

## Dynamics without a framework? Towards an ecological-enactive approach to the dynamical view of metaphor

¿Dinámica sin un marco? Hacia un enfoque ecológico-enactiva sobre la visión dinámica de la metáfora

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Artículo recibido el / *Article received*: 2019-03-31  
Artículo aceptado el / *Article accepted*: 2019-10-03

**RESUMEN:** Recientemente se han realizado varios intentos para unir el campo de estudios sobre la metáfora tratando de conciliar los enfoques conceptual-cognitivo y lingüístico-discursivo (Hampe, 2017a). Se dice que la visión dinámica de la metáfora como una forma de unificar el campo de los estudios de metáforas converge en los hallazgos y las predicciones teóricas encontradas en varios enfoques (Gibbs, 2017a). El autor fundamenta su enfoque en modelos dinámicos para explicar los aspectos socio-cognitivos de escala múltiple de la metáfora, ya que un fenómeno emergente no es lo suficientemente robusto. La complejidad y los sistemas dinámicos son simplemente una técnica de modelado que permita implementar la teoría a través de la prueba empírica de hipótesis. Una visión dinámica de la metáfora necesita una teoría de fondo coherente sobre la que fundamentar su modelado dinámico de la metáfora en acción (Chemero, 2009). En este artículo propongo que esta base puede estar fundamentada con éxito en el marco ecológico-enactivo que se enmarca en el paradigma moderno de la ciencia cognitiva 4E. Además, en este artículo esbozo cómo los conocimientos teóricos recientes del marco ecológico-enactivo (Baggs and Chemero, 2018, 2019) sobre la noción de medio ambiente de Gibson (1979) se aplican al intento de unificación del campo de estudios de metáforas. Concluyo sugiriendo cómo una comprensión de la metáfora como una provisión ecológica del entorno sociocultural puede proporcionar una base rica para hipótesis empíricas dentro de una ciencia dinámica de la metáfora.

*Palabras clave:* psicología ecológica, enactivismo, sistemas dinámicos, ofrecimientos estimulares, metáfora, filosofía de la ciencia cognitiva.

**ABSTRACT:** Recently several attempts were undertaken to unite the field of metaphor studies, trying to reconcile the conceptual/cognition and linguistic/discourse approaches to metaphor (Hampe, 2017a). The dynamic view of metaphor as a way to unify the field of metaphor studies is said to converge on findings and theoretical predictions found in cognition and discourse approaches (Gibbs, 2017a). The author argues the focus on dynamical models to explain the

multi-scale socio-cognitive aspects of metaphor as an emergent phenomenon is not robust enough. Complexity and dynamical systems are merely a modelling technique to deploy theory for empirical testing of hypotheses; a dynamic view of metaphor needs a coherent background theory to base its dynamic modelling of metaphor in action on (Chemero, 2009). I argue that it can be successfully based on the ecological-enactive framework available within the modern paradigm of 4E cognitive science. This framework makes possible explanation of both 'lower' cognition and 'higher' cognition emerging in the interaction of an organism with its environment. In addition, I sketch how recent theoretical insights from ecological-enactivism (Baggs and Chemero 2018, 2019) concerning Gibson's notion of environment (Gibson 1979) apply to the attempted unification of the field of metaphor studies. I close by suggesting how an understanding of metaphor as an ecological affordance of the socio-cultural environment can provide a rich basis for empirical hypotheses within a dynamical science of metaphor.

*Key words:* ecological psychology, enactivism, dynamical systems, affordances, metaphor, philosophy of cognitive science.

## 1. INTRODUCTION

The meaning of metaphor is contested and debated over between multiple research programs in metaphor studies. These programs are at odds not just about the empirical phenomenon of metaphor (i.e. what is the right level of analysis) but also about the applicability of research methods (Gibbs, 2017a: 83-90, b; Steen, 2017)<sup>1</sup>. Recent attempts were undertaken to unite the field, trying to reconcile divergent approaches to metaphor (Hampe, 2017a). These attempts illustrate the differences between embodied cognition and discourse approaches to metaphor, but also point to resources available within the social and cognitive sciences to ameliorate this division. According to Hampe, a “socio-cognitive [dynamical model]” of metaphor can “bridge the cognition-discourse divide” (Hampe, 2017b: 4). In recent work by Raymond Gibbs we find a similar approach to a dynamical view of metaphor (Gibbs, 2017a: 216-221).

I take the extant dynamical view of metaphor to concentrate on two central points. One of these is that the dynamical view is reflecting a larger cumulative corrective phase within metaphor studies due to insights how metaphor is an emergent processual phenomenon coming about through the interaction of many factors (cf. Gibbs, 2017b: 331). The other point is the integrative character of such a dynamic approach. It allows for a multitude of perspectives and approaches to metaphor, including cognition and discourse approaches, to be subsumed in a coherent unified whole. Importantly, metaphor dynamicists share a commitment to give a non-reductive explanation of metaphor consisting of more than one preferred level (cf. Hampe, 2017b: 11).

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<sup>1</sup> There are more approaches than the archetypical Conceptual Metaphor Theory (CMT) and Deliberate Metaphor Theory (DMT) that fall either on the conceptual / embodiment / cognition or linguistic / discourse / communication pole of metaphor studies. CMT adopts an embodied cognition perspective on metaphor, seeing the bodily and cognitive nature of metaphor as primary, investigating the conceptual metaphor-as-mapping (Lakoff and Johnson, 1980/2003, 1999; Gibbs, 2017a). DMT adopts a discourse perspective on metaphor, emphasizing the social interaction in which metaphor is deliberately used as opposed to various non-deliberate instances of metaphorical language (Steen, 2017). See Hampe (2017b) for an overview.

My worry about the present dynamical view of metaphor is that it is not yet a comprehensive scientific research program. Most, if not all, scholars focus on reconceptualizing metaphor as a dynamic emergent phenomenon. Some show the dynamics and complexity involved in actual discourse situations can be reanalysed through dynamic systems terminology. To become a flourishing research program, however, future research must move beyond the idea that “a set of models created on the fly to be applied to incoming data” is all there is to a dynamical view of metaphor (Chemero, 2009: 100). One must also give a positive account of *what metaphor is and does* (cf. Hampe, 2017b: 4). I believe that metaphor dynamicists have yet to provide such an account.

In what follows I first sketch the extant thinking about dynamical views of metaphor and related principles of dynamic systems theory, often used to analyse discourse events. I will then explain why current methodology is not robust enough to put forward a dynamical view as an independent scientific research program. In order to address this point, in this paper I argue the need to shore up a dynamical view of metaphor with a background theory. With this groundwork laid I explicate the ecological-enactive framework and argue for its use as background theory within a dynamical view of metaphor. Following the work of Baggs and Chemero (2018, 2019), I suggest that their reconstructed notion of environment can be seen as an example of the kinds of theoretical resources that the ecological-enactive framework can provide as background theory. I then examine whether it can be used to understand current theoretical and empirical content within metaphor studies. I close by arguing that an understanding of metaphor as an ecological affordance of the socio-cultural environment, can provide a rich basis for empirical hypotheses within a dynamical science of metaphor.

## 2. THE DYNAMICAL VIEW OF METAPHOR

I now discuss several dynamicists’s views to examine what their approach to metaphor entails. I end up concluding they all consider metaphor a processual phenomenon fit for reconceptualization using dynamical systems terminology. However, such approaches fail to make any (new) empirical predictions. If and how this is a problem for the dynamical view of metaphor will be treated in the next section.

### 2.1. METAPHORICITY AS GRADED ACTIVATION OF METAPHOR

Müller (2008) initiates her dynamical view by arguing for the importance of a dynamic sleeping/waking distinction at the use level over the traditional dead/alive (or conventional/novel) distinction at the system level of metaphor.<sup>2</sup> She shows at the level of use there is a subset of dead metaphor that varies in activation and salience, introducing the notion of metaphoricity to express this graded cognitive activation. Metaphor rests upon a “modality independent” cognitive process of activating metaphoricity, with its products “[materializing] in different modalities” (Müller, 2008: 215).<sup>3</sup> Depending on

<sup>2</sup> I understand the use level to mean social interaction, which includes discourse events (cf. Hampe, 2017b: 7). The system level is the lexicalized language system, consisting of conventionalized symbolic units of a language. Unlike Müller I consider both levels inherently dynamic.

<sup>3</sup> I take Müller to mean that a modality independent cognitive process is a process taking place in a brain region independent of sensorimotor processing areas. My position is that such processes have too much counterevidence from cognitive neuroscience suggesting the brain is not massively modular like that but consists of functional clusters of neurons soft-assembled to perform tasks (Machielsen, 2017: 68-70; cf. Edelman, 1992; Tucker, 2007). This is consistent with a recent proposal for the brain’s architecture to work according to ‘neural reuse’ (Anderson, 2014).

context and intention in the ongoing interpersonal dynamics of discourse this intrapersonally activated metaphoricity changes. For Müller “salience is the observable indicator of activated metaphoricity,” and one sees such metaphoricity “when it shows up in various modalities, triggers verbal elaborations, and/or is foregrounded” (ibidem: 209).

Her dynamical view is instrumentally useful for clearing up a longstanding dichotomy (ibidem: 221). But it also locates cognitive dynamics solely at the skull-bound level. While the instantiating of “a collectively established system” reveals “metaphors operate on the level of a linguistic system and on the level of use,” Müller claims that only “in use their nature is inherently dynamic” (ibidem: 221).

## 2.2. CONTOURS OF A DYNAMICAL RESEARCH PROGRAM

Unlike Müller, Gibbs and Cameron (2008) explicitly employ dynamic systems theory to show metaphor performance can be explained as a type of higher-order complex behaviour pattern.<sup>4</sup> All behaviour emerges from “interaction of a system’s components rather than from specialized cognitive or neurological mechanisms” (ibidem: 67). An individual’s behaviour emerges within a continuously coupled interaction of a brain, body, environment system. A human environment importantly includes social interaction. What are called self-organizing processes “emerge from both intra and interpersonal interactions” (ibidem: 65). Such processes give rise to continuously altering temporarily stable structures, from “knowledge structures” in an “individual’s mind,” to “status hierarchies ... among a group,” or “clusters of shared beliefs and other cultural norms ... across populations” due to interpersonal communication and influencing (ibidem: 67-68). Emerging structures show “reciprocal causality” or a “downward force” on “lower-level behaviors” (ibidem: 67). An example is how cultural considerations can shape a couple’s metaphor performance during marital counselling.

The multidimensional dynamic model of metaphor comprises a large array of levels, from the neurophysiological level enabling organism-environment interactions (i.e. locomotion, perception, and cognition) to the evolutionary level where phylogenetic development of the species takes place.<sup>5</sup> Metaphor is always a result of forces working at different spatiotemporal scales, from split-second cognitive processing to the centuries in which human culture took form (Hampe, 2017b: 11; cf. Gibbs, 2017a: 216; Kövecses, 2015). So, metaphor is never merely a conceptual mapping in the mind according to Gibbs, as “what happens at the cognitive level is partly determined by the neural and evolutionary constraints” (Gibbs, 2017b: 333-334). Nor can metaphor be reduced to an analysis of a discourse as the discourse level “is always partly embodied, and indeed, bodily experience is itself shaped by cultural and discourse factors” (ibidem).

Gibbs and Cameron argue little effort has been put into understanding how such synchronous factors influence metaphor performance. Instead, metaphor scholars selectively emphasize and privilege those factors or levels important to their discipline or

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<sup>4</sup> Dynamical systems have three characteristics: 1) a number of interacting components or agents, 2) they exhibit emergent behaviour (the collective behaviour cannot be predicted by the behaviour of the components separately), and 3) this emergent behaviour is self-organized (it does not result from a controlling component).

<sup>5</sup> Hampe (2017a) lists the following levels:

1. (neuro-)physiology
2. cognition (on/off-line)
3. discourse/communication (especially but not exclusively face-to-face interaction)
4. language (systems)
5. culture
6. evolution

logically following from their method (ibidem: 65-67; cf. Gibbs, 2017b, c). Our philosophical and methodological approaches in studying metaphor have an enormous implication for our respective theories of metaphor and can protract endless dichotomous debates. Worse, the consequences of metaphor experiments are sometimes reified and read back as the sole causal determinant or structure underlying a process. An example is the idea of a metaphor as cross-domain mapping realized as neural structure. Empirical data is inconclusive about whether such neural structures are consistently accessed, if they exist at all, because different findings show stability, instability or no effect at all (ibidem).<sup>6</sup>

Importantly, different experimental results now seen as contradictory might reflect different dynamical configurations and outcomes (Gibbs, 2017a: 217). Here dynamic systems theory can be used to explain the variability in metaphor performance: “If we see individuals engaged in conversation as dynamical systems, then patterns observed in metaphor performance can be seen as stabilities emerging from the dynamics and variability of discourse” (Gibbs and Cameron, 2008: 68). At the level of socio-cultural group membership it “may give rise to certain patterns of metaphor use,” and at the discourse situation level “particular metaphors may come to be used systematically between the individuals as they arrive at shared agreement on how to refer to topics” (ibidem: 68). For the authors then, conceptual metaphors are emergent stabilities within “the talking-and-thinking of a discourse community, which emerge from many different forces, ranging from neural to cultural, and are not fixed, stable entities encoded in the minds of individuals” (ibidem: 74).

Although the strength of dynamic systems theory is explanatory power on all levels or scales of a system using the same principles, most researchers “never attempt to examine the empirical predictions of dynamic systems theory in [linguistic] studies” (Gibbs, 2017c: 67). Gibbs and Cameron themselves note “the idea of [dynamic] systems is *just a convenient (and metaphorical) way of describing* what is going on in the brains and bodies of people as they interact with each other and the environment” (2008: 74; emphasis mine). Hereby they seemingly suggest the dynamical view is merely useful as a descriptive model for post hoc explanations of empirical studies. In later writings Gibbs seems undecided as to the right way forward. At one point he implores research on “metaphor performance in dynamical terms” by offsetting more traditional research methods with dynamic experimental tests (Gibbs, 2017c: 67). Yet another exhortation calls for reanalysing existing data from a dynamical perspective as constructing new dynamical experiments with empirical predictions will be hard (Gibbs, 2017a: 221). The very least scholars from diverse approaches can do is to open up and read other research programs’ findings (Gibbs, 2017b: 334).

### 2.3. DYNAMICS GOES ECOLOGICAL

Jensen reconstructs Müller’s notion of metaphoricity, thereby moving from an intrapersonal cognitive dynamic to an intersubjective dynamic system at the ecological scale. Metaphoricity is no longer a skull-bound cognitive process selectively activated through use, but “emanates as a joint process and accomplishment embedded in the dynamics and constraints of living (dialogical) systems” (Jensen, 2017: 260). Metaphoricity moves out of the head and into the organism-environment system where

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<sup>6</sup> I merely mean to illustrate that *if* scientists postulate that the central CMT construct, the metaphor-as-mapping, is biologically realized by a neural structure, they could conclude that this posited neural structure is the sole cause of metaphorical thinking. This (reductive) endpoint is reached not by empirical findings alone, but ‘helped’ along by uncritically assumed commitments to a discipline or method.

human action takes place (ibidem: 261, 2018: 2). Situating metaphoricity at the ecological scale is in line with a new notion of cognition put forward in recent cognitive science.<sup>7</sup> Cognition is seen as “something we do; we enact it, with the world’s help, in our dynamic living activities” (Nöe, 2009: 64; cf. Dewey, 1896; Johnson, 2017). Cognition is part of our active exploring and sense-making of the world and not a precondition to action. Metaphoricity comes about “integrated in inter-bodily dynamics and inter-affective behaviours in multimodal interaction” and is not accomplished just by verbal metaphor (Jensen, 2017: 259).

From an ecological perspective discourse is a dynamic system “in which the experiences of the participants are jointly shaped by the constraints and affordances (Gibson, 1979)” (Jensen, 2017: 260). Metaphoricity is established within this interpersonal ecology by “the ongoing and dynamic presence of other people, physical artifacts and sociocultural constraints” (ibidem: 257). Participants both adapt to a specific interpersonal ecology and co-develop it using diverse (metaphorical) behaviours. The emergent metaphorical structure within the interpersonal ecology functions as social affordance as it makes “possible certain further (metaphorical) ways of talking, thinking, acting and feeling about the topic of conversation” (Jensen, 2018: 19).

To conclude, metaphoricity is a gradable and shared phenomenon that constrains our experience and our ways of acting in the world (cf. Jensen and Greve, 2019). Jensen also suggests to study metaphor as affordances which puts metaphor on a proper ecological scale of human sense-making instead of previous research analysing it as a skull-bound cognitive process or linguistic property only.<sup>8</sup>

#### 2.4. PROCESSUAL EMERGENT PHENOMENON OF METAPHOR

All authors agree the characteristic feature of a dynamical view is that metaphor is not a mere cognitive product but a processual phenomenon emerging from discourse situations marked by non-linear interactions between factors, on many levels, over nested time-scales with differences in length and speed (from the evolutionary time-scale to neural activation). The use of dynamic systems theory shows metaphor can be reconceptualized as emergent stabilities over individual, dyad, group, and even population or linguistic community levels, thereby accommodating findings to date within metaphor studies. While this suggests progress, I urge we better speak about a dynamical turn in metaphor methods or modelling than a substantive vision on metaphor as dynamical phenomenon. Dynamical methods are used to (re)analyse multimodal discourse but so far there are no (new) empirical predictions being made from a dynamical perspective. In the next section I argue this is due to the fact that the current dynamical view is not a fully progressive research program.

### 3. CANDIDATE WANTED FOR BACKGROUND THEORY

Although this ‘new and improved’ view of metaphor professes that different spatial and temporal levels, or scales, all dynamically interact to produce the emergent phenomena of metaphorical action (Gibbs, 2017a, b; Hampe, 2017a: 3-4) this is not yet a

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<sup>7</sup> I use insights from recent cognitive science too. There are many resemblances with Jensen, even more so in recent work fully moving to an ecological context for metaphor (Jensen and Greve, 2019).

<sup>8</sup> I have made the same claim from a pragmatic naturalistic point of view (Machielsen, 2017).

satisfactory conclusion.<sup>9</sup> Mere invocation of complexity and dynamical systems can be interpreted as a magic wand intended to get cognition and communication approaches in line behind the banner of a dynamical view of metaphor. What is needed is a heuristic device to judge whether a move to the dynamical view of metaphor is warranted.

One well-known heuristic is Lakatos' idea of progressive research programs. The (theoretical) success of a scientific research program is commonly understood to be measured by "[the] new theory [having] some excess empirical content over its predecessor, that is, if it predicts some novel, hitherto unexpected fact" (cf. Lakatos, 1978: 33-34). The research program is also (empirically) progressive when "some of this excess empirical content is also corroborated, that is, if each new theory leads to the discovery of some new fact" (ibidem: 34). A historical example of a progressive research program was atomistic physics. By positing an underlying structure, it led to verifiable predictions and new facts (cf. Chemero, 2009: 80). So, to become a progressive research program, the dynamical view of metaphor should be able to both predict new hypotheses and to find empirical evidence for these predictions, in addition to covering empirical content of its predecessor theory.

Another heuristic is described by Chemero as the guide to discovery (2009: 78-83). Chemero illustrates this with a debate in theoretical physics early last century between atomists and phenomenologists. The latter refused to posit nonsensible entities or properties, like the atomists did. The guide to discovery argument holds that "by assuming that there are atoms, one is led to testable predictions of new phenomena" (ibidem: 79). Phenomenologist physics was held to be fact dependent: new anomalous empirical results led to ad hoc theoretical additions, and there was simply no way to predict novel facts through testable hypotheses before experiments. One can of course substitute conceptual metaphor theory and the dynamical view into this debate. Like the phenomenologists, current dynamicists posit no nonsensible entities or properties, thereby becoming fact dependent. This fact dependency necessitates constant alteration to theory "to fit existing empirical results," whereas CMT like atomism can use their theory "to predict empirical results before experimentation" (ibidem: 80). In this context it is important to note that dynamical systems (theory) is a modelling technique and as such is a set of tools to deploy a scientific theory for empirical testing of hypotheses and mediated contact with data (ibidem: 99-100). Since modern scientific theories are often too complex to be directly tested and result in computational and analytical intractability, models are interposed, both accounting for the data, and respecting the theory (ibidem: 100).

My worry about the dynamical view of metaphor thus boils down to the fact I do not consider it as a comprehensive theory yet but as "a set of models created on the fly to be applied to incoming data" (ibidem: 100).<sup>10</sup> As an example, look at Müller's starting point (2008). We have a system and use level of metaphor, we have empirical data not explicable by the dead/alive distinction, so we posit a sleeping/waking dynamical

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<sup>9</sup> I here channel Steen's observation (2011) that the field of metaphor studies does not necessarily revolve around one and only one research program, that of CMT. The same argument could be made against the dynamical view. My aim is thus to buttress the dynamical view against this objection.

<sup>10</sup> Note that my argument says nothing about the clear predictions made from CMT nor that these cannot be coherent with the dynamical approach. My argument is that qua *separate* research program (succeeding and covering predecessors) the dynamical view of metaphor is at the moment not able to advance any new research hypotheses and that this inadequacy is because it is fact dependent. I believe the current dynamical view is nothing more than CMT plus all alterations necessary to fit the latest empirical results (cf. Hampe, 2017b: 7). Such alterations are often formulated in the language of DST or mention spatiotemporal complexities and multidimensionality. While the dynamical view has so far helped to solve or redress concerns with extant problems in metaphor studies, I think as an overarching research program it has not been advanced far enough yet.

construct of metaphoricity as selective activation realized by general cognitive process. What is needed is a broad and comprehensive background theory to base our dynamic models of metaphor in action on. Next to enabling novel predictions, it makes sure that in the heat of our empirical data collection and studies, we do not fall back into reductionism to lower or more basic explanatory levels or fall prey to creeping Cartesianism.<sup>11</sup> The last would makes us reinvent and ontologize old dichotomies like mind/body, fact/value, or conceptual/linguistic and embodied/discursive. In my opinion, if Müller's distinction between cognitive amodal metaphoricity process and multimodal output or products is not carefully read, it is already dangerously close to relapsing into a cognition/action dichotomy.

#### 4. THE ECOLOGICAL-ENACTIVE FRAMEWORK

Now, following arguments that all metaphor use is not merely embedded in a physical but also a social and cultural sense, I outline how one particular background theory affords a comprehensive dynamical account of metaphor use.

Coming from the modern paradigm of 4E cognitive science (where the 4 E's stand for embodied, embedded, enactive, and extended cognition approaches) the ecological-enactive framework is a fitting theory as guide to discovery.<sup>12</sup> In addition to having been the source of several dynamical models (Chemero, 2009: 101) it provides a rich background on the nature of action, perception, and cognition, establishing a comprehensive view of how an organism interacts with and engages its environment. This will allow for hypothesis generation regarding *what metaphor is and does* (cf. Hampe, 2017a: 4). To start in explaining how the ecological-enactive framework can benefit metaphor studies, I will need to say a few things about the theory itself. The compound term indicates the theory combines insights from both ecological psychology and enactivism.

The locus classicus for enactivism is found in the work of Maturana and Varela (Maturana and Varela, 1980; Varela, Thompson, and Rosch, 1991). Enactivism sees the organism as a self-organizing, autonomous, autopoietic system which “generates and maintains itself constantly through structural and functional change” (Di Paolo and Thompson, 2014: 68). Cognition is shaped by the action-orientation of a living system within its environment, from bacteria to humans. Further shaping involves homeostatic life regulation processes (Damasio, 2010; Tucker, 2007) and the sociohistorical enfolding of sensorimotor couplings, or developmental dynamics, between an organism and its environment (Noë, 2004; Schulkin, 2011: 6-7; Gallagher, 2017: 5ff).

The classic ecological psychology work by Gibson formulates an ecological theory of perception directly opposed to the then dominant computational theory of mind (1966, 1979). His ecological approach has three core principles (Chemero, 2009: 98). First, perception is direct. Perception is not the result of an inferential process, i.e. adding internal information to external sensations represented somewhere in a cranium. Perceiving is part of a system that contains the organism and the environment, including

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<sup>11</sup> Creeping Cartesianism is the phenomenon described by Solymosi and Shook (2013). We can see it at work in a lot of cognitive science where there is talk of information being represented by particular things, like brain states or patterns. Such views easily degrade back into sensationalistic empiricism where the mind represents or mirrors the world.

<sup>12</sup> 4E cognition is a relatively young and thriving field of interdisciplinary research. It assumes that cognition is shaped and structured by dynamic interactions between the brain, body, and both the physical and social environments. Importantly for my efforts here, cognition is *enacted* in that it implicates the active engagement of an organism in and with its environment (cf. Varela, Thompson, and Rosch, 1991; Di Paolo and Thompson, 2014).



the perceived object or event. Second, perception is for action. An organism perceives its environment in order to do things, and it does things in order to perceive (cf. Dewey, 1896; Noë, 2004; Johnson, 2017). Third, perception is of affordances. This principle follows from the previous two. For perception to be direct, and to guide action, the environment must contain adequate information for an organism's perceptual systems. Such ecological information is the set of structures and regularities in the environment that allow an organism to engage with affordances. Gibson's notion of affordances, as we will see later, is an often discussed and misconstrued concept (Chemero 2009; Heras-Escribano 2019). For now, it suffices to say that affordances are both possibilities for action provided by the environment and depend in some sense on an organism's abilities and skills.<sup>13</sup> This coffee cup affords grasping, both because of its surface and layout, and because I possess the right skills.

The combined and complementary insights from ecological psychology and enactivism importantly enable an explanation of both 'lower' cognition, such as basic pattern recognition or locomotion, and 'higher' cognition, such as language use or instances where aspects of the environment are not sensorially present. Such an encompassing background theory as part of the augmented dynamical view of metaphor allows for engulfing theoretical and empirical content of both the cognition and discourse approaches in metaphor studies and is of import when a dynamical view attempts to unify the field of metaphor studies.

In the next section I highlight one important theoretical resource from the ecological-enactive framework, the environment, and show how this can help further dissolve debates in metaphor studies. Finally, I will show how my dynamical approach, where metaphor is seen as an ecological affordance of the socio-cultural environment, can be used to predict novel empirical hypotheses one could experimentally test.

## 5. ENVIRONMENTAL IMPACT FOR METAPHOR

I have argued that the ecological-enactive framework is an ideal background theory for a dynamical understanding of a diversity of behaviour, including metaphorical action. I now want to indicate how recent insights regarding the notion of environment—and how these impact the respective understanding of ecological information and affordances within our ecological-enactive background theory—can help to further the unification attempts in metaphor studies.

Baggs and Chemero (2019) note that many debates in ecological psychology in the last decades have been about understanding the central concepts of information and affordances. In their view these debates have their root cause in Gibson's ambiguous definition of environment.<sup>14</sup> Gibson's project starts off by distinguishing between two ways in which the world surrounds an organism (1979). There is the physical world "structured in various ways, prior to and irrespective of the existence of any animal living in it," and the environment "at the terrestrial scale" in which "animals have evolved to perceive and act, relative to objects and surfaces that are meaningful because they offer possibilities for action" (Baggs and Chemero, 2019: 2) Problems arose because Gibson tried to have environment stand both for the surroundings of an individual living organism

<sup>13</sup> For an extended account see Chemero's influential treatment (2009, 135-154).

<sup>14</sup> They trace it back to Gibson's own statement regarding his possible problematic double use of environment: "The environment consists of the surroundings of animals. Let us observe that in one sense the surroundings of a single animal are the same as the surroundings of all animals but that in another sense the surroundings of a single animal are different from those of any other animal. These two senses of the term can be troublesome and may cause confusion" (Gibson, 1979: 3).

and the surroundings of an idealized member of a species. What is missing is the differentiation between the evolutionary history of a species and the developmental history of a particular organism. The Gibsonian environment, argue Baggs and Chemero, should be carved up in the environment as it exists for a typical member of a species—the habitat—and the environment as it exists for a particular member of this species—the organism-specific *umwelt*.<sup>15</sup> With this reconstructed concept of environment, Baggs and Chemero go on showing how some standing tensions within ecological psychology can be resolved. Of these I will treat affordances and information and indicate the impact for the proposed background theory.

### 5.1. AFFORDANCES

Affordances are conceptualized as either dispositional or relational properties. They are dispositional properties belonging to objects and surfaces and as affordance actualized when an organism with a complimentary dispositional property comes into contact with it. They are relational properties when they are not simply ‘out there’ but can potentially arise in the organism-environment interaction. The question whether affordances are dispositional or relational properties is dissolved by explicating their different purpose. In the habitat affordances are dispositional properties or resources, existing independently of any given organism, and can exert selection pressure. In the *umwelt* affordances are relational properties, depend for their existence on the continued survival of a particular organism, and are undergoing constant change as the organism’s abilities and skills grow or degenerate. I have learned to walk stairs as a child, perfected it as a teenager, and slowly but steadily get worse at it through later life. The stairs have existed before me, will exist after me, but in my *umwelt* the stairs afford different and changing ways of ascend-ability throughout life depending on length and strength of my limbs and certain coordination of abilities. The *umwelt* allows us to talk about differences between individual members of a species. It also explains why particular organisms have a selective engagement with affordances: some affordances can invite or solicit particular behaviours (cf. Withagen et al., 2017), which I will come back to in later. The habitat provides a ‘landscape of affordances,’ all possibilities together forming a species’ ecological niche (Rietveld and Kiverstein, 2014). The *umwelt* consists of a ‘field of affordances,’ this or that momentarily available relevant and limited set of possibilities (van Dijk and Rietveld, 2017). I recur to the example of climbing the stairs. At any given moment in time the climb-ability of the stairs stands out as most relevant. But the stairs do also afford sitting-on, putting-things-on, and even sleeping-on. Changes in abilities through ontogenetic development and later degeneration of physical and mental function make us engage with different sets of affordances the objects in our environment offer us. Such development includes learning a language, acculturation of norms by partaking in diverse social practices, and obviously foundational conceptual understanding of the world—including the embodied understanding as reflected in our highly particular cache of primary and more complex metaphors.

### 5.2. ECOLOGICAL INFORMATION

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<sup>15</sup> Baggs and Chemero (2018: 6) note that this distinction does not imply that the *umwelt* is a “private, mental copy of the habitat,” but the habitat “considered from the point of view of a particular living animal.” Neither is the habitat separate from the physical world, but it is a “subset” of it “considered relative to a typical member of a species.” The actions of an organism normally have consequences in the *umwelt*, habitat, and the physical world.

Ecological information is traditionally understood as structure in energy arrays and is both about what structure in the world provided the array's pattern, and for an organism serving to guide its action. The question whether information is information-about or information-for is dissolved as well. In the habitat we talk of information-about. Information-about something is specified in certain patterns in the energy array and available for certain species. An example of this can be found in a pie that is cooling off in the kitchen, whereby certain chemicals are released into the air. In the *umwelt* we talk of information-for. Information-for a specific organism with the appropriate skills or abilities is available for detection and such information is actively sought by the living organism. A fly using the chemical trail in the air to actively seek out food is an example. The potential guide for activity is information-about, i.e. containing a (specifying) structure in energy arrays, available through direct perception as information-for pickup by the organism's perceptual system. Early followers of Gibson held on to a symmetry principle, a strict one-to-one relationship between ecological information and the affordance it specified (Baggs and Chemero, 2019: 8). If we allow that this relationship need not be exception-free but just sufficiently reliable to guide behaviour in usual circumstances we create room for non-specifying (or conventional) information being present in the habitat. Such information depends in part on our activities as a community of convention-makers and -observers often within a variety of social practices (Heft, 2017, 2018; Rietveld and Kiverstein, 2014; van Dijk and Rietveld, 2017). Allowing for non-conventional information to account for things we can directly perceive entails that an ecological approach can be further developed to deal with phenomena of culture and language. These aspects of our socio-material environment then enter as sources of richly structured information into both senses of the notion of environment providing possibility for (skilled) action (Heft, 2017; McGann, 2014).

I noted before that any successor theory unifying previous approaches in a scientific field should at least account for empirical findings, constructs and hypotheses of these previous approaches. Therefore, I will now see how ecological-enactivism as background theory for a dynamical view of metaphor holds up when confronted with some of the material noted by Hampe.

## 6. RECONSTRUCTION IN METAPHOR

I will explicate and further elaborate on both conceptual metaphors as individual possession and on conventionalized metaphors within a language.

First off, we can put the reconstructed notions treated above towards good use in understanding the critique on conceptual metaphors understood as static representations in individual minds (Hampe, 2017b: 6). Discourse analysts rightly state such static notions could not explain the emergence of metaphorical expressions in the social interaction of participants in specific contexts, nor the intricate patterns of co-occurrence over stretches of time or related communicative events—including the shifts in metaphorical meaning accompanying them (*ibidem*: 7). In an unfolding discourse situation, as speakers enact it, each linguistic or metaphorical action changes the dynamics and the available ecological information available for pickup by the participants. This provides affordances available for perception within participant's *umwelt*-based fields of affordances, further leading to possibly changing linguistic abilities and repertoire being put forward (cf. Jensen, 2017, 2018). The metaphors each participant has available in this repertoire is a matter of which metaphors they have picked up in their respective and unique developmental histories in the habitat-situated social practices they were or are a part of. The constant change of dynamics within a

communicative situation, brings a constant change of metaphoricity and selective engagement for each participant based on how each metaphor draws the participant in (cf. Gibbs and Cameron, 2008; Jensen, 2017, 2018).

Second, not all possible primary metaphors formed through experiential correlations available in the species-specific habitat are so reflected in conventionalized language of a particular linguistic community. Here (material) culture, social practices, and place may function as a ‘filter’, a higher-order emergent structure providing downward force, making certain aspects of embodied experience more salient (cf. Kövecses 2015; Heft, 2017, 2018). The classic example here is how some linguistic communities employ KNOWING IS HEARING instead of the more common KNOWING IS SEEING primary metaphor. We can understand this as follows. Through the social practices within the material setting of their environment, the available structured information in the medium combined with the skills of the humans within the community will more often have led to affordances related to hearing being actualized. Eventually the language system as part of their ecological niche will have started to reflect this enacting of cases of knowing in an environment often inviting hearing behaviour.<sup>16</sup>

Taken together, these two examples show that ecological-enactivism can place the findings related to culture, language systems, discourse situations, and cognitive events within the conceptual framework consisting of environment (as habitat and *umwelt*), ecological information, and affordances (cf. Hampe, 2017b: 10-12). Additionally, the framework allows for more stringent theoretical elaboration than a dynamical view without a background theory. It enables explanations of individual, local dyad, sociocultural group, and population level differences in a more consistent matter and specific vocabulary over and above what dynamic systems theory can do with its general (abstract) principles (cf. Chemero, 2009). From an ecological perspective on cognition and situated behaviour it places theoretical constraints upon a dynamical view of metaphor which allows for its guidance function.

In order for the dynamical view of metaphor to become a progressive research program and provide a guide to discovery I argued three methodological criteria must be met. First, it should be able to engulf existing (dynamical) explanations of metaphor by positing a background theory. I have done so in this section. Second, this augmented dynamical view allows for basing dynamical models of metaphor in action on. This was shown in the treatment of ecological-enactivism. Third, it must provide a guide to discovery by suggesting new hypotheses based on positing entities or properties. We ought to tell what metaphor is and does.

## 7. METAPHORDANCES

It would seem I have almost reached my goal of putting forward a background theory which can envelop the unification attempts in metaphor studies which have led to a dynamical view of metaphor. However, one of the hallmarks of such a theory according to Chemero (2009) is that it must also function as guide to discovery by postulating an underlying, unobservable structure (like the atomists did in physics), or at least clarify what a metaphor *is*.

I treated the work of Müller, Gibbs, Cameron, and Jensen which increasingly characterizes metaphor as a processual phenomenon. While the use of dynamic systems theory provided a notion of metaphor as emergent stabilities over individual, dyad, group,

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<sup>16</sup> Here I want to point the reader to the theory of behaviour settings developed by the ‘other’ ecological psychologist, Roger Barker and colleagues (see Heft, 2017, 2018). I do not have the room here to treat this further but see fruitful cross-disciplinary applications.

and even population or linguistic community levels, a move I termed dynamical turn, thereby importantly accommodating extant findings to date within metaphor studies, I have argued this leaves the current dynamical view of metaphor as an overarching research program without a clearly fruitful way forward. In this final section my aim is to argue that to trace the functional idea of what a metaphor *does*, we need to (re)locate it back into social situations, and by locating it there we can also give an ecologically valid account of what metaphor *is*.<sup>17</sup> In doing so I suggest elaborating on the notion of affordance with *metaphordance* as the unit of analysis for the dynamical view of metaphor.

Linguistic structure, Hampe's language system as inventory of symbolic units (cf. Hampe, 2017b: 12), has cultural and sociomaterial differences and is situated in the species-specific habitat. This emergent and slowly evolving structure functions within the *umwelt* of discourse participants as an informational constraint on the perception of affordances.<sup>18</sup> Or, as Gibson said, "the learning of language [...] is not simply the associative naming or labelling of impressions from the world. It is also, and more importantly, an expression of the distinctions, abstractions, and recognitions that [we come] to achieve in perceiving" (1966: 281). It has come to produce this down-ward force through the unique ontogenetic development and sensorimotor couplings of a particular individual of the species. Any linguistic utterance makes an observer aware. There is selection of information for purposes of indication, of directing attention through linguistically coded information (cf. Reed and Jones, 1982: 242). Whereas visual or pictorial information shows something, we are to a large degree left to draw our own conclusions. With language we can become aware of the conclusions other people draw. As speakers we are constantly piloting other agents' awareness of reasons to behave, making others pick up information specific to the (shared) environment. Some of the affordances that are then perceived might have to do with more basic ecological features, but others are more cultural and have to do with specific spatiotemporally evolved meaning and value. As humans we are preoccupied with "socializing the selection and detection of information itself," that become codified in cultural systems, but importantly lead to "discrete (and often warring) communities of meaning" (Reed, 1988: 310).

I contend that within the ecological-enactive framework, this is what we can hypothesize a metaphor *does*: it both constrains what out of the possible affordances is perceived or attended to in the participant's *umwelt*, and it also solicits certain behaviour (which is not necessarily linguistic) by the ways it influences awareness of directly perceivable meaning and value in the habitat (cf. Reed and Jones, 1982: 410; Jensen and Greve, 2019).<sup>19</sup> As this prediction is still too vague and can apply to literal utterances a clarification is needed.

To elucidate the working of metaphordances, it helps to first treat the inviting or soliciting character of affordances on behaviour (Withagen, et al., 2017). At any moment of time during its existence an organism has a so-called selective openness towards affordances due to the developmental history of organism-environment couplings. This is most visible when we talk of an organism's ecological niche, or its whole set of available affordances in the habitat. An example will illustrate this further. Chairs afford

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<sup>17</sup> I provide a full philosophical conceptualization of metaphordances, as I call this notion, in a separate paper (Machielsen, 2019).

<sup>18</sup> The functioning of the linguistic system within discourse was noted by Müller (2008: 221); the constraining down-ward force was noted by Jensen (2018: 19; Jensen and Greve, 2019).

<sup>19</sup> I have made the same claim from a pragmatist naturalist point of view in my *Metaphor in Moral Imagination* (2017). There I elaborate on a fourfold function of influence: priming, framing, obscuring, and steering.

many different actions to which we are selectively open because of our species-specific embodiment and socio-cultural practices. This is what we do with chairs, this is what we do not or no longer do with chairs. One could say this constitutes the emergent and slowly changing structure of socio-cultural norms around chairs available in the habitat. When a member of the species grows up, enculturation according to such available extant structures takes place, shaping the individual's pragmatic *umwelt*, their field of affordances related to chairs. Selective openness takes place within the organism's *umwelt* as well. Here we see that selective openness towards affordances does not solely depend on our bodily features and enculturation, but also to our changing needs and concerns over time. Out of all possible affordances a glass provides, right now it is perceived as a glass of water to drink from. Our changing skills are another factor shaping selective openness, as when an infant's bodily features would allow them to ride a bicycle, but the needed skills are not present yet. Last, our moving around towards different places within the environment distinctively shapes selective openness to affordances—a fridge within the house of a distant relative does not present us with the same open-and-take-drink-out affordance (cf. Withagen, et al., 2017).

I contend that selective openness and the resultant invitational character projected by affordances does not stop at prelinguistic behaviour. Because we have conceptualized of an affordance as a relation, with the *relata* being an aspect of the socio-material environment and an organism's skill or ability, we can characterize a solicitation as an effect of the interactional asymmetry within the organism-environment coupling (cf. Heras-Escribano, 2019: 133). In this context, phenomenologists often talk about an organism having the “feeling [of] immediately [being] drawn to do something [where] the subject experiences no act of the will” (Dreyfus and Kelly, 2007, 52). Here the environment does not provide a set of possibilities for action, but the environment is “*calling for* a certain way of acting” (ibid.) with the organism bodily responding to such callings. As stated before, behavior is always an emergent out of the interactions between brain, body, and environment. In most cases, the behavior taking place follows the path of least resistance—which is not necessarily always the same, we are talking about dynamics—with the organism following up on the invitations presented by the affordances.<sup>20</sup>

Metaphordances disclose a shifting landscape of action possibilities in the habitat presented to us as particular fields of action potentialities in our pragmatic *umwelt*.<sup>21</sup> Metaphordances emerge within, between, and through discourse in interpersonal ecologies that contain our interlocutors, physical artifacts, socio-material tools, and a diversity of operative constraints. The disclosing is often paired with the invitation characteristically projected by metaphordances. These are, compared to more conventional linguistic codified information, to a greater degree both open for interpretation and have a higher indeterminacy in that they allow for a wider range of potential meaning and value to be considered available in the environment than those utterances that are referential. In a way, a metaphordance allows speakers to appeal to participant's *umwelts* with the uniquely developed fields of affordances, whereas conventional language would more often than not refer to settled meaning and values that are shared with a wider community. Metaphordances work to open up, unsettle, and influence meaning and value perception by the projections of potential meaning and value

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<sup>20</sup> I note here that my approach takes into consideration the biological free energy principle. This principle is used to explain how (biological) systems stay in homeostatic equilibrium through restriction of possible states (cf. Damasio, 2010; see Friston, et al., 2006).

<sup>21</sup> Note that for me the effect of a metaphordance is not just within discourse situations. Jensen (2017, 2018) is not clear on his scope of effect but seems to suggest it is discourse limited.

made apparent by specific metaphorical utterances. Speakers appeal to participants to co-create meaning and value by making participants aware of potentialities in the habitat, by the projections of meaning and value inherent in metaphordances that resonate in participant's unique umwelts.

The unique interaction effects a metaphor as affordance shows within the dynamic system of brain, body, and environment necessitates its conceptual demarcation as *metaphordance*.

## 8. CONCLUSION

To summarize, I started out with noting that within metaphor studies there is currently an ongoing convergence upon a dynamical view of metaphor. The move toward a dynamical view was prompted by roadblocks accumulating through all too dogmatic following of either the cognition or communication paradigm (Hampe, 2017a). Interdisciplinary study increases in import; the more so since metaphor theory is argued to be moving towards a dynamic, multi-scale, socio-cognitive model of metaphor incorporating findings of diverse studies and approaches focusing on different levels of analysis (Hampe, 2017b: 34). At the moment, however, this dynamical view of metaphor is just a set of models from dynamic systems theory, which is perfectly fine if all you wanted to do is reinterpret the existing empirical data from both the cognition and communication approaches to metaphor. Taking for granted a move beyond fact-dependent research is wanted, I have argued that having the ecological-enactive framework as background theory is an excellent guide to discovery, as it provides both a source for dynamical models to investigate metaphorical phenomena, and it postulates what metaphor *is and does* in terminology of affordances which is widely used in interdisciplinary studies. The latter would open up metaphor studies even more to new cooperative efforts and vistas. I examined how the species-specific habitat and organism particular umwelt illuminated current debates in metaphor studies. The ecological-enactive framework makes one fully appreciate “that the way the world looks to us is to some extent a result of the way we currently are as individuals” (Baggs and Chemero, 2018: 3). I also put forward my admittedly still embryonic notion of metaphordance—or metaphor as affordance, as generative for new hypotheses. Leading from this I suggest the following perspectives for further research:

1. Research by enactivist cognitive scientists and ecological psychologists that take into account the rich history of findings within metaphor studies. Little to no work is done in this area so far.
2. Interdisciplinary studies where metaphor researchers, cognitive scientists and philosophers look into which ontogenetic and phylogenetic factors lead to metaphordances working as invitations in a diversity of (discourse) contexts.
3. One empirical hypothesis that follows from the difference between affordances and invitations would be that metaphor usage not salient or relevant to a specific (discourse) event or situation would not have the same information uptake (and thus direct perception of metaphordances) as coherent metaphor usage would.

To conclude, I contend my augmented dynamical view of metaphor shows itself capable to deal with the demands stated by Hampe that “any empirically valid theory of metaphor needs to take into account ... [that next to] social interaction [and] language systems, ... the use of metaphor in discourse feeds on rich, situated experiences that may

also determine the salience of a given source domain in a particular communicative situation” (2017b: 7). In this paper I have argued as much.

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