we showed that social phenomena often require fewer representations than non-social ones, we would be able to support this paper’s main claim that scaling up does not proceed by hierarchies (of classes) of problems.

**3. Dual-process models of (social) cognition and representation-hunger**

My strategy for refuting Clark and Toribio’s assumption of social phenomena’s absolute representation-hunger is to look at disciplines that systematically deal with social phenomena and see what they have to say. The first discipline I turn to with this goal in mind is social psychology, which continues the long line of inquiry, often traced back to Plato, that sees behavior as driven by two alternative processing systems (Frankish & Evans, 2009). What is today known as the “two-system” or “two-process” theory of cognition associates each processing system with a fixed set of alternative features (Evans, 2008). System 1 is variously described as unconscious, implicit, automatic, low-effort, rapid, high-capacity, default-process, holistic, perceptual, non-verbal, modular, associative, domain-specific, contextualized, parallel, and stereotypical, while System 2 is instead deemed conscious, explicit, controlled, high-effort, slow, low-capacity, inhibitory, analytic, reflective, language-based, fluid, rule-based, domain-general, abstract, sequential, and egalitarian (Evans, 2008, Table 2). This long list leaves out other philosophically relevant features such as intentionality, often exclusively ascribed to System 2. Importantly, increasing recognition of the existence of hybrid processes consisting of features from both systems[[5]](#footnote-5) – e.g., automatic *and* sequential, or conscious *and* stereotypical processes – has pushed dual-process theory to change substantially. The traditional idea of two entirely separate cognitive systems – System 1 and System 2 – consisting of fixed features has been turned into the more flexible view that each feature merely aligns with one of two broad processing categories, respectively named Type 1 and Type 2 (Evans & Stanovich, 2013).

Why is dual-process theory relevant to our argument? First, it is an approach that programmatically rejects cognitive-task essentialism, and secondly does so from the vantage point of a social discipline. Although the association of System 1 with simple tasks and System 2 with more complex tasks has been tempting (and sometimes innocuous), dual-process theory’s main message is that virtually any task can be accomplished via either system. The recent multiplication of hybrid processes, those made of both Type 1 and Type 2 features, has even expanded the range of cognitive alternatives behind any given task.[[6]](#footnote-6) As most of dual-process theory’s allure comes from the prospect of normatively comparing the two systems’ performances (Kahneman, 2011),[[7]](#footnote-7) the theory puts no descriptive limitation on what each system can do by itself. Recently, Neemeh (2021) has pointed out striking similarities between dual-process theory and phenomenological approaches to cognition which provide useful material for this paper’s inquiry.[[8]](#footnote-8) It is probably no accident that social psychologists and phenomenologists alike have lingered on what influential psychologist John Bargh called (with unmistakable existentialist undertones) “the unbearable automaticity of being” (Bargh & Chartrand, 1999), a common research interest converging with remarkable results on the study of expert behavior. As a matter of fact, there is no obvious correlation in expert behavior between task complexity and the widely used proxy of cognitive effort, reaction times. There is no need to turn to extreme cases, like great mathematicians’ ability to make complex calculations within seconds, to substantiate the point. Most foreign language students learn to communicate almost automatically after initial clumsy approaches with grammar books. The point is that expert behavior, under the magnifying glass of both social psychologists and phenomenologists, comes to defy the entire assumption that representation-hunger is a property of the task with fixed cognitive manifestations: if representation-hunger is the relevant explanatory category, the study of expert behavior shows that it can manifest itself in association with any sort of Type 1 processes.

Keen readers will have noticed that in the long list of dichotomies above there is no reference to representation and content.[[9]](#footnote-9) In other words, dual-process theory does not assume, contrary to what one might perhaps expect, that representation is a Type 2 feature and non-representation a Type 1 one. On the contrary, even a glance at the dual-process literature reveals that representation is ubiquitous across types.[[10]](#footnote-10) “The idea that social perception is a largely automated psychological phenomenon is now widely accepted,” says Bargh (Bargh & Chartrand, 1999, p. 465). One corollary of accepting the automaticity of social perception is, he goes on, that environmental information can “directly control” (p. 468) behavior. But how, Bargh wonders, can the environment control behavior *directly*, namely, irrespective of an agent’s goals?

The answer is as follows: if (and perhaps only if) the environment itself activates and puts the goal into motion. […] To entertain this possibility, *one must assume that goals are represented mentally* […] and like any other mental representation are capable of becoming automatically activated by environmental features. (ibid., p. 468, emphasis added)

In other words, social perception’s automaticity would invariably involve “social-perceptual representations” (ibid., p. 473), and would hence remain *indirect* as far as representations are concerned. This approach seems consistent with Clark and Toribio’s as long as the latter concedes – as I argued it does – that much representation-hunger can manifest itself through unconscious, implicit, automatic Type 1 processes. One example from social cognition is emblematic of the consistency between these two views. It concerns the Pope, himself the object of Clark and Toribio’s example. Baldwin et al. (1990) presented practicing Catholics with a subliminal (i.e. below conscious awareness) image of the Pope demonstrating that this was sufficient to induce behavioral modifications in the subjects; this was probably due, the authors explained, to the image’s ability to activate “*relationship schemas*, or cognitive structures representing regularities in interpersonal interaction” (p. 435). Any perception of the Pope, even unconscious ones, would be able in other words to trigger representations of a social structure, which in turn would require, as Clark and Toribio assume, a surplus of representational content (in comparison to non-social perceptions).

If dual-process theory in social psychology is in the end consistent with Clark and Toribio’s view, there are other possible interpretations of dual-process theory that are not so. This is not, for instance, how phenomenologists like Hubert Dreyfus see it. To Dreyfus, who spent considerable effort to make this clear in the debate with John McDowell, much of both experts and ordinary people’s “smooth coping” with the world (Neemeh, 2021; see also Gallagher & Zahavi, 2020) takes place at the perceptual level and for this reason would involve “non-mental content that is non-conceptual, non-propositional, […] and non-linguistic [content]” (Dreyfus, 2007a, p. 352).[[11]](#footnote-11) Consider again expert behavior. Dreyfus discusses how chess Grandmasters play lightning (i.e., short time-constrained) chess: “When the Grandmaster is playing lightning chess, as far as he can tell, he is simply responding to the patterns on the board. At this speed he must depend entirely on perception and not at all on analysis and comparison of alternatives” (Dreyfus, 2005, p. 53). There is for Dreyfus no phenomenological evidence that Grandmasters consciously make the (counterfactual) calculations. Nor is there any evidence that calculations are made at all, for instance in the form of unconscious rule-following.

To assume that the rules we once consciously followed become unconscious is like assuming that, when we finally learn to ride a bike, the training wheels that were required for us to be able to ride in the first place must have become invisible. The actual phenomenon suggests that to become experts we must switch from detached rule-following to a more involved and situation-specific way of coping.” (Dreyfus, 2005, p. 52)

Even more important for this discussion is how Dreyfus saw ordinary people’s smooth coping in the social domain. In contrast to Clark and Toribio, sociality does not require for him a representational surplus; on the contrary, it demands fewer representations. Building on Heidegger, who in turn built on Aristotele’s notion of situational intelligence and practical wisdom (*phronesis*),

phronesis shows that socialization can produce a kind of master whose actions do not rely on habits based on reasons to guide him. Indeed, *thanks to socialization*, a person's perceptions and actions at their best would be so responsive to the specific situation that they could not be captured in general concepts. (Dreyfus, 2005, p. 51, emphasis added)

In other words, socialization works for Dreyfus as a form of exercise that builds up skills requiring fewer and fewer representations as social learning proceeds.

Recently, Gallagher (2020) has argued in favor of truly direct – i.e. non-representationally mediated – social perception by discussing some examples from social psychology, especially racial bias and dehumanization. Gallagher points out that racial biases and dehumanization stem from a tangle of “moods, traits, habitual practices, and skills [that] can also modulate perception” (p. 154). But these heterogeneous pieces of social ontology surrounding perception in the social domain “are not additions to perception, an added-on set of inferences,” Gallagher explains; “rather, they transform the perceptual process itself. In the case of dehumanization, for example, one is not trained to make bad inferences; one is conditioned to directly perceive others as non-persons” (ibid.).

Social psychology’s main message discussed in this section is that naïve cognitive-task essentialism can be avoided by being aware that even complex tasks can be carried out in a variety of cognitive fashions aligning with Type 1 (Neemeh, 2021). However, social psychology’s cognitive pluralism does not reflect on representationalism, as most dual-process theorists seem to be unflinchingly representationalist. This has led me to complement social psychology’s message with insights from phenomenology, where Dreyfus and Gallagher have shown that sociality, through its non-representational building up of social skills, often acts as a cognitive relief, not as an additional representational burden. If social psychology fails by hinging too much on representationalism, phenomenologists would reply paraphrasing the title of Dreyfus’s (2007) paper, “fixing it would require making it more social.”

**4. Radical enactivism, sociality, and institutional phenomena**

***4.1 Radical enactivism’s deep social nature***

Before proceeding further with the critical examination of sociality as the peak of representation-hunger, it is important to make one thing right. In the Introduction I said that some dissatisfaction with the hierarchical understanding of scaling up has started to be noticeable in REC. In all likelihood, that was an understatement. Within REC, at least one thread of radical enactivism takes a stance in principle incompatible with hierarchies of task domains, and by implication incompatible with a hierarchical view of scaling up (Gallagher, 2017). The principle in question, believed to cut across task domains, is called the *social permeation of cognition* (see Hutto et al., 2020).[[12]](#footnote-12) Consider, for instance, driving a car, which like many other similar tasks does not seem to present a prevalent social nature, but which for radical enactivism is social to the bone. Driving a car is downright social in that it requires coordination not only with other car drivers but also with bikers, cyclists, skateboarders, and pedestrians, all of whom need to follow the rules of the road. This simple example shows that the boundary between what is individual and what is social in tasks is fundamentally blurred, a state of affairs that reflects in the conceptual impossibility of taking individual and social tasks apart, let alone making hierarchies between them. Gallagher & Crisafi’s (2009) example of Alexis can help to better unpack the inherently social nature of seemingly non-social tasks. Presumably not a legal expert, Alexis is asked to decide about the rightfulness of a claim and is provided with an exhaustive account of the situation in which the claim is made. Gallagher and Crisafi then ask to consider three scenarios:

1. Alexis is provided with no further help and is asked to decide on the matter using her own criteria and cognitive resources.
2. Experts help Alexis get clear on some aspects of the matter but still leave her free to make the final decision.
3. Experts provide Alexis with decision-making criteria and sketch out possible decisions.

The three scenarios seemingly differ in their degree of sociality. The first seems to involve nothing social: Alexis is asked to perform the task all on her own. It is only in the ensuing scenarios that she gets aided by experts and “scaffolded” by institutional rules. Gallagher and Crisafi argue, however, that the social nature of the task is there right from the beginning, from the very fact that Alexis is asked by someone, possibly institutional actors, to do something that will affect someone else. Moreover, even in the first scenario any piece of evidence is provided to Alexis by others, as from others arguably comes everything she had learned up to that point in her life. The entire example serves to dismantle the idea posited by Clark and Toribio that sociality appears in the form of a surplus, a cherry on top: instead, sociality permeates, radical enactivists argue, any task from the start.

It is worth emphasizing that the above is no fringe idea in radical enactivism. The profound social nature of cognitive activity is an integral part of a full-blown framework where social permeation begins at least at birth (Gallagher, 2020) and is later completed (or maybe never fully completed) in terms of increasing co-dependence between individuals, institutions, and a variety of “institutional entanglements”[[13]](#footnote-13) (Slaby & Gallagher, 2015). Such profound social and institutional permeation is framed by Gallagher (2013) in terms of what he calls the *socially extended mind*, “a liberal interpretation of the extended mind […] that [considers] cognitive processes as constituted in various social practices that occur within social and cultural institutions” (p. 4). Gallagher’s way to social permeation cashed out in terms of the socially extended mind suggests that the criticism of Clark’s representation-hunger would benefit from also including Clark’s approach to the extended mind (Clark & Chalmers, 1998; Clark, 2008). The rest of the paper will be devoted to this idea.

***4.2 The extended mind and representation-hunger***

It would be inaccurate, even misleading, to consider Gallagher’s socially extended mind a mere attempt to incorporate sociality into Clark’s original extended mind. This is not merely because Clark & Chalmers (1998) had anticipated the possibility of a social extension: “What about socially extended cognition?”, they wondered, to which they were quick to reply: “We see no reason why not, in principle” (p. 17). Focusing on the continuity between the extended and socially extended mind would overshadow the fact that they involve two alternative ideas of sociality, and this is crucial for us because nowhere is this more clear than in the way they relate to representation-hunger. To Clark, representation-hunger and the extended mind are two faces of the same coin in that the mind’s principal reason for extending is to cope with representational demands. Otto, the mildly cognitively impaired character of Clark and Chalmers’s example, comes to rely on his notebook because his internal equipment can no longer recollect addresses or accomplish similar (representational) tasks. The condition for off-loading cognition onto environmental vehicles like Otto’s notebook (e.g., Risko & Gilbert, 2016) is trivially that cognition be loaded with representations in the first place. It is hence reasonable to expect that mind extension can take the form of social mind extension also in Clark’s framework. “In an unusually interdependent couple,” Clark and Chalmers argue, “it is entirely possible that one partner's beliefs will play the same sort of role for the other as the notebook plays for Otto” (Clark & Chalmers, 1998, p. 17), beliefs being the type of representations off-loaded in this particular example. Although they are two faces of the same coin, Clark’s representation-hunger and the extended mind nonetheless collide once we realize one implication of Clark’s thought, his idea that sociality is *both* a way to cope with representation-hunger and, as discussed in Section 1, the domain that needs representations most.[[14]](#footnote-14) Representation-hunger would be in other words greatest in social phenomena and at the same time would use sociality as an off-loading vehicle. In brief, sociality appears on both sides of the equation, as a problem and a solution to representation-hunger.

This is not the place to decide whether this is a mere glitch in Clark’s framework or something more serious. It is instead the place to emphasize that Gallagher’s socially extended mind, with its non-representational approach to sociality, avoids the issue entirely. We do not need to fit social phenomena anywhere on a representational scale simply because they don’t consist of representations in the first place. The ontology of socially extended minds is populated with non-representational entities like practices, habits, cultures, and narratives sufficient to explain social phenomena without resorting to representational concepts. Sociality neither needs to be an answer to the problem of representations nor an additional problem for representations; rather, it is an alternative way to cope with the problems representations are supposed to address. And this is so because social interaction is what radical enactivists consider social cognition (and possibly cognition tout court) to consist of (De Jaegher et al., 2010). At this point, critics might object that even radical enactivists do not rule out that representations may play a role in cognition, that they can still lie somewhere. If this is true, representation-hunger can’t be so easily dismissed by radical enactivists. A possible reply to this concern is that even if we accepted that there is a domain absolutely more representation-hungry than others (as it should be clear by now, I don’t think there is), sociality and social interactions would not be the first places to look.[[15]](#footnote-15) Sociality provides a unique foothold for devising non-representational explanations. The next section will expand on this point by focusing on how institutions afford non-representational explanations.

***4.3 Cognitive institutions, value, and a representation-diet***

Section 3 turned to social psychology to establish a principle, the non-linearity between tasks and cognitive requirements, whose generality has been intended as a (hopefully) hard blow to the scaling-up problem. This section does something a little different, it turns to institutional theory to show that were scaling up a well-posed problem, REC would be already well on track to solve it. As rule-based social phenomena, institutions are seen by many as utterly representational (e.g. Searle, 2005) and for this reason a difficult target for scaling up. In the late 1990s, Clark tried to explain institutions by way of his extended-mind framework, an attempt recently radicalized by Gallagher in a socially extended mind fashion. In what follows, I will review this radicalization of institutional theory arguing that were it successful, REC could claim to have made a crucial step in the scaling-up process.

Over the years, application of the extended mind to institutional theory has given rise to two brand-new concepts of institution: Clark’s “scaffolded” institution (Clark, 1997; 1998) and Gallagher’s “mental” or “cognitive” institution (Gallagher, 2013; Gallagher & Crisafi, 2009). As for Clark, to illustrate the principle of social mind extension he makes an analogy with the famous example of pen and paper as mind-extending tools in mathematics: “Institutions, firms, and organizations seem to me,” he says, “to share many of the key properties of pen, paper, and arithmetical practice” (Clark, 1997, p. 279). It is no accident that organizations and institutions are thought to do for sociality what pen and paper do for mathematics. Through the explicit association between sociality and mathematics, Clark makes clear that we are facing two equally high representation-hungry domains that hence need offloading vehicles. From that comes Clark’s metaphor of institutions as “scaffolds,” that is, external structures that do the (representational) cognitive work required for sociality in place of individuals: ”what is doing the work, in such cases, is not (so much) the individual’s cogitations as the larger social and institutional structures in which she is embedded” (Clark, 1997, p. 272). On a slightly different interpretation of the scaffolding, Clark sees it working as a constraining structure that limits individuals’ choices and behaviors.

Gallagher’s definition of cognitive institutions touches different keys. “They are not only institutions with which we accomplish certain cognitive processes,” Gallagher says, “but also are such that without them such cognitive processes would no longer exist” (Gallagher, 2013, p. 7). This definition emphasizes the constitution of certain cognitive processes, which would not exist or even be possible without corresponding institutions. Recently, Candiotto (2022) has called Gallagher’s formulation an instance of the “not-possible-without” principle of mind extension, an alternative to Clark and Chalmer’s (1998) “parity” principle which requires functional parity between internal and external cognitive resources. Gallagher’s emphasis on constitution does not mean, however, that cognitive institutions have no functional role. On the contrary, their alternative naming as “problem-solving” institutions reflects a pragmatist background (Petracca & Gallagher, 2020). Although both Clark and Gallagher see institutions as solving problems such as coordination, signaling, and evaluation (e.g., Hindriks & Guala, 2021), Clark’s functionalism implies that prior to these problems, institutions’ most profound and crucial function involves the off-loading of representations (what coordination, signaling, and evaluation are supposed to be made of), a view that Gallagher’s non-representational constitutionalism of course rejects.

The case of evaluation can be helpful to explicate Clark and Gallagher’s alternative ways to institutional mind extension. Remember that when they discussed examples of representation-hunger, Clark and Toribio (1994) contended that “sensitivity to such features as valuableness surely *is* a 'tip of the iceberg' […] phenomenon” (p. 420). When in later works Clark came to deal with how valuableness is established through institutions, he would never stop dealing with it as a representational phenomenon. Taking its representation-hunger for granted, Clark sees institutions as helping alleviate the representational burden related to evaluation. His framing of the valuation problem is textbook economics:

You go into the supermarket to buy a can of beans. Faced with a daunting array of brands and prices, you must settle on a purchase. In such circumstances, the rational agent, according to classical economic theory, proceeds roughly as follows: The agent has some preexisting and comprehensive set of preferences, reflecting quality, cost, and perhaps other factors (country of origin or whatever). Such preferences have associated weights or values, resulting in a rank ordering of desired features. This complex (and consistent) preference ordering is then applied to a perfect state of knowledge about the options which the world (supermarket) offers. The bean-selecting agent then acts so as to maximize expected utility; i.e., the agent buys the item that most closely satisfies the requirements laid out in the ordered set of preferences. (Clark, 1998, pp. 180-181)

The representational way of presenting the consumer problem is unmistakable: there are *preferences* intended as representations of *values* that ultimately result in orders of *desires*. Clark acknowledges that this view of a consumer’s behavior is descriptively flawed, i.e., does not describe how consumers make real choices. In fact, overwhelming evidence demonstrates that consumers rarely (if ever) maximize their satisfaction, a state of affairs implicitly related, Clark seems to suggest by citing the work of Herbert Simon, to the difficulty of computing all the relevant internal representations. How can institutions fix this? By off-loading the required computations onto the market mechanism, of course. This can happen in a variety of ways, most of them intuitive, like providing information that market actors would have to find or compute by themselves. But this can happen also in more extreme fashions. In this regard, Clark discusses a thought-provoking computer simulation by Gode and Sunder (1993) which demonstrates how certain market arrangements can achieve high allocation efficiency even in the case of cognitively unsophisticated market actors called “zero-intelligent traders.” Both simulations and experimental evidence have since piled up in support of the view that market mechanisms work to achieve efficient allocation in substitution for market actors’ (representational) rationality (Smith, 2007).

In cases where the overall structuring environment acts so as to select in favor of actions which are restricted so as to conform to a specific model of preferences, neoclassical [i.e. traditional economic] theory works. And it works because individual psychology no longer matters: the "preferences" are imposed by the wider situation and need not be echoed in individual psychology. (Clark, 1998, p. 183)

What is crucial to emphasize here is that both ends of Clark’s ways to establish valuableness, the completely internalist consumer model and the completely off-loaded market case, are but two ways to cope with the same problem: representation-hunger (see also Schotanus, 2022).

Gallagher’s institutional way to valuableness – Gallagher’s view of markets and market mechanisms – rejects this representational picture (see Gallagher et al., 2019; Petracca & Gallagher, 2020). This reflects especially in his rejection of the view that markets either off-load or constrain representations such as preferences or expectations. It is the concept of preference itself that gets challenged when markets are conceived of as cognitive institutions, that is, as fundamentally dynamic cognitive mechanisms. For one thing: how can markets be mere reflections of internally held preferences if preferences co-depend on the market process, that is, depend on prices, the same prices that preferences are supposed to determine? Beck (2022) rightly implies that we can continue to talk about preferences even in a completely off-loaded, “Clarkian” case, but probably we can’t continue doing so in the case of cognitive institutions. Or better, if we kept talking about reflected preferences this would overlook more subtle processes underlying markets. Consider for example the basic market actions, bidding and asking for a market item at a given price. When understood as mere reflections of individual preferences, bid and ask are what Kirsh & Maglio (1994) would call “pragmatic actions,” i.e. actions that aim to achieve a precise objective, in this case buying or selling an item at a given price. But prices can also be used strategically, for instance as levers to push counterparts to reveal useful information (Gallagher et al., 2019). In this case bidding and asking become, again using Kirsh and Maglio’s term, “epistemic actions.” It might be argued that seeing prices not as reflections of preferences but as part of an epistemic strategy is no different than making preferences depend on higher-order representations, for instance representations of other market actors’ minds, expectations about their behavior, and so on. An epistemic action would end up requiring, critics would argue, more representations than a pragmatic action. This objection fails, however, to accept that most social interactions take place non-representationally, via embodied and situated processes of primary and secondary intersubjectivity,[[16]](#footnote-16) including direct social perception (Gallagher, 2020). On this view, in addition to being guided by formal rules, markets can be seen as embedded in a rich ontology (Beckert & Aspers, 2011) consisting of informal rules, habits, and customs that do not work as vehicles of propositional attitudes but as important interactional *practices*. Consider hand-shaking, whose normative significance depends not so much on contracting parties’ intentions but on the significance assigned to the practice in local cultures. When one closes a deal through hand-shaking in a culture that values reputation, the hand-shaking cuts short further representational needs. This way to market non-representationalism (for other ways compare, e.g., Colombo & Guala, 2021) is shored up by a materialistic view that considers material details of market arrangements crucial for identifying the full range of market mechanisms’ effects (MacKenzie, 2008).

While much more should be said about this framework for markets (see also Herrmann-Pillath & Boldyrev, 2014) embracing it would have at least one important consequence. If Clark’s market functionalism is fundamentally indifferent to the nature of the off-loading vehicles insofar as what counts is carrying out off-loading successfully, Gallagher’s cognitive institutions discriminate between mere off-loading and mind extension via interpersonal interactions. Although the former is often a more efficient form of mind extension – and efficiency, economists claim, is the principal economic virtue – it might be unsustainable in the long term. Gallagher & Petracca (2022) make the case that short-term market efficiency might impoverish relational skills and virtues, such as trust, which are otherwise necessary for preserving healthy institutions.

**5. Conclusion**

Representation-hunger has been operated as such a pivotal notion in the philosophy of cognitive science that it has inevitably shaped the agenda of the non-representationalist front, motivating attempts to solve scaling-up problems and applying the radical framework to ever-higher cases of representation-hunger. But what if the idea of representation-hunger was misleading from the beginning? This paper, not the first raising this question (see Zahnoun, 2021), has tried to show that representation-hunger is an unreliable guide for making sense of the social domain, although sociality is seen by many as the absolute vertex of representation-hunger. The paper’s arguments boil down to two main points.

1. Once a task gets conceptually severed from its (putative) cognitive requirements, any form of non-linearity may intervene between tasks and cognitive difficulty. This critically challenges the cornerstone assumption of representation-hunger, i.e. that tasks, and more generally task domains (e.g. mathematics, sociality, etc.), can be sorted in order of cognitive difficulty.
2. Sociality turns out to be a far less representation-hungry domain than many supporters of representations think. This is not because, as usually held, sociality allows for the off-loading of representations, but because most intersubjective phenomena come into being via non-representational interactions (explained in terms of embodied and situated processes of primary and secondary intersubjectivity).

One last remark seems in order. Although rejecting the possibility to sort tasks and domains in terms of inherent representation-hunger, the paper does not deal with the issue of representations’ existence. On the contrary, for the sake of argument, it somewhat concedes they exist; doing so, if possible, complicates the picture even more. Conceding that representations exist somewhere but not necessarily where they were supposed to be, renders their involvement in cognitive activity unpredictable, erratic. For this reason, representations require to be explained more than they can currently explain. This opens up a challenge for future research, one which seems to fall more on the shoulders of the representationalist front: if representation-hunger cannot be used as a reliable criterion for sorting or discriminating between tasks and domains, what is its role in the study of cognition?

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1. I take Clark & Toribio (1994) as the first influential formulation of the scaling-up problem, although partially similar arguments can be found in Vera & Simon (1993), or, even earlier, in Fodor & Pylyshyn (1981). [↑](#footnote-ref-1)
2. One clue that social phenomena are often considered on top of phenomenal complexity comes from psychology, where the distinction between “non-cognitive” (i.e. about perception and sensorimotor control), “cognitive”, and “social” psychology seems to follow a hierarchical order of complexity. [↑](#footnote-ref-2)
3. Because representations’ involvement in cognitive activity is here accepted only for the sake of the argument, I won’t deal with the thorny issues of what representations are or are supposed to be. [↑](#footnote-ref-3)
4. Again, this way of putting things (ubiquitous in Clark and Toribio’s paper) has the appearance of a tautology: a (cognitive) process described as involving the processing of semantic inputs, hence computational and representational in nature, is deemed to require computations and representations. The problem, as said above, is whenever those representations and computations are necessary to produce a certain behavior and for a problem’s solution. [↑](#footnote-ref-4)
5. This recognition is related to the “misalignment problem” in dual-process theory (see Melnikoff & Bargh, 2018). [↑](#footnote-ref-5)
6. Many wonder what is left of dual-process theory in its latest formulation (sometimes called “dual-process theory 2.0,” see De Neys, 2017). Arguably not much. This is why this paragraph is better understood in terms of what we can learn from the *debate* on dual-process theories than from dual-process theory itself. [↑](#footnote-ref-6)
7. Kahneman considers fast System 1 processes generally inferior, in terms of outcomes, to slow System 2 processes, a view that has been the object of compelling criticism (e.g., Gigerenzer & Todd, 1999). Although clearly important, I won’t delve much into normative aspects in this paper. [↑](#footnote-ref-7)
8. For Neemeh, Heidegger’s (1962[1928]) concepts of *Zuhandenheit* [“handiness”] and *Vorhandenheit* [“objective presence”] coarsely correspond to Type 1 and Type 2 processes respectively. Moreover, Heidegger’s famous example of hammering cited by Dreyfus (2005, p. 60) seems to be truly about the switch from Type 1 to Type 2 processes. [↑](#footnote-ref-8)
9. The attributes “perceptual” and “non-verbal” (associated with System 1) and “reflective” and “language-driven” (associated with System 2) seem the closest reference to the debate over representationalism, but it is perfectly possible for representations and content to be perceptual and non-verbal, and conversely for language and reflection not to involve representations. [↑](#footnote-ref-9)
10. Bargh & Chartrand (1999, p. 463) are aware that representationalism is not the only game in town as in footnote 1 they mention the alternative assumptions on cognition of Varela et al. (1991). [↑](#footnote-ref-10)
11. Dreyfus also mentions the attribute “non-rational” here, but with it he likely intends “non-rationalistic” or “non-intellectualistic”. As said, I won’t focus on normative aspects in this paper. [↑](#footnote-ref-11)
12. For the treatment of sociality and social embeddedness in the neighboring field of ecological psychology, see Segundo-Ortin (2022). [↑](#footnote-ref-12)
13. Institutional entanglements are also defined as “extra-institutional (but still social/cultural) constraints” (Gallagher, 2020, p. 215) on cognitive activity. An example Gallagher makes is the influence of extra-scientific factors in driving scientific research. [↑](#footnote-ref-13)
14. The shifting status of social mind extension at different points of Clark’s oeuvre might be related to this theoretical glitch. On the one hand, Clark & Chalmers (1998) explicitly accepted social mind extension, and Clark, as we shall see, even dealt with institutional cases of mind extension. On the other hand, as a way to prevent/reply to criticisms, Clark & Chalmers and Clark (2008) introduced stricter criteria for mind extension that seem to rule out the very possibility of social mind extension. For a more detailed discussion, see Petracca & Gallagher (2020) and Gallagher & Petracca (2022). [↑](#footnote-ref-14)
15. I read in this way Gallagher’s (2017, Chapter 10) choice of the example of mathematics as the most challenging to deal with in a non-representational fashion. [↑](#footnote-ref-15)
16. Primary and secondary intersubjectivity concern relational abilities acquired at a very early age which support later interactions. Primary intersubjectivity, which begins to develop from birth, refers to interactional sensorimotor abilities such as responding to gestures or imitation. Secondary intersubjectivity, which develops later, roughly from the age of one, involves capacities for joint attention and joint action, such as understanding contexts and others’ intentional actions. For further details, see Gallagher (2020, Chapter 5). [↑](#footnote-ref-16)