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Peirce's universal categories: On their potential for gesture theory and multimodal analysis

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Abstract: This paper presents an account of how Peirce's Universal Categories (UCs) of perception and experience may, as heuristic principles, inform gesture theory and multimodal analysis. Peirce's UCs – Firstness (possibility), Secondness (actuality), and Thirdness (law, habit) – constitute the core of his phenomenology and thus also the foundation of his triadic semiotics. I argue that compared to the basic sign-object relations icon, index, symbol mainly used in previous gesture research, the more fundamental UCs allow one to discern additional facets of how coverbal gestures act as signs. This notably pertains to the phenomenology, multi-dimensionality, and multifunctionality of gesture. The guiding assumption is that compared to Thirdness-laden linguistic symbols constituting written, spoken or signed discourses, gestures may exhibit the UCs to more strongly varying degrees and in different, modality-specific ways. The multimodal analyses discussed in the paper show how Firstness tends to draw attention to the articulatory qualities of gestural signs, including aesthetic and affective strata, Secondness to their experiential grounding and contextualized meaning, and Thirdness to embodied habits of perceiving, feeling, (inter-)acting, thinking, and communicating with others. I further suggest that particularly through interacting with embodied image schemata and force dynamics, such habits may give rise to flexible regularities and schematicity in gesture.

Keywords: gesture, Peirce, universal categories, image schemata, embodiment, multimodality

1 Introduction

This paper presents an attempt to apply Peirce's *Universal Categories* of perception and experience to dynamic multimodal messages: spontaneous manual gestures with spoken discourse. As is well known, Peirce established a set of trichotomies based on the three elements any semiotic process involves: the *sign*

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itself, the sign in relation to its *object*, and the sign in relation to its *interpretant*. For each triad of the sign model, Peirce systematically described the relata as a *first*, *second*, and *third*, assuming *Firstness*, *Secondness*, and *Thirdness* to underpin, as heuristic principles, all processes of perception, imagination, reasoning, and expression (e.g. CP; SS; EP 2; see, e.g. Farias and Queiroz 2017; Liszka 1996; Nöth 2016; Pape 1990 and Pape 2015; Potter 1967; Sonesson 2013; Stjernfelt 2007 and Stjernfelt 2014).

The Universal Categories (henceforth UCs) are mentioned in Peirce's writings as early as the late 1860s; since then, they kept developing throughout Peirce's oeuvre to finally constitute, after the 1900s, the core of his phenomenology, which, in turn, builds the foundation on which his triadic semiotics further evolved (e.g. Sonesson 2013; Stjernfelt 2007 and Stjernfelt 2014). Acknowledging their pervasiveness, as well as their vagueness, this paper examines the potential of Peirce's UCs to "goad and guide inquiry" (Colapietro 2001: 203) in the domain of gesture theory and multimodal analysis. The overall goal is to further illuminate our understanding of embodied cognition and multimodal semiosis during instantaneous *face-to-face* interaction.

Building on previous gesture research that has integrated Peirce's basic object-sign relations *icon*, *index*, *symbol* into various typologies and foci of analysis,¹ the present approach sets out to explore how employing the more fundamental UCs may reveal, and also account for, additional facets of coverbal gestures, that is, dynamic, spatio-temporal phenomena that literally embody experiential, felt, intersubjective, and thus social dimensions of thought and dialogue (Bakhtin 1981; Bourdieu 1980; Halton 2004; Vygotsky 1962). Gestures here are understood as discourse-embedded, kinetic action that is performed with the head, hands, torso or entire body and has some semiotic function(s). Since they are not as highly and systematically codified as language, and because their visuo-spatial, physical mediality affords a broad range of forms and functions (e.g. Kendon 2004; McNeill 1992 and McNeill 2005; Müller 1998 and Müller 2010; Müller et al. 2013 and Müller et al. 2014), co-speech gestures seem particularly apt to theoretically and empirically examine the nature and working of Peirce's UCs within dynamically unfolding semiotic contexts (Goodwin 2011; Jakobson 1987 [1960]; Mittelberg and Waugh 2009).

The guiding assumption of the account presented here is that compared to Thirdness-laden linguistic symbols constituting written, spoken or signed discourses (e.g. Deacon 1997; Jäger and Linz 2004; Liddell 2003), spontaneous

¹ See, e.g. Andrén (2010); Enfield (2009, 2011); Fricke (2007, 2012); Haviland (2000); McNeill (1992, 2005); Mittelberg (2006, 2008, 2013a).

coverbal gestures may exhibit the three UCs in different ways and to greater, more strongly varying degrees. In particular, I argue that due to their specific materiality and mediality, gestures have a strong propensity to (a) mediate *qualities of experience* (Firstness) and (b) exhibit various kinds of embodied *habits of feeling, action and thought* (Thirdness) that give rise to patterns, regularities and schematicity beyond the more narrowly defined concepts of symbol and conventionality (e.g. Nöth 2016; West and Anderson 2016). In order to support these ideas, I first characterize the semiotic idiosyncrasies of gesture and then discuss some of the theoretical premises and modality-dependent considerations that go into applying Peirce's UCs to gesture. Along the way, I present selected sequences from multimodal data collected in the Natural Media Lab, putting into relief how the UCs may manifest in communicative body movements and thus also guide their interpretation. When fitting, I will draw connections to cognitive linguistics, as this branch of the cognitive sciences (e.g. Gibbs 2006) shares common ground with Peircean semiotics regarding embodiment and habits of experience and expression (e.g. Danaher 1998; Mittelberg 2006 and Mittelberg 2008).

2 Semiotic characteristics of gestures: A brief sketch

The question of when and how a gesture acts as a sign is not trivial. To begin with, a large part of gestures is probably less consciously produced than most linguistic signs. This is partly why they may provide valuable insights into less monitored aspects of cognition and emotion during communication (Sweetser 2007). By the same token, gestures are not always consciously perceived by the addressee(s), except for attention-guiding pointing practices as exemplified in Figure 1 (adapted from Mittelberg 2008). When saying "*there is* the main verb," the speaker, a linguistics professor, creates with his right arm and hand a gestural index, thus drawing the students' attention to a verb form written on the blackboard behind him. Gesture production generally shows a great deal of variation depending on discourse genres, personal styles and cultural practices, among other factors (e.g. Enfield 2009; Kita 2003; Müller et al. 2013 and Müller et al. 2014). All these factors make bodily semiotics not an easy, but a very rich field of semiotic inquiry.

Gestures are polysemous and multifunctional in nature; they for the most part do not rely on culturally coded form-meaning pairings in the Saussurean sense of signifier-signified relationships (Saussure 1986). Consequently, they do



Figure 1: Pointing gesture (“there is”) and metaphoric container gesture (“the main verb”).

not constitute an as highly conventionalized semiotic system as spoken or signed languages do, except for culturally-defined *emblems* (McNeill 1992) such as the ‘thumbs-up’ gesture used for positive evaluation. Many gestures are to a great extent *motivated* by experience with the material and social world, as well as by embodied conceptual structures built up through repeated similar actions and experiences (e.g. Bressem 2014; Cienki and Müller 2008; Ladewig 2014; Mittelberg 2008, Mittelberg 2013a, and Mittelberg 2019; Müller 1998 and Müller 2017; Streeck 2009; Sweetser 2007).

Spontaneous gestures usually receive their local meaning in conjunction with the concurrently uttered speech and other contextual factors (e.g. Goodwin 2011; Müller 2010 and Müller 2017). For instance, while the speaker in Figure 1 is pointing at the verbal form *taught* as described above, his other hand exhibits basic form features of a small receptacle representing “the main verb” at a higher level of abstraction. Without considering the speech content, we would not know that the cupped hand does not stand for a physical object, but for a grammatical category. This metaphoric gesture thus can be said to embody the basic metaphorical concept CATEGORIES ARE CONTAINERS (Lakoff and Johnson 1980). In a similar fashion, the speaker could be taken to seemingly be holding a physical object in Figure 2. Continuing to explain the relation between main verbs and auxiliaries, he stresses the fact that the auxiliaries “*have*, *will*, *being*, and *been* ... must all belong to some sub-category.” By producing this gesture lower in gesture space than the gesture representing “the main verb,” as well as most of his other gestures, this portrayal literally depicts the idea of sub-ordination. We witness



Figure 2: Metaphoric gesture with contiguous virtual object (“must all belong to some sub-category”).

here the tendency and capacity of gestures to mediate between the concrete/physical and the abstract/conceptual through pretending to physically manipulate abstract ideas or categories as if they were tangible objects (e.g. Cienki and Müller 2008). The speaker here enacts the metaphor IDEAS ARE OBJECTS (Mittelberg 2008), despite the fact that the speech is not metaphorical but technical in nature. In Peircean (CP 2.277) terms, this metaphoric gesture represents a *parallelism* between an abstract object and a physical representamen.

While gesture analysis typically involves categorizing the vast array of communicative behavior in some way, gesture scholars have come to realize that many gestures actually defy neat categorization. One of the most widely used typologies is McNeill's (1992) Peirce-inspired scheme that devises *beats*, *deictics*, *emblems*, *iconics*, *metaphorics*, and *cohesives*.² To overcome the

² According to McNeill (1992), *beats* are rhythmic manual up-and-down movements mainly used to accentuate certain elements in the concurrent speech chain; *deictics* are pointing

difficulty to assign a gesture to a single category, McNeill (2005) now speaks of mixing *dimensions*, such as *iconicity* and *indexicality*, though without specifying how each of them weighs in a given sign.

In line with hierarchical views on semiotic processes (Jakobson 1987 [1960]; CP; Stjernfelt 2014; Waugh 1985), the present approach sees gestures and whole-body enactments as combining to varying degrees and in a *hierarchized* fashion iconicity, indexicality and conventionality/habit, the hypoicons *image*, *diagrammatic* and *metaphor iconicity* (CP 2.277; Farias and Queiroz 2006), as well as pragmatic and interactive functions described beyond Peirce-based paradigms (e.g. Bavelas et al. 1995; Kendon 2004; Müller 1998). Depending on the locally acting pragmatic forces one of the mixing modes comes to the fore, thus determining and foregrounding the *predominant* function of a given gestural sign (e.g. Mittelberg and Waugh 2009; Müller 1998 and Müller 2010). For instance, while pointing gestures that establish a connection between the hand and a physical object or location in the speaker's environment are highly indexical (Figure 1), muted degrees of indexicality can reside in predominantly iconic gestural portrayals that imitate an object-oriented action, thus alluding, or "pointing," to the virtual contiguous object the hands are seemingly holding and the speaker is referring to (as in the sub-category example illustrated in Figure 2; Mittelberg and Waugh 2014). As we will see in the following sections, the noted multidimensionality of gestural signs may be further highlighted by drawing on Peirce's UCs.

3 Peirce's universal categories: A phenomenological take on gesture semiotics

This section serves to lay out some of the main tenets concerning Peirce's UCs that seem particularly pertinent for gesture theory and analysis. Due to limits of space, the following discussion will not be able to do justice to either the semiotic complexity of the phenomena at hand, or the extensive literature on the topic (e.g. Colapietro 2001 and Colapietro 2008; Farias and Queiroz 2006 and Farias and Queiroz 2017; Liszka 1996; Nöth 2016; Oehler 1987; Pape 1990 and Pape 2015; Sonesson 2013 and Sonesson 2016; Stjernfelt 2007 and Stjernfelt 2014; West and

gestures; *emblems* are codified gestures with a stable form-meaning relation, such as the "victory"-sign or the "okay"-sign; *iconics* depict a physical action or a concrete object; *metaphorics* portray abstract actions or entities; and *cohesives* comprise repetitions of a given gesture form or location across a stretch of discourse.

Anderson 2016). More specific aspects and illustrations of how the UCs and gestures may elucidate one another will be presented throughout the paper.

Among the three strands of philosophy Peirce devised, phenomenology (as the first) is especially relevant for the study of gestures. It “contemplates phenomena as they are, simply opens its eyes and describes what it sees ... stating what it finds in all phenomena alike (5.37)” (Potter 1967: 10). Against this backdrop, Peirce's three Universal Categories *Firstness*, *Secondness* and *Thirdness* are defined as one-place, two-place, and three-place (monadic, dyadic, and triadic) relations, and have the status of heuristic principles (e.g. CP; EP 1; EP 2; SS). All perceptible and imaginable phenomena may be described and discerned into different kinds with the help of the UCs; they are irreducible, omnipresent, and interdependent (Potter 1967: 14). The UCs “roughly correspond to three modes of being: possibility, actuality, and law (1.23)” (Potter 1967: 11), or, “three states of mind,” namely, feeling, acting, and thinking (EP 2: 4–5).

Firstness pertains to possibility, e.g. of meaning or behavior, mere qualities of being, feeling, and sensation. Taken by itself, it is positively what it is, e.g. a quality of “redness,” but not existent, as it needs to be instantiated in relation to a second (EP 2: 267–271). *Secondness* is the realm of actual existence, experience, action and reaction, facts, and forces (EP 2: 267–271). *Thirdness* is the domain of rules, general laws, symbols, regularities, and habits; it thus allows predictions of what may happen based on acquired knowledge and patterns of experience (EP 2: 267–271). It may govern, to some degree, *Secondness*, such as in ruling the actual use of signs. A sign can only act as a sign in *Thirdness*, that is, if all three correlates interact (CP 2.228): a *representamen* (e.g. the cupped hand in Figure 1), its *object* (e.g. the category main verbs), and its *interpretant* (e.g. the gesture's meaning arising in the mind of the student).

The UCs underpin the three trichotomies pertaining to Peirce's sign model as well as the corresponding classes of signs (e.g. Farias and Queiroz 2006 and Farias and Queiroz 2017; Sonesson 2013), the most prominent of which, presented in Table 1, will be addressed one by one in the ensuing sections.

Peirce's UCs are vague and general in nature; both characteristics – especially the former – resonate with some of the properties of many gestures. The UCs' vagueness derives, according to Colapietro (2008: 40), from their being “semeiotically or experientially indeterminate”: “A sign is objectively vague, in so far as, leaving its interpretation more or less indeterminate, it reserves for some other possible sign or experience the function of completing its determination (CP 5.505)” (2008: 40). This is to a certain extent true of many gestural signs which typically need other signs, namely, speech signs, other gestures, and additional facets of experience to assume their context-dependent function. Peirce (CP 1.355) introduced three metaphors to characterize the vagueness of

Table 1: Overview of Peirce's universal categories and their relation to the sign correlates and trichotomies.

<i>Universal Categories</i>	<i>Semiotic relations</i>	<i>Correlates of triadic sign relations</i>	<i>1st trichotomy sign itself (presentative)</i>	<i>2nd trichotomy sign-object relation (representative)</i>	<i>3rd trichotomy sign-interpretant relation (interpretative)</i>
<i>Firstness</i> possibility (feeling)	similarity	representamen	qualisign	icon	rHEME
<i>Secondness</i> actuality, facts (acting)	contiguity	object	sinsign	index	diciSIGN
<i>Thirdness</i> law, mediation habit (thinking)	conventionality	interpretant	legisign	symbol	argument

the UCs which bring to the fore their very own Firstness. Being utterly sensorial, these metaphors strike a chord with multi-sensory perception and experience and, therefore, also with bodily semiotics: *moods* (affective experience), *tones* (auditory experience) and *tints* (visual experience). Gestures are, as will be shown below, susceptible to *articulate* such experiential qualities (Colapietro 2001: 205–207, 209; Mittelberg 2013a).

This strong emphasis on experience goes hand in hand with embodied, experiential accounts of cognition, language, and culture (e.g. Gallagher 2005; Gibbs 2006; Krois et al. 2007). In a similar vein, the present view highlights gestures' potential to mediate between "outward experience" with the world (physical engagement), "inward experience" (imaginative involvement; Colapietro 2008: 41), aesthetic experience (Potter 1967), as well as intersubjective experience. Our bodies and their gestures naturally participate in our making sense of the manifold phenomena we constantly encounter and interpret (Merleau-Ponty 1962). By the same token, gestures genuinely participate in multimodal acts of situated meaning-making and make thus inner thoughts and affective states palpable (e.g. Mittelberg 2013a; Müller 2017).

Since Secondness is comparably easy to seize (not only) in bodily semiotics (e.g. Potter 1967: 12),³ my main intent is to illustrate how spontaneous gestures may not only embody Firstness in a particularly intuitive way, but also the Peircean idea of *habit* as a form of Thirdness, brought about by repeated, similar

³ "Secondness is the easiest to comprehend, being the element that the rough-and-tumble of this world renders most prominent. We talk of hard facts. That hardness, that compusiveness of experience is Secondness" (EP 2: 268).

instantiations of Secondness (e.g. Sonesson 2016). Different kinds of habits, corresponding to the three states of mind mentioned above, play a central role in the present account of gesture semiotics: habits of *feeling* (Firstness), *action* (Secondness), and *thought* (Thirdness; Nöth 2016; see contributions in West and Anderson 2016 on Peirce's notion of habit). A central aim of this undertaking is to provide further evidence that spontaneous gestures are more patterned and principled than it might seem at first sight (e.g. Müller et al. 2013 and Müller et al. 2014).

4 How Peirce's universal categories may manifest and interact in gestures

Building on my previous work on gesture at the juncture of Peirce's semeiotic and cognitive linguistics (e.g. Mittelberg 2006, Mittelberg 2008, Mittelberg 2013a, and Mittelberg 2019), this section lays out a first, empirically-grounded account of how Peirce's UCs may manifest in co-speech gestures and thus also guide their interpretation on the side of the interlocutor or observer.⁴

4.1 Firstness: Possibility of meaning and qualities of experience and gestural signs

Firstness is the category of presence, possibility, unreflected emotions, spontaneity, freshness, immediateness, and potentiality of meaning, among others (CP 1.302–1.303; see Section 3). It may manifest in gestures in several ways, typically interacting with Secondness and Thirdness to varying degrees. Generally speaking, many gestures seem to embody some of the very characteristics of Firstness: They are forms with multiple possible meanings and typically express ideas, emotions, and inclinations in quite spontaneous, non-reflected and non-premediated, and thus rarely in carefully planned and executed, ways.

Since human bodies, and especially hands, perceive the world in both immediate and mediated ways, the *feel* of things, states and situations may resonate in gestures. Just as the human body partakes in the sensorial experience of basic conditions of human existence (e.g. space, time, light, momentum,

⁴ The present approach to gesture also includes the work of Roman Jakobson, as his writings bridge Peircean semiotic theory and cognitive linguistics. For more details, see Mittelberg (2006, 2010a, 2013a, 2019) and Mittelberg and Waugh (2009, 2014).

shape, gravity, temperature, touch, taste, smell and textures) or aesthetics (e.g. of music, dance, film, and the visual arts), gestures and postures may evoke, and translate into their own affordances, essential aspects of physical and aesthetic experiences by expressing, e.g. moods, atmospheres, noise levels, tonal qualities, spatial dimensions, and other kinds of impressions and sensations. Gestures are thus predestined to evoke what Johnson (2007) refers to as the felt qualities of experience, meaning and understanding (see also Colapietro 2001 and Colapietro 2008; Halton 2004; Kappelhoff and Müller 2011; Mittelberg 2013a and Mittelberg 2013b).

Firstness seems to predominantly reside in small hand movements that do not show any clear deictic, iconic, or even beat-like form or contour, but rather assume a *phatic* function (Jakobson 1990 [1966]), e.g. accompanying the flow of speech and signaling the speaker's intention to keep talking, or an *emotive* function, e.g. expressing the speaker's being upbeat, impatient or nervous. Importantly, no actual act of reference (Secondness) takes place.

Moreover, Firstness comes to the fore when a manual configuration and/or movement is observed in isolation. This is the case when no speech is coproduced, or when the accompanying speech is incomprehensible (due to a distance between speaker and observer or because the language spoken is unfamiliar to the interpreter). Interestingly, the first step in form-based gesture analysis creates this condition artificially, as it involves attending to the gestures' form (e.g. Bressem 2013) and thus to the phenomenon as such, while disregarding the speech content that usually serves to discern their actual meaning (Secondness). Firstness here gives rise to the possibility of different meanings of a given form or behavior, prompting the interpreter to check whether it brings to mind any Thirdness elements, e.g. attested gestural patterns rooted in action habits, such as holding or placing an object (Figure 1), or cultural practices that may serve to establish Secondness in a given moment of multimodal performance (see also Section 4.3).

To characterize the idiosyncratic nature of gestural signs in a more fine-grained way, it makes sense to narrow in on the first trichotomy of Peirce's triadic sign model (CP 2.228), which concerns the character of the *sign itself* (*qualisign*, *sinsign*, *legisign*; EP 2: 291; CP 2.244–2.246). Peirce refers to the mere qualitative dimension of the sign as the *qualisign*, pertaining to Firstness, which needs to reside in something else to become available for interpretation. It characterizes the sensory quality of a sign, e.g. its perceptible properties, such as the impression of slowness or of a certain color such as redness (EP 2: 268). It thus refers to the *presentative* nature of the sign, prior to any kind of representation, that is, any embodiment of relational actualities. The instantiation of a quality, e.g. its specific existence in an actual dynamic sign (the *sinsign*), takes

place in the realm of Secondness, e.g. when the qualisign redness is instantiated in a painting by Mark Rothko (e.g. "Orange, Red, Yellow," 1961), or the qualisign quickness materializes in the rapid way a movie is cut or in a brisk gestural push into the periphery of gesture space. Qualities of this kind may thus characterize a gesture's articulation (Secondness), for instance, as slow and precise versus quick and sketchy. Moreover, just as a sinsign can involve one or several qualisigns (Peirce 1955: 7), a single gesture may embody several qualisigns: An open flat hand with the palm facing upwards combines several form parameters and has many possible meanings, such as presentation, obviousness or cluelessness (Bressem 2013; Bressem and Müller 2014; Kendon 2004). Changing one of the parameters, e.g. by turning the palm downwards, would also instigate a different semantic quality, e.g. closedness or belowness.

Additional fabrics of Firstness in gesture may reveal themselves through new recording techniques and creative transformations of numeric gesture data. For instance, Firstness vividly comes into play when speakers who are in the process of developing and articulating fresh ideas and new connections produce, through manual configurations and movement traces, semiotic material that does not necessarily *represent* existing objects, spaces or relations (Secondness), but evidence the *presentative* and creative functions of gestural signs. As shown in an architectural design study (Mittelberg et al. 2017),⁵ gestures recorded with motion-capture technology (henceforth MoCap) may, through undergoing transmedial processes, be turned into visualized diagrammatic icons, virtual models, or 3D prints. Stills of digital motion traces, as shown in Figure 4, and gestural sculptures, like the one in Figure 6, are decontextualized to different degrees in that the original discourse context, and even the speaker's characteristics, are omitted. As such, these signs may stand for themselves.⁶

Figure 3 captures a moment when the speaker is talking (in American English) about her habit of watching certain sitcoms.⁷ Her arced hand movement does not depict a motion event, but brings to bear an assumed (counterfactual) process-like experience: "if I were to continue to watch." The person in Figure 5 below talks about a childhood memory (adapted from Mittelberg 2017a), describing how on her daily way to kindergarten she would run down a seemingly endless winding

⁵ This study was conducted in the Natural Media Lab (HumTec, RWTH Aachen University) in cooperation with Hannah Groninger and Thomas Schmitz from the Dept. of Visual Arts (BiG, Architecture Faculty); for details regarding the study design and methods see Mittelberg et al. (2017). For a detailed analysis regarding iconicity and viewpoint see Mittelberg (2017a).

⁶ See Schüller and Mittelberg (2016) for a semiotic analysis of such digital traces of gestural movement.

⁷ These data stem from joint research with Jennifer Hinnell (University of Alberta) on gestural expressions of aspectual framing.



Figure 3: “if I were to continue to watch”.

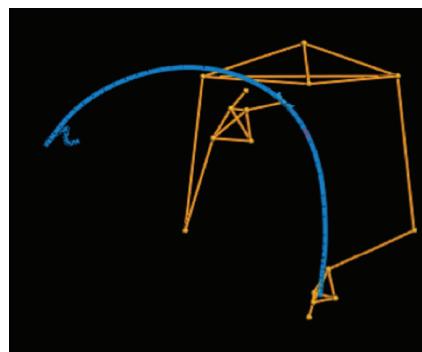


Figure 4: Arc-like MoCap trace and partial stick figure.

staircase. With the help of the motion-capture trace we can see the gestural gestalt portraying a repeatedly experienced motion event in its entirety and in a precise manner as far as its movement trajectory and qualities are concerned.⁸

The semiotic gestalts born out of such creative transformations of gestural traces are good examples of Jakobson’s (1987 [1960]) poetic (or aesthetic) function in that reference (Secondness) to an object or event in the real world is not the primary concern, or even gets distorted. Rather, comparable to abstract drawings and paintings, the focus is on their form, materiality and aesthetic, self-absorbed qualities (Mittelberg 2011; Waugh 1985). When appreciating these configurations, we remain for a moment within the realm of Firstness. We might come to realize that the gestural trace in Figure 4 has a stunning regular, geometric form, while the gestural motion sculpture in Figure 6 has a particularly

8 Speech transcript:

... und immer wenn ich halt zum Kindergarten musste, dann konnte ich immer die Treppe von oben runtersausen, ganz schnell, aber diese Treppe nahm und nahm und nahm und nahm kein Ende, weil ich eben das Gefühl hatte, dass wir in einem riesengroßen Turm wohnten. [...] and each time when I had to go to kindergarten, I would always run down the stairs from the top ... very fast, and the staircase didn’t and didn’t and didn’t and didn’t come to an end because I had the feeling that we were living in this enormous tower.].

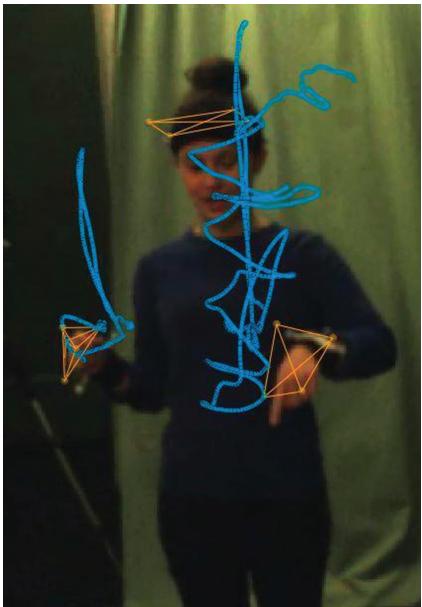


Figure 5: MoCap trace of gesture portraying PATH of a downward SPIRAL motion event (cf. transcript in footnote 8).



Figure 6: 3D-printed MoCap sculpture of gesture trace shown in Figure 5 (©BiG/NMLab).

fluid movement quality to it, which other sculpted materials probably could not as easily achieve. As Nöth (2016: 45) points out, “(a)esthetics, for Peirce, is the study of ‘those things whose ends are to embody qualities of feeling’ (“Harvard Lecture V,” CP 5.129; EP 2: 200).”

These observations remind us of how Peirce in his reflections on “What is a sign” describes a person in a dreamy state, “thinking of nothing but a red color” (EP 2: 4), to then note that also “when we are awake, something is present to the mind, and what is present without reference to any compulsion or reason, is feeling” (EP 2: 4). It seems that such first, felt strata of consciousness and experience, involving visceral reactions, gut feeling, and vague mental or emotional states, are particularly disposed to be mediated via bodily signs: especially via qualia instantiated in gesture when experiencers talk about the phenomena they were exposed to, how those felt, or how they made them feel.⁹ On the side of the interpreter, the first kind of interpretant, the *immediate interpretant*,

⁹ See Rekittke et al. (2015) on how film sound translates into different qualities and trajectories of gestural movements during film retellings.

captures the first, unreflected and unanalyzed impression we may sense of a person, dance performance, painting, space, painting, or symphony. We can take from these observations that such imaginative or ‘poetical’ experience is strongly attuned to the categories in their Firstness (Colapietro 2008: 4; see also Corrington 1993: 160; Mittelberg 2006: 44–46).

4.2 Secondness: Experience, (re)action, reference, and contextualized meaning

Secondness is the category of existence, reference, action, reaction, opposition, reality, facts, association, and the instantiation of one meaning among many possible ones, among others (CP 1.356–359; see Section 3). Some of these phenomena precede and also motivate gestural sign formation: experienced physical action/reaction, witnessed behaviors and scenes, facts, and existing objects may be imitated or otherwise portrayed by gestures. Pointing gestures are excellent examples of how “indices have exclusive reference to objects of experience” (CP 2.295; Colapietro 2001: 206). In addition, gesturally evoked pragmatic links between the gesturing hands and the seemingly held object may reenact *Secondness*, i.e. re-establish a connection with the material world and one’s ability to manipulate it; thus giving in to “the compulsions of experience” Colapietro (2001: 206; EP 2: 268). As evidenced by the sub-category example (Figure 2), through operationalizing the contiguity relations (*Secondness*) instilled between the hands and the imagined object, the gesture recreates the sense of being in touch with the real, encountered world (Mittelberg and Waugh 2014). The virtual object, referred to in speech, is not part of the visible, physical representamen, but can be imagined, almost sensed, through inferring it metonymically from the basic manual action performed by the speaker. At the same time, it is the letting go of the material environment that typically turns an object-manipulating action into a more abstract, communicative gesture (Mittelberg and Waugh 2014).

Reference in gesture is no clear-cut affair, an aspect that keeps being addressed in the literature (e.g. McNeill 2005; Müller 1998; Streeck 2009). As pointed out earlier, it is generally assumed that in order to afford specific acts of reference, spontaneous gestures, including indexical pointing gestures (*Secondness*), need to be contextualized through other signs (e.g. speech sounds, preceding gestures, or facial expressions) and/or the material, social and interactive context in which they are embedded (Goodwin 2011; Müller 2010 and Müller 2017). Despite their tight relation to speech, it seems important to also account for gestures in their own right, by keeping the option open that

they *do*, or *accomplish* (Gallagher 2005; Levin 2016), something apart from what is being expressed or done verbally. For instance, gestures may partake, either together with the concurrent speech or more independently, in discourse management and regulate face-to-face interaction (e.g. Bavelas et al. 1995; Kendon 2004; Müller 1998). Considering these discourse-pragmatic functions of gestures in the multimodal give and take between interlocutors illuminates their high potential and inclination for Secondness, that is, for action and reaction.

Peirce's second trichotomy, comprising the three *sign-object* relationships (*icon*, *index*, *symbol*; EP 2: 291–292; CP 2.247–2.249), as well as the hypoicons *image*, *diagram*, *metaphor* (EP 2: 273–274; CP 2.276–2.277; Farias and Queiroz 2006 and Farias and Queiroz 2017), has been amply employed in gesture research (e.g. Fricke 2007; McNeill 1992; see work cited in Section 2). It seems, though, that the broad range of possible semiotic objects (Secondness) has yet to be fully exploited in gesture studies. Peirce's understanding of what an object can be is extremely wide and ranges from real to imagined things: possibilities, goals, qualities, feelings, relations, modes of being, etc. (Liszka 1996: 21). As Shapiro (1983: 25) has pointed out: "Anything can be an object, as long as it is represented by a sign" (see also Kockelman 2005: 242).¹⁰

Gestures are genuinely indexical (Secondness), as they are always anchored in real or imagined bodies, environments and discourse contexts (Mittelberg 2017a; Sweetser 2012). This does not only pertain to prototypical gestural indices (seconds in the second triad) such as pointing gestures (Figure 1; e.g. Fricke 2007; Kita 2003). As in other visual modalities, indexicality conditions how iconic depictions are *viewpointed*: Speakers may portray witnessed or imagined scenes from the perspective of a participant (character viewpoint), from a distance (observer viewpoint), or a blend of the two (dual viewpoint; e.g. McNeill 1992; Parrill 2009). While describing her way to school, the speaker in Figure 5 immerses herself into the imagined space and seemingly watches – directing her indexical eye-gaze downward – her own running down the stairs from the top floor which she iconically resumes as a viewpointed downward-winding motion trace.¹¹

Indexical modes may further lend iconic portrayals a momentary (inter-) subjectivity and affective expressiveness. Gestures, postures and facial expressions may add modality-specific sinsigns to what is being said by establishing an indexical connection to the speaker's mental disposition. Certain movement qualities, for instance, may instill emotive or attitudinal layers (e.g. humor,

¹⁰ On the role of the *immediate* and the *dynamic object* in gestural signs see Fricke (2007, 2012); Mittelberg (2006, 2013a).

¹¹ For a more detailed analysis of this gesture, highlighting the interaction of immersion, viewpoint and metonymy, see Mittelberg (2017a).

enthusiasm, conviction, despair, or indecision) to their articulation, thus pointing to the stance or inner state of the speaker and indicating *how* what is being described was or is being experienced, or how it is meant to be understood intersubjectively (see Mittelberg and Waugh 2014 on *modal indices* and *mental/emotional state indices*).

From a Peircean perspective, gestures seem to literally embody the experiential grounding (Secondness) of human existence, expression, and interaction. As Colapietro (2001: 41) insightfully put it: "Experience is a phenomenon in which secondness or opposition is predominant, somewhat eclipsing both qualitative immediacy (firstness) and grounded intelligibility (thirdness)." Given the observations made so far, several questions keep coming up: Since all three universal categories are supposed to interact in any sign process, how and to what degree does Thirdness factor into gestures? Do individual iconic/metaphoric gestures have a corresponding type in Thirdness, and if so, what can be said about the source, manifestation, and dynamic emergence of this Thirdness? These questions, which I began to examine in Mittelberg (2006), cannot be fully answered in this paper; however, some insights will be offered in the following sections.

4.3 Thirdness: Conventionalization, habits, invariance, and schemata of experience

Thirdness is the category of convention, law, habit, memory, necessity, continuity, mediation, concepts, signification, synthesis, and semiosis, among others (CP 1.337; see Section 3). One of the central premises of the present proposal is that Thirdness in gesture not only underpins symbolic emblems, such as the victory sign, but resides in different kinds of embodied habits and schemata, social practices and entrenched pragmatic inferences (Mittelberg 2006, Mittelberg 2017a and Mittelberg 2019). As stressed earlier, Peirce's understanding of different kinds of habits is a cornerstone of this account (e.g. Nöth 2016; Sonesson 2016; Stjernfelt 2016; West and Anderson 2016). While processes of conventionalization clearly play a role here, working with the wider concept of Thirdness has the advantage to encompass a larger array of regularities that may be observed in the formation and interpretation of gestural signs as such, as well as in individual and social practices of gesture use.

With respect to the first trichotomy of Peirce's sign model (CP 2.244–2.246; see Section 4.1), legisigns (Thirdness) themselves express a law, and representation is secured on the basis of conventionality or habit: through instantiating established categories and general types that get locally embodied in sinsigns

(replica), such as a word's meaning in a particular discourse context. Likewise, a thumbs-up symbol not only involves making a replica of the gestural legisign that needs to fulfill, as all emblems do, certain well-formedness conditions in order to be recognized and correctly interpreted. It also needs to be contextualized (Secondness) by speech or other factors in order for the interpreter to figure out what is being positively evaluated by the speaker.

As Peirce (CP 2.238) stated, “(t)riadic relations are in three ways divisible by trichotomy, according as the First, the Second, or the Third Correlate, respectively, is a mere possibility, an actual existent, or a law.” The third trichotomy contains the three *sign-interpretant* relations *rHEME*, *dicisign* and *argument* (CP 2.250–2.252; Farias and Queiroz 2006 and Farias and Queiroz 2017). Given the underlying premise that each sign has a certain interpretative potential, the question is whether “its interpretant represents it as a sign of *possibility* or as a sign of *fact* or a sign of *reason*” (Peirce 1955: 7). Since the interpretant, i.e. the reaction in the mind of the sign interpreter (“an equivalent sign, or perhaps a more developed sign” [CP 2.228]), is a dynamic and adaptive concept, what one sees in a gesture and whether one detects Thirdness depends on an individual’s semiotic history, cultural background, and expertise (Fricke 2012; Mittelberg 2006 and Mittelberg 2013a). So, for gesture researchers, a given gestural sign is probably more likely to exhibit Thirdness than for someone who has never studied mediation via gestures.

Regarding sign-interpretant relations, gestures again seem to exhibit a natural affinity with firsts, that is, with rhemes, in that they may evoke several possible interpretants (Mittelberg 2006: 47–51). The rheme (Peirce 1955: 9) tends to focus the interpretant on the qualitative characteristics of the sign and not so much on any existential or law-like features. It is pre-relational, and carries the potential for interpretation, but remains vague in terms of reference (Liszka 1996: 40; CP 2.250). In order to afford information, the rheme needs to hook up with other signs to build a dicisign, that is, “a sign of actual existence” (Peirce 1955: 9). Dicisigns may connect sense with reference in a communicative act through combining rhemes into a higher interpretative organization. While many gestures, taken by themselves, exhibit notably rhematic qualities, together with speech signs they may form dicisigns, thus making a claim about the world. As Stjernfelt (2014) in his work on dicisigns emphasizes, it takes an index and an icon to form a dicisign, which may then fulfill the functions of both indicating an object and describing it. One possibility to do so via gestures is to combine a gestural index, e.g. pointing at someone, with a gestural icon that describes some aspect about that person, e.g. by imitating her happy facial expression. This gesturally achieved dicisign could signify that the person pointed at is in a happy state. Seen this way, the two gestures shown in Figure 1 constitute, jointly

with the co-occurring speech, a multimodal proposition through the combination of linguistic and gestural icons and indices. As such, they afford specific, multimodally expressed information and make a claim about main verbs (see also Stjernfelt 2016 on dicisigns and habits).¹²

Attributing the uppermost significance to interpretative processes (rather than to sign production), Peirce (CP 8.314) distinguished three kinds of interpretants, depending on what kind of reaction the sign creates in the receiver: anything from a feeling, an action or a thought (e.g. Corrington 1993; Kockelman 2005). The *immediate interpretant* (Firstness) aims at the understanding of the sign as a sign. It “is a potential interpretant that brings a sphere of possible meanings to an interpretative situation”; in the process, it “maintains some possibilities and denies others” (Corrington 1993: 160). Of those maintained possibilities the *dynamic interpretant* is the actual interpretation the sign evokes in a singular interpretative event, e.g. a gesture is understood as having a specific meaning. The idea that “(t)he dynamic interpretant is what is experienced in every act of interpretation and is different from every other act of interpretation” (Oehler 1987: 6) seems very fitting given the nature of gestural signs, whose interpretation is strongly context-dependent.

The *final interpretant* (Thirdness) is any rule-like, law-like, or habitual effect a sign has on the interpreter: It is “the interpretant to which the actual process of interpretation tends” (Oehler 1987: 6). As Liszka (1996: 27) put it, “(i)ts products will be thirds, such as laws, habits, dispositions, and regularities; its cousin is the logical interpretant.” Of special interest to the present proposal are dynamically evolving habits of action, interpretation, and thought:

The logical interpretant can be thought of as the conceptual import, the meaning of the sign (CP 5.475) ... that is the *expression* (CP 5.491) of the generalizable outcome of the sign (CP 5.483). The final or ultimate logical interpretant, on the other hand, is the habit of interpretation or the habit of action (CP 5.491, 5.486) ... Thus, according to Peirce, the most perfect account of a concept, or any sign, consists “in a description of the habit which the concept is calculated to produce” (CP 5.491). (Liszka 1996: 27)

This account allows us to detangle different, yet interacting, processes and levels of habit formation. Gestures that enact routinized actions, or sensorimotor programs, can be regarded as exhibiting regularities that have formed through repeated similar physical actions and experiences and their interpretation. While these seem to draw on *habits of action*, the other kind relies rather on *habits of*

¹² Peirce (1955: 17) on how an index may be a constituent of a symbol: “A man walking with a child points his arm up into the air and says: ‘There is a balloon.’ The pointing arm is an essential part of the symbol without which the latter would convey no information.”

thought (Nöth 2016): Gestures that are also, or primarily, motivated by embodied conceptual metaphors and image schemata (Figures 1, 2, and 7 & 8) seem to exhibit a stronger tendency towards generalization and concept formation (e.g. Colapietro 2008; Mittelberg 2008 and Mittelberg 2018; Streeck 2009; West and Anderson 2016).

Seeing Thirdness in gestures is an interpretative habit, or skill, that dynamically evolves in a person, for instance, when one tries to read and understand the gestural behavior of someone one has just met or of a cultural group one is not yet familiar with. If one observes a person, or members of a group, repeatedly making the same kind of eye blink or manual gesture in similar linguistic and/or pragmatic contexts, a gestural sign tends to acquire a Thirdness-like general core meaning with contextual variants. Here Jakobson's (1990 [1966]) concepts of *variance* and *invariance* may illuminate gestural and multimodal semiosis, distinguishing between (a) the range of potentiality, considering all contextual variants, and (b) the common denominator, that is, the *invariant* or general meaning of a sign across the local meanings (Waugh 1976). Multimodal analysis includes identifying variants of a gestural form to then abstract general formation and semantic features shared by all the occurrences (Mittelberg 2006: 45 and Mittelberg 2010b; see Section 4.1). This involves cultural, cognitive, and personal habits, and dynamic processes of usage-based conventionalization within a given pragmatic or social context, as shown by the work on *recurrent gestures* in German-speaking contexts (e.g. Bressem and Müller 2014; Ladewig 2014; Müller 2010 and Müller 2017) or *gesture families* in Italian culture (Kendon 2004). When such gestures and postures can be said to carry characteristics of legisigns, their semantic structure and/or pragmatic functions should, at least to some degree, be discernable without speech (e.g. Wolf et al. 2018).

Iconic gestures representing a particular physical object (Secondness) may also through their schematic nature reflect prototypical, conceptual features of the object type (Thirdness) in question (Calbris 2011; Fricke 2012), such as the hand evoking the shape of a round container in Figure 1. Moreover, icons of physical actions tend to draw on sensory-motor patterns, or motor schemata, such as swimming or grasping a glass and raising it to the mouth. While such iconic portrayals do not rely on law-like relations between the hand form/movement and that which they convey, they enact embodied patterns of experience that encompass not only Secondness but also Thirdness.

Especially when dealing with high levels of abstraction and schematicity, concepts central to cognitive linguistics have proven pertinent in order to account for the cognitive-semiotic processes and structuration in situated, experience-driven instances of multimodal meaning-making. Thirdness here comes into play via hand configurations and movements that reflect semantic structures

and construal operations such as embodied image schemata (Johnson 1987), force dynamics (Talmy 1988), semantic frames (Fillmore 1982), metaphor and metonymy (Lakoff and Johnson 1980 and Lakoff and Johnson 1999), and/or syntactic frames and constructions (Goldberg 1995).¹³ Limits of space do not allow for a detailed discussion of all the relevant thirdness-laden conceptual processes just mentioned, but let us briefly turn to embodied image schemata which are, according to Johnson (1987: xiv), “recurring, dynamic patterns of our perceptual interactions and motor programs that give coherence and structure to our experience.” The point I wish to make here is that gestures are akin to such patterns, as well as to force gestalts such as BLOCKAGE or RESISTANCE (Talmy 1988),¹⁴ and have a natural propensity to reflect and enact them (Cienki 2013b; Mittelberg 2013a and Mittelberg 2018).¹⁵ Danaher (1998) argues that image schemata can be seen as iconic symbols that have acquired symbolic status based on habits of interpretation, that is, through repeated, regular interactions between experiential and conceptual domains resulting in the gradual formation of similar interpretants (Mittelberg 2008: 143–147). For instance, the cup-like gesture in Figure 1 reflects pertinent aspects of the CONTAINER schema and the bimanual object-holding gesture in Figure 2 of the OBJECT schema. In the form of these gestures, the idea of CONTAINMENT becomes, if only for a moment, tangible and thus intersubjectively sharable between the speaker and his audience.

Another pervasive structure is the PATH schema with a source, trajectory and goal; it may get instantiated by walking from A to B or by gesturally tracing the walking path into the air (e.g. as in Figures 5 and 6). The speaker in Figures 7 and 8 talks about her habit of watching a particular sitcom, specifying a time period “from the point of where I was till like the end of the season.” Here the

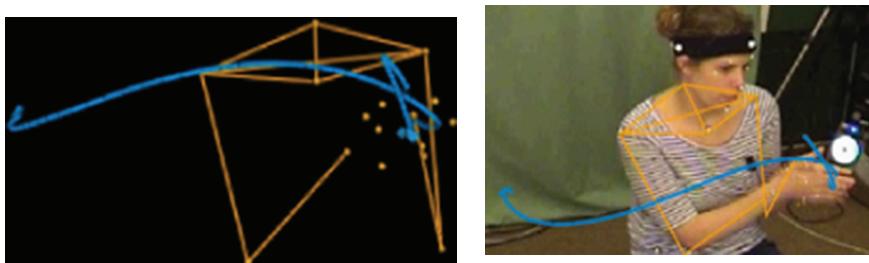
¹³ See also Dancygier and Sweetser (2014). For gesture, see, e.g. Cienki (2013a); Cienki and Müller (2008); Mittelberg (2013a, 2017b); Müller et al. (2013), Müller et al. (2014).

¹⁴ Force dynamics predominantly pertain to Secondness, as they relate to interactions with the physical world. RESISTANCE is an example Peirce himself uses:

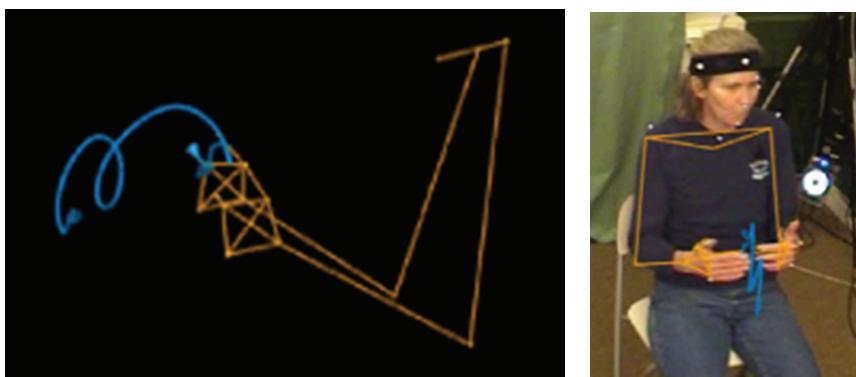
A door is slightly ajar. You try to open it. Something prevents. You put your shoulder against it, and experience a sense of effort and a sense of resistance ... they are two aspects of one two-sided consciousness. It is inconceivable that there should be any effort without resistance, or any resistance without a contrary effort. This double-sided consciousness is Secondness. (EP 2: 268).

¹⁵ Cienki (2013b) and Zlatev (2014) provide overviews of gesture research involving image schemata and the less abstract *mimetic schemas* (Zlatev 2005). Mittelberg (2006, 2008, 2010b) discusses image schemata underpinning gestural representations of grammar; Mittelberg (2013b) provides an image schema and force dynamics analysis of paintings by Paul Klee and their gestural enactments; Mittelberg (2018) presents a dynamic systems approach to image schemata in gesture.

PATH schema underpins the portrayal of a bounded temporal phase and thus how the metaphor TIME IS SPACE manifests as a horizontal movement EXTENSION from left to right, that is, from a point earlier to another one later in time (Mittelberg 2018). Exploiting the sagittal axis, the speaker in Figures 9 and 10 makes a forward looping gesture when saying that in the movie scene she describes, things “did not progress into a scary situation.” While in her utterance she refers to a process that has not taken place, her bimanual gesture instantiates a forward movement with two phases along a virtual, yet not as clearly demarcated, PATH leading ahead into the future. Hence, this portrayal bears additional semantic facets through reflecting the conceptual metaphor FUTURE IS AHEAD (Núñez and Sweetser 2006).¹⁶



Figures 7 and 8: Gesture evoking the PATH, HORIZONTAL, LEFT/RIGHT, BOUNDEDNESS, and CONTAINER image schemata (“from where I was till like the end of the season”).



Figures 9 and 10: Gesture evoking PATH, SCALE, PROCESS, AWAY/TOWARD, FRONT/BACK schemata (“it did not progress into a scary situation”).

16 These data stem from joint work with Jennifer Hinnell (University of Alberta) on gestural expressions of aspectual framing.

It is important to realize that these two PATH gestures, as well as the arc-like motion trace in Figures 3 and 4, reflect in a schematic fashion construal operations occurring at a high level of abstraction, mediation and metaphorical understanding (Thirdness). Hence, they are not iconic representations of the path and manner of observed or experienced motion events, as is the trace evoking the speaker descending a staircase in Figures 5 and 6. While iconic gestures such as the spiral trace generally also involve cognitive analysis and metonymic abstraction, they primarily seem to entail referential and/or simulated action (Secondness). Seeing an abstract spiral in the trace's gestalt as a whole certainly also imports Thirdness. Indeed, SPIRAL also is an image schema, but the level of image-schematic construal is not as abstract (and metaphoric) as in the PATH gestures discussed in this section.

Spatial-relation schemata (Lakoff and Johnson 1999) also need to be considered here, for they can be said to pre-structure gesture space into virtual semanticized regions, and thus motivate the ways in which speakers direct, orientate, and place gestures in front and around their viewpointed bodies: e.g. UP/DOWN, FRONT/BACK, LEFT/RIGHT, AWAY/TOWARDS, VERTICAL, HORIZONTAL, and DIAGONAL (e.g. Koch et al. 2011; Mittelberg 2013b; Núñez and Sweetser 2006). The UP/DOWN schema got operationalized in the sub-category portrayal (Figure 2) and the SPIRAL PATH gesture (Figure 5); the schemata HORIZONTAL, FRONT/BACK and AWAY/TOWARD undergird the orientation and direction of the gesturally evoked PATHs in Figures 7–10. In Jakobson (1990 [1966]) terms of variance and invariance, image schemata are the invariant, essential elements characterizing these phenomena, while the different gestural articulations in terms of manner and extension are the variants.

Coming back to the Peircean habits of feeling (Firstness), action (Secondness) and thought (Thirdness; Nöth 2016; West and Anderson 2016), we can draw from the foregoing discussion that gestures may exhibit and combine all of them to varying degrees. It seems safe to assume that physical, cognitive and culturally shaped habits condition one another at various interfaces of experience and sign use (e.g. Bourdieu 1980).¹⁷ These different habits foster interpretative skills and inclinations to discern moods and emotions in the gestural behavior of others, but also action routines, and processes of conceptualization such as metaphor (e.g. Cienki and Müller 2008). Such Thirdness-importing modes in gesture help, together with the speech content, the interpreting mind to transition from Firstness to Secondness in the here and now of a speech event. Deeply entrenched habits, especially pragmatic functions, such as

¹⁷ Highly relevant in this connection are Bourdieu's 1980 notions of *hexis* and *habitus* (e.g. Mittelberg and Schüller 2016; Sonesson 2016; Streeck 2009).

gestures dismissing or highlighting a discourse content (e.g. Bressem and Müller 2014), should be identifiable and comprehensible to some degree without considering the concurrent speech.

Peirce's semiotic theory allows us to see how signs stemming from two very different sign systems jointly contribute to the constitution and interpretation of multimodal utterances. It would probably be difficult to produce, and interpret, highly symbolic signs in several modalities at the same time. Yet, as compared to spoken language, gestures have the capacity to create other kinds of *grounds* (CP 2.228; e.g. Mittelberg 2006 and Mittelberg 2013a; Sonesson 2007) for semiosis: notably iconic grounds and those that profile sensorial, action-based or otherwise perceivable qualities of an object, person, space, or piece of music, but also indexical grounds such as in gestures that evoke the immediately contiguous virtual elements (as shown in Figure 2; Mittelberg and Waugh 2014). However, Thirdness may reside in gestural and speech signs at the same time: While speech is always predominantly symbolic, the accompanying gestures may, as shown above, reflect deeply embodied, schematic facets of experience – for instance, through image schemata and metaphors. Within such multimodally achieved acts of mediation drawing on the realm of Thirdness, gestures may thus render embodied strata of firstness and/or secondness tangible and also intersubjectively sharable.¹⁸

5 Concluding remarks

This paper's principal aim was to demonstrate that the Peircean UCs offer a powerful lens through which gestural phenomena can be observed and discerned in great detail, ranging from characteristics of the sign itself to object-sign and sign-interpretant relations. We saw how Peirce's concept of Firstness tends to draw our attention to the qualitative, including aesthetic, characteristics of gestural signs, Secondness to their experiential grounding and local, contextualized meaning, and Thirdness to personal and culturally shaped habits (and conventions) of perceiving, feeling, acting, communicating, cognizing, and interacting with others.

Signs are generally conditioned and regulated by their usage (EP 2: 10; Clark 1996). It should thus be a given that bodily signs are also pragmatically

¹⁸ In the NeuroPeirce project (University Clinic and HumTec of RWTH Aachen Univ.), Peirce's UCs are operationalized for gesture reception studies combining behavioral and brain-imaging study designs (Wolf et al. 2017); see also Wolf et al. (2018) for an application of the UCs in an fMRI study examining the interpretation of social interactions in a feature film.

regulated by their preferred, recurrent uses in particular cultural communities, material environments, and discourse contexts (e.g. Bourdieu 1980; Streeck et al. 2011). The concept of Thirdness has the advantage to encompass a broad spectrum of regularities that may be observed in individual and social practices of gesture use, as well as in (micro-) processes of learning and conventionalization. These occur during language development (Andrén 2010; Zlatev 2005 and Zlatev 2014) as well as within certain pragmatic and cultural contexts, as suggested by work on, e.g. *gesture families* (Kendon 2004), *gesture ecologies* (Streeck 2009), *recurrent gestures* (e.g. Bressem and Müller 2014; Ladewig 2014; Müller 2017), image-schematic and force-dynamic patterns (e.g. Cienki 2013b; Mittelberg 2008 and Mittelberg 2018), and multimodally instantiated constructions (e.g. Zima and Bergs 2017). As these research strands show, in multimodal performance acts, habits of feeling, action, and thought, including the content and structure of the concurrent speech, tend to jointly drive gestural forms, functions, and patterns.

Yet more empirical studies across languages, genres and developmental stages are clearly needed to gain a better understanding of how exactly different habits of perception, object-manipulation, movement through space, social interaction, and conceptualization interact in motivating gestural sign formation, engendering patterns, and also in guiding multimodal analysis. Such an understanding will allow gesture researchers to anticipate, or predict, the occurrence of certain gestures in certain semiotic, e.g. discourse-pragmatic, contexts.

In Modern art, Klee (1986: 185) saw and exercised “a striving to express the essential character of the accidental.” Since gestures may articulate both essential and accidental dimensions of experience, it seems worthwhile searching to arrive, even at the risk of neglecting reference, at a theoretically and empirically grounded understanding of the forces and structures that mediate the oscillation between these facets of multimodal semiosis, including forms of resonance between interlocutors or between a work of art and its beholder.

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