Epistemic Feelings and the Psychological Foundations of Force Fynamics: A Case Study in the Psychoaffective Theory of Image Schemas

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Abstract

The present article is a case study in the "psychoaffective" theory of image schemas, in which I explore the link between force schemas and epistemic feelings. My paper is divided into six main parts. First, I expound the psychoaffective approach to semantics and explain why epistemic feelings are good candidates to act as the psychological basis of image-schematic structures. Second, I offer a few words on the research program on force dynamics and the related concept of FORCE schema. Third, I critically discuss the research program in question, showing that it suffers from severe epistemological shortcomings. Fourth, I highlight the problems inherent in the typological analysis of FORCE schemas as it prevails in the literature. Fifth, I review the rich psychological and philosophical literature on force-related feelings. Sixth, I show that, although force-related feelings are natural candidates to act as the constituents of FORCE schemas, they are not sufficient to account for them, and the psychoaffective approach to force-dynamics should appeal to further categories of epistemic feelings. In conclusion, I insist on the soundness of the psychoaffective approach to force dynamics and on the need to consider epistemic feelings as the semantic primitive of force dynamics.

Keywords

Image schema, FORCE schema, force dynamics, epistemic feeling, psychoaffective semantics

1. Introduction

The views advocated in the present study are in line with those expounded in the article "Image schemas as epistemic feelings: The shift from cognitive to affective semantics" [1], which I presented on the occasion of the Seven Image Schema Day (ISD7). In that article, I explained why there are good reasons for locating the psychological foundations of image schemas, and thereby, semantics, under the category of mental states called "epistemic feelings." Epistemic feelings are long-recognized affective phenomena that are characterized by the fact of carrying a specific kind of knowledge (e.g. the feeling of familiarity, certainty, expectation, effort). They are now widely recognized as essential constituent elements of the human mind and as being involved in a great variety of its functional manifestations, including high-level processes like language and thought [2, 3]. As I sought to demonstrate there, the generic and particular properties of epistemic feelings make them natural candidates to act as the semantic primitives underpinning image-schematic structures. My conclusion was that the possibility of refounding the theory of image schemas on the basis of the concept of epistemic feeling must be taken seriously, as should be the hypothesized shift from a "cognitive" to a "(psycho)affective" semantic paradigm. In the present article, I would like to bring further credibility to the feeling-based approach to image schemas and semantics by discussing its significance in the special case of *force dynamics*. As Walter De Mulder reminds us in the eponymous entry to the *Oxford Handbook of Semantic Linguistics* [4, p. 294]: "'Force dynamics' is a schematic system that pertains to the linguistic representation of force interactions and causal relations occurring between certain entities within the structured situation." This a topic that, over the last four decades, has established itself as one of the leading and most innovative research programs in cognitive semantics. The name and the notion of "force dynamics" are closely tied to Leonard Talmy, who, in addition to coining the expression, was instrumental in

Proceedings of the Joint Ontology Workshops (JOWO) - Episode XI: The Sicilian Summer under the Etna, co-located with the 15th International Conference on Formal Ontology in Information Systems (FOIS 2025), September 8-9, 2025, Catania, Italy

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systematically investigating the place of dynamicity and force-related phenomena in language and in elucidating their centrality in the creation of linguistic meaning [5]. As specified in the above quotation, force dynamics is a "schematic system" that is at the core of the theory of image schemas as it has been elaborated since the late 1980s. From the beginning, the concept of FORCE schema has been counted among the chief categories of image schemas and it continues to fuel an abundant literature today [6, 7]. As I highlight in my essay, despite valuable theoretical outcomes the research program on force dynamics suffers from severe epistemological shortcomings. I also insist that, as currently defined, the typological analysis of FORCE schemas proves problematic in several respects. As I strive to demonstrate, the psychoaffective approach to semantics and image schemas offers a simple and elegant solution to these difficulties: it allows us to not only revisit the research program on force dynamics on a sounder epistemological and theoretical basis, but also to specify the very nature of FORCE schemas. I show that "force-related feelings," as well as other types of epistemic feelings long identified in the literature, are well-placed to act as the semantic primitives constitutive of FORCE schemas, and I show how these specific affective qualities, through their arrangement vis-à-vis each other, can give rise to the full variety of force-dynamic patterns.

2. The psychoaffective approach to image schemas and semantics: An overview

By revisiting the notion of image schema in light of the psychological concept of epistemic feeling, I argue that a paradigm shift is needed, namely, one from a "cognitive" to a "psychoaffective" approach to semantics [1]. As vehicles of linguistic meaning, image schemas are assumed to be something that is, as Peter Gärdenfors puts it, "in our heads" [8], that is, properties constitutive of individual consciousness. But in reality such statements have mostly remained at the level of a statement of principle in the literature, since cognitive semanticists have largely overlooked the question of what exactly image schemas consist of from the psychological point of view [1]. Contrary to this, I want to argue that if we take seriously the claim that image schemas are "in our heads," then we should also admit that they are to be ascribed to the *actual* components of the mind, that is, to those categories of mental states whose existence and specific properties have been identified in the literature. Here my claim is that epistemic feelings are not only excellent candidates to serve as the psychological foundations of image-schematic structures, but also represent the only category of mental state that is capable of fully assuming this role.

The ontological view in which the linguistic notion of image schema is refounded on the psychological concept of epistemic feeling goes hand in hand with the adoption of a threefold epistemological stance on language in general and semantics in particular. My feeling-based theory of image schemas and linguistic meaning involves a strictly mentalistic, internalist, and naturalistic approach to semantic knowledge [1]. First, I endorse a "mentalistic" approach to semantic knowledge in that I regard it as having basically to do with the constituent elements of psychical life: it should be attributed to the manifestation of mental states, which, as entities of an experiential nature, are irreducibly distinct from those of a physical or material nature. Second, my approach can be said to be "internalist" because I see semantic knowledge as a property that is inherent in the speaker's/hearer's inwardness and which only exists within individual consciousness. Third and last, my approach is also "naturalistic" insofar as semantic knowledge, far from being a mental property of a merely formal nature, is in my view rooted in the "natural" language of the mind, as it can be theoretically and empirically explored by psychologists and, by extension, neuroscientists.

In my above-mentioned article [1], I raised a number of arguments in favor of the hypothesis that epistemic feelings should be regarded as the psychological basis of image schemas. As I have highlighted, image schemas and epistemic feelings have in common the two general properties of being "felt experiences" and ubiquitous constituent elements of the mind. More specifically, I also argued that epistemic feelings, as a special category of affective states, share four experiential properties that are usually ascribed to image schemas, namely: (i) abstractness (they are non-eidetic mental entities); (ii) typicality

(they express something generic about objects or events); (iii) epistemic immediacy (the knowledge they carry manifests itself instantaneously and irreflectively); (iv) polar opposition (they are organized as couples of antagonistic qualities). Taken together, these properties make epistemic feelings particularly suitable as vehicles of semantic knowledge as expressed in words and morphosyntactic features. As I also highlighted in my article, epistemic feelings appear all the more suitable for constituting the psychological basis of image schemas given that they belong to a category of mental states whose existence is undisputed today and of which many varieties have been identified. In conclusion, we are here dealing with a category of mental states that is capable in every way of being the natural building blocks of image-schematic structures. More specifically, insofar as we see elementary affective qualities in them, epistemic feelings can be legitimately regarded as the *semantic primitives* that image schemas ultimately consist of. By adopting the psychoaffective approach to image schemas, we should be able to scientifically account for all forms of image-schematic structures, and, more generally, for the main categories of semantic processes, by relating them to a number of epistemically well-defined kinds of feelings and to the way they are combined with each other, whether simultaneously or successively.

3. The research program on force dynamics: A survey

It is now widely recognized in linguistics that a significant part of semantic processes consists of the experience of dynamicity and that such processes should therefore be interpreted in terms of force-related properties [6, 5, 9, 10]. This idea, which emerged in the 1970s, was systematically explored in the following decade, giving rise to a research program known as "force dynamics." The development of this research program has been inherent to the rise of cognitive linguistics and the theorization of the notion of the image schema. As a matter of fact, since the 1980s, *FORCE schemas*—that is, image-schematic structures expressing basic kinds of dynamic interactions—have been recognized as one of the chief categories of image schemas and have given rise to a number of specialized studies [6, 11, 12, 13, 7].

In Chapter 3 of his seminal book *The Body in the Mind* [6, p. 41-64], Mark Johnson discusses "preconceptual gestalt for force," "gestalt structures for force," etc., which he also describes as "force schemata." He identities seven kinds of force schemas, namely COMPULSION, BLOCKAGE, COUNTERFORCE, DIVERSION, REMOVAL OF RESTRAINT, ENABLEMENT, and ATTRACTION, while specifying that the list is not exhaustive. In his book, Johnson insists on the role of these image-schematic structures in grounding the meaning of modal verbs, since for him force schemas provide the basis of "our pervasive experience of things, events, and relations as being actual, possible, or necessary" [6, p. 49].

Leonard Talmy is another pioneer of cognitive semantics, who, in addition to coining the expression "force dynamics," has established himself as the chief theorist of the relevant paradigm. As he explains in the first volume of *Toward a Cognitive Semantics* [5, p. 12], force dynamics is one of the four "schematic systems," along with configurational structure, location of perspective point, and distribution of attention. In the introduction to the book, Talmy writes:

> Force dynamics covers the range of relations that one entity can bear to another with respect to force. This range includes one entity's intrinsic force tendency, a second entity's opposition to that tendency, the first entity's resistance to such opposition, and the second entity's overcoming of such resistance. It further includes the presence, absence, imposition, or removal of blockage to one entity's intrinsic force tendency by a second entity. In force dynamics, causation thus now appears within a larger conceptual framework in systematic relationships to such other concepts as permitting and preventing, helping, and hindering. [5, p. 10]

Talmy has become famous for formalizing the force interactions that allegedly underpin semantic phenomena as *force-dynamic patterns*, which he depicts in the form of diagrams. According to him, force patterns basically consist of the opposition between two unequally strong forces, namely "the Agonist" and "the Antagonist." These two interacting entities are each characterized by the fact of spontaneously tending either toward action or rest, and by the fact of having either action or rest as a

resultant. The many kinds of force-patterns identified by Talmy are capable of explaining, in his view, the meaning not only of modals but also of a great number of verbs, such as *cause, keep, prevent, let, make, overcome, hinder,* etc., and connectives, such as *because, despite, although, against.*

In recent decades, in response to Talmy's seminal contribution, scholars have proposed a series of alternative force dynamics models, although without necessarily explicitly appealing to the concept of image schema [8, 9, 14, 15, 10]. Suffice it to say here that, as a rule, in line with the approach launched by Talmy, the models proposed are characterized by a more or less high degree of formalism: force-related phenomena that allegedly underpin semantic processes are usually construed as systems of mutually interacting entities and depicted using functional diagrams (see [10]).

4. A critical reassessment of the research program on force dynamics

As it stands, the research program behind force dynamics has three characteristics that make it problematic from the epistemological point of view. First of all, it is problematic because it offers a speculative conception of semantic phenomena and their cognitive underpinnings. As typical representatives of cognitive linguistics, the theorists of force dynamics are supposed to explain language properties based on an in-depth analysis of mental processes. In reality, however, the manner in which Talmy and his followers address the question of the foundations of force dynamics falls well short of this basic scientific standard. The theoretical models they have elaborated are in fact more interpretative than explanatory as they are based not on a systematic, empirically-informed investigation of psychical life, but rather on a kind of commonsense psychology in which the psychical underpinnings of force dynamics are ultimately justified in light of the linguist's own introspective experience. As a matter of fact, the semantic analysis proposed by the theorists of force dynamics is largely based on a method that consists of commenting on and construing ordinary-language statements. Although a few scholars have tried to revisit force dynamics from an experimental perspective [16], the theoretical achievements of this research program remain poorly justified, because, as a rule, semanticists have failed to ground it on an authentically psychological approach.

Second, the theorists of force dynamics can also be faulted for artificially accounting for semantic phenomena by attributing them to fictitious entities and processes. The elements they depict in the form of force-dynamic diagrams, like "the Agonist," "the Antagonist," "vector," etc., although allegedly of a mental nature, correspond to nothing real in the speaker's/hearer's consciousness. They define these elements in a formal sense, completely leaving aside the question of their specific ontological status. The force-dynamic entities and processes postulated by Talmy and other cognitive semanticists are sui generis properties that remain undetermined from the psychological point of view; at no time do they attempt to match them up with special categories of affective states that are known to be actual constituents of mental life.

Third, the theorists of force dynamics can be critiqued for their propensity to *reify* the semantic processes at stake. I am here referring to how they tend to identify force-dynamic phenomena with concrete entities or events in the external world, even though the processes in question are assumed to be abstract properties that exist nowhere but in the mind. Talmy's famous diagramming, for example, which depicts force-dynamic patterns in a quasi-mechanical way—as an "Agonist" and an "Antagonist" that interact with each other, and in terms of "action," "rest," "resistance," etc.—is emblematic of the reificatory tendency that is found in virtually all force-dynamic models. It is generally the case that in force dynamics studies not only are the vocabulary ("force", "motion," "vector," etc.) and diagrams that are used to describe semantic processes directly rooted in a physicalist approach to reality, but so is the very way in which semantic processes are conceptualized and interpreted. Indeed, it is significant in this regard that Talmy explicitly admits that his modeling of force dynamics overlaps with the basic tenets of naive physics. As he eloquently writes in the first volume of *Toward a Cognitive Semantics*: "Now, it appears on the whole that the conceptual models within linguistic organization have a striking similarity to those evident in our naive world conceptions, as well as to historically earlier scientific

models" [5, p. 455][1]. Along with the traditional Talmy-esque "informal and pictorial" depictions of force dynamics [9], we also find more formalized physics-inspired models based on a vector formalism [10, 14] or even a mathematical description of the dynamics of language [9]. In addition to this underlying physicalist trend, there is another reificatory tendency in force dynamics studies, which consists of personifying and anthropomorphizing the mental phenomena in play. Here it suffices to look at some of the force-dynamic patterns modeled by Talmy [5], in which he de facto regards the Agonist and the Antagonist as two interacting agentive individualities. In that case, the model proposed not only echoes naive physics but also suggests a kind of folk psychology. Such an approach of reifying semantic processes might be an acceptable approach if it were envisioned as having a merely metaphorical value or if it were simply a convenient and simplifying means of accounting for these processes. But in reality, the problem of reification appears to be inherent in how cognitive semanticists address the question of dynamicity in language and strive to theorize it. Ultimately, the theorists of force dynamics can be said to make what philosophers call a *category mistake* [18, p. 58]: they conflate properties belonging to two different ontological realms (i.e., the hearer's/speaker's subjective experience of dynamicity with the dynamic interactions as they are assumed to occur in the material world).

5. Problems inherent in the typological analysis of FORCE schemas

In the previous section, I mentioned Johnson's pioneering topology of FORCE schemas, which consists of the seven "most common force structures," namely, COMPULSION, BLOCKAGE, COUNTERFORCE, DIVERSION, REMOVAL OF RESTRAINT, ENABLEMENT, and ATTRACTION [6, p. 45-48]. This typology has been largely taken up in the literature either without change or with only minor changes. To gain a clear idea of this, we can look at the two classic typologies by Clausner and Croft [11, p. 15]–who distinguish between BALANCE, COUNTERFORCE, COMPULSION, RESTRAINT, ENABLEMENT, BLOCKAGE, DIVERSION, ATTRACTION–and Hampe [13, p. 2]–for whom FORCE image schemas consist of ENABLEMENT, BLOCKAGE, COUNTERFORCE, ATTRACTION, COMPULSION, RESTRAINT, REMOVAL, DIVERSION.

Among the few theorists who critically analyzed the typologies of FORCE schemas, we can mention Sandra Peña Cervel [12], who has established a hierarchical typological model based on the subsidiarity relationships that are posited between image-schematic structures. According to her, FORCE, which is subsidiary to the PATH schema, is an image schema to which the following are subservient, in three different degrees: (a) COMPULSION, BLOCKAGE, REMOVAL OF RESTRAINT; (b) ATTRACTION/REPULSION, COUNTERFORCE, ENABLEMENT; (c) DIVERSION. More recently, Aleksander Szwedek [7] has proposed a threefold taxonomy of "FORCE image schema variations," whose three "types" are: (a') "contact force schemas" (BLOCKAGE, APPLIED FORCE, DIVERSION, REMOVAL, FRICTION, PRESSURE); (b') "non-contact force schemas" (ATTRACTION and REPULSION); and (c') "complex schemas" (ENABLEMENT and COMPULSION).

As with all the other image-schematic systems, there are in my view three major problems inherent in the way scholars have envisioned the typology of FORCE schemas.

First and most importantly, the way in which scholars identify and characterize FORCE schemas appears to be largely *unnatural* and *arbitrary*: it is highly questionable that the entities in question are what speakers/hearers effectively have "in their heads" when experiencing force-dynamic semantic processes. Here we are dealing with more or less fictitious mental phenomena whose ultimate justification lies in a kind of common-sense knowledge and in the fact of having been established by tradition since Johnson. When we look at the typological models discussed in the previous paragraphs, we can legitimately wonder why scholars posit the existence of these or those specific entities rather than others, and why, in each model, they identify this or that specific number of image schemas and do not enumerate them in another way[2]. The two models proposed by Peña [12] and Szwedek [7] are not

[1]For a detailed discussion of the relationship between Talmy's force dynamics and naive physics, see Kuźniak and Woźny, "Linguistic force dynamics and physics" [17].

[2]The problem that I raise here is explicitly recognized by some of the chief theorists of FORCE schemas. In *The Body in the*

substantially different in this respect: although supposedly based on a more elaborate approach than the mainstream typologies, they are in reality largely indebted to them and share with them a degree of artificiality and arbitrariness[3] in the way they envision the typology of FORCE schemas.

Second, the way in which theorists envision the typology of FORCE schemas is also problematic in that they tend to identify the latter with *qualitatively complex entities*. Of course, not all image schemas necessarily have to be simple. Nevertheless, any sound typology of image schemas should must contend with the necessity of listing elementary image-schematic structures. Indeed, any image-schematic system should match, in the final analysis, a set of *semantic primitives*, that is, well-defined and irreducible experiential entities. This is most certainly not the case with the various typologies of FORCE schemas that have been proposed in the last four decades. Let's take as an example the notion of COMPULSION, a type of FORCE schema that is common to all the models mentioned above. A brief psychological analysis of COMPULSION will demonstrate convincingly that this putative schema is reducible to simpler and more accurately defined elements. Indeed, we are here dealing with a complex experiential state that involves a number of more elementary experiential states, such as the sense of effort, the experience of a constraint, the consciousness of being oriented toward a specific end, etc[4].

Third, a further major problem inherent in the typological analysis of FORCE schemas is the fact that, as rule, the latter are identified with *qualitatively redundant entities*–a problem that directly echoes the previously discussed issue of their qualitative complexity. In the various typological models proposed, each type of schema is characterized by qualitative features that are found in many other types of schema, so that the image-schematic structures at stake appear to be largely overlapping with each other. For instance, the sense of effort, which in the previous paragraph was said to be involved in COMPULSION, is encountered in virtually all the FORCE schemas identified in the literature, as is the experience of spatiality. The theorists of FORCE schemas prove unable to correctly separate the constituent elements of force-dynamic semantic processes, and in particular to identify the semantic primitives that are supposed to be their ultimate basis.

6. Force-related feelings: An overview of past and recent literature

By "force-related feelings," I am generally referring to affective states associated with the experience of any form of "dynamicity" or "activity," whether the latter is apprehended as occurring in ourselves, between the elements of the external world, between ourselves and the elements of the external world, or between ourselves and another individual. Here we are dealing with a specific category of epistemic feelings that have been extensively investigated over about a century and a half, both theoretically and experimentally, and in a variety of disciplinary fields.

It is at the end of the 19th century that the notion of force-related feeling was first thematized in the context of affective science and recognized as a specific affective state. In an article published in 1889 [19], Theodor Lipps came to the idea that the feeling of will or conation (*Willen-/Strebungsgefühl*) is a qualitatively irreducible affective state of its own, distinct from pleasure and displeasure. In his 1902 work *Vom Fühlen, Wollen und Denken* [20, p. 17-53], Lipps devotes many pages to an analysis of the phenomenology of the feelings of conation (*Strebungsgefühle*). In addition to the feelings of activity and passivity, he identifies many experiential varieties of conation—such as the feelings of strain, effort, endeavor, satisfaction, coercion, etc.—which he conceives as organized as a system of

Mind, Johnson remarks that the sevenfold typology he proposes "is only a selection of the most important image schemata that play a role in our experience of force," and that "a more complete list [...] would have to distinguish among schemata for IMPACT versus CONTINUOUS STEADY FORCE versus INTERMITTENT FORCE versus DIMINISHING FORCE, and do on" [6, p. 48]. Clausner and Croft go even further in recognizing the low value of the typologies proposed, admitting that "one can define image schematic domains only by enumeration" [11, p. 21]

[3] Szwedek's typology, in particular, appears to be artificially affected by the language of physics ("APPLIED FORCE," "FRICTION," "ATTRACTION," "REPULSION," etc.).

[4] Szwedek [7] is right in ranking COMPULSION, together with ENABLEMENT, among "complex schemas," even though he does not convincingly explain why it should be so with these two types of FORCE schemas and not with BLOCKAGE, APPLIED FORCE, DIVERSION, REMOVAL, FRICTION, PRESSURE, ATTRACTION and REPULSION), the other types of FORCE schemas that he implicitly regards as "simple schemas."

polar opposites with multifaceted functional implications in conscious life. Another key theorist of force-related feelings was Richard Avenarius, who in the second volume of his *Kritik der reinen Erfahrung* [21, p. 25-27, 88-94] identified a specific category of affective states–which he designates as "the co-affectional"–encompassing all the feelings of activity and passivity and their phenomenological nuances (feelings of strain, movement, pushing, action, coercion, etc.). Here, for the first time, force-related feelings were recognized as constituting a specific group of epistemic feelings within the general taxonomy of affective phenomena. Among German scholars who theorized the psychoaffective concept of force-related feeling, we can also include Wilhelm Wundt [22, p. 98-105]. Wundt famously elaborated a tridimensional theory of feeling, in which he regarded strain/resolving as one of the three chief affective dimensions, along with pleasure/displeasure and arousal/easing. Here the affective dimension "strain/relaxation" (*Spannung/Lösung*) is conceived as a pair of polar opposites and as a class of feelings encompassing countless affective nuances.

The question of force-related feelings has also been extensively explored by English-speaking psychologists and philosophers. Here it will suffice to briefly comment on the views expounded in two significant handbooks of psychology published at the end of the 19th century: James Mark Baldwin's *Feeling and Will* (1891 [23]) and John Dewey's *Psychology* (1893 [24]). Besides "the feeling of activity" that accompanies attentional processes [24, p. 175-177], Baldwin identifies the "feelings of effort," which are involved in the experience of voluntary action [23, p. 334-344]. According to him, effort is a complex experiential state that consists of various subcategories of feelings: (a) the "feeling of preparation by selection and exclusion, of the adoption of the particular alternative for realization," (b) the "feeling of the waxing importance of th[e] end to me in my consciousness," (c) "the feeling of fiat," (d) the "feeling of control over the muscles," and (e) the "feeling of antagonism to the muscular system" [23, p. 335-336]. Dewey, for his part, identifies what he calls "active feelings," a group of affective states that belong to the broader category of the "feelings of adjustment directed towards the future," and that he describes as follows:

> The activity directed toward the future may not merely passively await the expected event, but may, as it were, go forth to meet it. This in its most general form takes the form of a feeling of pressure, of effort and of striving. If the action is to reach the end, the feeling is one of seeking. If the seeking is intense it is yearning. If the striving is to avoid the expected end, there is a feeling of aversion. There is also a class of feelings which accompany the end itself. There is feeling of success or failure; of satisfaction or of disappointment. [24, p. 273]

Here I have chosen two examples that are particularly representative of psychological research on force-related feelings in the English-speaking context.

In recent years, perceived force and perceived causality have been the topics of an experimental research program, in which the studies of Timothy L. Hubbard [25] and Peter White [26] are prominent examples. These studies have highlighted that the experience of forces and the experience of causality are phenomenologically and functionally closely related. In the present day, force-related feelings have mainly been studied within the framework of the research program on the phenomenology of action and agency [27, 28]. Subjective states that one experiences when apprehending oneself or another individual as being the agent of an action have been referred to as "agentive feelings" or "feelings of agency," and sometimes also collectively as the "feeling of agency" or "feeling of doing." Scholars have identified in it a number of more specific kinds of "feelings," such as "the feeling of control," "the feeling of trying," "the feeling of effort," etc. It should be kept in mind that in these studies the term "feeling" is often taken in its broader sense and it does not necessarily refer to a mental state of an affective nature. Here, instead of "feeling," scholars also commonly speak of "sense," "awareness," "consciousness," and "experience." The *feeling of effort* is the force-related experiential state that has aroused most interest in current philosophy of mind. This experiential state, whose precise meaning changes according to the authors, has been investigated on the basis of a variety of theoretical models. In the last few years, some philosophers have explicitly advocated the view that the feeling of effort is a specific kind of

epistemic feeling [29]. Although force-related feelings described by theorists of action and agency have generally not been explicitly identified with epistemic feelings in the specialized literature, theorists of epistemic feelings, for their part, are often willing to consider them in such terms. For instance, in their classical review articles, Arango-Muñoz and Michaelian [2] and Dietrich et al. [3] regard, respectively, "the feeling/sense of agency over thoughts" and "the feeling of agency" as constituting a definite kind of epistemic feelings.

7. Beyond force-related feelings: The presumptive role of further types of epistemic feelings in force dynamics

In light of the previous discussion, force-related feelings might appear to be natural candidates to provide the psychological basis for force-dynamics. By expressing experiential qualities like activity and passivity, effort and resistance, etc., they seem well suited for underpinning semantic processes involving dynamicity. But in reality, this category of epistemic feelings alone is far from sufficient to account for the phenomenological richness of the force-dynamic phenomena described in the linguistic literature.

There is a crucial aspect of the force-dynamics paradigm that force-related feelings seem to be unable to account for: the experience of spatiality. Indeed, the analysis of dynamicity in semantic processes appears to be inescapably bound to the analysis of spatial properties. As Gärdenfors emphasizes: "[…] the cognitive representation of an action can be described as a spatio-temporal pattern of forces. […] functional properties 'live on' action space. When it comes to functional properties, the key idea is that the function of an object can be analysed with the aid of the actions it affords" (Gärdenfors, [14]: 265). Or, as Copley and Harley put it: "Forces are intuitively spatially and temporally located, in that they arise from objects and their properties, which are themselves the components of spatially – and temporally-locatable situations" [15, p. 112]. As early as the late 1980s, Johnson had identified various spatial properties inherent to force schemas, namely "interaction," "vector quality" or "directionality," "path of motion," as well as the "origins" and "sources" of forces and the fact they are the "targets" of agents [6, p. 43]. Diagrams depicting force-dynamic patterns and the formalization of forces as "vectors" are the most blatant illustration of the centrality of spatiality in force-dynamics. Here, if we admit the claim that processes described by the force-dynamics paradigm are mental phenomena, then the question is not that of the attribution of forces to the properties of the physical space, but rather the mental elaboration of spatial properties as a necessary accompaniment of our experience of dynamicity.

Another important experiential dimension inherent to force dynamics, as we saw earlier in the passages from Gärdenfors and Copley and Harley, are temporal properties. Besides the fact that, indeed, force-related phenomena are always experienced as flowing in time, there are many force-related semantic phenomena that express purpose, finality, intentionality, etc. For instance, in understanding the meaning of verbs such as *want, intend, strive, aim, desire,* we typically have an experience of dynamicity that occurs together with an experience of anticipation or expectation, that is, with some degree of the apprehension of futureness.

As defined in the linguistic literature, force dynamics always involves a specific kind of interaction between agent and patient, as canonically exemplified by Talmy's notion of "Agonist" and "Antagonist." Each of the two elements corresponds to either an animated entity or an unanimated object or event. In force-dynamic semantic processes we are as a rule (depending on the case) dealing with something objective (that is, something experienced in relation to the external reality) or something subjective (that is, with something experienced in relation to inner life). In this respect, we can also introduce, in addition to force-dynamic feelings, spatial qualities, and temporal qualities, the apprehension of objectivity and subjectivity as a fourth experiential dimension inherent to force dynamics[5].

Finally, there is a fifth additional dimension that should be taken into account when analyzing semantic processes expressing dynamicity. This experiential dimension is well exemplified in the case

[5]It is worth noting that the experience of subjectivity is contained in the many psychological verbs expressing dynamicity (desire, want, reflect, etc.).

of modals, which from the beginning have established themselves a privileged case study of force dynamics [6, 5]. As Johnson writes: "Modal verbs, such as *can, may, must, could, might*, are verbs that pertain to our experience of actuality, possibility, and necessity" [6, p. 48]. It is true that there is an authentic force-dynamic component in modals in that they all express something like an action tendency, whether to be realized freely or coercedly (an experience that possibly occurs together with some consciousness of anticipation or expectation). But on the other hand, the idea of possibility or necessity that is included in modals also involves feeling the realization of the action tendency as "certain" or "doubtful". In this respect, I identify the experience of certainty and of its counterpart, doubt, as a further phenomenological constituent of force dynamics. In addition to the semantics of modals, this kind of experience may be involved in causal semantics too, a field of investigation that has established itself as a major focus of interest in force dynamics.

At first glance, the assumption that force-related feelings are just one kind of factor among others in the making of force-dynamic semantics may appear to be at odds with the view advocated here that epistemic feelings are the psychological basis of force dynamics. In reality, however, as I sought to demonstrate in my article "Image schemas as epistemic feelings" [1], not only can force-related feelings be interpreted in psychoaffective terms and identified with particular types of epistemic feelings, but the other four categories of experiential states discussed above can as well. Here I apply the theoretical framework I had previously defined for image schemas in general to the special case of force schemas. Let us briefly review the five types of epistemic feelings that, in my view, can be hypothesized as being involved in force dynamics:

- **Force-related feelings**
  As I previously tried to demonstrate in my talk, by analyzing both old and recent psychological and philosophical literature, there are good reasons to think that the experience of dynamicity, that is, the experience of acting on or to be acted on, can be ascribed to a definite category of epistemic feelings [19, 21, 23, 24, 22, 20, 2, 3, 29].

- **Space-related feelings**
  The idea that our experience of directionality is rooted in a system of three pairs of qualitatively opposite epistemic feelings was overtly contemplated by Ewald Hering [30] and Alois Riehl [31] in the late 19th century. Current cognitive linguists' concept of "orientational schema," although not directly envisioned in psychoaffective terms, is reminiscent of this view [32].

- **Time-related feelings**
  Theorized in the late 19th and early 20th centuries [33, 34], the idea that the experience of past and the experience of future, and their various phenomenological nuances, are mediated by certain kinds of affective states has been recently revived on a more empirical basis within the framework of memory studies [35].

- **Objectivity/subjectivity-related feelings**
  In the late 19th and early 20th centuries a great many psychologists and philosophers advocated the view that there are epistemic feelings specifically involved in the experience of objectivity and subjectivity, that is, in our spontaneous capacity to decide whether object or events belong to either the external world or ourselves [21, 23, 20]. The idea that objectivity/subjectivity-related feelings are a special category of affective states has been revived in current philosophy of mind, as shown, for instance, by research on "the feeling of reality" [36], and "phenomenal force" [37].

- **Certainty/Doubt-related feelings**
  The fact that there exist epistemic feelings specifically involved in experiencing certainty, doubt, and associated subjective states has been widely documented in the literature since the 19th century [21, 20, 2, 3]. In addition to the feeling of certainty and the feeling of doubt, the feelings of truth, obviousness, knowing, rightness, error, confusion, believing, confidence, etc. are some

of the commonly identified affective states that can be subsumed under the general category of certainty/doubt-related feelings.

8. Concluding remarks: Epistemic feelings as the semantic primitives of force dynamics

Taken together, the various types of epistemic feelings discussed in the previous two chapters, especially the so-called force-related feelings, share the experiential characteristics of force-dynamic semantic processes and their relevant image schemas. Here we are dealing with psychological entities that appear remarkably well fitted to account for language dynamics, and we do not see why we should refrain from considering them as the ultimate foundation of force-dynamic semantics. Provided that we endorse a *mentalistic*, *internalist*, and *naturalistic* conception of semantics, the psychoaffective model seems to be the most adequate way of explaining force-dynamic semantic phenomena. In particular, the aim at refounding force-dynamic semantics on the basis of affective psychology is an excellent means of avoiding the epistemological shortcomings of the research program on force dynamics, as discussed in Section 4. First, by relating force-dynamic phenomena to affective states as those described in Sections 6 and 7, we pave the way for a study of force dynamics that is no longer speculative but is rather scientifically grounded in psycho- and neurolinguistic approaches. Second, by doing so—that is, by identifying force-dynamic properties with actual entities of mental life—we are able to specify the ontological status of these properties. Third, the psychoaffective perspective on force dynamics has the great merit of avoiding the reification of semantic processes insofar as force dynamics-related entities and events are then expressed in the experiential language of affective psychology. Similarly, endorsing a psychoaffective approach to the dynamics of language allows us to solve the three problems that in Section 5 I identified as being inherent in the typological analysis of FORCE schemas. When we equate FORCE schemas with epistemic feelings, their typology no longer appears unnatural or arbitrary, but rather appears naturally grounded and scientifically motivated because it is directly rooted in effective components of mental life, whose existence can be demonstrated and whose nature can be specified. Moreover, by ascribing the relevant image-schematic structures to specific kinds of affective states–like those belonging to the five psychoaffective categories discussed in the previous section–we de facto resolve the issue of their qualitative complexity and redundancy. Indeed, in that case the ultimate components that underpin force-dynamic semantic processes are qualitatively defined and are irreducible experiential entities. Each of these experiential properties correspond to the manifestation of an elementary, well-defined form of cognizance (like, say, "effort," "objectivity," or "doubt"). Here, "complexity" and "redundancy" no longer appear as properties inherent in the constituent elements of image-schematic structure, but rather as the result of the way they are combined with each other (simultaneously and successively). According to this view, to speak of FORCE schemas makes sense only insofar as they can be related to *semantic primitives*, whose function is assumed by specific kinds of epistemic feelings.

Declaration of Generative AI

The author(s) have not employed any Generative AI tools.

References

[1] D. Romand, Image schemas as epistemic feelings: The shift from cognitive to affective semantics, in: roceedings of The Seventh Image Schema Day co-located with The 20th International Conference on Principles of Knowledge Representation and Reasoning (KR 2023), Rhodes, Greece, 2023.

[2] S. Arango-Muñoz, K. Michaelian, Epistemic feelings, epistemic emotions: Review and introduction to the focus section, Philosophical Inquiries 2 (1) (2014) 97–122.

[3] E. Dietrich, C. Fields, D. D. Hoffman, R. Prentner, Epistemic feelings: Phenomenology, implementation, and role in cognition, Frontiers in Psychology 11 (2020) 606046.
[4] W. D. Mulder, Force dynamics, in: D. Geeraerts, H. Cuyckens (Eds.), The Oxford Handbook of Cognitive Linguistics, OUP USA, 2007, pp. 294–317.
[5] L. Talmy, Toward a cognitive semantics, volume 1: Concept structuring systems, volume 1, MIT press, 2003.
[6] M. Johnson, The Body in the Mind: The Bodily Basis of Meaning, Imagination, and Reason, The University of Chicago Press, Chicago and London, 1987.
[7] A. Szwedek, A cognitive study of force image schemas, Theoria et Historia Scientiarum 19 (2022) 7–33.
[8] P. Gärdenfors, Cognitive semantics and image schemas with embodied forces, in: Embodiment in cognition and culture, John Benjamins publishing company, 2008, pp. 57–76.
[9] W. Wildgen, The "dynamic turn" in cognitive linguistics, Studies in Variation, Contacts and Change in English 3 (2009).
[10] P. Wolff, R. Thorstad, Force dynamics, The Oxford handbook of causal reasoning (2017) 147–168.
[11] T. C. Clausner, W. Croft, Domains and image schemas, Cognitive Linguistics 10 (1999) 1–31.
[12] M. S. P. Cervel, Subsidiarity relationships between image-schemas: an approach to the force schema, Journal of English studies (1999) 187–208.
[13] B. Hampe, Image schemas in cognitive linguistics: Introduction, in: B. Hampe, J. Grady (Eds.), From Perception to Meaning: Image Schemas in Cognitive Linguistics, Mouton de Gruyter, Berlin and New York, 2005, pp. 1–12.
[14] P. Gärdenfors, Representing actions and functional properties in conceptual spaces, in: T. Ziemke, J. Zlatev, R. M. Frank (Eds.), Body, Language, and Mind: Embodiment, Mouton de Gruyter, 2007, pp. 167–196.
[15] B. Copley, H. Harley, A force-theoretic framework for event structure, Linguistics and Philosophy 38 (2015) 103–158.
[16] P. Wolff, A. K. Barbey, Causal reasoning with forces, Frontiers in human neuroscience 9 (2015).
[17] J. Woźny, Conceptual models of physics in linguistic force dynamics, Linguistica Silesiana (2014) 327–340.
[18] S. Blackburn, The Oxford Dictionary of Philosophy, Oxford University Press, Oxford, 1994.
[19] T. Lipps, Bemerkungen zur Theorie der Gefühle, Vierteljahrsschrift für wissenschaftliche Philosophie 13 (1889) 160–194.
[20] T. Lipps, Vom Fühlen, Wollen und Denken. Eine psychologische Skizze, Barth, Leipzig, 1902.
[21] R. Avenarius, Kritik der reinen Erfahrung. Zweiter Band., Reisland, Leipzig, 1890.
[22] W. Wundt, Grundriss der Psychologie, Engelmann, Leipzig, 1897.
[23] J. M. Baldwin, Feeling and Will, Henry Hold and Company, New York, 1891.
[24] J. Dewey, Psychology (3rd edition), Harper and Brothers, New York, 1893.
[25] T. L. Hubbard, Phenomenal causality I: Varieties and variables, Axiomathes 23 (2013) 1–42.
[26] P. A. White, Perceived causality and perceived force: Same or different?, Visual Cognition 22 (2014) 672–703.
[27] T. Bayne, N. Levy, et al., The feeling of doing: Deconstructing the phenomenology of agency, Disorders of volition 49 (2006) 68.
[28] E. Pacherie, The phenomenology of action: A conceptual framework, Cognition 107 (2008) 179–217.
[29] J. P. Bermúdez, What is the feeling of effort about?, Australasian Journal of Philosophy 103 (2025) 88–105.
[30] E. Hering, Beiträge zur Physiologie. Fünftes Heft: Vom binocularen Tiefsehen. Kritik einer Abhandlung von Helmholtz über den Horopter, Engelmann, Leipzig, 1864.
[31] A. Riehl, Der philosophische Kriticismus und seine Bedeutung für die positive Wissenschaft, volume 1, W. Engelmann, 1876.
[32] D. Pecher, I. Boot, S. Van Dantzig, Abstract concepts: Sensory-motor grounding, metaphors, and beyond, in: B. Ross (Ed.), Psychology of Learning and Motivation, volume 54, Elsevier, 2011, pp.

217–249.
[33] A. Riehl, Realistische Grundzüge. Eine philosophische Abhandlung der allgemeinen und nothwendigen Erfahrungsbegriffe, Leuschner & Lubensky, Graz, 1870.
[34] B. Russell, The Analysis of Mind, George Allen and The Macmillan Company, London and New York, 1921.
[35] D. Perrin, A. Sant'Anna, Episodic memory and the feeling of pastness: From intentionalism to metacognition, Synthese 200 (2022) 109.
[36] J. Dokic, J.-R. Martin, Felt reality and the opacity of perception, Topoi 36 (2017) 299–309.
[37] L. Teng, A metacognitive account of phenomenal force, Mind & Language 38 (2023) 1081–1101.