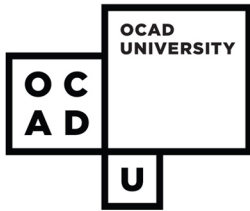




Ryerson
University



Toronto 2018

Multimodalities

IAACS3

BOOK OF ABSTRACTS

Third Conference
of the International
Association for
Cognitive Semiotics
iacs-2018.org

Book of Abstracts for the
**3rd Conference
of the International
Association for
Cognitive Semiotics**
Multimodalities

Book of Abstracts for the

**3rd Conference
of the International
Association for
Cognitive Semiotics**

Multimodalities

Toronto, Ontario (Canada)

July 13–15, 2018



Some rights reserved.

Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0)

Among other sponsors, this project was made possible by funding from the Dean of the Faculty of Arts, Ryerson University, in addition to funding from the Ryerson University Office of the Vice President for Research and Innovation and the Ryerson University Department of Languages, Literatures and Cultures, including a Knowledge Dissemination Grant (KDG), an Undergraduate Research Opportunity Grant (URO) and an Event Funding Grant. Please see the back cover of this manuscript for a full list of project partners.

No responsibility is assumed by the IACS-2018 Local Organizing Committee for any injury and/or damage to persons or property as a matter of product liability, negligence or otherwise, or from any use or operation of any methods, products, instructions or ideas contained in the material herein.

Printed in Toronto, Ontario (Canada)

About the International Association for Cognitive Semiotics

The International Association for Cognitive Semiotics (IACS) was founded in 2013 at Aarhus University, Denmark, in connection with the Eighth Conference of the Nordic Association for Semiotic Studies (NASS).

Cognitive semiotics is the study of meaning-making, both in language and by means of other sign vehicles, as well as in perception, and in action. Cognitive semiotics investigates the properties of our meaningful interactions with our surroundings in all domains. We integrate perspectives, methods and insights from cognitive science, cognitive linguistics and semiotics, placing signs and sign use (in the broadest sense) into the wider context of cognitive, social, and neurobiological processes, using experimental methods, as well as classical text analysis and theory.

Today, cognitive semiotics is an established domain of study at the Universities of Aarhus and Lund, and is an emerging field of inquiry in many other parts of the world, as testified by the international audience at IACS conferences. The purpose of the International Association for Cognitive Semiotics is to advance research in cognitive semiotics and facilitate scholarly discussion and ex-change in this growing field, as well as organizing conferences and other academic events.

Committee Members and IACS Board

Local Organizing Committee

Core Committee

Jamin Pelkey, Ryerson Chair: Associate Professor, Ryerson University

Peter Coppin, OCAD Chair: Associate Professor, OCAD University

Stéphanie Walsh Matthews, Coordinator: Associate Professor, Ryerson University

Dana Osborne, Coordinator: Assistant Professor, Ryerson University

Conference Liaisons

Dave Kemp, IMA Liaison: Assistant Professor, Ryerson University School of Image Arts

Melissa Smith, AGO Liaison: Coordinator, Art Gallery of Ontario

David Lidov, General Advisor: Professor Emeritus, York University

Conference Assistants

Ali Aird, Volunteer Coordinator, Ryerson University, MA Student

Gabriele Aroni, Volunteer, Ryerson University, PhD Candidate

Calla Evans, Photographer, Ryerson University, MA Student

Talia Eylon, Media Support, Ryerson University, Masters Student

Annie Levy, Volunteer Coordinator, OCAD University, Masters Student

Ambrose Li, Designer, OCAD University, Masters Graduate

George Martin, Volunteer, York University, PhD Candidate

Sophia Melanson, Volunteer Coordinator, York University, PhD Candidate

Paul Messina, Volunteer, Ryerson University, BSc Student

Natasha Naveau, Media Support, Ryerson University, Masters Student

Sari Park, Volunteer Coordinator, Ryerson University, BA Student

Sahar Raza, Volunteer, Ryerson University, MA Student

Richard Rosenbaum, Volunteer, York University, PhD Candidate

Jana Vigor, Volunteer Coordinator, Ryerson University, MA Student

Scientific Committee

Ines Adornetti, Università Roma Tre, Italy

Elisabeth Ahlsén, University of Gothenburg, Sweden

Kimi Akita, Nagoya University, Japan

Jens Allwood, University of Gothenburg, Sweden

Kristian Bankov, New Bulgaria University, Bulgaria

Alexander Bergs, Osnabrueck University, Germany

Per Aage Brandt, Case Western Reserve University, United States
Peer Bundgaard, Aarhus University, Denmark
José Luis Caivano, University of Buenos Aires, Argentina
Alan Cienki, Vrije Universiteit Amsterdam, Netherlands
Paul Cobley, Middlesex University, United Kingdom
Eve Danziger, University of Virginia, United States
Simon Devylder, Lund University, Sweden
David Dunér, Lund University, Sweden
Francesco Ferretti, Università Roma Tre, Italy
Piotr Giza, Maria Curie-Skłodowska University, Poland
Adam Głaz, Maria Curie-Skłodowska University, Poland
Randy Harris, University of Waterloo, Canada
Henryk Kardela, Maria Curie-Skłodowska University, Poland
John Kennedy, University of Toronto, Canada
Piotr Konderak, Maria Curie-Skłodowska University, Poland
Evangelos Kourdis, Aristotle University of Thessaloniki, Greece
Hannah Little, University of the West of England, United Kingdom
David Machin, Örebro University, Sweden
Douglas Niño, Universidad de Bogotá Jorge Tadeo Lozano, Colombia
Jonas Nölle, The University of Edinburgh, Scotland, United Kingdom
Todd Oakley, Case Western Reserve University, United States
Leonard Olsen, East Carolina University, United States
Anneli Pajunen, University of Tampere, Finland
Joel Parthemore, Eindhoven University of Technology, Netherlands
Esther Pascual, Zhejiang University, China
Susan Petrilli, University of Bari, Italy
Gareth Roberts, University of Pennsylvania, United States
Victor Rosenthal, École des Hautes Études en Sciences Sociales, France
Göran Sonesson, Lund University, Sweden
Martin Švantner, Charles University, Prague, Czech Republic
Monica Tamariz, Heriot-Watt University, Scotland, United Kingdom
Vera Tobin, Case Western Reserve University, United States
Morten Tønnessen, Universitetet i Stavanger, Norway
Kristian Tylén, Aarhus University, Denmark
Patrizia Violi, University of Bologna, Italy
Sławomir Waciewicz, Nicolaus Copernicus University, Poland
Wolfgang Wildgen, University of Bremen, Germany
Lia Yoka, Aristotle University of Thessaloniki, Greece
Jordan Zlatev, Lund University, Sweden

Board of the International Association for Cognitive Semiotics

President

Todd Oakley

Vice President

Esther Pascual

Secretary

Monica Tamariz

Treasurer

Kristian Tylene

Public Relations Officer

Hannah Little

Past President

Jordan Zlatev

Officers

Peter Coppin

Piotr Konderak

Table of Contents

1. Welcome to IACS-2018	8
2. Plenary Lectures	9
3. Theme Sessions	16
4. General Session	43
5. Poster Session & Student Exhibits	109
6. References.....	117
7. Author Index.....	138
8. List of Participants.....	141

See back cover for list of project partners.

Welcome to IACS-2018

Dear conference participant,

As president of the *International Association for Cognitive Semiotics* (IACS) let me welcome you to the third biennial conference!

Founded in 2013 in Aarhus, Denmark, IACS gathers together scholars and scientists in semiotics, cognitive science, linguistics, anthropology, philosophy, psychology and related fields, who wish to share their research on meaning and contribute to the interdisciplinary dialogue. Since inception, IACS has enjoyed two exceptional biennial conferences (the first in Lund, Sweden in 2014 and the second in Lublin, Poland in 2016) with inspiring plenary addresses and equally inspiring talks, conversations, and collaborations.

The theme of this conference is *multimodalities* in the pursuit of the manifold phenomenon of *meaning*, with panels on cross-cultural multimodalities, intercultural multimodalities, blending, gesture and culture, iconicity, the visual, language emergence, humor, as well as scientific modeling, affect & simulation, multimodal reality, and classification. Concurrent to these panels, we have four special theme sessions: two on Friday, July 13 on *Multimodal Modeling* and *Multimodal Translation* a third on *The Rhetoric of Contemporary Metaphor* on Saturday, July 14th and a fourth, *Chiasmus in Culture & Cognition* on Sunday, July 15th.

The conference organizers and governing board wish to thank all of our plenary speakers, each of whom evidences the depth and vibrancy of the larger cognitive semiotics community. We are fortunate to have them and are eager to hear what each has to say.

Please plan to attend the General Assembly meeting scheduled for 5:00 pm on Saturday, July 14th. Not only will you be kept apprised of the workings of the organization; but, as a member, you will have the opportunity to participate in decisions that will shape the future of the organization, especially as it pertains to the election of the next president and board and the selection of the next conference site. You may even want to consider running for office! These meetings also present opportunities for the organization to recognize outstanding scholarship, research, and leadership within cognitive semiotics. Professor Merlin Donald of Queen's University is just such an inspirational member of the community, and we will honor him at this meeting. So, please be there for this good and salutary event before heading to the conference banquet.

Finally, I wish to thank Jamin Pelkey, Peter Coppin and the rest of the local organizing committee for doing a wonderful job of organizing this meeting in welcoming us to Toronto, Ontario, Canada.

Very Truly Yours,



Todd Oakley
President

2. Plenary Lectures

Calming the kaleidoscope

How language structures thought

Eve Danziger

University of Virginia

Linguistic relativity (Whorf, 1940/1956) proposes that the structures of different languages help to bring order to the “kaleidoscopic flux of impressions” that would otherwise constitute human experience. Results from empirical investigation have recently moved scholarly attitudes from blanket denial of this possibility to cautious acceptance. Perhaps particularly influential has been the finding (Pederson et al., 1998) that habitual use of Allocentric (e.g. ‘north/ south’) rather than Egocentric (e.g. ‘left/ right’) terminology correlates across populations with a preference for Allocentric rather than for Egocentric solutions to non-linguistic spatial problems. But the current wide range of unordered observations, in domains ranging from colour classification through numeracy and the nature of material objects to spatial cognition, has also now itself become slightly kaleidoscopic. I propose that we can bring some order to this kaleidoscope of results by noting that they can be organized into two general types: both recent colour term research (Roberson et al., 2000; Winawer et al., 2007), and work that focuses on the location of the count/mass nominal boundary (Imai & Gentner, 1997; Lucy, 1996), quite readily come under the rubric of “categorical perception” in cognitive science, in which it is well known (Harnard, 1987), that imposing an arbitrary boundary onto a perceptual continuum creates phenomenological results such that stimuli are experienced as perceptually closer to one another if they are on the same side of the boundary, and perceptually further apart if they are on different sides. These effects have obvious affinities with the Whorfian proposal (1940/1956) that languages “cut up” (p. 213) universal perceptual experience in alternative ways. On the other hand, results from research into spatial conceptualization (Pederson et al., 1998) or numeracy (Everett & Madora, 2012) across languages come closer to showing the effects of “conceptual tools” as proposed in Vygotsky’s (1934/1986) writings. Such tools do not offer alternative means of “cutting up” universal experiences. Rather, they must be learned, on a culturally particular and often contingent basis. As an example, I draw on my own work in Mopan (Mayan), an indigenous language of Eastern Central America, to show how it is only in some—not in all—languages that adults learn to apply “projective” (Piaget & Inhelder, 1948/1963) conventions to Egocentric spatial locutions. Once learned, conceptual tools create and organize new cognitive experiences when compared to the experience of those who have never learned to use the tool. Research in child development, education and literacy will offer the most fruitful avenues for exploring this set of linguistic relativity results. I conclude by demonstrating how distinguishing between the sets of effects in linguistic relativity not only helps us to orient fruitfully toward different areas of research within cognitive science and cognitive semiotics, but also should help us to avoid making the kinds of errors that have arisen (Levinson et al., 2002; Li & Gleitman, 2002) when one of these two types of linguistic relativity effect has been mistaken for the other. I illustrate this final point by describing a new case of such misunderstanding (Li et al., 2011), in which Egocentric problem-solving was observed even in a canonically Allocentric language-using group.

In vision and touch, dots fit a function

A theory for museums open to the blind as well as the sighted

John Kennedy

University of Toronto

In the last ice-age, people began making representational pictures, especially outline pictures. Alas, it has long been thought that these only suit the sighted, and the unfortunate result has been that blind people have been largely ignored by art galleries and art education. A revolution in recent decades has overturned this limit on our thinking about blind people. It is now obvious that raised-line tactile pictures work well for blind children and adults. They recognize raised-line drawings, and can draw with raised-line drawing kits. It follows that access for the blind to museums and galleries should be inspired by theories of pictures that apply to touch and the blind just as much as they do to vision and the sighted. To begin with, we need to explain how outline pictures work. Here is just such a theory. In vision and touch, lines fit a function. The functions can portray surfaces by depicting their edges. But further, surfaces and their edges are always perceived from vantage points. This is as true for touch as it is for vision, and for the blind as well as the sighted (Chao & Kennedy, 2015; Kennedy & Juricevic, 2006; Wnuczko & Kennedy, 2014). This fundamental thesis is essential for any accessible museum dealing in pictures. Pictures are as natural for the blind as they are for the sighted. Tactile pictures showing edges of surfaces from a vantage point can be realistic. But tactile pictures can be a great deal more than that. Metaphors and expression can be highly effective in tactile pictures much as they are in vision. Hence, touch is open to a broad swathe of the arts in a fashion that is remarkably akin to visual art. However, there is much still needing an explanation. Coppin questioned how a set of dots can suggest a continuous line and depict a continuous feature such as a surface edge, though continuous features do not stand for dotted lines. Why is representation one-directional in Coppin's sense? Here is an answer: to perceive a surface, or a swarm, or a flock, the elements making up the surface, swarm or flock must be grouped, and the statistics of the group must be extracted. In the case of dots, the elements might pair-up, and then a set of pairs might fit a mathematical function. Of significance, the function would be continuous, even though the dots are separated. The function crosses the spaces between elements. This proposal solves problems of perception dating from the early twentieth-century Gestaltists. But in addition, the function permits perception of edges. The edges are perceived via linear perspective. Perception uses linear perspective well, with an important restriction. It underestimates azimuth changes as elevation increases, as both Juricevic and Wnuczko have argued. Juricevic studied perception of squares, and Wnuczko tested perception of angles. Their results are compatible. Further, Chao found very similar perspective effects in vision and touch, in the blind and the sighted, as the observer's perspective on a scene is altered. The kind of representation in these studies is realistic. But blind people should not be limited to realistic pictures. Deliberate violations of realism should underpin metaphors in tactile pictures that should be understood and created by the blind. In principle, the blind should be able to create "trick" pictures, that is, to play with shapes that hide messages, much as sighted artists have done for centuries. In short, access studies needs a theory of realistic and metaphoric expressive shapes applying to the blind and the sighted.

Meaning-making, Gestalt, and the phenomenal present

Kalevi Kull

Tartu University

what most concerned me was to underscore the conflict, continually latent, between the correlational and inferential notions of the sign.

(Eco, 2014, p. 171)

Following Umberto Eco's understanding of general semiotics (as defined in Eco, 1999), the common object for semiotics is semiosis. Accepting that semiosis exists in (at least some) other species of living beings, the study of its origins and primary forms belongs to the area of biosemiotics.

Consider the following implications. Semiosis includes interpretation. Interpretation necessarily assumes a choice between possibilities—this is what makes interpretation different from other processes (mostly identified as physical). Possibility and choice mutually assume each other. In order to have choice, there should be more than one possibility at a time. Thus, possibility is never single. In order not to be single, the possibilities should be simultaneous. This means, possibilities for a choice should exist in the present. Since process cannot be instantaneous, the present should have an extension in physical time. This kind of present is called the subjective (or phenomenal) present—the Now. The duration of the subjective present (moment, according to K. E. von Baer) as the condition for simultaneity has been measured to last from some milliseconds to some seconds (see, e.g., Pöppel & Bao, 2014).

From this we conclude that the irreducibility of sign relation (both Peircean and Saussurean) can be understood as the non-sequentiality or simultaneity of the aspects of sign. We present a model according to which the origin of semiosis is equivalent to the origin of subjective present. We admit that the existence of gestalt would be impossible without subjective present. According to this approach, biosemiosis always includes a cognitive aspect. This means that sign relations emerge as cognitive processes, not as evolutionary adaptations (more in Kull, 2015, 2018).

Historically, we find some common points with Viktor von Weizsäcker's (1940) concept of Gestaltkreis, Julius Fraser's (1999) idea of time as conflict and the organic present as a necessary and sufficient condition of life, and Francisco Varela's (1999) naturalization of phenomenology. These can be seen as steps towards a general biosemiotic model of meaning-making.

This model implies that the more complex the sign, the more expanded should be the phenomenal present, while symbols and symbolic complexes expand it the most. Accordingly, the sign types and temporal windows are mutually dependent.

Gestures as image schemas and force Gestalts

Towards a dynamic-systems account of enacted schematicity

Irene Mittelberg

RWTH Aachen University

Embodied image schemas are central to experientialist accounts of meaning-making. Research from several disciplines has evidenced their pervasiveness in motivating form and meaning in both literal and figurative expressions across diverse semiotic systems and art forms (e.g., Gibbs, 2005; Hampe, 2005; Johnson, 1987; Lakoff, 1987; Talmy, 1988). This talk aims to highlight structural similarities between dynamic image schemas and force schemas, on the one hand, and hand shapes and gestural movements, on the other. Such flexible correspondences between conceptual and gestural schematicity are assumed to partly stem from experiential bases shared by incrementally internalized conceptual structures and the repeated gestural (re-)enacting of bodily actions, as well as more abstract semantic primitives (Lakoff, 1987) and experiential gestalts (Gibbs, 2005). Indeed, gestures typically consist of evanescent, metonymically reduced hand configurations, motion onsets or movement traces that minimally suggest, for instance, a PATH, the idea of CONTAINMENT, an IN-OUT spatial relation, or the momentary loss of emotional BALANCE. So, while physical in nature, gestures often emerge as rather schematic gestalts, which, as such, have the capacity to vividly convey essential semantic and pragmatic aspects of high relevance to the speaker. It is further argued that gesturally instantiated image schemas and force dynamics are inherently meaningful processes involving, for instance, metonymy, metaphor, and frames (e.g., Cienki, 2013; Mittelberg, 2018b).

In this talk, I first briefly discuss previous work on how image schemas, force gestalts, and mimetic schemas may manifest in hand gestures and body postures (e.g., Cienki, 2013; Mittelberg, 2010; Wehling, 2017; Zlatev, 2014). Drawing on Gibbs' (2005) dynamic systems account of image schemas, I then introduce an array of tendencies in gestural image schema enactments (Mittelberg, 2018a): body-inherent/body-impacting (body as image-schematic structure; forces acting upon the body); environment-oriented (material culture including spatial structures), and interlocutor-oriented (conversational interaction). Adopting a dynamic systems perspective (e.g., Thompson & Varela, 2001) thus puts the focus on how through operating in gesture image schemas and force gestalts may function as cognitive-semiotic organizing principles that underpin a) the physical and cognitive self-regulation of speakers; b) how they interact with the environment and make use of gesture space while talking; and c) intersubjective instances of resonance and understanding between interlocutors, or between an artwork and its beholder (Mittelberg, 2013). Examples of these patterns are enriched by motion-capture data stemming from American English and German multimodal discourse, showing how numeric kinetic data allow one to measure the temporal and spatial dimensions of gestural articulations and to visualize movement traces. In this way, motion-capture technology may provide new, three-dimensional insights into the dynamic, gestalt-like nature of bodily enacted schematicity.

The silence of movement

A beginning empirical-phenomenological exposition of the powers of a corporeal semiotics

Maxine Sheets-Johnstone

University of Oregon

The creative power and the rejuvenating power of movement are not commonly recognized much less celebrated. Only when, through accident, illness, or violence, the ability to move is suddenly gone, or impeded, or less than coordinated do we commonly recognize the foundational gift of movement to the most everyday aspects of everyday life, let alone to sign language and to determining whether someone is alive. When we take time to reflect upon real-life, real-time experiences of movement—not transliterating it into action, behavior, or even gestures—we have the possibility of realizing the creative power of movement, namely, the power of movement to create its own distinct qualitative dynamics, not only in the art of dance, but in the falling of a leaf and the crashing of a wave. We have the possibility of realizing the rejuvenating power of movement in equal measure when we take time to reflect upon real-life, real-time experiences of movement, movement that, in addition to spanning multiple forms of play, includes jogging, t'ai chi, and more. In short, movement has the power to awaken us in both an aesthetic and rejuvenative sense. Moreover movement has a formidable additional power, a power that makes us ontologically beholden to movement, namely, the power to awaken the sheer feeling of feeling alive—and further, to awaken us perceptually to the sheer aliveness of that which moves voluntarily. With recognition of that capacity, we have the possibility of deepening our appreciation of movement as both the source of agency and the cornerstone of our felt lives, felt in terms of our being moved to move, hence our felt lives in both an affective and tactile-kinesthetic sense.

The keynote sets forth each of these power dimensions of movement, beginning with the ontological power of movement to generate aliveness, both feelings of aliveness and perceptions of aliveness. In doing so, it shows that the kinetic silence of movement has formidable powers. In particular, observations of a film critic, a poet, a professor of political history, and a medical doctor attest to the fact that that kinetic silence is replete with meanings. These meanings in turn testify to a movement-anchored corporeal semiotics that resounds not merely functionally but experientially in animate forms of life. It does so consistently and directly in kinesthesia, the ever-present sense modality by which we experience the qualitative dynamics of movement and synergies of meaningful movement. Phylogenetic and ontogenetic perspectives attest to those dynamics and synergies. So also does Aristotle's description of movement as a *sensu communis*. Because a movement-anchored corporeal semiotics discovers and describes what is existentially meaningful in the lives of animate organisms, such a semiotics is the foundation of a cognitive semiotics. It is so in a number of ways, most significantly in terms of thinking in movement and of cognition itself.

The Psammetichus syndrome and beyond

Four (or more) experimental approaches to meaning-making

Göran Sonesson

Lund University

Thanks to the pioneering work of Galantucci & Garrod (2011), “experimental semiotics” is usually nowadays taken to mean the study of “novel forms of communication which people develop when they cannot use pre-established communication systems” (p. 1). In this sense, experimental semiotics features a very narrow notion of semiosis and a very restricted set of experimental layouts. In spite of Galantucci’s claim to have picked the label because it was free, it has actually been used in different ways at least twice before: by Colin Ware (1993), who takes it to be involved with “the elucidation of symbols that gain their meaning by being structured to take advantage of the human sensory apparatus”, as opposed to conventional meaning-making, and by Kashima & Haslam (2007), who apply it to complex social situations. It might perhaps be said that at least one colleague and sometime collaborator of Galantucci, Simon Kirby, goes some way to approaching the latter notion of experimental semiotics in taking on the notion of sociability which seems to be a requirement of core varieties of semiosis. Taking his inspiration from Frederik Bartlett’s (1932) studies in “serial reproduction” (Cf. Wagoner, 2017), Kirby et al. (2014) have recently designed some experiments in “iterated learning”. The label could however also conveniently be used to describe the kind of experiment that we have realised at Centre for Cognitive Semiotics (Hribar, Sonesson & Call, 2014; Sonesson & Lenninger, 2015; Zlatev et al., 2013), which are classical psychological experiments which have been enriched with a focus on the particular semiotic resources involved, while also applying phenomenological analysis to both the experimental situation and its outcome. These are all reductive uses of the terms “experimental” and “semiotics”. In fact, although Galantucci himself refers to Psammetichus famous experiment (see Herodotus, 1954, p. 102f) as being roughly analogous to his understanding of experimental semiotics, there are important differences, the Psammetichus experiment, in spite of its intentions, being more unbiased, if it could really be accomplished. While the specific forms taken by the acts of communication in Galantucci’s experiments are indeterminate, the semiotic resources of these forms are given before-hand. Perhaps such a presuppositionless experiment as that imagined by Psammetichus (or Herodotus) can only be realised by means of phenomenological variation. It would amount to something like the act of communication without any further determinations. This question becomes particularly urgent, since it was rather recently that it still seemed that the Galantucci type of study could only be accomplished by means of variation in the imagination. From the point of view of the Lund brand of cognitive semiotics, we are committed to what I have called the dialects of phenomenology and experiment, and what Jordan Zlatev has termed the conceptual-empirical loop. Pursuing this principle, I will suggest, in the present paper, that these different experimental approaches can be related to different varieties of semiosis, and that such an analysis of semiosis may be of some help in going beyond such fuzzy notions as multimodality and multimediality.

3. Theme Sessions

Theme Session 1

Cross-Modal Modelling and Mapping

Throughout history, human beings have relied on maps and models as a means of communicating and representing objects, spatial environments, navigational pathways, patterns/trends and more. Modelling and mapping are fundamental to learning, communicating, and problem solving. However, the majority of models and maps are not available in accessible modes beyond visual displays. Advancements in computer graphics enable the display of more dimensions of information, thus reinforcing an oculo-centric bias. Yet, why should modelling and mapping be restricted to a visual mode when the underlying data—from which a display stems—is modally agnostic?

In terms of current non-visual mapping approaches, tactile models and maps are expensive, low definition, and cannot be made by users at home without special equipment. Auditory models and maps are less expensive and a growing body of evidence demonstrates their effectiveness for both visually impaired and sighted users (Krygier, 1994; Flowers, Turnage & Buhman, 2005). Advancements in the field of sonification enables the creation of auditory displays of large data sets for users wishing to spot trends which are not visually obvious (Ballora, 2017).

Although current sonification techniques tend to focus on mapping data to the materials of music (pitch, rhythm, timbre, etc.), this is not the only way to represent maps and models auditorily. Developers of audio games have successfully created effective displays of geographical data and beyond. The integration of sonification theory and practice with audio game development points to a massively unrealized potential in the design of auditory representations. Despite a recent wave of legislation requiring governmental content be made accessible to everyone—and overwhelming research showing the efficacy of auditory models and maps—there has been little development in the creation of effective auditory substitutes, such as digital versions of governmental maps for blind users. To move beyond visual data analytics means optimizing the pathways of access to complex data sets while increasing information independence for visually impaired users through non-visual pattern recognition (Zhao et al., 2008; Diaz-Merced et al., 2011; Brock et al., 2015).

In a seemingly paradoxical world where both visual impairment and human dependency on data processing continues to grow, why doesn't every display have an auditory counterpart (Walker, 2013; Jiang, Tarczy-Hornoch, & Varma, 2017)? This session explores how ideas from cognitive semiotics, such as notions of iconicity and symbolicity, can identify cross-modal correspondences such as similarities between the graphic-linguistic distinction (Shimojima, 1999) and distinctions between “earcons” and “auditory icons” in data sonification (McGookin & Brewster, 2011; Brazil & Fernström, 2011).

Sonifying Napoleon's march

A cognitive semiotics approach to translating infographic maps into cross-modal information displays

Richard C. Windeyer* and **Peter W. Coppin†**

*University of Toronto, †OCAD University

This presentation describes an ongoing, semiotically informed design investigation focused on translating the 2D properties of charts, graphs, and maps into an 'equivalent' auditory representation with implications for mapping the graphic-linguistic distinction (Shimojima, 1999), to the sonic domain (Coppin et al., 2016). A demonstration of our principle design prototype (Windeyer, 2017)—an interactive sonic representation (or 'sonification') of Charles Minard's 1869 infographic flow map Figurative Map of the Successive Losses in Men of the French Army in the Russian Campaign 1812–1813 (Figure 1)—will serve to illustrate our application of a cognitive semiotic perspective to the design of auditory displays. Drawing from existing literature (Brazil & Fernström, 2011; Gaver, 1994; Walker & Nees, 2011; Jeon, 2015), our approach focused on the design of auditory icons (sonic elements that resemble their real-world equivalents) which were then parameterized and indexed across a 2D virtual auditory space. This approach sought to replicate the spatial-temporal distribution of corresponding visual items in the original map while effectively exploiting a central affordance of auditory perception—the ability to localize discrete sound events within a 360 degree radius around a fixed listening position. The result is an attempt at cross-modal translation in which the infographic depiction of changing troop position, travel direction, and distance traveled are conveyed through the changing spatial placement of an auditory icon, while changes in troop quantity are conveyed by variations in the number of auditory icons heard simultaneously. As a case study aimed at addressing an inclusive design problem, our investigation sought to develop a cognitive semiotics model to inform practical design strategies for making graphic representations—in this case, infographic maps—accessible to visually impaired individuals. In the process, we identified auditory correlates of four graphic-linguistic distinctions identified by Shimojima—2D vs sequential, relation symbols vs object symbols, analog vs digital systems, and

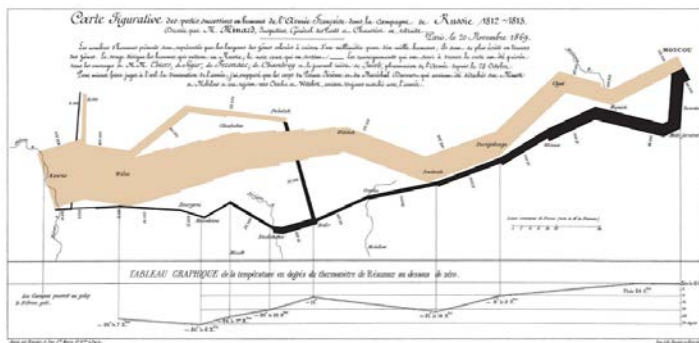


Figure 1. Charles Minard's Figurative Map of the Successive Losses in Men of the French Army in the Russian Campaign 1812–1813 (1869). Public domain.

The audio game laboratory

Brandon Biggs, Lena Yusim, Peter Coppin

OCAD University

Currently, digital geographical maps used in government, education, or industry are presented through visual representations, without suitable alternative formats for obtaining information from maps non-visually (Bliss, 2015; Studieren et al., 2012). Audio games, where content is presented to the player primarily through audio (audiogames.net, 2018; Rober & Masuch, 2005), suggest a framework for developing auditory maps. Despite a recent wave of legislation requiring governmental content be made accessible to everyone (Commission, 2017; Justice, 2010; Ontario, 2018)—and overwhelming research showing the efficacy of auditory displays (Balan, Moldoveanu & Moldoveanu, 2015; Dell’Aversana, Gabbriellini & Amendola, 2017; Diaz-Merced et al., 2011; Flow-ers, Turnage & Buhman, 2005; Krygier, 1994; Walker & Mauney, 2010; Walker & Nees, 2011)—there has been little development in the creation of effective digital auditory maps (Zhao, Plaisant, Shneiderman & Lazar, 2008).

Tactile maps have been presented as a non-visual alternative for representing map data. However, this requires access to 3D printing, which can be inefficient in terms of time and resources required to create the map (Jafri & Ali, 2015; Kärkkäinen, 2018; Siu, 2014). Current sonification techniques, where data is strictly presented through the auditory modality, have focused on non-geographical data, utilizing both passive tour-based displays, such as recordings, and symbolic and other non-speech based sounds.

The interfaces observed in audio games greatly expands the potential for advancements in the field of sonification (Ballora, 2017; Walker & Nees, 2011). This session explores how ideas from cognitive semiotics, such as notions of iconicity and symbolicity (Peirce, 1902) along the analogic-symbolic representation continuum (Kramer, 1994), can identify cross-modal correspondences such as similarities between the graphic-linguistic distinction (Shimojima, 1999) and distinctions between “auditory icons” and “earcons” or spearcons in data sonification (Brazil & Fernstrom, 2011a; McGookin & Brewster, 2011; Walker, 2013).

Auditory icons are the visual equivalent of visual icons, either analogically referencing real-world phenomena, or drawing a metaphor to the real-world (Brazil & Fernstrom, 2011b; Gaver, 1986). Symbolic sounds can be split into three categories: earcons, short musical phrases that represent information (McGookin & Brewster, 2011); speech or spearcons, textual descriptions of information (Walker et al., 2013); and arbitrary icons, sounds that bear no resemblance to the information they are representing (Gaver, 1986).

The authors have categorized five audio game map interfaces (MUD based, tree based, grid based, side-scroller, and first-person 3D), that utilize all of these elements in different proportions (Balan et al., 2015). MUD and tree based interfaces depend primarily on speech and contain very few analogical elements (Connector, 2013; Crafting Kingdom, 2018). This dependence on speech indicates that conceptual specificity, such as numbers or categorical descriptions, are trivial (Coppin, 2015). Grid based interfaces contain almost an equal number of speech and analogical elements which allow for designers to build maps that are easy to understand (Balan et al., 2015).

Side-scroller and first-person 3D maps are analogical with only a few symbolic elements that specify game status (Friberg & Gärdenfors, 2004).

Analogical interfaces are fairly linguistic agnostic, whereas symbolic interfaces are unusable without language. To move beyond visual cartography means optimizing the pathways of access to complex geographical information while increasing information independence for visually impaired users through non-visual interfaces (Brock, Truillet, Oriola, Picard & Jouffrais, 2015; Diaz-Merced et al., 2011; Zhao et al., 2008). In a seemingly paradoxical world where both visual impairment and human dependency on data processing continues to grow, why does not every display have an auditory counterpart (Varma, Tarczy-Hornoch & Jiang, 2017; Walker, 2013)?

Referential iconicity in music and speech within and across sensory modalities

Verónica Giraldo and Jordan Zlatev

Lund University

Musical meaning is multifaceted: both highly sensory and yet abstract, able to cross cultural boundaries and yet embedded in specific traditions. For the most part it is not denotational (Monelle, 1991). Nevertheless, in “programmatic music”, musical themes are intended to refer to worldly objects and events on the basis of iconic (and indexical) grounds. Such non-arbitrariness of the sound-sign (Sonesson, 2013) appears to apply to speech as well, where research has established that the iconicity in question is subtle, but systematic enough to be detectable by both children and adults (Ahlner & Zlatev, 2010; Imai & Kita, 2014). Very often, it operates across sensory modalities, so that for example a sound form like *lulu* is linked to round shapes, while *titti* is associated with sharp and hard ones.

Still, questions remain: How similar is referential iconicity in music and in speech? Is it primary, secondary (cf. Sonesson, 1997) or some combination of these (Ahlner & Zlatev, 2010)? Is it easier to recognize it when the mapping sound-object is in the same sensory modality (hearing), than across modalities? What roles does cultural background play?

To address these, we designed an experiment in which Swedish and Chinese native speakers had to match musical fragments or spoken word-forms to referents (represented by schematic pictures). The musical stimuli consisted of six melody fragments from the piece *Peter and the Wolf* by Sergei Prokofiev, where each character (Hunter, Bird, Cat, Duck, Grandfather, Wolf) is represented by an instrument with its own melody. The speech stimuli consisted of fictive words like *lulu* and *titti* (to be matched to round or edgy figures) and Basque ideophones (Ibarretxe, 2017), to be matched to pictures representing their referents. Importantly, we included two different conditions. In one there were two sound-stimuli and two referents (more contrastive). In the other, a single sound-stimulus was to be matched to one of four alternative referents (less contrastive).

Preliminary results for the musical stimuli support the prediction that the more contrastive condition was easier for both groups, showing that cultural background played little role for making the appropriate cross-modal mapping when the choice was so constrained. In the less-contrastive condition, only two musical themes were correctly matched. One was that of the Bird, where the resemblance was unimodal. The only other correctly matched theme (in both groups) was the Wolf, where participants reported that the theme reminded them of the “motion of a predator”, i.e., clearly a cross-modal mapping. We will report the final results of the study, drawing implications for the theoretical issues in question.

Theme Session 2

Cross-Modal “Translation” or “Interpretation” of Visual Art

The Very Idea

Museums house visual art—paintings, prints, drawings, photographs, sculptures and beyond—and traditionally assume that visitors will access these artefacts through visual perception. However, accessibility legislation in many societies, where individual autonomy, agency, and access is considered a fundamental human right, mandate that alternative non-visual representations be provided of these artefacts. In response, contemporary museums are employing a variety of strategies, such as “tactile tours”, where professional tour guides aim to afford access through verbal descriptions, often supplemented by tactile and/or sonic “translations” or “interpretations” of paintings and Sculptures.

But what do visual properties of these artefacts afford for an audience (Bundgaard, Kennedy, and Coppin) and how, if at all, can these properties be conveyed through non-visual perceptual modes such as sound or touch (Coppin and Kennedy)? How does this cross-modal translation/interpretation process change the meaning of an artefact (all presenters)? What might be afforded via translations/interpretations, both positively and negatively, within societies that strive to include increasingly diverse perspectives, including perspectives from non-Western or non-visual traditions (all presenters)? The theme session will also examine how these activities can be treated as a “natural laboratory”—where museum practitioners, designers, and the public, induced by human rights ideals, employ material practices to produce design interventions that aim to translate and interpret what is meaningful about these artefacts through non-visual modes—to expose a range of contemporary (Smith) and emerging (Levy and Coppin) strategies that can be explored through the lens of cognitive semiotics.

The twofolded perception of visual artworks

Peer F. Bundgaard

Aarhus University

A famous claim in the philosophy and psychology of art is Richard Wollheim's (1987), to the effect that the perception of artworks is "twofolded": it consists of seeing something in an object (the recognitional aspect), while being aware of the object or the surface in which this is seen (the configurational aspect).

A lot of ink has been used pro and contra this claim. One of the reasons may be that it is not always easy to grasp its exact nature. There is, for example, a sense in which it is trivially true: if we don't mistake a picture of a girl with a watering can for a real girl with a watering can seen face to face, it is because we co-perceive it as a picture. However, this cannot have been Wollheim's point, since he was interested in understanding picture seeing, and the above distinction doesn't tell us anything about what it is to perceive pictures. Now, Wollheim has himself explained twofoldness in these plain terms: when I see a face in a cloud, my perception is a mesh of my seeing the face and my seeing the cloud; and when I see, say, a girl with a watering can on a canvas, I see the girl and I see the surface in which the girl appears to me.

Here the crux of the argument is what we should understand by "surface". There is a sense in which the claim limps a bit; in the case of a picture, the counterpart to the cloud would be the physical substrate of the picture, the picture as a thing: canvas or paper or wood, and so on. However, it does not seem correct to say that when I see the girl with the watering can, I also see "canvas" or "paper". In the case of the cloud, I would say, "the cloud looks like a face", but in the picture case, I would hardly say, "the canvas looks like/has taken the form of a little girl". There is an essential sense in which we, in picture seeing, are not at all aware of the physical properties of the thing in which we see something.

Therefore, I would make a distinction (found in Husserl, i.1898-1925/1980) between the picture as a material surface (canvas, paper, and so on), and the picture as a depicting surface. Usually we are not aware of the former, but arguably always of the latter. The depicting surface contains (or displays) perceptual structure in virtue of which I see something in the picture. Picasso can endow the depicting surface with three marks or lines (the perceptual design structure), and I see a naked human body seen from behind. Artists can choose to enhance the visual saliency of the perceptual design structure in virtue of which we have a perceptual experience with a certain content, or they can choose to make it as transparent as possible. Whatever they do, it is an integrated part of our perceptual experience.

Here, then, is the empirical claim: When we perceive artworks, we see what they represent, and we see the way in which they present those things. A corollary to this claim is then: meaning-making in visual art is by and large tied to the design structure of the depicting surface, not only to the entities or actions or shapes represented in the picture.

This is, however, nothing but that: an empirical claim. How can we support it, then? To answer this question, my colleagues and I (Bundgaard, Heath, & Østergaard, 2017) have designed an experiment that tests the visual system's sensitivity to properties pertaining purely to the depicting

surface. The results of the experiment suggest that we do indeed perceive pictures at different levels, and that processing design properties of the depicting surface is a fully integrated part of picture seeing, not in the trivial sense in which they elicit a perceptual experience of something represented in the picture, but in the stronger sense in which they inform the perceptual experience in virtue of their location on the depicting surface, irrespective of what they represent.

In this talk, I shall present this experiment as well as other possible ways of testing the multi-layered perceptual access to visual artworks.

A participatory approach to cross-modal translations/interpretation of visual artworks

Annie Levy and Peter Coppin

OCAD University

Museums stress their interest and focus on their audiences (Watson, 2007) and their multidimensional nature of access (Dodd & Sandell, 1998). However, traditional art and cultural exhibits continue to heavily rely on sight. Blind visitors thus continue to experience sensory barriers. Multisensory museum experiences can reduce these barriers and thus increase access, but in the process they can also benefit museum visitors without disabilities (Eardley et al., 2016; Levent & McRainey, 2014).

To create multimodal translations/interpretations of visual artworks for Canada's Art Gallery of Ontario (AGO), expert and novice designers, museum stakeholders, and blind audience members came together through a graduate course on multisensory inclusive design at OCAD University. Three strategies emerged to varying degrees across eight translations/interpretations. We refer to these as: i. "Literal" ii. "Constructivist" and iii. "Original Object."

- i. The "literal" strategy aims to map visually perceived spatial, topological, or geometric relations of the artwork to ones that could be perceived aurally and/or tactilely. This can be described in terms of Peirce's notion of iconicity, which does not privilege vision and equally applies to sound and touch—an iconic correspondence to the visual properties of the original artwork is the aim.
- ii. The "constructivist" strategy makes no attempt to produce a literal mapping but instead seeks to employ non-visual cues to engender retrieval/recall of audience memories that are deemed to correspond to what might have inspired the artist. This can be described in terms of symbolicity—the relationship between the perceptual cues and the items they refer to is conventionalized.
- iii. The "original object" strategy equips museum audiences with protective gloves, enabling them to touch and experience an artwork's contours. This can be described in terms of indexicality—meaning is through spatio-temporal contiguity to the artwork.

Finally, the creative processes and learning methods that led to these artefacts will be discussed to better understand the participant's meaning-making journey.

A Museum Practitioner’s Perspective

Cross-Modal Translation/Interpretation “In the Wild”

Melissa Smith

Art Gallery of Ontario

Museums are more than repositories of knowledge and objects, and museum staff are shifting practices to create environments for exploring ideas and making meaning (Adams & Koke, 2008). In Hooper-Greenhill’s (2000) often-cited lofty vision of the post-museum, rather than upholding objectivity, rationality, order, and distance, the post-museum negotiates responsiveness, encourages mutually nurturing partnerships, and celebrates diversity. Nevertheless, institutions continue to prioritize visual consumption. In particular, because of the “aura” (Benjamin, 2008) of unique objects in their collections (consider the Louvre’s Mona Lisa), art museums struggle to create inclusive experiences and methodologies that counteract dominant visual pedagogy, which may be at odds with curatorial interpretation.

The Art Gallery of Ontario’s (AGO) Multisensory Program is designed to support blind and low-vision people, and to explore the use of non-visual interpretation (such as descriptive, olfactory, auditory, and tactile vehicles) as ways to communicate the collection’s stories. Ours is a constructivist program (Hein, 1999) that accommodates personal meaning-making, provides opportunities for visitors to validate and express their interpretations, and stresses that the material represents interpretations of nature or culture. Exploring artwork through multiple perspectives and modalities sits between theory and practice. In partnership with OCAD University, the AGO worked with students from the Inclusive Design program to produce multimodal experiences, moving past simple replicas to question conceptual and perceptual barriers in an art museum context. By embedding the class in the institution and supporting co-creation with the blind community, we enacted a version of Freire’s (1970) dialogical theory of action which involves not an authority but Subjects who meet to name (or, in this case, build) the world to transform it. Multisensory approaches support multiple ways of knowing but require thoughtful rigour. It is through this work that we understand the need to establish conventions that address the participatory, literal, and experiential lenses that can be applied to sensual perception.

The Rhetoric of Contemporary Metaphor Studies

Following upon several books by Lakoff and his collaborators, there is now a robust tradition of studying “conceptual metaphors”, in particular as manifested in verbal language, though with some excursions into other semiotic resources. The claim that such cross-domain mappings lack psychological reality can hardly be justified, but it does not follow that abstract concepts have to be structured as metaphors, in any sense of the term. Indeed, it might be argued that the term “metaphor” is seriously misleading in this context. Before Lakoff’s writings, there has been a long tradition of rhetoric since Greek Antiquity which understands metaphor in a very different way from that suggested by Lakoff. Far from being extinct, this tradition has, on the contrary, been reinvigorated in recent decades, by being related first to structural linguistics, and then transferred to the study of visual rhetoric, notably in the important work of Groupe μ , which has been extended and clarified in a number of papers by Sonesson.

The study of visual metaphors has recently spread outside semiotics to marketing, where the two traditions are often confused. A positive aspect of the absorption of visual metaphors into marketing, however, has been the creation of databases, often available online, which can be used to verify different theories of metaphor, breaking with the earlier tradition of picking the examples which happen to confirm the theories. Another approach which allows for a more systematic confrontation of theories and facts consists of field studies, such as, for instance the study of metaphors in street art in a particular city during a specific period. A third empirical approach, the study of metaphorical use in children, is only at the beginning, in particular when involving pictorial metaphors. All these empirical approaches rely on a notion of metaphor which better corresponds to the classical tradition. It is when metaphors are taken to be at least partly socio-culturally derived that the Sedimentation and Motivation model proposed by Zlatev makes sense.

The metaphor is also the third kind of hypo-icons characterized by Peirce, along with images and diagrams. While Peirce’s definition of metaphors as “those which represent the representative character of a representamen by representing a parallelism in something else” remains enigmatic, the fact that it is a kind of Thirdness brings it much closer to the classical notion of metaphor, whereas “cross-domain mappings” are more readily understood as diagrams or, to pick a non-Peircean term, as analogies.

Cross-domain mappings and the structure of abstract concepts

Peer F. Bundgaard

Aarhus University

If metaphorical expressions abound in language, according to Lakoff and Johnson, this is not a particularity of language use; it is a reflection of a deep property of the mind: if we pervasively talk about things in terms of other things, it is because we systematically tend to think of things in terms of other things. A basic and well-known claim in Conceptual Metaphor Theory is, thus, that we structure our concepts by mapping structure from more concrete domains onto more abstract domains (such as Love, Death, Anger, Justice, and so on). Metaphors are said to be ‘cross-domain mappings’.

This presentation assesses two objections directed at Conceptual Metaphor Theory to this effect: [1] it is circular in that it only provides linguistic evidence for the psychological reality of those cross-domain mappings, which are invoked to explain the reality of metaphorical expressions in language; [2] it does not support the conclusion that the massive existence of metaphorical expressions in language reflects the metaphorical structuring of abstract concepts. It is my aim to disentangle these objections. Evidence abounds that makes the first objection obsolete, proving the psychological reality of cross-domain mappings (Boroditsky, 2000; Casasanto, 2009). However, this does not imply that abstract concepts are metaphorically structured: experiments that prove objection [1] wrong cannot automatically be invoked to reject objection [2]. Some even tend to justify it (e.g., data from Boroditsky’s 2000 article, which strongly support the psychological reality of cross-domain mappings, but do not suggest our concept of Time requires iterated mappings of structure from the spatial domain [as Lakoff & Johnson are likely to claim]).

For this, and other reasons (Casasanto & Gijssels, 2015; Zwaan, 2014), it may still be an open issue how deep the metaphoric structuring of our abstract concepts goes. As I will try to show, it seems rather clear, in turn, that you cannot infer from the psychological reality of cross-domain mappings to the conclusion that an important subset of our concepts is metaphorically structured through and through, i.e. rest on the iterated recruitment of structure from a more concrete source domain.

Metaphors in street art

The case of Athens

Georgios Stampoulidis

Lund University

Since the beginning of the 21st century, art in “publicly accessible spaces” (Bengtson, 2018, p. 125) has received significant attention within a number of academic fields, including most recently cognitive semiotics, which integrates methods, models, and theories from semiotics, cognitive science, and (cognitive) linguistics (Zlatev et al, 2016). Street art, graffiti, and urban art as expressive and worldwide phenomena are often considered to be variants of urban creativity (an umbrella term), encompassing several types of art in urban space (Bengtson, 2018; Stampoulidis, 2016). Here, street art is understood as a visually perceived (un)sanctioned cross-cultural medium addressing socio-political issues and has been chosen due to its all-embracing nature. It typically combines two interacting semiotic systems—language and pictures, and is thus a form of polysemiotic communication (Zlatev and Devylder, forthcoming). By taking into account the interactions between those systems, the attention here, is paid on the expression of metaphorical and/or other potential figurative constructions.

To do so, we need to take into account the embodied experiences on some level of universality (based on shared human nature and biology), via historical constraints on the level of shared conventionality and culture-specificity among sign users, unified on the level of contextual creativity and pragmatic communication. The figurative (metaphorical and other) interpretation of street artworks is challenged by our intersubjective lifeworld nature, historical knowledge-based expectancy and experiential ground, linguistic and context-specific information, and further genre conventions (for example, performativity and intertextuality).

For this paper, we use data derived from fieldwork research undertaken in central Athens periodically between 2014 and 2017, including photographic documentation and interviews. Along these lines, a further contribution is offered to the questions of 1) how street artworks can be interpreted in the light of metaphorical conceptualizations, and 2) how these are related to the semiotic systems of language and pictures by taking into account their quite frequent interaction.

How institutions think analogically

A sedimentation and motivation model of money systems

Todd Oakley

Case Western Reserve University

This presentation examines how analogical thinking legitimizes and delegitimizes institutions. Money and banking are conspicuous test cases for a Sedimentation and Motivation Model (SEaM) model of metaphor/analogy (Zlatev 2017) insofar as SEaM offers explanations of collective action that are not viciously circular. Institutions are founded on analogy and confer identity, says the anthropologist Mary Douglas (1986), such that institutional legitimacy depends on the situational, historical, and universal appeals that ultimately link to "that which is natural." Western history is punctuated by moments of financial crisis that test economies and politics and debates about money are motivated by longstanding, but incommensurate, conceptualizations of money. Principally between the analogical equivalency of money as a commodity, and money as a record of debt. The analogy of "commodity money" is deeply entrenched across many cultures and through time but does not accurately track the functions of money systems; the analogy of debt money, on the other hand, is likewise a deeply entrenched practice defining the essential operations of all known state money systems, but suffers from the rhetorical disadvantage of a more tenuous link to "that which is natural," money as debt is transparently a social convention, lacking "a naturalizing principle to confer the spark of legitimacy" (1986: 52). Money systems represent an interesting case study of institutional cognition because the most intuitive, ready-to-hand concepts of it mislead and misinform the polity at the same time as more accurate concepts of money as debt remain semiotically impoverished in their ability to motivate them. Thus, money as commodity enjoys a richer vein of rhetorical resources. This rhetorical situation turns the history of money on its head: not all cultures use coins or other commodity tokens, but all cultures with money systems use them to record debts. Here we have the problem of perceived universality (the commodity analogy) overriding empirical universality (money as debt). In short, the indexical relationship between signifier (metal substance) and signified (record of debt) collapses so that signifier becomes signified, full stop: money is gold.

Studies in children’s understanding of visual metaphor

A literature review from a cognitive semiotic perspective

Sara Lenninger

Kristianstad University

The use of metaphor is pervasive in human communication (Stites & Özçaliskan, 2012). However, in the literature there are many ways to define metaphors (e.g. Black, 1954; Kirby, 1997; Gibbs, 2008). In this paper, the metaphor will be considered to be a sign, and in addition, as an instance of iconic sign use (Peirce, 1998). This means, firstly, that metaphor is studied as a meaning construction based in a sign relation. In this context, a sign relation consists of something perceived as an expression for something else, which also is conceived as its corresponding meaning or “content” (Sonesson, 2008). As a consequence, a sign relation always involves subjectivity. Secondly, it means that iconic relations are crucial to the definition of what the metaphor is. As a consequence, the concept of iconic signs has to be explored. This is why developmental studies on metaphor use (and understanding) link to both cognitive theories on metaphor thinking (Billow, 1975; Lakoff & Johnson, 1980; Kogan et al., 1980) and to semiotic theories of meaning relations in sign use. Departing from a review on studies in children’s development of metaphor use with particular attention to pictorial metaphors, this paper discusses theoretical implications on metaphor.

Models of pictorial metaphors and their impact on the study of verbal metaphor

Göran Sonesson

Lund University

Starting out from Peirce's distinction between three kinds of hypo-icons, we have suggested elsewhere that the so-called conceptual metaphors abundantly studied in the wake of Lakoff's and Johnson's (1980) proposal are, formally, diagrams rather than metaphors (Sonesson 2015). From the point of view of content, on the other hand, the so-called conceptual metaphors are most of the time part and parcel of the world taken for granted, the Lifeworld, in Husserl's terms, also called the world of ecological physics by Gibson (2982; cf. Sonesson, 2003; 2005; 2010; Zlatev, Faur, & Sonesson, 2017). Even if so-called conceptual metaphors can be demonstrated to be diagrams, it is true that Peirce's characterization of real metaphors is not of much help, but we can make sense of it relying on the two thousand year long rhetorical tradition before Lakoff and Johnson, which tells us the metaphor is a sign being used in place of another sign, with which it entertains a relation of both similarity and dissimilarity.

Different theories, from Aristotle to Black (1962) and Groupe μ (1992), have conceived of the relation between the two contents involved in the metaphor as being one of tension and/or of union. Still, this tradition has retained certain constants, which are opposed to Lakoff's and Johnson's conception: 1) it is not limited to a small number of "cross-domain mappings", but may involve any categories extant in language or in any other semiotic resource; 2) while metaphors are certainly cognitive in some sense, they are not implanted directly in the brain, but are often the result of socio-cultural presuppositions; 3) there is only metaphor (or any other rhetorical figure) to the extent that the term is felt to be "improper", that is, if there is a sense of the term being misapplied (which is not true of such cross-domain mappings as, for instance, "argument is war").

In addition, the extension of rhetoric to visual meanings has demonstrated that 4) metaphorical cognition is modified by being expressed by means of different kinds of semiotic resources. Pictorial metaphors are doubly iconic, and thus suppose a double discovery procedure to pin down the similarity. Indeed, though the result of the metaphor is to posit similarity, its way of operating on the pictorial surface is more dependent on contiguity, normally assimilated to the notion of metonymy. To make sense of this conundrum, they have to have recourse to the distinction, which we have made elsewhere, between performative and abductive indexicality, where the former creates a contiguity, while the second reposes on the socio-culturally sedimented knowledge of existing contiguities. This recognition should have consequences also for the analysis of verbal metaphors, although contiguity is here restrained by syntax. Since the difference between verbal and pictorial metaphors have prompted new approaches to rhetorical taxonomies, it seems relevant to bring these new tools to bear also on verbal language.

Theme Session 4

Chiasmus in Culture and Cognition

Over the past ten years it has become increasingly clear that the ABC's (and CBA's) of chiasmus involve far more than the pleasing enantiomorphic exhibits on display in the classical rhetorician's cabinet of curiosities. Much like metaphor at the beginning of the 20th century, chiasmus continues to be classified as merely another formal figure of speech; but this is beginning to change. Moving beyond the mere reversibility of form and its fleeting flourish, moving beyond the simple mnemonic device for internalizing long passages, chiasmus is now slowly coming to be recognized in processes more meaningful and complex: in logical processes of both synthesis and symmetry breaking, in semiotic processes of ideology and anxiety, reflexivity and reversal, understanding and becoming—as a structure fundamentally constitutive of human culture and cognition (Fahnestock, 1999; Harris, 2001; Douglas, 2007; Lissner, 2007; Pelkey, 2013a; Wiseman & Paul, 2014; Pelkey, 2017; Harris et al., 2017). But such possibilities are only beginning to be articulated and thematized.

This day-long panel provides both a sampling of current developments and an orientation to some of the vast, under-explored territory and potential leverage that a better understanding of chiasmus might afford. The goal of the panel is to bring together voices working from a wide variety of perspectives, including linguistics, rhetoric, computer science, philosophy, religious studies, literary studies, music composition, psychology, anthropology and more, to move the study of chiasmus further out into the open and into new relationships, with fresh evidence, all while identifying empirical problems, conceptual challenges and knowledge gaps—along with research priorities, potential solutions, and promising theories to guide ongoing development. The panel is structured in three parts, consisting of three papers each. Papers in Part 1 explore computational and psychological aspects of chiasmus. Papers in Part 2 explore chiasmus in mythological and philosophical contexts. Papers in Part 3 explore relationships between chiasmus and multimodal blending.

Antimetabole and its friends

Randy Allen Harris

University of Waterloo

Rhetorical Figures are cognitive. That’s why they are salient, memorable, and aesthetically pleasing, and that’s why their form conveys meaning beyond their constituent elements. This claim has become a truism for at least a small cluster of tropes—metaphor in particular, but also metonymy, antithesis, and synecdoche, each of which is as pervasive as metaphor in ordinary language, and each of which leverages a well-established cognitive affinity (respectively, correlation/contiguity, opposition, and meronymy). But the same is true of many lesser known and cognitively less explored figures—in particular, schemes, which embody a semiotics of form.

My argument pursues this claim by way of the chiasmic scheme, antimetabole, the parade-example of which is #1:

1. All for one, one for all
[T]ous pour un, un pour tous. (Dumas 1849, p. 129)

Example #2 is also an antimetabole, though it can be found on no one’s figural parade grounds:

2. You hear about constitutional rights, free speech and the free press. Every time I hear these words I say to myself, 'That man is a Red, that man is a Communist!' (Dubremetz 2017a)

In fact, Computational Linguist, Marie Dubremetz, who develops algorithms to search texts for rhetorical figures, ranks #2 very last in her list of the 3000 instances of antimetaboles, with a chiasmic rating of 0.01% (her highest ranked instance is rated at 99.77) (Dubremetz 2017b).

Most of us would agree with Dubremetz, if not her numbers, certainly the relative chiasmic ‘purity’ of #1 vs. #2. But why? If antimetabole is, in the standard definition, “inverting the order of repeated words (ABBA)” (Lanham 1991:14), why is #1, and all the similar examples that rhetoricians have curated for millennia, so much better than #2? Example #1 has two inversely repeated words (all and one); so does #2 (hear and free). Both realize the classic ABBA structure: They should be equally good antimetaboles.

All of the reasons are cognitive: #1 is a more elegant piece of language than 2 (more salient, memorable, aesthetically pleasing, and communicatively efficient). But most of those reasons are attributable to other schemes—that is, to the semiotics of form—figures that have been perennially unacknowledged travelers with antimetaboles, especially the examples rhetoricians have collected and put on display in our figural galleries: mesodiplosis (clause-medial repetition; for), and two types of parallelism parison (semantic repetition; Nominal-Preposition-Nominal) and isocolon (prosodic repetition; figure 1). Rhetoricians have been lazy and negligent in our representation of figures, overlooking the many cognitive conspiracies in our catalogues of examples. I argue that a properly Cognitive Semiotics must redress this negligence.

²ɔl f³ɔr w¹ən / w²ən f³ɔr ¹ɔl

Figure 1. Prosody for Example #1

Shapes we speak

On cognition, chiasmus and universal use

Christine Grausso

University of Edinburgh

Semiotic research on the representational power of X shows that the sign has an extreme, embodied meaning—that X captures the essence of an expanded posture of the human body, stretched to its limits and on the brink of collapse (Pelkey, 2017). Such extremism extends into “chi” or X patterns more generally, especially in chiasmus, a cross-linguistic structural phenomenon characterized by a reversal or ABBA arrangement. This presentation centers on the extremism of X in the Western tradition, including logic, then goes beyond to construct an argument about its role as a salient feature of systematic human language. Systematicity is used here in Fodor’s (1975) sense of the fact that being capable of generating statements like “John loves Mary” also involves the ability to state, “Mary loves John.” This often cited example of systematicity entails the same sort of reconfiguration of syntactic elements as chiasmus: “John (A) loves Mary (B)” and “Mary (B) loves John (A).” There have been few attempts to fully describe systematicity; it has been suggested that it a) involves all possible and cost-effective rearrangements of elements in any sentence, and b) captures how certain types of representations entwine. I propose that chiasmus is evidence of the latter—specifically, that it is a syntactic- rhetorical and semiotic phenomenon that exhibits at least eight clear systematic relationships that are spatially definable. My short survey of sentence level examples from a wide range of language families reveals that these relationships also hold for speakers from vastly different cultural backgrounds. Becoming more aware of these systematic relationships may open up new avenues for any developers and researchers who are constructing machine intelligence with human-like language. Although the concept of systematicity is associated with classical approaches to human language and intelligence, it may also be relevant to a discussion of Bayesian approaches and other competing models like SPA. The systematic relationships found by investigating chiasmus might point to a useful organizing principle in human language—or otherwise prove that natural language processing requires contending with too many variables, even within such restricted ABBA forms.

Multimodal chiasmus in cognition?

First report on cognitive trials using ritual knot priming

**Jamin Pelkey, Zahra Vahedi, Sari Park, Michael Lisinski,
Stéphanie Walsh Matthews, Matthew Iantorno**

Ryerson University

Intertwining design symmetries emerge in widely diverse cultures around the world. Celtic knots, Vanuatu *sandroing* patterns, Tibetan eternal knots: what shared motivations underlie these remarkably similar patterns? Why do they emerge and persist independently across space and time? What, in short, do they mean in a cognitive semiotic sense? One way to help answer such questions would be to explore the potential links they share with general human cognition. Discoveries here would have the added benefit of elucidating the interconnected nature of language, thought and material culture. With these questions in mind, and following up on a proposal by Pelkey (2016b), our study investigates potential relationships shared between chiasmus, analogical reasoning processes and the reproduction of visual lattice symmetries drawn from material cultures around the world. Using a Tibetan eternal knot pattern as a basic exemplar, we hypothesized that manually re-tracing the design for 90 seconds as a behavioural prime would correlate with enhanced performance in creative analogical reasoning tasks and/or increased preference for chiasmic syntax relative to control group participants.

We administered four studies to this end: (1) a basic test of verbal reasoning capabilities using typical analogies (Carriedo, 2016), (2) an analogy finding task requiring more open-ended reasoning strategies (Green et al., 2016), (3) a standard measure of creative thinking using remote associates, and (4) a multimodal syntax test, focused on reciprocal constructions with matching visual illustrations to gauge potential preferential bias for chiasmic syntax. We also administered a Five-Factor Mindfulness questionnaire (Baer, 2006) test-internally to provide an independent measure addressing a secondary hypothesis of the study; i.e., that increased mindfulness among prime-condition participants would correlate positively with test performance. 250 undergraduate student participants volunteered to complete the study across a six-month period in a controlled lab setting using Qualtrics software and a desktop touchscreen interface for response input and tracing exercises. Test components were randomized both between and within studies and macro-level test design also included within-study and between-study controls using equal, randomized assignments of prime, antiprime and control group participants.

Although we discovered a statistically significant learning effect shared across participant conditions for tests 1 and 3, the prime condition patterned no differently from control and anti-prime conditions in tests 1, 3 or 4; and test 4 results demonstrated a significant decrease in preference for chiasmic syntax across all participant conditions. Test 2 results, by contrast, suggest a correlation between retracing the symmetrical design and enhanced detection of novel (vs. conventional) analogies. The observed effect was strongest in cross-domain (vs. within-domain) analogical reasoning.

The Buddha's hagiography as prototype for Buddhist textual and experiential chiasmus

Matt Orsborn (慧峰)

Fo Guang University

Studies discovering, analysing and interpreting chiasmus in classical Indian Buddhist literature have previously been undertaken on the *Aṣṭasāhasrikā Prajñāpāramitā*, the *Vimalakīrtinirdeśa*, and the *Vessantara Jātaka*. All three texts share a common feature of Avadāna type past life stories of the characters involved, of which, the *Prajñāpāramitā* and *Vessantara* make direct reference to past lives of the Buddha. Seeking a prototype for such a recurring theme of chiastic hagiographic literature, this study will examine the traditional hagiographies of the Buddha as the master narrative of Buddhism. Building on well-established elements of this story found in all textual exemplars, we shall focus on the structural elements of the bodhisattva's renunciation from the palace (A), his awakening in the forest (X), to his first return to Kapilvastu to convert his family members (A'), plus other paired elements (...-B-C-D-...-D'-C'-B'-...). This study will not rely exclusively on any single text, but will draw from a range of texts in Pāli, Sanskrit and Chinese such as the *Nidānakathā*, the *Lalitavistara* and the *Abhiñṣkramaṇa*, giving due attention to the problems this pastiche approach can create; as well as modern translations and studies of this literature. Finally, some comparisons and reflections will be made between this paradigmatic structure and van Gennep's (also Turner's) notion of "liminality" in initiation rites, working toward an understanding of how textual structural chiasmus relates to the experiential social chiasmus of ordaining monastics in a Buddhist context.

How the Goddess makes meaning

Uncovering chiasmus in ancient Indian myth

Raj Balkaran

University of Toronto

The body of Sanskrit myths enshrining India's Great Goddess into the orthodox fold (The *Devī Māhātmya*, "The Greatness of the Goddess", DM) has been sliced and diced for the sake of philological and historicist purposes over the past two centuries of Western scholarship. It has never been taken seriously and examined as a unified literary work in its own right—until now. This paper details the world's first comprehensive literary analysis of the glories of the Indian Goddess, the myths around which the world's oldest surviving Great Goddess tradition revolve (Balkaran, 2015). This study showcases an important discovery: the Goddess' glories have been cleverly crafted in the chiastic form of a narrative ring composition, a literary practice pervading the ancient world, present in, e.g., the Hebrew Bible (Radday, 1981), Beowulf, the Iliad, the Quran, Buddhist literature (Orsborn, 2012), Sufi literature (Safavi & Wightman, 2009). This paper argues that the DM's narrative ring cleverly engages a dichotomy at the heart of Hinduism: the opposing ideals of asceticism and kingship. Crucial to this argument is close examination (Balkaran, 2018) of the narrative frame of the DM wherein a deposed king enters the forest and emerges a contented sage. This encounter is an encounter of world-affirming royal ideology and world-denying ascetic ideology, both crucial to the Indian world. These ideologies comprise two strands of what is referred to herein as the *brāhmaṇic* double helix. While the DM offers allegiance to both nonviolent ascetic ideals and the violence of kingship alike, it emphatically privileges the sanguinary work of kings. Engaging the tension between the moral necessity for nonviolence and the sociopolitical necessity for violence, the glories of the Goddess emphasize a theme inalienable to the rubric of the episodes themselves: sovereignty on both cosmic and mundane scales. To draw from Umberto Eco's (1994) narrative theory, this study argues that the DM's model reader is not only expected to be equipped with the ideological savvy outlined above, but also with structural savvy with narrative rings (Douglas, 2007). The glories of the Indian Goddess therefore uphold royal ideology by virtue not only of their content, but by their very chiastic form.

The divine chiasmus of Heraclitus and Plotinus

Patrick Lee Miller

Duquesne University

Heraclitus wrote often in chiasmus. For example: “Immortals mortals, mortals immortals, living the others’ death, dead in the others’ life.” (D. 62) In my first book (Miller, 2011), I argued that he did so in order to communicate a way of thinking about the world that would match the structure of the world itself (see also Miller, 2010a, 2010b). Time is paradoxical; it is impossible to think and speak about it consistently. To describe it accurately, then, one must instead adopt a way of writing that tolerates inconsistency.

Rather than forbidding such thought in the manner of Parmenides—whose poem “Truth” described only eternal being—Heraclitus developed a way of writing that honored the contradiction of becoming without descending into the nonsense feared by Aristotle and other proponents of the principle of non-contradiction.

Heraclitus proposed, in short, a more comprehensive principle, entwining contradiction with consistency in the sensible pattern of becoming itself. This cosmic pattern, chiasmus, was divine: “wholes and not wholes, convergent divergent, consonant dissonant, from all things one and from one thing all.” (D. 10)

After presenting this principle, the principle of chiasmus, I transpose it from becoming to being, especially when it emerges in the theology of Plotinus. As a Platonist, he followed Parmenides in his suspicion of contradictory becoming.

Positing eternal Forms—the Beings of which becoming was but a shadow—Plotinus saw the need for an Intellect to think them, and ultimately a One to be the original source of both. This One, however, was supposed to be “beyond Being,” and thus beyond consistent thought. Platonism tries to flee the contradiction of becoming, but seems to come apart when it finds contradiction again at the summit of its cosmos.

Yet in a mysterious passage (6.7.35.20–25), Plotinus distinguishes the “Intellect thinking” from the “Intellect loving.” The former is unable to grasp the One, so it recoils from speaking and thinking of It, soberly thinking only what It is not (Bussanich, 1994). “Intellect loving,” however, is not content to be rebuffed by its beloved, the One, but returns drunkenly to It by abjuring consistent thought. To encounter the One, Plotinus seems to be saying, requires both: thinking and loving, drunkenness and sobriety. This is the chiasmus first described by Heraclitus, now transposed from becoming to Being—and beyond. If this is correct, Plotinus incorporates the rich chiasmus of Heraclitus with the austere consistency of Parmenides, revealing time to be but a moving shadow of eternity.

Symmetry, asymmetry and self-actualization

Rebecca Meyer

Ryerson University

This paper explores the idea that we, as human beings, are innately drawn to symmetry; yet still desire, and require, the unique complexities of asymmetry. I examine the apparent mutual-exclusivity of symmetry and asymmetry and go on to explore their truer dualistic relationship. Using a general concept of chiasmus as crisscrossing or intertwining patterns and inverse parallelisms (Pelkey, 2013b, p. 41), I suggest that dichotomies need not exist in relationships of mutually exclusivity, but can intersect to make way for new ideas. Looking first to the relationship a child has with their reflective mirror self (Lacan n.d., p. 502) and our comfort and desire to understand the world through bi-laterality and the isomorphic relation between the inner self and our interconnection with the outer world, I then delve into theories of individuation (Jung 1969, p. 350–351), self-actualization (Schott 1992, p. 110) and will-to-meaning (Frankl 1962, p. 132) to suggest that, although our ideal view of self may be based upon perfect symmetry, it is the contrasting deviations and intersections of asymmetry and dissymmetry that inspire conscious development. I examine Jung and his theories regarding personal growth and the development of the uniqueness of the individual (Schott 1992, p. 112) and the uniting of consciousness and unconsciousness in what could be recognized as an isomorphic relationship. I then look to Maslow who stressed a broader human isomorphism in noting the importance of humankind's relationship with inner-self and the outer world (Maslow 1967, p. 195) and to Frankl who also focused on a relationship with self and the world positing that each individual must find a unique purpose that is outside of themselves (Frankl 1962, p. 132). Approaching the relationship between human consciousness and our interactions with the world in the context of cognitive chiasmus, I further propose that it is necessary to repurpose our understanding of symmetry and asymmetry in order to truly understand ourselves and to reach more developed stages of cognition. In this sense it is the crossing or intersecting of two supposedly opposed ideas that show how supposedly fundamental oppositions are not necessarily true in themselves, but rather open up a space of doubt or confusion that can bring forth new and exciting understandings. It is with this new apprehension that symmetry and asymmetry, along with numerous other false dichotomies, are actually entangled or intertwined that we can come to fully know our inner selves and the outer world and begin to strive toward finding purpose and reaching our full potential.

Extending chords and metaphors

Musical meanings, catachresis, and conceptual blending

Michael Lisinski

Ryerson University

Drawing from Fauconnier & Turner (2002), Derrida (1982) and Chrzanowska- Kluczevska (2011), I introduce catachresis as a musical trope. Generally seen as a linguistic phenomenon whereby metaphor is ‘extended’ to produce incongruous associations, I contend that certain musical works produce similar incongruous associations in listeners’ perceptions. Following Chrzanowska-Kluczevska, I adopt a view of catachresis broken into three types; the first uses novelty to fill a semantic gap, the second produces bizarre juxtapositions, and the third generally resists closure within the text at hand. I also adopt her view that these three types of catachresis exist ‘within’ the mind as well as within the text. Furthermore, these three mental processes may be produced by certain musical phenomena in addition to linguistic phenomena. Alongside supporting evidence such as Feld’s (1981), I use Lakoff & Johnson’s (1980; 1999) work on conceptual metaphor and Zbikowski’s (2002) work on musical metaphor to further justify the view that such metaphorical associations are present in music. Following Ord’s (2018) and Zbikowski’s application of Fauconnier & Turner’s research to music, I use blending theory to map this process, creating a preliminary modified blending diagram based on existing versions. While more thought and research is needed, my primary intention is to introduce the idea of musical catachresis to the scientific, musicological, and philosophical communities.

While doing so, I outline how it may operate while providing brief examples. Focusing primarily on popular music, I also aim to provide second-generation cognitive science with further insight into music perception, while highlighting underappreciated connections with Derrida’s treatment of catachresis and metaphor, which may in turn further understanding of such subjects as genre evolution.

Composers and songwriters can also benefit from using catachresis as a rhetorical technique in music composition. Unresolved issues include the exact relationship between catachresis and conceptual blending, connections and tensions with other fields of research, and empirical evidence for the similarity in mental processes between linguistic and musical catachreses. Researching musical catachresis may allow scholars to understand broad cultural developments in musical meaning as well as individual responses to musical signification.

Why conceptual blending needs embodied chiasmus

Transverse proprioception grounds double-scope integration

Jamin Pelkey

Ryerson University

A little-appreciated and largely unexplored aspect of Conceptual Blending Theory (Fauconnier & Turner, 2002) holds that most types of imaginative cognition are shared between human beings and various alloanimals. Simplex blends, Mirror blends, and Single-Scope blends are modes of thought and action that are necessary but not sufficient to account for the emergence of human cognition. Double-Scope integration (thinking of two category sets in terms of each other) is said to underlie the human cognitive singularity, giving rise to more and more complex modes of reflexive modeling. Since this is an evolutionary account, it is reasonable to expect that plausible evolutionary/developmental processes or mechanisms should be identified to ground the emergence of the double-scope singularity. Working from a cognitive semiotic perspective, the search for clear sources of *bodily* grounding would also seem to be a priority; but there has been curiously little movement (or progress) toward either of these ends. In response to these gaps, and other problems, this paper takes the next step in developing a long-range argument (see also Pelkey, 2016a, 2017, 2018) that upright posture and its watershed corollary, the experiential and functional reorganization of the anatomical planes, were essential ingredients in the evolutionary emergence of the double-scope singularity.

The enactive conception of upper-body category sets (e.g., arm, wrist, hand, finger) in terms of lower-body category sets (e.g., toe, foot, ankle, leg)—and vice-versa—provides a plausible, experiential modeling source for the origins of paradigmaticity, markedness, reflexivity and creative analogy. These are essential ingredients of double-scope conceptual integration. Notably, these are also basic features of chiasmus in cognition. Developing early insights from Ellen (1977) and Heine (1997), and problematizing the current state of body partonym research (Enfield et al. 2006, Wierzbicka 2007, Majid 2010, Brenzinger & Kraska-Szlenk 2014, Majid and Staden 2015), I summarize known domains of interfield body partonym mapping drawing on findings from historical-comparative linguistics and anthropological linguistics. I then move on to a more systematized summary of known sources of linguistic evidence. The evidence in question suggests transverse proprioception as a key candidate for primary double-scope integration. The paper closes with a statement of plans for the development of a publicly accessible cross-linguistic database dedicated to the compilation of multimodal evidence for chiasmic bodily pattern mapping between upper- and lower-body category memberships and their meanings.

4. General Session

Translating business advertisements from English into Arabic

Problems of intercultural communication and equivalence

Jamal Mohamed Gaber Abdalla, Nour Hammo, Safa A. Saeed Hraiz, Du'aa Rashad Qadan, Rahf Y. Al-Nnamer and Shaikha A. A. Al-Mamari

United Arab Emirates University

Advertisements are multimodal consumer-oriented texts with embedded persuasive functions to cognitively attract the attention of customers and persuade them to buy a product or use a service. To achieve this, advertisers rely on cognitive semiotics using linguistic and non-linguistic elements such as images, symbols, colours and logos. Specific advertisements are created for specific products/services depending on the target audience. Because culture is part of any context and audience, advertising makes use of cultural semiotics through visual and non-visual elements that have cultural connotations. When products/services are to be marketed in a culturally different context with a different language, their advertisements are translated into that language to target the new audience. The success of a product or service in a culturally different context depends on how its advertisement is translated and how its message is cognitively processed and received by users of that language. This study investigates how business advertisements are translated from English into Arabic and how they are received in the context of marketing products/services in UAE. The aim of this study is to identify (a) strategies used in translating advertising texts, (b) their implications for translation quality, (c) intercultural communication problems and (d) customers' views over the appropriateness of translations in terms of contextual functionality and cultural acceptability. The study is based on a descriptive analysis of two types of prime data: (a) data collected from authentic translated advertisements circulated by different businesses and (b) data collected from potential customers in the form of feedback on the appropriateness of translated advertisements. The study findings indicate that (a) variation in and semiotic interaction between multimodal elements of advertisements require translators to adopt different translation strategies resulting in different degrees of translation quality and (b) different potential Arab customers seem to cognitively receive translated advertisements in different ways and identify some problems related to the achievement of communicative function, naturalness and cultural acceptability.

How “force” permeates through emotive discourse

A case of (inter)subjectivity in Japanese

Sayaka Abe

Middlebury College

Force is ubiquitous in human experience both literally and metaphorically—from everyday actions to intra-/inter-personal conflicts. Some force phenomena result from the laws of physics, and some are crafted or intended—as in a dramatic effect in a musical piece or a play, or the act of alleviating social pressure. The present study examines how the schematic concept of “force” permeates through language at multiple functional levels, that is, varying degrees of (inter)subjectivity. It extends a classic yet understudied cognitive semantic framework, force dynamics (FD), to the domain of affect (Talmy, 1988, 2000; cf. Kövecses, 2000, Sweetser 1990). FD describes how causation is conceptualized analytically in terms of two conflicting force elements, agonist and antagonist, each attributed to a force tendency, toward “action” or toward “rest”, and the resulting state of a force interaction, associated with the force with a stronger tendency. The present study benefits from this abstract analytical tool, by extending it to characterize internal or interpersonal psychological conflicts, paired with usage-based analysis of textual data. It draws on samples from spoken and written corpora in Japanese, a language known for its rich inventory of linguistic devices of emotivity (cf. Maynard, 1993, 2002; Ochs & Schieffelin, 1989; Suzuki, 2006; cf. Minagawa, 2016), with varying degrees of speaker/writer involvement (emotive, reader/addressee-conscious). The goal of the study is two-fold: 1) to present a set of FD patterns that underlie linguistic emotivity across different functional layers, and 2) to elucidate a systematic connection between (inter)subjective meanings and other conceptual systems, such as attention (Talmy, 2007) and affective valence (negative, positive).

Accordingly, it will be suggested that: 1) FD schemata allow us to identify commonalities across different coding systems, open class and closed class—the latter often being more (inter)subjective. For example, a given FD pattern can underlie expressions of psychological conflict between “not being able to see someone and wanting to do so” (e.g., “longing”, referential), between “not wanting [the situation in the propositional content] to happen/to have happened and having it actually happen” (e.g., grammaticalized “regret”: subjective), or between “not wanting to say something and actually saying it” (e.g., hedge marker indicating speech act modality: intersubjective); 2) Certain FD patterns, in particular, those with stronger antagonist, tend to be associated with negativity and stronger formal salience (attention).

From magic to science, and back again

Myrdene Anderson and Katja Pettinen

Purdue University

Increasingly, scholars and scientists recognize that processes, cognition included, while bearing labels in language, are not hermetically sealed; they leak, they absorb, they lag, they anticipate, and dance with and around other processes. While one unit of analysis has been an individual, individuals also fall into synchrony with others—socially, physically, cognitively, and even at microscopic levels, especially when sharing space-time—this dance given the habits and affordances characterizing anticipatory systems.

The four E's of cognition—embodied, embedded, extended, enactive—acknowledge the leakiness within and continuities between brain, body, world. Within those sinuous spacetimes, both consciousnesses and cosmologies come into play. In language, performative utterances, buttressed by "felicity conditions", magically accomplish actions—in oaths, swearing, and officially declaring a change in status (cf. Austin, 1962), and also precipitate from certified behavior besides languaging.

We consider another peculiar form of extended cognition: algorithms—a notion itself extended by metaphoric and magical usage. Standard algorithms, though, are not linguistically performative; they seriously perform, they prosper in a closed contemporary world of linearities, of function, of mastery, not in a zone of magic and emergence. The algorithm, serially refined and tested instruction, focuses on a single outcome executed by a machine, leaning on the assumption that anything can be reduced to data points associated with function, hence with ends-oriented problem-solving. Yet what is disregarded here, are all of the irreducible qualitative ways in which we as humans aim to "improve", or explore, or tweak, our various ways of "doing things", with our own soft anti-machine called brain-mind-body-society-Umwelt.

This invites a distinction between hard, discrete, machine-drivable quantitative algorithms vis-à-vis soft, analogue, behavior-based qualitative algorithms in provisional worlds of emergence. In order to do so, we will journey back into linguistic performativity wherein one can locate a somewhat fundamental component of extended cognition. At the same time, we recognize that "decisions", "intentions", and conscious awareness are themselves magical, ultimately tacking back to anterior neurological processes, a separate cosmos, if not cosmoes, inferred as "cognition".

The semiotics of architecture in digital games

Gabriele Aroni

Ryerson University

This presentation will investigate how we experience the virtual spaces of digital games under a semiotic point of view. How do we experience architecture in digital games? Is its significance related to the gameplay, as conveyor of messages for the story, or just a backdrop for the action?

Digital games are a complex and multimodal media, and as a system of visual, textual and aural signs they warrant a semiotic analysis (Upton, 2015, p. 157). Brian Upton brings forth the concept of anticipatory play, the notion that in digital games, the expectations of events and actions before they unfold is as important as the interaction itself (2015, p.76). A large part of anticipatory play is expressed through the design of the game space, which, in the words of Aarseth is “symbolic and rule-based” (Aarseth, 2001, p. 163): “For example, if you are playing a shooter, a blank corridor is less exciting than a corridor with an open door on one side, even if there are no enemies beyond the door” (Upton, 2015, p.78). The concept of anticipatory play is thus an excellent instrument to analyze the architecture of digital games, as the design of virtual architecture does indeed accommodate anticipatory play as one of its main functions, and not exclusively the gameplay itself. In light of this, we can apply Umberto Eco’s semiotic theory in regard to architecture, in which he considers it to be based on a semantic code composed of denotative, fixed primary functions (the functional parts) and connotative, variable secondary functions (the symbolic aspect) (Eco, 1997, p. 185).

Digital games architecture, as well, can be interpreted as composed of denotative functions necessary to gameplay, and connotative functions that are instead aimed at conveying other aspects of the game, such as the story. As Siabra-Fraile explains with respect to the game Ico (Team Ico, 2001): “[a] story, such as the one told in Ico, is unfeasible without the space of doors, chains, cornices and stairways that constitute the castle” (2009, p. 70). By applying the aforementioned theories to the analysis of the architectural design in games such as NaissanceE, (Limasse Five, 2014) Layers of Fear (Blooperteam, 2016), The Witcher 3, (CD Projekt RED, 2015) and ECHO (ULTRA ULTRA, 2017), the presentation will investigate how these virtual spaces communicate with the player, i.e. how virtual architecture can be read as a system of signs that allows for the development of gameplay as primary function, while at the same time having a secondary communicative aspect that informs players of other aspects of the game.

A contrastive analysis of gesture in spontaneous and staged human interactions

Tunisian gestures as a case study

Amira Arous

University of Paris 8

In his classic study, Adam Kendon (2004) defines the term gesture as “a label for actions that have manifest deliberate expressiveness” (p. 15); and thus highlights gesture as an activity and a deed. This study compares two sets of co-speech gestures that are grounded in two distinct but related contexts of interpersonal interactions: the spontaneous and staged settings. According to Scherer (2005, pp. 695–729), stances “spontaneously develop or are strategically employed in the interaction with a person or a group of persons coloring the interpersonal exchange in that situation”. To test the connection between stance-taking, grammar, and gesture, my hypothesis is that Tunisian interlocutors use more simplified gestures to express stance in staged performance.

The corpus for this study consists in twenty transcribed video-recordings: The first ten videos are a collection of semi-structured interviews conducted with three Tunisian judges and a lawyer. The second compilation of videos represent sequences extracted from Tunisian detective shows and TV series. The aim of this research is to analyze the co-occurrences of stance-bearing lexical anchors with visual stance markers. For this purpose, the Behavioural Profile approach is used (Geeraert et al., 1994; Gries, 2003) and the meaning of the text is approached semasiologically, moving on from the utterance to the co-expressed gestural pattern (Read & Carroll, 2012; Fuoli, 2015). The tokens consist in manually identified lexical items that express the speakers’ stance. A non random sample of thirty examples of similar co-speech gestures co-happening in the two contexts of interaction is selected. The operationalisation of gestures is enabled by approaching the indexing of items of stance-taking in lexical marking.

The exploratory results can be synthesized into three basic lines: firstly, in terms of length, the co-speech gestures in the staged interactions are shorter than natural gestures. Secondly, gestures in the staged context are less complex and involve less body parts in the action than in the spontaneous counterpart. Finally, and most importantly, these results underline not only the role of intentionality (Grice, 1957, 1969) in gesture production, but also the link between the characteristics of gestures and the interlocutor’s level of “deliberate expressiveness” (Kendon, 2004). The usage-based model as well as the semasiological analysis proved to be an effective method for understanding aspects of cognitive mechanisms behind the non-verbal communication and tapping into links between both speech and gesture without excluding one mode at the expense of the other.

Learning to hear meaning

Sound symbolism and embedded gender and relational meaning in Western Fijian kin terms

Pauline McKenzie Aucoin

Concordia University

This paper will examine sound symbolism evident in kinship terms used in the Western Fijian Dialect, terms which serve not only as identifiers for particular relationship categories, but also contain phonemic patterns which create meaningful associations between sounds and words in non-kinship domains. Through processes of embeddedness, these terms carry what Edmund Leach (1971) termed semantic colour, a complex set of associations and chains of associations that establish connections between the domain of kinship and this culture's wider social, political and conceptual system.

Phonemic associations carried through terms for patrilineal kin convey information regarding seniority, status, and affect, particularly respect, relationships that are hierarchically ordered according to primogeniture, birth order and relative age. Terms are loaded with respect to gender and cosmological imagery as well. Kin terms represent not merely terminological referents for kin, therefore, but also signs that are inscribed with secondary meaning. Associations or dissociations between words map out relations of kin vis-a-vis other kin, making phonological patterning "one of the basic ways by which referents of words are put into categories" (Leach, 1971, p. 81). Phonemic patterns evident in kin terms include phonological similarity and contrast, pairing, rhyme, similarity in form, and metathesis or the abstraction and reformulation of sounds, which in this context represent morphemic constituents. This paper extends the study of the semantics of kin terms to include analysis of sound production and hypothesizes on how distinctions in the production of sounds serve as an additional means of the embodied association that draw together sounds, physiological processes of articulation, and social distinctions, making for a multimodal system of cognition. Following Leach, I argue that the phonemic similarities or dissimilarities found within a set of kin terms has semantic implications in that phonemic differences may parallel social differentiation. Sound symbolism in this context is significant to language ideology and the establishment of linguistic habitus.

Multimodal contradiction as index of the semiotic real

Tyler James Bennett

University of Tartu

One pivotal moment in the development of Peirce's semiotic was the transition from his doctrine of thought signs, which held that all signs are thoughts and refer strictly to other thoughts, to a doctrine that made room for types of signs that refer to objects outside of thought (Short, 2007, p. 32–44). From this, he developed his theory of the index, and later the emotional, energetic, and logical interpretants (Peirce, c.1906: CP 5.473). If signs can be interpreted non-conceptually, not only are sensation and affect drawn within the descriptive domain of semiotics and cognition, but so drawn also are non-human behavior and meaning making (Short, 2007, p. 52). However, what is the substance of an emotional or energetic interpretant at the level of analysis? Are they not intractable to metalinguistic description? One solution Peirce identified was contradiction as a precondition of semiosis. Peirce considered vagueness as intrinsic to sign action (Peirce, 1931–1958, 5.505). What is of central interest here is that this necessity of contradiction has parallels in other, seemingly disparate branches of semiotics, and the productive friction that arises in the transposition of terminology between said branches. In Juri Lotman's (1977) semiotics of culture, sign action depends on the contradiction between at least two incompatible codes (p. 35). In bio-semiotics, Jesper Hoffmeyer maintains the principle of code duality, where semiosis in the organism requires the co-presence of an analog and a digital code. Kalevi Kull develops this, holding that a situation of "confusion, of certain logical conflict, incompatibility, inconsistency or contradiction" is a necessary condition of semiosis" (Kull, 2015, p. 3), and that the law of non-contradiction does not apply to semiotic analysis (Kull, 2012). When it comes to method, according to Julia Kristeva (1986) necessary contradiction entails the transposition of otherwise incompatible theoretic systems and the juncture of their respective, internally inconsistent terms into new provisional models, whose application is then partially a critique of their own sources (p. 74–88). Contradiction serves as index of the sensory ground of the sign, as only symbols can signify across contexts without contradiction. The suggestion that the semiotic real registers as disruption of the symbolic evokes other theoretical sources (e.g. Lacan, 1988), whose transposition with Peircean cognitive semiotics gives rise to even fresher contradictions.

See what I mean?

The role of gesture in scopal ambiguity

Amanda Brown and Masaaki Kamiya

Hamilton College

Gestures can play a facilitative role in the interpretation of structural ambiguities (Guellaï et al., 2014; Tubau et al., 2015) and are associated with spoken expression of negation, with research on Open Hand Prone gestures (Kendon, 2004), head shakes (Kendon, 2002; Calbris, 2011), and their interaction and synchronization (Harrison, 2014). The current study examines a context of negation in English in which the presence of quantification yields scopal ambiguities (e.g. all the people didn't go), and asks to what extent gestural forms and timings help speakers convey intended interpretations.

In a quasi-experimental design, 25 native speakers of English were familiarized with scopally ambiguous sentences embedded in disambiguating contexts. An example is shown in (1).

(1) All the magnolias won't bloom. (Syrett et al., 2014b)

In this example, the negator not may take scope over the quantifier all, yielding partial 'not all' negation. In the alternative interpretation, the quantifier all takes scope over the negator not, yielding total 'all not' negation. Speakers produced the target sentences as expressively as possible while being video recorded. Analyses focused on sentences incorporating quantifiers and verbal negation, for which one of two interpretations were each possible.

Analyses of 317 gestures revealed a preponderance of head gestures as well as relationships between gesture form, placement and length and the communication of scopal interpretation. Speakers were observed to be more likely to align gestures with the negative particle, not, when interpretations of total negation with the quantifier all were intended; to employ semantically congruent head shakes and to align gestures with a negative particle when conveying a negative focus of the quantifiers many/most; to align prosodic gestures, i.e. beats, with quantifiers; and to lengthen gestures to convey total negation, especially in sentences containing all.

Results are discussed with reference to scope of negation as reflected in gesture (Harrison, 2010, 2013, 2014a, b). Moreover, the contribution of gesture will be evaluated in the context of mixed results regarding the robustness of prosodic signatures in scopally ambiguous sentences involving quantification and negation in English (Syrett et al., 2014a).

Affective force in different Umwelten

Gisela Bruche-Schulz

University Hong Kong

All life forms exhibit—along their specific continuum of existence—“agency and goals” (van Hateren, 2015, p. 403), whereby the resulting species-specific narratives exhibit their own ways of experiencing problems and solutions (Propp, 1968 [1927]; Hoey, 2001 on human narratives). All living entities make use of particular environments that grant the needed affordances, and they greet them with forms of satisfaction. It is suggested that the motivation that underlies the acceptance or non-acceptance of a solution, discursive or other, is driven by the visceral urge to “experience the because” [of there always being an affordance, and therefore a solution] (Wittgenstein, 2009 [1953]: §177, 78e—my elaboration, G.B-S). In other words, to feel the presence of an affordance reflects a constant need at all levels of existence.

Evaluations of solutions from the neural, genetic, or metabolic perspectives are not expressed in language. But they do exist since each living entity pursues “the local ends” of a particular survival project (Hoffmeyer, 2007, p. 149). “[E]ven the simplest prokaryotic ... life forms take an interest in their surroundings with regard to finding solutions to survival problems” (2007, p. 155). A selective “categorical sensing” (Bruni, 2007, p. 384 and *passim*) is applied at each level, even when brute force seems to dominate the “action apparatus of mammalian brains” (Panksepp, 2005, p. 30).

I suggest that studies such as Pelkey (2017), and Bruche-Schulz (2014, 2013) provide pathways of description. Pelkey reports how the Sentilenese reject intruders (i.e. the problem) with X-posed threatening gestures, and how they then celebrate—using the same gestures—after making the intruders leave. In all these gestures, an intense affective force manifests itself. Bruche-Schulz reports on five different groups of students who read the same excerpt from Saint-Exupéry’s *The Little Prince*, each in their own language. In all five languages, high response numbers give evidence of the foregrounding of positively evaluated experience. While Pelkey deals with the occurrences of the X-posed gesture as expressions of an affective underlay (2017, p. 29) of “X-posed cognition” (p. 20), Bruche-Schulz treats her readers’ response numbers as the result of an underlying affective process that mirrors the recognition of solutions.

Can affect-cum-emotion be seen to play a role comparable to the “quantum of action” (Bohr, 1950)?—After all, visceral feels are found at the already proverbial spooky-action-at-a-distance in relation to discursive cognition.

Multimodalities and the Meaning of Language in the *Universal Declaration of Human Rights* (1948)

Clara Chapdelaine-Feliciati

York University

This presentation conducts a case study of the meaning of language in the main international instrument for human rights (UDHR, 1948), the Universal Declaration of Human Rights, adopted by the international community in 1948. This instrument is of particular relevance worldwide, and has been described as the ‘Magna Carta of Human Rights’, and translated into hundreds of languages. Firstly, this presentation explains the legal and symbolic value of universal rights, and the significance of their recognition at the international level. Secondly, it examines the language used in the *Universal Declaration of Human Rights* to phrase human rights and fundamental freedoms. It considers key contributions to shape the wording of human rights in the *Universal Declaration of Human Rights*, notably by China (Dr. Peng Chun Chang), USA (Eleanor Roosevelt), Canada (John Humphrey), India (Hansa Jivraj Mehta), France (René Cassin), Chile (Hernan Santa Cruz), Lebanon (Dr. Charles Malik), and the Dominican Republic (Minerva Bernardino). It studies the incorporation of various perspectives in the *Universal Declaration of Human Rights*, including from the West, Confucianism, and several religions and traditions from all continents. For this purpose, this presentation applies ‘Semioethics theory’ (Petrilli & Ponzio, 2003), a doctrine located at the intersection of semiotics and ethics. In this context, semioethics allows for an examination of the ethical value of the contributions made by these State representatives. More specifically, this presentation studies the impact of the current formulation of rights on the principle of non-discrimination and equality between men and women, notably as regards the expressions ‘human rights’ vs ‘men’s rights’. It also investigates whether the provisions enshrining rights are all inclusive of various cultures and traditions. To conclude, this presentation assesses the meaning value of the formulation of rights in the *Universal Declaration of Human Rights*, as it applies to all individuals and all peoples, globally.

Communicative reference and cognition

Libby Chernouski

Purdue University

Although dealing with external objects and internal processes or beliefs, linguistic reference has not been examined thoroughly as a linguistically negotiated process of cognitive association among speakers whose lived experiences are inherently multimodal. Reference has traditionally been treated as a relation of a term and an object, generally (Sainsbury, 2008), and many theories of linguistic reference presume a divide between the internal, mental, intentional (and so, linguistic) on the one hand, and the external, physical, real-world (the object[s]) on the other. Within Cognitive Linguistics (CL), however, the distinction between mind and world is challenged, as language is not an autonomous cognitive faculty (Croft & Cruse, 2004), and cognition itself involves external reality as much as mental activity (Ellis & Robinson, 2008; Atkinson, 2010). A theory of reference that sees speakers as embodied and whose experiences are liminal, involving an intimately multimodal experience, is overdue.

Framing linguistic reference as both an act in the pragmatic tradition (Searle, 1958; Strawson, 1960; Putnam, 1973) and a relation in the analytic tradition (Frege, 1982; Russell, 1905), I claim that reference is best studied as a communicative, cognitive process. Reference relies on language user's embodied experiences and is therefore 'bigger' than linguistic reference proper. Following pragmatic literature, I prioritize interlocutor intent in successfully communicating or "focusing" (Bertolet, 1987) an object. The act of bringing a particular object to the attention of an interlocutor is not restricted to linguistic means alone but can also be brought about through a number of physical gestures (Nunberg, 1979; Bertolet, 1987; Eriksson, 2009) in instances of extra-linguistic reference. In linguistic reference, I claim, the referential relation between a term and object is both established and interpreted. Reviewing the importance of collaboration and common ground (Clark, 1992) for interlocutors to collaboratively establish reference in a Gricean manner, I also highlight language users' extra-linguistic experiences and emphasize users as embodied individuals interacting with the environment in order to express or determine reference, both pre- and post-utterance. In my account, reference relies on the environment in that 1) it provides the speaker with the object to which they want to refer, and 2) it can aid the hearer in identifying the speaker's referent, providing extra-linguistic cues to assist in determining reference. Finally, I revisit the concern over how to handle the speaker's reference production, the process of selecting a term by which to refer to an object with which the speaker is cognitively associated pre-utterance. While this theory is presented as linguistic, I encourage an interdisciplinary approach, drawing on the strengths and goals of semantics, pragmatics, philosophy, and cognitive studies, broadly.

Comparing constraints in lexical and graphic numeral systems

Stephen Chrisomalis

Wayne State University

With some partial and debated exceptions, all human societies use some form of numeration, most commonly through two related, but distinct modalities. Lexical numerals are the structured systems of number words found in almost every language. Less common worldwide are graphic numerical notations, used to notate numbers in structured, relatively permanent, but largely trans-linguistic ways, such as Roman numerals. Thousands of attested lexical numeral systems and well over one hundred numerical notations provide a broad dataset, allowing a careful comparison of the semiotic properties of these systems of expression within a single cognitive domain. Trans-coding between lexical and graphic numerals (e.g., writing down a spoken number, or reading a graphic notation aloud) is accomplished rapidly and fluidly (although transcription errors are highly informative). Explaining why these two representational systems, so closely interlinked and used for the same domain of experience, differ in systematic ways, requires attention to their semiotic properties, their contexts of use, and human cognitive capacities.

The present study identifies three properties of number systems that differ systematically across lexical and graphic modalities. Iteration is the property of expressions whereby the cumulative repetition of signs indicates addition. Iteration is widespread in numerical notations (e.g. Roman numeral CCC = 300) but very rare in lexical numerals—no language expresses three hundred as hundred hundred hundred. Orderliness is the property whereby numerical signs are ordered from highest to lowest powers of some base. While almost all numerical notations are orderly, many lexical numeral systems are not—for instance, in the German number words like vierundsiebzig where the units (4) precede the tens (70). Finally, operability refers to the explicit use of signs or words indicating arithmetical operations. Languages very frequently do this—e.g. Latin *duodeviginti* ('two-from-twenty' = 18) but numerical notations almost never do.

Three possible sources of these patterns are proposed. First, channel effects highlight the different affordances of visual and auditory systems for semiotic representation. For instance, spoken numerals are impermanent and produced sequentially, so it would be cognitively challenging to use iteration widely in the absence of a permanent visual record. Second, signal conciseness constrains numerical notation and lexical expressions differently. While we often deride systems like the Roman numerals for being cumbersome, we forget how compact they actually are in comparison to the corresponding lexical numerals, and how much lexical information must be added in by the reader of any numerical notation. Third, the rapidity and informality of lexical expressions creates variability in languages that are not reproduced in notations. Almost any number has multiple lexical expressions (e.g. two thousand eighteen vs. twenty eighteen) and one of the important human capacities for processing numerical expressions must be to rapidly manage this variability when reading and writing graphic notations. Lexical and graphic numeral expressions thus play a significant role as components of an extended, distributed cognitive system for working with numbers.

AI as EI

Evolutionary Intelligence (EI), Peirce's Ten Classes of Signs, and the Biology of Ironic Arithmetic (BIA) in Neuromorphic and Quantum Computing

W. John Coletta and Connor L. Schoelzel

University of Wisconsin-Stevens Point

In this presentation, we argue (1) that **Artificial Intelligence (AI)** would be more productively understood as **Evolutionary Intelligence (EI)**; (2) that **Peirce's Ten Classes of Signs** may be understood as the evolutionary and epistemological basis for training deep-learning neural networks in this new **EI** tradition; (3) that for **EI**, the notion of **visual irony** ($1=0$), the basis for a **Biology of Ironic Arithmetic (BIA)**, is the *starting point* of cognitive semiosis, not a sign of advanced cognition as it is in **AI** research; and (4) that a **BIA** can be built into **code theory** through the use of **modulo-2 arithmetic** and the **Boolean operators "XOR" and "AND,"** whereby additive identity 0 and multiplicative identity 1 may even be "seen" (in the context of René Thom's perception catastrophes involving the complex visual ironies of predator-prey interactions) to coincide, such that $1 = 0$ (the binary-code for irony)—and a prey species can vanish down the rabbit hole of itself. In other words, in modulo 2, the language of digital circuitry, "If $1 + 0 = 1$ and $1 \times 1 = 1$, then $1 = 0$," which equivalence can be used to map the successful collapsing of a sign (say a "toad") into an object (a "stone") within the interpretant generating mind of a predatory heron: as Theodore Roethke writes, "A toad folds into a stone," $1 = 0$, in quantum computing or biological mimicry.

Marguerite MacNeal, in *Wired*, writes, referencing the work of Stanford cognitive scientist Fei Fei Li, "Vision is so critical to how we understand the world [that] it's hard to imagine any intelligent computer of the future without it. Any decent self-driving car will eventually need to distinguish between, say, a large rock in the roadway and a similar-sized paper bag—and that it should brake and steer to avoid the rock but ignore the bag." What lies in the future for autonomous cars (rock \neq bag) is the very present state of cognitive competence for the heron, who must tease the stoni-ness of the toad out of the stone (rock \neq toad) if it wishes to eat. EI is the past and the future of mind, of both neuromorphic and quantum computing.

When a lie is not a lie

Simile, counterfactuality, and multimodal content

Barbara Dancygier and Adrian Lou

University of British Columbia

We have all heard about fake news and alternative facts. We often use these terms to refer to public statements which are false, and intend to deceive. However, we are also seeing a rise in interpretive statements, especially in late night talk shows (e.g. Seth Meyers and Stephen Colbert), which make references to non-existent or distorted past events to comment on current events. Building on our earlier work on counterfactual and similitive meanings (Dancygier, 1998; Dancygier & Sweetser, 2014; Lou, 2017), we propose an interpretation of this recent communicative phenomenon, which we have termed ‘similitive counterfactual commentary’. We argue that it highlights the central features of multimodal communication.

One of our examples refers to the footage from President Trump’s visit to the disaster area of Hurricane Harvey. In his responses to reporters, Trump referred to the relief effort as “a beautiful thing” and ended by telling everyone to “have a good time”—strikingly out of synchrony with the drama developing in Houston. The word choices showed an obvious lack of empathy, which the evening’s commentators described through innovative similitive and counterfactual multimodal constructions. In surprising synchrony, two shows (see Meyer’s clip¹ and Colbert’s²) compared the situation to the Hindenburg disaster, showing the original footage with fictive reenactment of Morrison’s original commentary (available online³).

The fictive comments call the Hindenburg disaster ‘beautiful’ and wish everyone ‘a good time’. In effect, both newscasters are building a meaning equivalent to: Trump calls the effects of Harvey beautiful. It is as if Herbert Morrison had called the Hindenburg crash beautiful (which he did not).

Many types of such multimodal constructions have emerged (using fictive email trails, fictive news events, etc.). We interpret this noteworthy humorous genre of news commentary in terms of simile, counterfactuality, scalar implicature, and blending. As Lou (2017) points out, simile in multimodal artifacts such as memes uses images as representative of emotional or behavioral responses. Importantly, memetic similes can create similitive meanings without using the word like.

Similitive counterfactual commentaries now go further in building an as if meaning through multimodal means, relying on blends of the familiar and the imagined. Such multimodal uses raise important questions regarding cognitive patterns of figurative reasoning, with counterfactual and similitive reasonings serving as salient examples.

¹ <https://youtu.be/qWFYdl-nFsw?t=1m45s>

² <https://youtu.be/Y-LpTaWYdXM?t=4m43s>

³ <https://www.youtube.com/watch?v=F54rqDh2mWA>

Applying generative, functional and cognitive grammars to naturally-occurring language and multimodal data

Charles Denroche

University of Westminster

In the first part of this paper, I propose that the numerous and different approaches to grammar within the discipline of linguistics can be categorized into just three broad types: GENERATIVE, FUNCTIONAL and COGNITIVE. Each approach is briefly described through the lens of the pioneering work of the scholar most closely associated with each, Chomsky (1965), Halliday (1983) and Langacker (1987). It is argued that each approach can be identified with one of the three points of the semiotic triangle, as modelled e.g. by Ogden & Richards (1923), the WORD, the THING and the THOUGHT. Thus, the main focus of generative grammar is the code itself; functional grammar, real and imagined worlds; and cognitive grammar, conceptualization and mental processes. The shift in focus determines the potential each has as a tool of research for investigating naturally-occurring data.

The Three Grammars were designed with language in mind. The second part of the paper explores their application to multimodal texts. It is observed that the ‘grammar of visual design’ developed by Kress & Leeuwen in *Reading Images* (1996) draws explicitly on functional grammar, adopting concepts such as actor/goal, recipient/participant/circumstance, given/new, offer/demand, carrier/attribute, coherence/cohesion, collocation/colligation, and the ‘six processes’; while at the same time being redolent of concepts from cognitive grammar, such as construal (the partial nature of meaning making), salience, information value and framing. Similarly, Leeuwen’s grammar of music (Leeuwen, 1999) draws explicitly on functional grammar and implicitly on cognitive grammar, such as figure and ground (two layers within a ‘sound perspective’).

It is argued that cognitive grammar often offers a richer, more naturalistic, tool of research than generative or functional grammar because it gets closer to mental processes and therefore production. Concepts from cognitive grammar, such as radial categories, prototype effects, figure/ground relations, construction, sanctioning, metonymy and metaphor, all have the potential to provide scholars/researchers with powerful research tools for fine-grained analyses of language and multimodal data, in areas such as discourse analysis, language teaching and translation. To date this potential has not been fully realized.

Diagrammatic iconicity in Paamese language and experience

Simon Devylder

Lund University

Grammatical asymmetries in possessive constructions are overtly coded in about 18% of the world languages according to the World Atlas of Language Structures (Dryer & Haspelmath, 2013) and illustrated here in Paamese (1–2).

- (1) avo -k
body -1SG
'my body'

- (2) vakili ona -k
canoe POSS-1SG
'my canoe'

The possessive relation is marked either with a suffix (-k) on the possessed noun (1), or attached to a separated possessive qualifier (ona-k), in (2), hence the term grammatical “asymmetry”. What primarily motivates these grammatical asymmetries is controversial and has been at the crux of the iconicity vs. frequency debate (e.g. Croft, 2008; Haiman, 2008; Haspelmath, 2008).

I propose to contribute to this debate by focusing on the grammatical asymmetries of Paamese possessive constructions, and looking for their primary motivating factor in multidimensional experiential contexts. After a careful account of four experiential dimensions of distance (functional, affective, sociopragmatic, and embodied), the degrees of experiential distance appears to systematically correspond to the degrees of formal distance of the possessive constructions used to refer to these experiences (e.g. direct or indirect suffixation of kinship and body part terms). By turning back to the non-linguistic experience of distance based on anthropological and phenomenological data, the argument defended in this paper aims at clarifying the notions of iconicity and frequency/economy, as a necessary first step in deciding on the relevant merits as explanations of linguistic asymmetries. When confronted with the Paamese data, diagrammatic iconicity is ultimately argued to be the primary factor that motivates the grammatical asymmetries of possessive constructions. I also show that economy and iconicity can collaborate in motivating some cases, and thus do not necessarily need to be opposed.

This paper more broadly emphasizes the necessity to develop a more integrated semantic theory that pays equal attention to human experience, pragmatics, and to the social and embodied dimensions of meaning-making, so as to avoid treating its functional, sociolinguistic and typological aspects as independent modules.

Mapping the body

Simon Devylder^{*}, Soichi Kozai[†], Poppy Siahaan^{††}, Misuzu Shimotori^{}, and Christoph Bracks^{††}**

^{}Lund University, [†]Kansai Gaidai University, ^{††}Köln University, ^{**}Göteborg University*

The human body is a universally shared domain of experience, yet the way it is segmented into parts greatly varies across languages and cultures of the world (e.g. Enfield et al. 2006; Majid 2010; Majid & Van Staden 2015; Devylder, 2016). To further understand the segmentation of the human body into parts across the variety of the world languages and cultures we ran two studies with a total of 120 speakers of three unrelated languages (French, Indonesian, and Japanese). More generally these two studies have broader theoretical and methodological implications in the study of linguistic and non-linguistic meaning and lead us to ask important questions about ways to interpret the unsystematic symmetry of language and cognition. In Study 1, we compared the descriptions of 32 pictures showing people with photoshopped injuries on various parts of their body (e.g. a cut on the foot) by 30 speakers of the three studied languages (10 per language). This non-linguistic to linguistic experiment revealed interesting shared pattern and variations of body representation across cultures. For instance, French speakers never described a cut on the foot as a leg injury, whereas Indonesian participants collapsed the distinction. In contrast, speakers of all three languages marked a formal distinction when describing injuries affecting fingernails or toenails in contrast to the constructions used for all the other descriptions. This observation provides evidence for a cross-culturally shared hierarchy in body part integration (i.e. fingernails are felt as being less integrated parts of our body than our hands). To determine the existence of a hierarchical structure in the representation of the body and its parts (e.g. forearm is part of the arm) a hierarchical cluster analysis was performed within each language. The results of this analysis show interesting patterns: the Indonesian and Japanese participants make a clear distinction between parts of the upper and lower body, which they grouped together (e.g. arm vs. leg), in stark contrast with the French participants who seem to attribute a particular cognitive salience to joints (e.g. elbow & knee) which leads to a quite different architecture in the representation of their body. Study 2 consists of an elaboration of the coloring task designed by Majid & Van Staden (2015). 90 participants (30 per language) were given a booklet containing pictures of a whole human body and asked to color-in the body part named on each page, using the list of terms provided by Study 1. The study confirmed some of the results from Majid & van Staden (ibid), but also revealed a number of interesting findings that remained unnoticed in the previous literature. For example, the fact that the Japanese term *ashi* could be written with two distinct characters (足 and 脚), or that there is a body part term in Indonesian (*lengan*) that exclude the [hand] segment as in French (*bras*) or Japanese (*ude*) were overlooked in the literature. We also found that the order of presentation of the stimuli had no effect on the performance of the participants, hence showing the robustness of lexicalization patterns in the three languages. Methodologically, these two studies draw attention to the pitfalls of using English as a metalanguage in semantic typology: to say that participants collapse the distinction between leg and foot implies to have already evidenced what those culturally loaded terms precisely refer to (and this has not yet been determined). We propose an alternative culturally neutral model for future research in the semantic typology of body representation.

The emergence of humor in object interaction

An agentic semiotics explanation of an *objet introuvable* by Jacques Carelman

Cesar Augusto Diaz Roa

Universidad de Bogotá Jorge Tadeo Lozano

Although different authors have proposed equally different classifications of theories of humor (Morreall 1987 proposes three groups of theories, Carroll (2014) proposes five, Gallud Jardiel 2016 proposes four great categories and twenty sub-categories), they all vary in terms of their granularity and reach. However, all those classifications share one category, and some even favor it over the others: incongruity theories of humor. Based on the plausibility of these type of theories, Carroll proposes that “someone is comically amused if and only if (i) the object of their mental state is a perceived incongruity, which (ii) they regard as neither threatening or anxiety producing nor (iii) annoying and which (iv) they do not approach with a genuine, puzzle-solving attitude, but which, rather, (v) they enjoy precisely for their perception of its incongruity. Humor is the response-dependent property that affords comic amusement” (Carroll, p. 2014, 37). Our proposal, based in Niño’s agentic semiotics, as well as P. A. Brandt’s Aarhus model of conceptual blending, will try to explain through a case study—French artist Jacques Carelman’s convergent and divergent tandem bicycles—what is, in the first place, that “perceived incongruence” proposed by Carroll.

By way of Brandt’s Aarhus model, we’ll pose said incongruence doesn’t result from the basic blending of conflicting information on the network’s virtual space or blend space (Brandt, 2014, 27), which, in the case of Carelman’s tandem bicycles would only result in two useless artifacts. It rather results from the evaluation of conflicting information between said virtual space and the base space of the network, which would in turn render the useless object humorous because of, first, the structure of the communicational situation it contains (e.g., it is presented by an artist and not a product designer, it’s part of a catalog of “impossible” objects, etc.); and second, because of the basic physical properties of the category of artifacts of the “real world” that Carelman over-rides, in order to achieve some sort of conceptual coherence: that is, in the real world, motion is a necessary affordance of a bicycle.

However, in line with Carroll’s definition, “perceived incongruence” would only be a point of departure for semiotics analysis, and we also have to account for the relationship between such incongruence and humor effects such as amusement and critical judgement. For that reason, the last part of this presentation will articulate two aspects of Niño’s agentic semiotics to the analysis: its pragmatic orientation, inasmuch as it establishes an intrinsic relation between meaning and purpose: “meaning will emerge where purpose emerges or has emerged” (Niño, 2015, p. 20); and emotions as conditions for meaning-making, since “processes thought before as exclusively cognitive, such as adding, require affective states in order to be performed” (Niño, 2015, p. 54). Thus, the purpose of humor will be explained as the production of specific affective/cognitive effects, and the success or failure of conceptual blending should be evaluated according to this purpose.

Multimodal humour in *Far Side* cartoons involving verbal idioms and proverbs

Patrick Duffley

Université Laval

The aim of this paper is to explore the relation between the visual and verbal modes of communication when idioms and proverbs are the vehicle for humour in single-frame cartoons. It represents an extension of research carried out on creative variations in idioms that violate the principle proposed by Langlotz (2006) that such wordplay is possible only with expressions in which the association between the literal and idiomatic scenes is motivated and analyzable (Gibbs & Colston, 2012; Duffley, 2013). The main body of the corpus is constituted by all of the approximately 4900 cartoons in the three-volume *The Complete Far Side* by Gary Larson. Based on Tsakona (2009)'s framework for analysing image/text interaction, two hypotheses are explored:

- (1) Due to the fact that idioms and proverbs involve two levels of meaning—a salient foregrounded idiomatic or proverbial meaning and a backgrounded literal meaning—cartoons involving idioms and proverbs should show a tendency to play on the distinction between these two levels of meaning in the interaction between text and image; consequently one should expect more cases of image/text contrast than of image/text reinforcement.
- (2) Since the visual mode is less abstract than the verbal mode, when there is contrast/contradiction between the text and the image, the latter should tend to be used to represent the literal meaning of the idiom or proverb.

The evidence confirms both hypotheses: not only do all of the cartoons play on the idiomatic vs literal levels of meaning by exploiting image/text contrast, but in all except two the cartoon drawing represents the literal sense of the idiom. This is argued to raise a question for Construction Grammar theory, which views idioms and proverbs as a paradigm case of form/meaning pairings that are “independent of the lexical items which instantiate them” (Goldberg, 1995).

“¡Accomarca vive!”

Social semiotics of music, ritual and memory in Lima and Ayacucho

Diego Fernández-Stoll Valdman

Pontificia Universidad Católica del Perú

In this presentation I will share the current outcome of my research regarding the social semiotics of music and dance as performance of traumatic memory in Perú. My investigation focuses on the staging of a massacre that took place in 1985, when the peruvian army murdered 69 citizens in the Accomarca district in Ayacucho, accusing them of being terrorists conspiring with the maoist uprising led by Sendero Luminoso. Every year since the case was taken by a peruvian court in 2010, the surviving families of the victims have organized themselves to perform a staged representation of the massive killing during the celebration of traditional andean carnivals in Lima. These celebrations involve several contests in which a community of migrants from the Ayacucho region gather in Lima, Peru's capital city, to sing and dance in groups of dozens of people known as "comparsas". These "comparsas" usually compete for prizes that involve money and recognition thanks to their ability to execute a traditional localized repertoire while providing some sort of creative innovation to their twenty minute presentations. The group known as "Asociación Hijos de Accomarca" (AHIDA) decided to stage a pantomime of the massacre during their carnival presentations in order to involve the younger generation of dancers—most of them already born in Lima—in their quest for justice and memory. During my fieldwork in Lima and Ayacucho I have followed the creative process of AHIDA, as well as the legal process regarding the families of the victims, to document and analyze the strategies for cultural transmission of traumatic memory both inside and outside the community of migrants from Accomarca in Lima. My presentation will focus on the visual methodologies used during ethnographic fieldwork and the semiotic interpretation of music and ritual in the context of contemporary urban settings in Peru.

Intellectual attention, consciousness, and understanding

Mark Fortney

The University of Toronto

This paper is about the relationship between intellectual attention, consciousness, and what it is like to comprehend speech. Intellectual attention is opposed to perceptual attention; it's the kind of attention we pay in deep rumination rather than in carefully listening to a tune.

According to a traditional view, the state of linguistic understanding is knowing what was said by the speaker's production of an utterance. But this view has been critiqued: the state of knowing some fact seems dispositional, and not always conscious, while states of linguistic understanding seem to be occurrent conscious experiences. According to some philosophers that have criticized the traditional view, linguistic understanding is having a perceptual or quasi-perceptual experience of the utterance's meaning (Hunter, 1998; Fricker, 2003). According to some other philosophers that have critiqued the traditional view, the state of linguistic understanding is having a cognitive experience of the utterance's force and content (Longworth, 2005).

Both these revisionary views are on the right track, but they seem to imply that the state of linguistic understanding is one in which an audience comprehends an utterance all at once, and in a relatively static way. But this is in tension with recent psycholinguistic research, which shows that audiences start interpreting and understanding utterances before the speaker has actually finished producing the utterance. This is shown, for example, by the fact that people have more difficulty processing sentences with incongruous endings—e.g., “They wanted to make the hotel look more like a tropical resort. So along the driveway they planted rows of palms” is easier to process than “They wanted to make the hotel look more like a tropical resort. So along the driveway they planted rows of pines” (Wlotko & Federmeier, 2015).

I give an account of linguistic understanding which is compatible with these empirical facts. In so doing I draw on William James's distinction between transitive and substantive states of consciousness. James observed that “[when] we take a general view of the wonderful stream of our consciousness, what strikes us first is the different pace of its parts. Like a bird's life, it seems to be an alternation of flights and perchings” (James, 1890, p. 243). He called the perchings of consciousness “substantive” states, and the flights of consciousness the “transitive” states. I argue that episodes of understanding an utterance are composed of a set of transitive states of consciousness of parts of the utterance's meaning rather than single experiences of the utterance's entire meaning, and that transitions from one transitive state to another are caused by a shift of intellectual attention.

Joint intentionality and embodiment

A multimodal approach

Barbara Fultner

Denison University

This talk brings into dialogue two philosophers working in disparate subfields—feminist and queer theory icon Judith Butler and Finnish philosopher of action Raimo Tuomela—in order to develop a view of joint action that does justice to its embodied nature, to the multiple forms it can take, and the multiple modalities it involves.

Joint action is a form of meaning-making. What does it take for two or more people to act together? What is the relationship between joint agency and solidarity? Many social theorists have thought that solidarity requires unity of purpose, perhaps even of identity. But as feminists and others have increasingly drawn our attention to the diversity among groups making up social movements, such unity seems harder and harder to come by. What are the conditions of possibility of joint agency across difference? On the one hand, recent research in joint agency and social ontology (e.g., Searle, 2010; Gilbert, 2013; Bratman, 2014; Tuomela, 2013; Epstein, 2015; Ludwig, 2017) has largely failed to tap feminist scholarship and critical theory as a resource. Paying attention to processes of semiosis such as the social construction of identity of individuals as well as groups, the relationality of the self, and the role of power fundamentally reframes the problem of collective intentionality. On the other hand, feminists have placed solidarity front and center of their theoretical and political projects (e.g. Mohanty, 2003; Dean, 1996; Weir, 2013) and routinely refer to collective bodies and collective action, but detailed analyses of joint action are largely lacking in feminist discourse. Rather, they have tended to conceptualize solidarity in terms of identity rather than joint action. The literature on collective agency may thus be helpful for feminist theory. In particular, Tuomela offers a fine-grained categorization of collective action that differentiates between different modes of acting in concert. Nonetheless, any such categorization must be examined and reframed in light of the above feminist critical insights. I focus particularly on Butler's emphasis on performativity and the bodily component of acting in concert as vital for an account of collective performativity. Although her focus on large public assemblies and movements like Black Lives Matter leaves out an arguably more basic joint agency at the level of dyads and small groups that greatly helps us to understand collective agency in general, collective performativity nonetheless offers a rich resource for exploring new forms of sociality and collective semiosis.

Signs of syntax?

David Hart

Ryerson University

Saussure contended that natural language is to be treated as a system of linguistic signs, and that the analysis of natural language phenomena should be guided by this principle (Saussure, 2005 [1916]). This dictum is here interpreted to mean that a model of an individual linguistic utterance or indeed of an entire language ought to consist solely of linguistic signs. Such an approach would appear to be compatible with the so-called generalization commitment of more recent cognitive and functional approaches to language, whereby language is to be characterized by general principles applicable to all linguistic phenomena in contrast to the autonomous-subsystem approach common to most structural models (Butler & González-García, 2014). The ‘general principle’ argued for in the present paper is precisely the mechanism of the linguistic sign. Alongside lexical and morphological signs (i.e. morphemes), which are widely recognized in linguistics, a complete model of an utterance would also need to represent its syntactic and communicative organization (or information structure). As an incremental step towards such a model, this paper presents the concept of syntactic signs: a category of linguistic signs tasked with signifying semantic relations which hold between the signifieds of the lexical signs that make up an utterance (Apresjan, 1992); the signifier of syntactic signs in English is claimed to be the relative ordering of the words implicated in underlying semantic relations. Linear order is but one of many possible forms of syntactic signifier, and it is assumed that different languages may use a variety of expressive means (word-form modifications, particles, intonation contours, etc.) for this purpose (Mel’cuk, 1988; 1992). The efficacy of the syntactic sign in utterance-modeling is illustrated in a number of examples, and then contrasted with other linguistic models which recognize the meaning-bearing capacity of word-order and other supra-lexical constructions, but which stop short of positing syntactic signs, introducing instead a variety of alternative formalisms which tend to obscure the semiotic affinity between syntactic and lexico-grammatical signification. These include Columbia School Sign-Based linguistics (Contini-Morava, 1995; Huffman, 2002), Cognitive Grammar (Langacker, 1987; 2006), Sign-Based Construction Grammar (Sag, 2012) and Meaning-Text Theory (Mel’cuk, 1988). Finally, it is demonstrated that the concept of the syntactic sign presented here is not only plausible from both the neurological/evolutionary (Bouchard, 2010) and cognitive/developmental points of view (Luria, 1990 [1976]; Bogdashina, 2010), but is also consistent with current research programs in biosemiotics relating to natural language, such as Hoffmeyer’s semiotic scaffolding (Hoffmeyer, 2010; 2015), the interaction between language games and thought semiosis within Brier’s cybersemiotic framework (Brier 2010), and Tønnessen’s concept of predicative reasoning as proto-language in the context of his tripartite Umwelt model (Tønnessen, 2015).

Iconicity in the body

Signaling contrast in discourse

Jennifer Hinnell

University of Alberta

Discussions of iconicity in gesture have focused predominantly on lexical and depictive expressions; e.g. holding two hands in front of one's torso as if holding a steering wheel to indicate that one is driving (LeBaron & Streeck, 2000). More recently, studies in gesture have examined clusters of co-speech behaviour that may accompany pragmatic information (Debras, 2017; Schoonjans, 2014). In this study, I investigate iconicity in kinesic expressions of CONTRAST—the valuing of one position against another. The conceptual binariness inherent in contrast is paralleled by a binariness in the movement that co-speech bodily articulators can take: shoulders moving up/down, hands moving in/out, and head tilting or gaze shifting from side-to-side. Using videos gathered from the Little Red Hen™ (Steen & Turner, 2013), this qualitative study examines the verbal and embodied means of expressing CONTRAST in North American English.

The prototype (or, indeed, archetype) for embodied expressions of contrast in English is the fixed expression *on the one hand...on the other hand*, in which manual gestures performed sequentially on opposite sides of the body by the left and right hand depict the options or contrasts inherent in the expression. However, English speakers have a variety of other linguistic means without explicitly mentioning the hands for expressing opposition or contrast: the logical operator *or*; phrasal units such as *by contrast* and *whether (or not)*; semi-fixed idiomatic expressions such as a David and Goliath situation; lexical pairs (e.g. *offense/defense*); and modal verbs (*should I.... (or) should I....?*), to name just a few.

These expressions are often accompanied by the same bilateral embodiment of contrast as seen with *on the one hand...on the other hand*, but without the overt reference to the body in the linguistic expression. Using data from the Distributed Little Red Hen multimedia database (Steen & Turner, 2013) and 3D motion capture data of natural dialogues from speakers of North American English, I examine a range of expressions of contrast in English and document which bodily articulators are active and to what degree with different expressions. Co-speech behaviour is annotated according to established schemas (Bressem et al., 2013). Results show that the signaling of contrast is accompanied by a range of predictable bodily behaviours that iconically represent the binary notion of contrast.

Dynamic multimodal blending

A cognitive reading of Stanley Kubrick's Bone-Spaceship Match Cut in *2001: A Space Odyssey*

Brad Jackson

University of British Columbia

Multimodal artifacts construct meaning through the cross-modal integration of linguistic phenomena as well as images and embodied behaviours. The focus of this paper is on how cognitive linguistics tools (such as framing, blending, and image schemas) can explain the ways in which meaning emerges in modalities that are non-verbal—specifically, the visual mode—and how meaning produced in the visual mode crosses over to other modalities.

Specifically, this paper will examine the bone-spaceship match cut within Stanley Kubrick's *2001: A Space Odyssey* (1968) to show how meaning emerges through dynamic cinematic images, and how such images engage with all the associative spaces of a film's narrative. The bone-spaceship match cut is a scene in *2001: A Space Odyssey* wherein Kubrick compresses the narrative and temporal shift from prehistory to the not so distant future using dynamic moving imagery and juxtaposing like images in subsequent shots. The joint effect of dynamic images, represented types of motion, and film editing techniques contribute to a complex, narrative-wide construction of a temporal shift that spans millennia, and gives meaning to the entire narrative. This proposal relies on notions of conceptual blending (Turner, 1997; Fauconnier & Turner, 2002; Oakley & Pascual, 2017), framing (Fillmore 1982) and material anchors (Hutchins, 1995, 2005).

There are three key conceptual elements that add to the understanding of the bone-spaceship match cut: 1) the bone spins in a counter-clockwise and clockwise direction materially anchoring the concept of the hands of a clock through circular motion and image similarity, so that in the following shot of the spaceship the viewer understands that a temporal narrative shift has occurred; 2) the upward progression of the bone (and its final position in space, without any landscape features in sight) maps onto the destination of the spaceship in the following shot to signify the technological development of human civilization over thousands of years; and, 3) the narrative construction of the bone as a tool, within the first narrative space of the film, is compressed into the image of the bone and graphically matched with the spaceship so that the spaceship metonymically evokes the concept of technology in all of the subsequent narrative spaces. By elaborating upon the compressions and decompressions of frames within and around graphic images in film, an analytical approach to such dynamic visual blends can reveal the ways in which images add meaning to multimodal narratives.

From gesture to sign

Grammaticalization and pragmaticalization of fictive questions to focus in Catalan Sign Language

Maria Josep Jarque and Esther Pascual

Zhejiang University

In signed languages the question-answer pattern seems the most unmarked way of expressing topicality, focus, conditionality, connection, and relativization (Jarque 2016). Such questions thus serve to set up a non-genuine interaction for grammatical or discursive meanings (Pascual 2014). An example of fictive questions for focus is:

HELLO [GROUP DEAF VIC COUNTY]c.e. WE ORGANIZE FOUR LSC.VIC.LIFE [LSC.VIC.LIFE WHAT]f.e. INSIDE CONTEST MONOLOGUE [DAY] c.e. 19 OCTOBER 2011 [NOW] c.e. 3 UNTIL 9 [PLACE]f.e. VIC p ATLÁNTIDA ITSELF gesture:points to building

Lit. 'Hello! *The Deaf Association of Vic and county?* We are organizing the fourth edition of 'LSC Vic Life'. *What is 'LSC Vic Life'?* A monologue contest. *What day?* The 19th of October 2011. *What time?* From 3 until 9 [pm]. *Where?* In Vic, at La Atlántida.'

'Hello! We at the Deaf Association of Vic and surroundings are organizing the fourth edition of 'LSC Vic Life', a monologue contest, which will take place on the 19th of October 2011, from 3 until 9[pm], in Vic, at 'La Atlántida' (i.e. a theater).'

We examine fictive questions to express focus in Catalan Sign Language, through 40 informational and opinion TV and vlog texts by native or near-native signers. We discuss three fundamental processes. First, gestural elements of actual questioning from the surrounding spoken Catalan language (eyebrow rising, head movement) are 'recruited' for a linguistic function in Catalan Sign Language, and after a process of ritualization, automatization, formal reduction, abstraction, and schematization (cf. Haiman 1994)—these gestures-turned-signs are used to express genuine information-seeking questions in the signed modality. Second, the signs for actual questioning become grammaticalized and constitute the by-default sign markers to encode discourse focus (as well as other functions). Third, fictive questions used for focus become the prototypical discourse structure in the announcement genre in Catalan Sign Language, thus illustrating a process of pragmaticalization.

We argue that in Catalan Sign Language the question-answer pattern is a highly schematic symbolic unit and that the specific linguistic constructions involved form a complex network. We show that intersubjectivity allows the ritualization that eventually leads to the grammaticalization and pragmaticalization processes of the skeletal question-answer structure. Lastly, we conclude, together with Jarque (2006, 2016), Shaffer and Janzen (2002), and Wilcox (2004, 2007), that grammatical signs may emerge from gesture sources in the multimodal interaction of the surrounding spoken language.

Enactive constitution, neuroscience, and metonymy in philosophy

Don Jones

University of Central Florida

What would an enactivist say about meaning problems in philosophy? In “Making Sense of Non-sense” Tom Froese talks about the “the experience of non-sense” given the framework of enactivist views of perception. Can one, and if so, how, does one understand the development of meaninglessness within an enactivist perspective? What evidence do we have to answer that question? I think the answer depends primarily on the notion of constitution used by the enactivist. Overall, I will argue that on some main conceptions of constitution, some research in neuroscience supports the thought that to the extent that some philosophy remarks are analogous to metonymy, even if a kind of nonsense, they are coherent with standard versions of enactivism. Tom Froese suggests one way of seeing the problem for the enactivist:

[I]f all cognition is situated sense-making, then how shall we account for cognition of the absurd? How should the enactive theories characterize non-sense, and the fact that it plays a major role in our cognitive life through abstract and symbolic concepts? The problem is not only that enactivism cannot rely on wrong, missing, or “blank” representations to differentiate between meaningful and nonsensical events, but also that it often seems to implicitly assume that every directed form of practical engagement with the world not only can but – to some extent – must be inherently productive of sense. But is it correct to assume that the cognitive horizon described by enactivism is entirely saturated with sense? (Froese, 2012).

Indeed, it seems that enactivism is accompanied by an assumption of saturated sense. While my focus in this paper is on meaning problems just in philosophy, Froese’s broader statement would seem to include those. What can saturated mean in these contexts? In an earlier paper, I referred to saturated enactivism as “the pragmatists’ dream”: What is saturated enactivism, if anything? Along the way, I will try to address this question. To develop the connection with philosophy, I borrow some thoughts of Ludwig Wittgenstein about secondary sense, link those to remarks by Cora Diamond about philosophy statements, liken such philosophy statements as analogous to metonymy at least in part due to conceptions developed by George Lakoff, link the conceptions of metonymy to the kinds of enactive constitution presented by Shaun Gallagher, and cite some neuroscience research used by Gallagher along with some original research by Irene Mittelberg on metonymy. Using these thoughts, I conclude that some research in neuroscience supports the thought that to the extent that some philosophy remarks are analogous – to metonymy, even if a kind of nonsense, they are coherent with standard versions of enactivism. I show that with either of the notions of constitution as conceptualized recently by Shaun Gallagher (“New Mechanism and the Enactivist Concept of Constitution”), enactivist views imply an ability to handle metonymy as developed by George Lakoff and as it occurs in philosophy. The neuroscience cited by Gallagher and the original neuroscience research by Mittelberg is consistent with enactivist conceptions of the constitution of metonymy. As a postscript, I consider, following Gallagher, that presentations of enactivist constitution are commonly criticized as confusing causation with constitution. Surprisingly, I think, when talking about causation versus constitution, it will turn out that it would seem to matter whether one is talking about the brain doing the enacting or the person doing the enacting.

The semiotics of surgical safety and team-based communication in the operating room

Cait Jordan, Felipe Sarmiento and Kate Sellen

OCAD University

Preventable medical errors in the Operating Room (OR) account for the third leading cause of death in North America (Baker et al, 2004; Donaldson, Corrigan & Kohn, 2000; Sarker & Vicente, 2005). As technical skills are prioritized within the surgical environment, communication is considered a non-technical skill with minimal training provided (Greenberg et al., 2007). Current forms of communication are generally invisible and ambiguous during high-stress situations or medical emergencies and may be misinterpreted (Leonard, Graham & Bonacum, 2004; Lingard et al., 2004; Xiao, Seagull, Mackenzie, Ziegert, Klein, 2003).

Surgical team members indicate levels of engagement with one another through various modalities, such as a change in body position or a slight touch (Moore, 2011; Norris, 2004; Van Leeuwen, 2005). Multisensory communications (body movement, gaze, touch, gesture, speech, sound) contribute to the ability to create meaning in various human contexts (Moore et al., 2010; Norris, 2004; Van Leeuwen, 2005; Kendon, 1964; Kendon, 1997; Klatzky & Lederman, 1987; Klatzky & Lederman, 1999; Kress & Van Leeuwen, 2001). All modalities are equally relevant to the success of a surgical team yet are not clearly defined, practiced or evaluated in this environment (Greenberg et al., 2007; Lingard et al., 2004; Moore, Butt, Ellis-Clarke & Cartmill, 2010). Therefore, a gap remains in the ability of teams to learn and acquire an understanding of the various communication modalities available and to further build strategies for applications in professional practice. To create a more engaging learning environment, the use of serious games can aid in the development and understanding of multisensory communication modalities (Graafland et al., 2014; Guo, Singer & Bastide, 2014; Qin, Chui, Pang, Choi & Heng, 2010).

Serious games provide a safe and reliable environment where teams can engage with tangible tools in order to practice real-life scenarios through flexibility, collaboration and humour (Arnab et al., 2015; Baby, Srivastav, Singh, Suri & Banerjee, 2016; Ushaw, Eyre & Morgan, 2017). If mismatches in communication modalities can be identified and prioritized, teams can become adaptable to the requirements of the procedure and ultimately contribute to patient safety. Two serious games have been developed for use during surgical team trainings and debriefs to encourage connections between context and meaning of various communication modes. The first game is an introduction to multisensory communication modes engaged during a procedure in the form of a humorous card game. The second game supports surgical debriefing sessions where team members assess video footage of procedures and provides an increased challenge by building strategies for deliver multisensory communication.

Participants include laparoscopic surgical staff members at St. Michael's Hospital and the Surgical Safety Team (SST) in Toronto, Canada. Video recordings have been reviewed with the SST to better understand current gaps in team communications. Review of video footage included assessments of non-technical skills, focusing on key areas of communication: delivery, response and feedback. Initial stakeholder interviews and co-design sessions (Sanders & Stappers, 2014) have

demonstrated the need for tangible tools for the ongoing development and practice of team communications. Difficulties with learning varied team communications have been outlined. Upcoming workshops with surgical nursing staff and residents will confirm the functionality and use of the games for improved team communications and strategic development and provide feedback for continued prototyping. Further assessment will consider how team member learn to read and interpret multisensory communication cues based on surgical specialties and roles. If a consistent language and understanding can be developed across teams, meanings may cease to be misunderstood.

The thing of meaning

Two quite modern semiotic experiments and a quite archaic interpretation of their results thereof

Skirmantas Junevicius and Eugenija Juneviciene

Independent Scholars

Cognition is categorization (S. Harnad 1987). Categorization might take a variety of different forms—each one might be absolutely natural for associated mentality (and might appear to be nonsense for the other).

This paper explores the kind of mentality that is documented by ancient Stoic logicians in the formula LOGOS = LEMMA + EPIPHORA and their texts expanding on it (where epiphora is sometimes substituted by epagoge, sêmeiōsis, or a similar near-synonym).

The Stoic kind of mentality appears to agree with the corresponding kind of categorization. The latter, i.e. the categorization of the stated kind (epiphoric categorization), together with the corresponding response based interaction with the accordingly categorized environment is claimed to be a standard practice of sustaining in the archaic human reality, which once was believed to consist of agent-like (“theonymic”) phenomena (contrary to the one that apparently should consist of “things in itself”).

Following that claim, the repertoire of responses is argued to be the basis for the initial human vocabulary—not the parts or “impersonal” features of the external world, as sometimes it is presumed.

A call is made for rethinking available linguistic data bases. New lines in the development of semantic genera have been suggested. The issue of archaic mentality is approached through the interpretation of results brought forward by two great experiments.

The Pavlovian experiment on conditioned responses in dogs makes it easier to accept two seemingly unrelated meanings of epiphora—Galenic “excessive salivation” and “conclusion” of Stoic logicians—as cognates within the broad semantic field of similar not immediately obvious cognates.

The experiments carried out by Seyfarth and colleagues expose the possibility of choice between lemmic and epiphoric types of categorization in building naming conventions: “alarm call for leopard” vs “invocation all up into trees” and “alarm call for eagle” vs “invocation all down to dense cover at earth”.

The initial approach towards the mentality of ancient logicians is complemented by the analysis of what they were talking about. That, however, is not the analysis as usual: it is not about the Stoics—it is about the history of human mind. Its aim is not to provide the best possible translation of ancient philosophic ideas into the language of modern human beings or to present them as very smart—its aim is to demonstrate the untranslatability of the categories they used and the oddity of the mentality they lived with.

Qualities of sensation and knowledge claims

Michal Karla

Charles University in Prague

This paper considers the so-called “knowledge argument for qualia” (Jackson, 1982: 128ff.) from the perspective of Peirce’s account of sensation and its role in cognition. According to this argument, the phenomenal, qualitative dimension of perceptual experience (sensation) cannot be captured in terms of “physical information” (1982, p. 127)—if knowledge of what it is like to be in a particular phenomenal state cannot be derived from the totality of physical facts, the state is not physical and, therefore, physicalism is false. Such an argument rests on the assumption that qualia are informative, that to have a quale is to know something, something unknowable by any other means. A Peircean analysis of this assumption is the subject of my paper.

Peirce presented at least two accounts of how sensation (or, more broadly, perceptual experience) functions as an element of cognition. Both early (e.g. 1866–7 MS 740; 1868, W 2: 211–242) and later (e.g. 1903, EP 2: 226–241) versions of the theory, however, present the same central thesis: a character of sensation is accessible only by means of hypothetical, or abductive, inference. If considered in abstraction from that inference, sensational quality is entirely incomprehensible and does not bring about any knowledge. According to the early theory, a sensation (quale) is understood as a “simple conception” produced by “nominal hypothesis” (1866–7, MS 740: 648).

In this way Peirce’s account can be seen as a precursor of modern approaches explaining qualia as “modes of presentation” (as summarized by Prinz, 2012: 308ff.), most particularly as either “recognition concepts” (Loar, 1990) or “phenomenal concepts” (Stoljar, 2005). It shares with the latter the thesis that phenomenal state’s quality is not a new fact to be known but rather a mode of how some fact is known. My aim is to sketch-out the ways in which the Peircean perspective can be utilized to support the modern modes of presentation strategy and answer the objections raised against it. I will defend the claim that Peirce’s theory meets all the requirements for a non-dualistic solution of the knowledge argument stated by Prinz (2012, pp. 303–317). Besides, it has the advantage of avoiding not only ontological dualism (phenomenal/physical properties) but an epistemological dualism (direct access to mental states/indirect access to objects via mental states) as well.

Integrating critical stylistics and visual grammar

A multimodal stylistic approach to the analysis of non-literary texts

Shatha Khuzaee

University of Huddersfield

The study offers, on the basis of several on-line news articles concerning the so-called Arab Uprising, a multimodal stylistic account of the meaning negotiation process taking place between the text/image and the reader. Informed by Halliday's (1978, 1994) Systemic Functional Linguistics, Kress's (2010) Functional semiotics and Jeffries' (2010) Critical Stylistics, the study integrates three tools developed by the framework of Critical Stylistics, namely, transitivity, naming and prioritizing with their equivalents from Kress and van Leeuwen's (2006) model of visual grammar. These integrated tools introduce a new method on how multimodal texts can be analysed on the ideational level of meaning using the semiotic resources available to the linguistic and the visuals systems. Analysis shows that these tools can account for the process of meaning making in multimodal texts on the textual-conceptual level. The analysis also shows that using these tools can investigate how both modes reinforce, extend, add or suppress the meanings made in the multimodal texts. An important result gained by analysing texts using these tools is that they offer a better understanding of the concepts of text, co-text and context that has an effect on reducing the number of possible interpretations of the meaning suggested by the image as text. Considering linguistic and visual text as equivalent units allows analysis to explore what potentials each mode can afford to make meanings that the other mode might stop short to provide. The three tools proposed in this study can be regarded as the first step into designing a well-defined set of tools to explore meaning making on the textual conceptual level of meaning. The use of definite set of tools that operate on one level of meaning making, namely the ideational meaning, makes the analysis achieve more rigour and replicable results. Moreover, the use of news texts in the analysis compensate for the lack of analysing such types of texts within the multimodal stylistic approach were the main concern were on different types of literary texts.

Cognitive science for cognitive semiotics

Between 4e approaches and cognitivism

Piotr Konderak

Maria Curie-Skłodowska University

One of the initial visions of cognitive semiotics stressed the prevailing role of enactive cognitive science (cf. Zlatev, 2011). A closer analysis of the enactive approach, however, shows that the situation is not so clear-cut. I will argue that reference to enactivism in the context of studies on meaning-making is insufficient and may be confusing (cf. Hutto & Myin, 2012). The extension of a view on cognition to 4e approach—embracing enactive, embodied, embedded and extended views—improves the situation, but simultaneously it gives rise to new problems (e.g. consistency of these views). These doubts make the reflection on views on cognition indispensable. Accordingly, I attempt to assess the putative role of both: cognitivist and non-cognitivist (i.e. 4e) approaches to meaning-making processes. Specifically, I discuss the following areas of inquiry:

- **boundaries of the mind** (as a meaning-making system): non-standard approaches stress the role of brain-body-environment interactions, but contemporary cognitivism does not close meaning-making processes inside the head either: the notions of exploitative representation and wide computation (Wilson, 1994) in combination with the complementarity principle (Sutton, 2010) allow for extension of cognitivism beyond boundaries of the skull;
- the role of **representations** in explanations of meaning-making activities: I suggest that the opposition between representationalism of cognitivism and anti-representationalism of enactivism should be replaced by so-called revisionary representationalism (Clark & Toribio, 1994). This stance postulates application of a spectrum of various kinds of representations in explanations of cognitive processes—depending on the task at hand;
- the role of **embodiment**: the very claim about embodiment can be interpreted as an explanatory thesis, a dependence thesis and a constitution thesis (Rowlands, 2010). I argue that the former two interpretations can be squared with cognitivism, the latter—drawing primarily on the phenomenological notion of embodiment—favors non-cognitivist explanations;
- the **empirical basis** of studies on meaning-making: I argue that in this respect standard cognitive science seems to dominate, even if it is no longer “the only game in town”. In other words, it is hard to deny that the application of non-standard frameworks in empirical investigations is still somehow limited.

My ultimate conclusion is that cognitive semiotics needs a conciliatory approach to cognition (and meaning-making), an approach combining elements of standard cognitive science and non-standard approaches. Rowlands’ (2010) idea of the amalgamated mind shows that it is not a Utopia.

The semiotics of photography

Towards objective hermeneutics

Salvador Leon

ESAV Superior School of Visual Arts

This article proposes a semiotic analysis of photography, based on different scientific findings about visual perception; such as those of neurobiologist Margaret Livingstone, that explain how we process visual information in our brains via two separate visual systems: ‘What’ and ‘Where’. We apply her research to devise a technique for objectively interpreting photography. Neurological, physiological and evolutionary findings serve us to explain and expand upon the findings from experimental psychologists like R. Arnheim, with the ‘skeleton structure of the square’—that let us understand figure placements, balance, and direction within a photo frame—and other experimental psychologists published by (AAP) on how chromatic data is arranged (hue, tone, and saturation) to produce meaning.

The analysis presented here is based on the hypothesis that when we experience or observe photographs, two simultaneous readings occur; these is the emotive reading and the conventional reading. Thus, we form a third reading—that is the associative reading—and by these we can decode the total meaning of the visual work of photography, something that will not only help us understand its meaning, as part of the audience, but will help artists and designers to optimize their work.

Mainly, our methodology builds upon the recently published *Semiology for Artists and Designers*, by Dr. Jaime Jimenez Cuanalo—currently being applied intensively at ESAV—that seeks to facilitate the understanding of the meaning—to improve the hermeneutics—of the photographic image. This in a very different path from the more ideological proposals of currently more commonplace authors such as Barthes, Flusser, Fontcuberta, Dubois, James Elkins, and others, built more on philosophical and poetic considerations, rather than on the state of knowledge about our body perceives, processes and responds to information.

Genuine triadicity in computation, cognition and consciousness

David Lidov

York University

Charles Peirce insisted that a sign, to be a sign and to effect a representation, must engage a genuinely triadic relation, one that can not be reduced to a complex of dyadic relations. His formulation lets us understand why a hand calculator can provide you with the answer to an arithmetic exercise without engaging in semiosis even though you, in order to understand the result, must be involved in semiosis, engaging, minimally, a Representamen, a Sign-Object and an Interpretant. Information technology adopts the word “representation” but normally, in IT, descriptions in terms of triadic relations (representations) tells us nothing that we could not learn from descriptions by dyadic relations (rewritings).

It is not as obvious as we might wish how we should distinguish irreducible triadic relations from those that are equivalent to complexes of dyadic relations. Yet, the failure to attempt this distinction leads to mystification where semiotics deals with biology, computation and even unconscious psychology. Peirce himself added to the confusion with his well-known thought experiments that describe the behaviors of sunflower reproduction and the reflex of an amputated frog leg in unwarranted semiotic terminology. Anything *can* be taken as a sign, but semiotics’ special insights accrue where we consider what, in its own context, not ours, *must* be taken as a sign (Lidov, 1999/2017).

Like many, I find the hint of a link between genuine triadicity and consciousness tantalizing. Dare we accept that distraction? Dare we ignore it?

Current developments do suggest that genuine triadic relations may be inherent in some classes of computation and animal behavior. Roughly speaking, this role for triadic relations is suggested where a learning ‘system’ starts from a representation of an action or situation and advances a hypothesis-like query or amendment to test or develop that representation. Reports such as one about honey bee learning that recently flamed on the internet, proposals like Jeff Hawkins’ (2004) for bidirectional computer learning, writings by Evan Thompson (2007), Shaun Gallagher (2017) and many others may indeed oblige us to recur to semiotic theory for adequate models, but such a fresh turn can not show its real colors if we do not clean up the reigning and widespread confusion about representation. To do so we need not “semiotics of” but a critical “general semiotics”.

Modality effects on the emergence of structure in communication

Hannah Little

University of the West of England

Combinatorial structure (meaningless units combining into meaningful signals) and compositional structure (meaningful units combining into bigger meaningful units) are almost ubiquitous in human languages. But which came first? Combinatorial structure is sometimes seen as a basic prerequisite for more advanced combinations involving meaning. There are examples of combinatorial systems within animal communication where units within combined signals are not connected to their meanings when produced alone. However, humans do not often produce novel signals without structure that mirrors a meaning space in some way, either through iconicity or compositional structure. As such, linguistic structure likely originated as compositional. Indeed, emerging sign languages exist that are fully expressive languages without a level of combinatorial structure (Sandler et al., 2011).

Little et al. (2017) argued that emerging sign languages can go through a phase where they do not use combinatorial structure because they have more possibilities for making distinctions between signals, meaning more signals can exist before combination of those signals becomes necessary. If a modality allows for many holistic signals, then a system is likely to adopt compositional structure first, as in emerging signed languages. If, however, a modality is a lot more restrictive in the number of distinct signals it can produce, as in speech, then combinatorial structure will become necessary a lot more quickly to aid discrimination.

In animal communication studies, structure is often linked to the cognitive abilities of the animals in question. One confound that is rarely considered is the modality being used. However, structure is always defined using its relationship to meaning, and a signal's relationship to meaning is tied to the flexibility of the modality being used. If a species only has either the physical or cognitive capacity to produce two different signals, then when a need for a third call arises, they only have the option to combine the two calls they already have. How we define this structure depends on how related the meaning of the combined signal is to the meaning of their individual parts. This dependency may be happenstance, especially considering that animals are often only concerned with communicating a very small number of things. Accordingly, the mechanisms leading to structure labelled both combinatorial and compositional in animal studies may be more similar than they are different.

In this contribution, I will set out a theoretical framework outlining the dependencies between the modality being used and how structural behaviour emerges and is defined.

Walking Montreal's Chinatown as a speech act

Kay Ma

Independent Scholar

Semiotic scholarship has examined and criticized concepts of the Other, yet little has been discussed about walking as an ethnographic experience. To expand on the concept of walking as a multimodal speech act, we must first understand how moving one's body through a planned space signifies a mode of speech. Then, we must determine the various spaces, places, and land that one is covering while walking. In this regard, I propose that Chinatowns give semioticians a perfect setting in which to read an ethnicized neighbourhood through its symbolic exchanges.

The talk will ground itself in the semiotics of museums and everyday life in order to show that Chinatowns are a planned part of a visitor's experience. I will discuss Barbara Kirshenblatt-Gimblett's readings of museums, their folklorization of culture and ethnic displays, as well as Umberto Eco's idea of hyperrealities in order to reveal the previously misunderstood connections between how pedestrians make meaning through walking a neighbourhood located inside a city. A metaphorical, metonymic, in context, in situ, substitutive, and descriptive analysis of phenomena in Montreal's Chinatown is offered via Michel de Certeau's idea of walking and crossing bridges, as well as Gunnar Sandin's Vista Observation Analysis. Semiotic analysis will be used as an insight into modes of thought in the creation and reception of a space that compel one to think and behave in certain ways.

This talk offers ways in which such entities as the individual, the neighbourhood, the city and translocals are cognitively embodied in a mimesis of global and intercultural signs.

This project, by closely examining the act of walking in Chinatown in a North American city, sheds new light on the issue of covering symbolic ground of a peoples displaced from one location to another, whether as a tourist in one's own city visiting an ethnic neighbourhood, or as a member of a diaspora living in that neighbourhood. By reading multimodal experiences of place through the lenses of urban semiotics and semiotic anthropology, this talk reinforces cognitive semiotics' ability to identify and analyze meanings created through different ways of experiencing the world.

The Aristotelian Universals and Mendeleev's Periodic Table

Anna Makolkin

University of Toronto

Contemporary semiotics, having its origins in the pre-Socratic legacy, tends to overlook Aristotle's contribution to the Doctrine of Signs and, particularly, its manifestation in the cognitive trajectory of the modern scientific discoveries. Aristotle begins "Prior Analytics" with the clear formula of the triadic pathway of cognition: First, we must state the subject of the enquiry and what it is about, next we must determine what a proposition is, what term is, and what a deduction is (1984, vol. 1, p. 39).

In the same work, Aristotle introduces the terms "extreme signs" and "single signs" while his complete classification of signs is spread over the entire corpus of his work. We shall follow only the "universal signs," as most significant for the scientific discoveries, the determination of the universal laws, phenomena and qualities (1984, vol. 1, p. 113).

The Aristotelian universal signs paradigm will be demonstrated by the case of Mendeleev's Periodic Table of Elements which not simply applies Aristotle's cognitive formula but also uses his universal sign hypothesis for the historic discovery in chemistry.

Dmitry Mendeleev (1837–1907) presented his paper "The Concordance of Properties and Atomic Weight" in 1869, having marked a transformative phase in chemistry and contributed to the principles of cognition. He came to the discovery, treating the atomic weight as a universal sign and using Aristotle's concepts.

We will present a single cognitive pathway, representative of the general universal route outlined by Aristotle. In the process, we shall also reveal the role of memory in the cognitive triad.

Accounting for urban futures

‘Dwelling’ and historic accounts in the grounding of urban planning discourse

George Martin

York University

Recent interest in smart cities and algorithmic governance together with the emergence of the subfield of urban media archaeology (Mattern, 2017) provides an occasion to reconsider the basic ways people participate in urban planning and the methods of communication they use when engaging the future of the city. My paper takes a step back from media technology to consider Conceptual Metaphor Theory (Lakoff & Johnson, 1980) and ethnomethodology (Garfinkel, 1984) as platforms to examine low-end, practical, ways people organize cities through discussion, argument and rhetorical conventions, or what may be called the vernacular of urban planning. By examining transcripts of municipal urban planning committee meetings, I ask how historical accounts, such as autobiographical reports or storytelling, relate to the metaphor making is dwelling. While considering Heidegger’s well-known notion of dwelling being prior to building, making is dwelling in historic accounts is treated as evidence of ad-hoc methods participants formulate to situate their talk within the fluctuating and indeterminate experience of city life. To examine this hypothesis, I ask two main questions. The first concerns documenting rhetorical techniques of engaging in a discourse about urban planning. Specifically, how does making is dwelling appear in rhetoric addressing the merits of architecture or land development? The second question is more theoretical in that it considers how such rhetorical methods underpin the construction of a common order grounding the practice of city-making.

How do historic accounts founded on making is dwelling authorize a participant’s talk in the collective project of organizing the city’s future where this talk is accountable to other participants? In other words, how does their talk confront the phenomenon of making something in common? By responding to these questions, the I aim to draw attention to everyday practical methods of communication in city life at a time when information technologies take on a growing role in reshaping the social and physical fabric of urban communities.

Psychographic profiling, a-signifying machines & the cognitive management of meaning

Sophia Melanson

York University / Ryerson University

Though ample discussion related to phenomenology, language, behaviour, cognition, reasoning, metaphor, perception and embodiment has been presented within the pages of a recent publication entitled *Meaning, Mind and Communication*, little has yet been offered among scholars of cognitive semiotics in confronting the distinct ways that new media technologies challenge our traditional understanding of the human production and cognitive management of meaning.

The integration of digital media research within existing discourse on modes and modalities using a cognitive semiotic approach will produce meaningful insights relative to contemporary intersubjective experiences. As digital culture and its neoliberal appendages gradually influence the banal textures and rhythms of commonplace existence, cognitive semiotics must account for new media's role in generating meaning intersubjectively. This paper will evaluate recent revelations surrounding *Cambridge Analytica's* questionable practice of gleaning personal data from Facebook in order to psychographically profile users. The affective, socio-cognitive implications of digital profiling techniques on intersubjectivity will be the target of such an evaluation. This paper will argue that through increased exposure to the signifying byproducts of a-signifying mechanisms (i.e. technological protocols, code, software), the heavily habituated routines of mobile devices render the human mind vulnerable to algorithmic constitution of meaning. The hypothesis underlying this argument is that mental schemas ("rules" that we mentally construct for ourselves according to our experiences to help us process information more efficiently, relevant to Zlatev's 2007 concept of mimetic schemas), of the human mind may be calibrating to the pervasive and, to some degree, imperceptible ways in which algorithms direct our interactive habits online and, therefore, to the ways that the mind interprets and shapes meaning. In exploring this hypothesis, this paper will present Guattari's a-signifying semiotics as a serviceable model for illustrating how non-agentive technological mechanisms (mobile devices, social media platforms, algorithms, etc.) direct the nature of signification and, thus, the content and expression of meaning. In doing so, Guattari's model (Langlois, 2011) will guide an examination of the ways in which digital profiling mobilized through technological protocols shape signifying content that elicits the most targeted and affectively charged mental responses (Chun, 2018) to politically and economically directed communications. Even more significantly, this paper will put forth the possibility that the patterns and rhythms of digital logic are disciplining our mental schemas to process information in particular ways that may be conducive to heuristic and homogenized forms of reasoning.

The logic of Galileo

Cognitive multimodalities in scientific modeling

Christopher S. Morrissey

Trinity Western University

The logical distinctions made by John Poinsot, in his *Cursus Philosophicus* (1631–1635), about induction (i.e., “ascending” induction vs. “descending” induction) can clarify the logic of scientific thinking that William A. Wallace discusses in his historical treatment of science’s “demonstrative regress” in *The Modeling of Nature: Philosophy of Science and Philosophy of Nature in Synthesis* (1996).

This paper uses symbolic notation to more closely track the logical structure implicit in the scientific reasoning of the scientific demonstrations discussed in Wallace’s book, thus further clarifying how scientists reason about cause and effect.

Wallace has shown how Galileo learned the “demonstrative regress” (*regressus demonstrativus*) from the tradition of the art of discovery. In the regress, an a posteriori demonstration quia is convertible to a *propter quid* demonstration when the cause is observed, through careful and deliberate experimentation and dialectical reasoning, to be convertible with its effect.

In John of St. Thomas, this “demonstrative regress” is clearly described with three key distinctions: (1) ascent (*ascensus*) from sensible effect to intelligible cause; (2) deduction (*sylogismus*) as the work of the discursive intellect; and, finally, (3) induction or, better, “retroduction” (*descensus*) from intelligible cause to sensible effect.

Abduction intuitively abstracts a cause from the sensory data; deduction rationally draws out the consequences of this sense-based intellectual intuition; and then “retroduction” tests the deduction’s insight against further sense experience in order to strengthen the initial abductive intuition (or to revise it in light of new sensory data).

If a tree falls in the forest, what direction does it fall

Writing direction's role in mental simulation

Kevin Newhams

Case Western Reserve University

Combining two previously separate lines of research, the present study tests an easily replicable (and translatable) experiment design and provides preliminary evidence of writing direction's role in mental simulation. Mental simulation is a largely unconscious process that plays a key role in language comprehension by reactivating relevant prior knowledge to accurately simulate information as it is presented (Zwaan & Pecher, 2012). Writing direction leads to an unconscious bias when presenting, receiving, and interpreting information that is congruent with one's writing direction (Maass, Suitner, & Deconchy, 2014). The present study examines whether this writing direction bias extends to mental simulations, leading people to more quickly identify directionally congruent than incongruent information. A go-no go task presented simple action sentences ("The man runs.") aloud via computer speakers followed by a silhouetted image. Participants responded only when the image matched the sentence and saw an equal number of images from four image categories: matching directionally congruent, matching directionally incongruent, non-matching congruent, and non-matching incongruent.

Control stimuli were adapted from Zwaan, Stanfield, and Yaxley (2002) and were shape, instead of direction, congruent or incongruent, helping to keep participants unaware of the studies true nature. As predicted, response times were significantly faster for rightward-facing matching images than leftward-facing matching images and there were no significant accuracy differences between any image categories. These results support the hypothesis that direction is activated during language comprehension and biased by writing direction. Future studies will need to look at right-to-left languages and bilinguals in both to build upon these initial findings.

A quantitative analysis of the use of emoticons by cameronian youths and young adults

Herbert Rostand Ngouo

University of Maroua

The development of Information and Communication technologies (ICT) in Africa and in Cameroon particularly has fostered digital literacy as well as electronically-mediated communication (EMC). One of the signs of digital literacy is the use by competent users of emoticons on Facebook conversations to summarize their thoughts. This paper makes a quantitative survey of the choice of emoticons on Facebook conversations by Cameroonians aged between 15 and 45. The data were collected using a multiple rejoinder discourse completion task (MRDCT) in which 300 participants were asked to express emotions to suggested information on emotional events using an emoticon followed by a short phrase or sentence to indicate the illocutionary force (Dresner & Herring, 2010). The task was administered in English as well as French. The conversation situations on social events included expression and reaction to expression of love, failure in exams/loss of job/missing job opportunity, the death of a dear one, success in exams, announcement of courtship and wedding/ birth of a child. Some research assistants participated in the data collection. Information on the social background of the participants was collected and associated with the answers. All these were coded and analyzed using Sphinx.

The data show that emoticons to express feelings like love are used systematically by 90% of the participants irrespective of their age, personality and occupation. Other emotions were expressed using a variety of emoticons. The phrases and short sentences used were also compared with the emoticon used in each situation. They gave more cues to the emotions represented by the icons, thereby allowing the interlocutor to guess what the signer actually meant (signified) with the visual form (the signifier) (De Saussure, 1916).

The development of conceptual blending in children

A proposal

Douglas Niño

Universidad de Bogotá Jorge Tadeo Lozano

In their Conceptual Blending Theory, Fauconnier and Turner (2002) claim, first, that advanced conceptual blending is what differentiates us from other animals, for children are certainly capable of advanced blending. Second, that Conceptual Blending is a theory that helps us to explain human creativity. Briefly, conceptual blending is for them a “tiny but very important” part of human cognition that makes possible not only logical reasoning but language, art, culture and science. Now, the blending hypothesis would satisfy evolutionary standards (Turner, 2014). So, if we are to explain the role that blending plays in creativity, we need an evolutionary account. I want to suggest here that an evolutionary account of the human meaning-making capabilities without a developmental explanation is incomplete, just as Michael Tomasello has shown for language acquisition (2003, 2014). In other words, I suggest that a phylogenetic account of creativity (and, broadly speaking, of all those cognitive processes associated with blending) is incomplete without an ontogenetic account. I would like to follow this clue based on what cognitive scientists call the development of the executive function. It refers to all those general-domain cognitive processes involved in our conscious control over thought, action, and emotion (Carlson & White, 2013). I will use the empirical data of the development of executive function to offer an account of the development of conceptual blending in children.

Representation and the semiotic circuit

Hypotyposic abstraction as a human singularity

Todd Oakley

Case Western Reserve University

For human beings, hypostatic abstraction forms the semiotic basis of representation, defined as using X to stand for Y, for which X is intentional and Y can be decoupled from the here-and-now. In fact, as Stjernfelt (2014, p. 165) reminds us, human beings can create hypostatic abstractions about completely fictional beings, such as Unicorns. Anyone familiar with these fantastical beasts has a sense of "unicornicity," such that they are typically white and have spiraling horns between their eyes. In fact, it is possible to regard a particular manifestation of unicorn as "unacceptable." In this case, hypostatic abstraction leads to hypothetical abstraction, or reasoning about range of self-consciously possible and impossible entities and situations. What really marks human semiotic circuitry as unique is hypotyposic abstraction, the skill of reasoning or investigation about an absent Y (real for fictional) as if it were present in the here-and-now. A signal feature of human representational practices is the making present that which is otherwise absent for specific collective and communicative purposes, such as verbally ridiculing an absent political opponent, weaving the likeness of a hunted unicorn into tapestries to symbolize Christ and the Passion, and so on. It is these capacities for hypostatic, hypothetical and hypotyposic abstraction that leverages the power of representation for human minds. The fact that we routinely construct these representations for the benefit of others, or to entrain others to help realize our own projects, is a singularity for human beings that calls for greater investigation.

A climactic ontology

Cliff O'Reilly*, **Sarah Bott†**, **Katherine Tu***, **Yetian Wang***, **Tyler William Black***, **Paulo Pacheco*** and **Randy Allen Harris***

**Anglia Ruskin University †University of British Columbia, *University of Waterloo*

Rhetorical Figures are cognitive. That's why they are salient, memorable, and aesthetically pleasing, and that's why their form conveys meaning beyond their constituent elements. This claim has become a truism for at least a small cluster of tropes—metaphor in particular, but also metonymy, antithesis, and synecdoche, each of which is as pervasive as metaphor in ordinary language, and each of which leverages a well-established cognitive affinity (respectively, correlation/contiguity, opposition, and meronymy). But we believe the same is true of many lesser known and cognitively less explored figures.

Our project explores this claim with a knowledge representation of the compound figure, Climax, exemplified as follows:

- (1) One voice can change a room. And if it can change a room, it can change a city. And if it can change a city, it can change a state. And if it can change a state, it can change a nation. And if it can change a nation, it can change a world. (Obama, 2012)

Climax is a compound figure, combining the two figures Incrementum (2) and Gradatio (3); Gradatio, in turn, is compound of iterating Anadiploses (4):

- (2) Neither silver, gold, nor precious stones might be compared to her vertues. (Peacham, 1593)
- (3) The stories seem sadly familiar. They are becoming almost routine, which is frightening. Man behaving strangely is confronted by police. Police shoot man. Man dies. Details are sketchy. Repeat. (Hutchinson, 2015: A15)
- (4) Snow turned to sleet, sleet to rain. (DeLillo, 1986, p. 124)

Anadiplosis is repetition at the juncture of adjacent phrases or clauses; Gradatio is a sequence of more than one instance of Anadiplosis; Incrementum is a sequence of words each of which is higher on some semantic scale than the previous one; Climax is a Gradatio where the relevant terms realize an Incrementum, rising up a semantic scale.

Schemes are fundamentally an ancient cognitive semiotics of form—not merely structures of salience that direct attention, stock memory, and appeal to aesthetic judgement, but structures that drive communicative, argumentative, and pragmatic meaning. The structure of Anadiplosis, Gradatio, and especially Climax propagate semantic attributes in ways that can epitomize arguments and even narratives. In creating an OWL ontology suite, we elucidate numerous cognitive features that support these complex structures: we augment our base model of surface entities with related cognitive functions (edge-detection, increase/decrease), affinities such as SIMILARITY, REPETITION, SEQUENCE, and Image Schemata, e.g. BALANCE, SCALE and PATH.

Teaching a second/foreign language with the assistance of cognitive linguistics methods

Tatiana Orel and Mara Alagic

Carleton University

Modern methodologies of teaching a second/foreign language emphasize the importance of language introduction through use. Thus, through exposure to language in context, second/foreign language learners are able to observe and master language patterns, structures and their relationships and find some correlations or discrepancies between their first and second languages. These cognitive processes involve learning and general information processing they use in their daily life. With the assistance of cognitive linguistics methods, language knowledge can be extracted from language use with the description of cognitive processes involved. When second/foreign language learners encounter a mismatch between their first and second/foreign languages at the lexis and grammar levels, cognitive linguistics methods become useful tools to assist a learner in understanding those differences and adjust accordingly in the learning process.

Moreover, the application of cognitive linguistics methods, based on introducing the rationale of certain language structures in teaching a second/foreign language, can help learners understand deeper language elements by comprehending connotations and activation of semantic networks. Learning a second/foreign language does not need to be grounded on rote memorisation but must involve the process of “making sense” of certain segments of the target language. At the same time, any communicative situation in which foreign speakers are engaged, may involve a cultural misunderstanding for which such language forms and units are used as idioms or figurative language. Thus, we propose facilitation of cognitive linguistics methods for learners, who study a foreign/second language, so they are better prepared to resolve language misunderstandings in real communicative situations.

In this presentation, the main cognitive linguistics methods, such as categorization, cognitive-onomasiological modeling, frames, metaphors and metonymies applicable to teaching a second/foreign language will be presented and some examples where they can be effective will be demonstrated. Besides, these examples can be used to yield new insights into teaching languages for special purposes, cross-cultural awareness development, ontologies and visualization of conceptual models. The integration of cognitive linguistics methods in teaching a second/foreign language shows promise as a new innovative sphere that requires further research.

Multimodal thinking-for-speaking

Speech, gesture, and codeswitching in Philippine political discourse

Dana Osborne

Ryerson University

This analysis examines the semiotic and cognitive significance of co-occurring speech, gesture, and codeswitching as tools in the multimodal construction of abstract concepts in contemporary political discourse in the Philippines. Of particular importance to this study is McNeill and Duncan's (2000) application of Slobin's (1987) concept of "thinking-for-speaking," which understands co-occurring speech and gesture as a window into thinking, demonstrating that gestures are "material carriers" of meaning – in this way, gesture is semiotic. This analysis takes this observation a step further by interrogating the effects of codeswitching in the multilingual milieu of the Philippines as a highly productive semiotic tool that adds another layer by which complex social meaning is rendered and which reflects an additional layer of "thinking-for-speaking" for users – here, codeswitching selects and hails real and imagined interlocutors and constructs regimes of alignment, recognition, and understanding within a given speech stream. Data for this analysis examines the gestural repertoires and codeswitching practices of current president of the Philippines, Rodrigo Duterte, in select political addresses where co-occurring speech, gesture, and codeswitching between English and Tagalog create dynamic conceptual spaces in which "citizen-subjects" and "outsiders" are located and enregistered in many overlapping semiotic spaces (speech, gesture, linguistic code/language), which when combined, create new spaces for complex, socially enregistered semiotic meaning. In these systems, which are often ad hoc and emergent in naturalistic speech, preliminary analyses suggest that the imagined political and epistemological positions of ideal "subject-citizens" are rendered in gestural space as closer to the speaking ego than "outsiders," indicating an underlying familial conceptual metaphor that organizes gestural space and which is legible within the Philippine cultural milieu as particularly socially salient. In this way, the conceptual metaphor of "family" as the basis for creating complex semiotic meaning rendered through a complex dynamic of co-occurring speech, gesture, and linguistic code can be diagrammed as forming a complex, emergent set of semiotic relations, with meanings derived from the relations between the forms arranged on various spatial axes to represent abstract concepts and their relations (Sweetser, 2006) and as a way in which embodied structures are externalized (Mittelberg, 2006). In the end, this analysis unites observations from linguistic anthropology, cognitive linguistics, and semiotics to explore possible new directions in interrogating the ways that complex social meaning rendered multimodally in natural speech in the laboratory of Philippine political discourse.

Conceptual blending and image schemas in editorial cartoons during the peace process in Colombia (2012–2016)

Carlos A. Pérez

Universidad de Bogotá Jorge Tadeo Lozano

Most of the work done within the limits of conceptual blending theory about political cartoons, take them as a case of study to put into practice the main theoretical tenets of the proposal (Coulson, 2003, 2005, 2009; Bergen & Binsted, 2003; Rohrer, 2004). My presentation is both an extension and a critical comment to the work done so far on this subject. Based in the analyses of some of the editorial cartoons published during the recent peace process in Colombia, I will try to show the central place of schematicity (a subject often left aside in the analyses) for an appropriate and comprehensive description of the blending processes involved in the interpretation of cartoons. My presentation is divided in three parts: first, I will present the criticisms made to the “generic space” proposed in the original formulation of conceptual blending theory (Fauconnier & Turner, 2002). Secondly, I will make a critical defense of the “generic space”, stressing that it must be understood as an image-schematic construction that structures the blend (something close but not equal to the “relevance space” proposed by Brandt & Brandt, 2005). Finally, I will present some examples to illustrate my point.

Comparing iconicity in signed and spoken vocabulary

Marcus Perlman*, **Hannah Little[†]** and **Robin Thompson[†]**

**The University of Birmingham, [†]The University of the West of England*

Language likely originated from iconic beginnings. This premise is often used as evidence for gesture-first accounts of language evolution because the manual modality is often assumed to afford more iconicity than the spoken modality. However, much recent research argues that the lexicons of both signed and spoken language exhibit a significant amount of iconicity (Perniss, Thompson & Vigliocco, 2010). However, there may be some important differences in how iconicity is distributed across lexical items from languages that use different modalities. In this contribution, we investigate the differences between the iconicity present in signed languages and spoken languages. We used previously collected iconicity ratings to compare iconicity across the vocabularies of American Sign Language, British Sign Language, English and Spanish. We show how iconicity is affected by modality, semantic variables (concreteness, sensory experience, imageability, and perceptual strength of vision, audition, touch, smell and taste), lexical classes (e.g. nouns, verbs) and more particular semantic categories (e.g. manual verbs, clothes, colors).

The results show several notable patterns that characterize how iconicity is spread across the four vocabularies. Overall, we found substantial correlation in the iconicity ratings between the four languages. The highest correlation was between ASL and BSL, suggesting iconicity may be more robust in signs than words. In each language, iconicity was distributed according to an array of semantic properties in ways that reflect the semiotic affordances of its modality. Across languages, signs and words for more sensorial meanings tended to be more iconic. More concrete meanings were more iconic in signs, but not words. Haptic strength was strongly correlated with iconicity in signs, while auditory strength was strongly correlated with iconicity in words. Further, in the signed languages and in English, verbs were especially high in iconicity. Adjectives were relatively high in the two spoken languages, but low in the signed languages. We also found distinct patterns of iconicity between signed and spoken languages in the more specific semantic categories: signs for manual actions were particularly iconic in ASL and BSL, while signs for colors were particularly low. In comparison, in English and Spanish, words for perceptual properties were especially iconic.

Altogether, our findings provide a preliminary but empirically-grounded and detailed account of how iconicity is spread across the lexicons of signed languages in comparison to spoken languages. We demonstrate the prevalence of iconicity across human languages, no matter the modality, which may have implications for theories of language evolution.

How focus systems might arise in language

An experimental test of an information-theoretic account

Gareth Roberts and Jon Stevens

University of Pennsylvania

We report an experiment testing an information-theoretic account of the emergence of focus, a grammatical system for marking critical elements (Schmitz, 2008; see Figure 1 for examples). According to the information-theoretic account (Stevens, 2016), focus involves adding redundancy to compensate for noise (Shannon & Weaver, 1949; Schmitz, 2008; Bergen & Goodman, 2015). Effort and time pressures encourage restriction of redundancy to critical elements. These factors should operate over multiple timescales. In interactions, speakers respond dynamically to information-theoretic pressures (Krauss & Weinheimer, 1964; Clark, 1996; Brennan & Clark, 1996). Over generations, such strategies become grammaticalized as focus systems (Tamariz & Kirby, 2016).

Question:	"Who invented the printing press?"
Answer 1:	"GUTENBERG invented the printing press.
Answer 2:	" It was GUTENBERG who invented the printing press.
Competitor 1:	"TURING invented the printing press.
Competitor 2:	" It was TURING who invented the printing press.

Figure 1: Examples of focus. Small caps indicate prosodic redundancy; boldface indicates morphosyntactic redundancy; "Gutenberg", which does not overlap with material in the competitor answers, is the critical element.

Focus-like behavior should emerge in any communication system facing similar constraints. For such systems we predict: (1) Message length should vary according to time and effort costs; (2) shorter messages should have lower proportions of redundancy on non-critical elements; (3) redundancy on critical elements should correlate with noise; (4) communicative accuracy should remain constant, because focus is designed to help maintain accuracy.

Method

Participants played a simple two-player game. Players sat separately, taking turns to be "Sender" or "Receiver". The Sender saw a screen as in Figure 2 and had to communicate the green line figure by clicking cells on the blank grid. In half of trials, line figures overlapped by five cells. The Receiver saw the completed grid and had to choose the correct line figure.

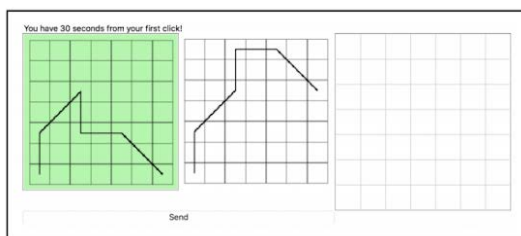


Figure 2: Sender's Screen.

There were six conditions (Table 1). For a cell to be sent, a Sender had to click it 15 times in the High effort condition and five in the Low effort conditions. In the Noise conditions, any clicked cell was sent with a probability of $1-(1-d)^n$, where n equals the number of clicks. Two values were used for d : 0.1 in the High noise condition and 0.4 in the Low noise conditions.

Table 1: *Experimental Conditions.*

Sender's Time limit	Effort	Noise
30 seconds	High effort	High noise
30 seconds	Low effort	Low noise
5 seconds	Low effort (5s)	Low noise (5s)

Results and discussion

All predictions were supported. Message length was constant in the Low effort and noise conditions, and declined over time in the High effort and noise conditions. The proportion of clicks on non-critical (i.e., overlapping) cells correlated with click rate ($r = 0.29$, $p < 0.001$), but more strongly ($r = 0.56$) in the High effort and noise conditions. Distribution of effort took noise into account, with more clicks on critical cells when noise was higher ($\beta = 58.57$, $SE = 7.56$, $t = 7.75$, $p < 0.001$). Overall accuracy was 97%, and did not differ between conditions, except that it was lower in the Low ($\beta = 58.57$, $SE = 7.56$, $t = 7.75$, $p < 0.001$). Overall accuracy was 97%, and did not differ between conditions, except that it was lower in the Low noise (5s) condition ($\beta = -0.07$, $SE = 0.02$, $t = -2.81$, $p < 0.01$), likely due to participants' underestimating noise.

Our results support the information-theoretic account, suggesting how focus systems might arise. This experiment focused on strategies emerging in one generation; future work will investigate their grammaticalization through generational transmission (cf. Kirby, Griffiths, & Smith, 2014).

Toward a renewed theory of the narreme

Richard Rosenbaum

York University/Ryerson University

From Propp's functions (Propp, 2013) through Lévi-Strauss's mythemes (Lévi-Strauss, 1955) and Greimas's actants (Greimas, 1987) to Barthes' narrative units and beyond, numerous scholars of linguistics, comparative mythology, and narratology have proposed frameworks for identifying and systematizing the fundamental particles of narrative and describing how they interact. The term "narreme" was suggested by Eugène Dorfman (Dorfman, 1969) and has caught on, as the proposed basic unit of narrative structure, analogous to the "phoneme" in phonology; however, although the term has been deployed by many contemporary scholars (primarily within the context of ludology (or "game studies"), this has not yet led to definitions or descriptions of the narreme and its associated architecture that have been broadly accepted, nor has it produced any robust descriptive or generative model that has come into wide use. None of the proposed formulations provide a sufficient degree of precision or granularity, and none operate at a suitable level of abstraction to make generative research on the subject possible.

Building on the insights of the aforementioned classic scholars in the fields of structuralist semiotics and cognitive studies, as well as contemporaries such as David Herman, Paul Copley, Walter Fisher, and others, I will propose a preliminary model of the narreme, its available values, permissible combinations, and codified conventional patterns within the construction of the narrative objects that the human mind instinctively recognizes as a "story." My intent is to contribute to an atomic theory of narrativity that can be further developed and deployed as an apparatus for the analysis and creation of works of narrative art, as well as possible uses in education and narrative-based therapies.

The concept of HEALTH in a cultural cognitive linguistic perspective

Penelope Scott

Xi'an Jiaotong-Liverpool University

The word health is highly polysemous, and many attempts have been made not only to define its concept in terms of actual use, but also to put forward a definition for a workable and even universal concept of HEALTH (Balog, 1978; Boruchovitch & Mednick, 2002). The World Health Organization in 1947 defined health as “a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.”, and this multifaceted definition has been criticized for being idealized to the point of unattainability (Dolfman, 1978; Balog, 2005).

Other models of HEALTH have been put forward, including as suggested by Smith (1981) the ‘clinical’, the ‘role performance’, the ‘adaptive’ and the ‘eudaemonistic’ models. This is an issue of importance not only in terms of communication of issues relating to health but also in health psychology. Laffrey (1983; 1986) shows for example that smokers with a eudaemonistic conceptualisation of health had better rates of smoking cessation than those with a clinical model. Recent work in lexical semantics demonstrates the cultural specificity of concepts (e.g. Goddard & Wierzbicka, 2014), and indicates that a ‘universal’ HEALTH concept is unlikely to be attainable. Cognitive Linguistics, and particularly Prototype Theory (Rosch, 1975) provides a model that can account for the meaning of polysemous words such as health, where a single and clearly delineated concept is not possible to model in terms of necessary and sufficient conditions.

Cultural Linguistics reveals the cultural schemas underpinning meaning, and through this framework the current paper aims to make a contribution to the analysis of the concept of HEALTH. The meaning of health has been examined in light of its historical context by Dolfman (1978), but more recent advances in the accessibility of historical data, including the Dictionary of Old English Web Corpus allow for a more detailed examination of the earliest periods, a survey of which provides the historical backdrop to this study. This paper focuses on the conceptualisation of HEALTH in English in the early 21st Century, based on readings of the health word family in the Birmingham Blog Corpus. The various meanings are modelled in terms of Prototype Theory and are analysed in terms of their cultural conceptualisations, including image schemas, proposition schemas, and conceptual metaphors (Lakoff & Johnson, 1980; Quinn, 1987; Sharifian, 2011).

Thinking about how cognitive semioticians might do cognitive semiotics

Gary Shank

Duquesne University

There are a number of ways to approach Cognitive Semiotics foundationally. One strategy is to examine how Cognitive Semiotics might integrate itself into the larger framework of Cognitive Science. Given that the key disciplines of Cognitive Science are Cognitive Psychology, Neuroscience, Computer Science, Philosophy of Mind, and Linguistics, it might make sense to consider Cognitive Semiotics as a more inclusive replacement for Linguistics. This paper will argue that there are two reasons not to do this, and these reasons allow Cognitive Semioticians to pursue a path of authentic Post-Cartesian empirical inquiry.

The first reason not to incorporate Cognitive Semiotics within Cognitive Science is that when we do so, we end up privileging Saussurean semiological models, such as those developed by Structuralists like Hjelmslev, Levi Strauss and Barthes. These models look at linguistic and quasi-linguistic phenomena as instantiated coding systems. But as Peircean semioticians understand, semiotics is more than a way to decipher codes. Second, both semiotics in general, and semiotic inquiry in particular, are fundamentally Post-Cartesian. No matter how you parse it, each discipline within Cognitive Science, as well as its overall framework, is inescapably Cartesian. So, if we attempt to conduct inquiry within Cognitive Semiotics under the aegis of Cognitive Science, we are at best restricting what we can do, and at worst working at cross purposes against ourselves.

The alternative is to acknowledge that Cognitive Semiotics is both Post-Cartesian and Peircean. This makes sense given that one of the first topics Peirce pursued, and one of the few areas he never changed his thinking over his long philosophical career, was his position on refuting Cartesian ideas and their implications on how real human beings do real inquiry. Rejecting a Cartesian a priori foundational system, Peirce suggested instead that empirical inquiry is best approached through an enlightened model of beliefs and how they might be turned toward the pursuit of resolutions of Genuine Doubts. Because Peirce was also committed to a model of Truth ultimately independent of inquiry, his approach allows us to develop a non-foundational, collective, and self-correcting model of empirical inquiry based on things that matter the most to us and things we most need to know. Instead of building abstract models, we weave coherent networks and patterns of empirically substantiated beliefs that allow us to operate in a world where truth matters. Some implications of this approach for Cognitive Semiotics will be addressed in this paper.

Experiencing myth, religion and politics through literary expression

The case of The Persian Book of Kings

Shekoufeh Mohammadi Shirmahaleh

Universidad Nacional Autonoma de Mexico

This paper focuses on some applications of Charles Sanders Peirce's semiotic theory to the history of Jamshid, Zahak and Fereydoun, one of the most important passages of The Persian Book of Kings, the national epic of Iran. The aim is to explain the semiotic strategies used by the Persian poet to narrate a history with various religious, mythical and historical layers that in a first reading seems to be only an epic legend. Due to the sociopolitical limitations of the poet, the pre-Islamic dimensions of the passage had to be concealed through such strategies and they are manifested in the special use of given names, adjectives and analogies, verbal tenses, rhetorical resources such as repetition, ellipsis, etc., as well as in an intentional change of the order of narration. The poet has created a great number of icons, in Peircean terms, of different categories that work as keys to the interpretation of the text. A semiolinguistic approach to this passage points out its iconic aspects and suggests a new reading of it.

Pragmatic/Pragmatist mind

Eco's cognitive semioticization of qualia

Martin Švantner

Charles University in Prague

The paper deals with the problem of qualia in the contexts of the semiotics of Umberto Eco and his interpretation of some concepts taken from C. S. Peirce's semeiotic. The main attempt of this text is to explore one of the various parts of this synthetic and eclectic but original perspective—Eco's creative semiotic and pragmatic conception of—"bricks of our cognition"—qualia, based on his reinterpretation of C. S. Peirce.

I further propose that Eco started to focus specifically on the problem of qualia mostly in his later period when he turned from the idea of almost universal theory of semiotics (presented p. ex. in *Theory of Semiotics*) to, let's say, cognitive realism (in *Kant and the Platypus*) with the help of more precise reinterpretation of Peirce's conceptions.

In my point of view there are (at least) two "pragmatisms" in U. Eco's works about semiotics. First perspective is rather close to the "pragmatics" (Eco, 1976, p. 102). This perspective is in general close to the semiotic analysis of dimension of the use of language and its cultural and communicative functions. Later Eco moved to the questions concerning the realm of human cognition, which is not understood only from social/cultural perspective (which was predominant in Eco's "early and middle" works), but is much more influenced by Peirce's concepts of mind, consciousness and cognition and Peirce's own philosophy of pragmatism. In other words, in *Kant and the Platypus* Eco proposed his version of semiotic cognitive realism and the accent is put much more on the structure of language based on its crucial semiotic function that mediates between culture and nature.

As shown in the paper, his view on the problem of quale is closely connected to his understanding of cognitive processes based on the process of understanding leading from cognitive type to molar content—Eco understands qualia as "semiosis primes", which are considered as the fundamental base of the possibility of all the signification, therefore as a base of cognitive types, on the other hand, which leads from the fact that they are considered as a base of cognitive types, we should regard them as having every-day communicative character. The aim of the paper is therefore to explore this specific two-fold understanding of qualia.

Transformative communication as semiotic scaffolding of cognitive development

Duygu Uygun Tunç

Universität Heidelberg / Helsingin Yliopisto

The paper examines the role of intersubjectivity in development of cognitive functions through a communication-theoretical interpretation of Hoffmeyer's notion of "semiotic scaffolding".

Drawing on Bateson's notion of "meta-communication" and social-relational theories of cognitive development, it first gives a conceptual distinction of two complementary modes intersubjectivity operates in: coordinative and transformative communication. Bateson defines meta-communication in terms of a hierarchy of signs, where meta-communicative signs frame communicative signs through constraining how they are to be interpreted. Ontogenetically regarded, differentiation of levels of communication can be defined as an intersubjectively achieved process of semiotic scaffolding. Following a Vygotskian approach to cognitive development, scaffolding of multi-level communication is argued to furnish a necessary condition of the peculiarly human activity of meta-semiosis, which enables self-reflection and social cognition. Transformative communication denotes the mode exclusively or mostly operating on the meta-communicative level. It characterizes primary intersubjectivity (Trevarthen, 1979, 1998) exclusively, where yet the only content of communication is communication itself. Through transformative communication, semiotic scaffolds of (inter)action are intersubjectively formed by effectuating a top-down social modification on the psycho-somatic level of semiotic scaffolding (Thibault, 2000).

Coordinative communication is explicated as the mode of communication where stably scaffolded semiotic activities of individuals are coordinated. It enables reliable sharing of experience on the basis of common sign relations, collective action, cognitive and affective resonance among social agents. There is a complementary relation between the two modes of communication, which manifests a punctuated equilibrium between phases of transformation and preservation of sign-relations that scaffold individual and collective activity.

Secondly, the operation of transformative communication in development is investigated in terms of a hierarchical series of transformations in the Peircean structure of semiosis through the shifting semiotic focus of intersubjective scaffolding. The major phases are investigated following Deacon's (1997) hierarchy of modes of reference: (i) mimetic imitation ("protomimesis" to "dyadic mimesis"; Zlatev, 2013), where communication is mainly iconic (Thibault, 2000; Cowley, 2004), interpretant on the child's part is direct and implicit in sensorimotor activity, the central problematic is to achieve sign-object differentiation and indexicality; (ii) coordinated interactivity, where indexical relations organize iconic relations and give rise to indexicalized icons and indexes proper (Favareau, 2015), interaction is temporally patterned through ritualized turn-taking, sign-object differentiation is in place and interpretant becomes indirect; (iii) symbolic play (Lewis, 1992; "internally directed symbolic games"; McCune-Nicolich, 1981a), where sign-sign relations come to dominate over sign-object relations, object and action-incongruent meta-communicative frames are established, interpretant becomes articulate.

“Do we even know what the drumstick stands for?”

Use of emoji in China

Sheena Van Der Mark* and Sabina Tabacaru†

**BNU-HKBU United International College; †Université Paris 8*

The digital era of the 21st century has given rise to many new ways of communicating. Derived from Japanese with the meaning of picture character (Evans, 2017), emoji use has rapidly spread worldwide with the use of smartphones and social media. Similar to non-verbal cues in face-to-face interactions (gesture, facial expressions, tone of voice, etc.; see Tabacaru & Lemmens, 2014), emojis are a powerful means into analyzing human communication, focusing on the emotional side of a speaker’s message as well as their attitude. The use of emoji has become so popular that Oxford Dictionaries chose the ‘Face with Tears of Joy’ emoji as their Word of the Year for 2015 (see also Evans, 2017).

This paper explores variation in the interpretation of meaning of emojis (gathered from WeChat, a Chinese social media platform) and their high degree of variance in the interpretation of meanings between Chinese and non-Chinese speakers. We focus on common emoji use by Chinese university students—both when using WeChat-specific renderings and different renderings across platforms. Surveys have been carried out in order to find out how often the participants use certain emojis and the interpretations they attribute to them (as well as their negative-neutral-positive roles in conversations). These will be compared to Ekman’s (1979) findings regarding facial expressions and emotion (such as anger, happiness, sadness, etc.), emphasizing the semantic role they have in daily communications within a Chinese context. A later stage of this study involves comparisons of emoji interpretations from non-Chinese speakers residing in Europe and North America.

History of linguistics... against linguistic relativity?

An epistemological point of view on recent discussions around the Pirahã language

Ekaterina Velmezova

University of Lausanne

In the history of linguistic ideas there were several languages, the “discoveries” and studies of which pretended to change radically many essential ideas on human language in general—including linguistic semantics. One of such languages is Pirahã, spoken by an Indigenous People of the Amazon rainforest in Brazil. In particular, Daniel Everett, who studied it, insisted on a series of very particular linguistic features of Pirahã at several levels. At the same time, besides the well-known claims that this language lies beyond the “universal grammar” frame, Everett’s descriptions of Pirahã seemed to (re)confirm the theories of linguistic relativity, including linguistic relativity with regard to lexical and grammatical semantics. That is why, *a priori*, Everett’s studies of the Pirahã language and culture were expected to be very welcome in the academic circles of those countries where the theories of linguistic relativity are currently favored—for instance, in Russia. However, recent discussions organized in Russia around Everett’s descriptions of Pirahã show a rather critical attitude towards his works. Particularly sharp criticism comes from historians of linguistics and, in general, from linguists appealing to linguistic theories of the past. The main argument against Everett’s conclusions about the exclusivity of Pirahã semantics in comparison with other languages was the idea that such exceptional character was not inherent to this language, but to a specific way of its description: as history of linguistics shows, many theories about exclusivity—including the semantic one—of one or another language usually don’t stand the test of describing the same language(s) in other ways.

In this respect, the case of reception of Everett’s works is not unique and can be compared with other attempts made by historians of linguistics to criticize the very concept of semantic relativity. In the presentation, we will show whether, indeed, history of linguistics can “destroy” a number of key ideas about linguistic relativity as based in particular on semantic typologies, or, on the contrary, if in spite of seemingly skeptical arguments, historians of linguistics can offer additional arguments to support these theories. Particular attention will be paid to the discussions of linguistic relativity vs linguistic universals and therefore to the problem of the very existence of semiotic boundaries separating human language from other semiotic systems.

Semiotically unfit

How social media tools are rewriting
our cognitive processes

Stéphanie Walsh Matthews* and **Marcel Danesi†**

**Ryerson University; †University of Toronto*

Marshall McLuhan's perspectives on the role of media in human life are more relevant today than they ever were. His views of how media amplify the human body into the world (both the biosphere and the semiosphere), allowing it to do more than would be possible by biology, is actually a fundamental principle of semiotic science as a whole. Above all else, it fits in with the notion of "semiotic fitness," or the idea that our semiotic brain, like the body, can be fit or unfit depending on the environment in which it finds itself. This paper will revisit McLuhan from the semiotic angle, given the kind of world in which we live. The concept of amplification and its interconnection with semi-osis is a critical one, providing a theoretical lens through which we can better understand the psychological and emotional kinds of the systems (communicative, expressive, intellectual, etc.) in which we are enmeshed today. The world is being reshaped in fact by the digital-electronic sensorium in which we all live. This is leading to the re-wiring of the human brain. It was, of course, McLuhan who was among the first to emphasize this fact, showing how the sensorium—in this case influenced by electronic structure—shaped human cognition. The social, psychological, communicative, and overall semiotic implications are discussed and concretely articulated so that they can be discussed further in an interdisciplinary fashion. The digital world in which we live may be what McLuhan called an "overextension" and as such it may lead to what he called "amputations" of all kinds. A semiotic diagnosis may help avoid them.

Simulation and supposition

A new approach to truth in fiction

Zach Weinstein

University of Toronto

Previous accounts of truth in fiction have taken one of two approaches. Some analyze fictional truth in terms of fictional worlds (Hanley, 2004; Lewis, 1983a). Others analyze fictional truth in terms of prescriptions to make-believe (Gatzia & Sotnak, 2014; Byrne, 1993; Walton, 1993; Currie, 1990). I suggest a fresh approach to the problem of truth in fiction. What is distinctive of fictional discourse is the standpoint from which we speak. In most contexts, when I say “Reckall Brown is an art dealer”, this is false. However, if I’m talking about *The Recognitions*, this is true. Why? I set forward a view on which “Reckall Brown is an art dealer” is true because of my suppositional state: I speak this sentence from the stance of the author of *The Recognitions*, and only then is it true. The suppositional standpoint from which we make claims about fiction is, I hope to show, an essential element in a theory of fictional discourse. The goal is to motivate this approach and to sketch the positive view, the nested simulation view of fiction.

My theory is motivated by a conviction that to engage with a fiction, we need to take up the mental life of authors and characters. There are two elements. First, we come to know what is true in a fiction by simulating the author of a text (Heal, 2003; Collingwood, 1993). This activity of simulation will allow us to see what it is she wanted us to imagine, and what she wants us to imagine is true in a fiction. This author is not the real, historical author, but rather an idealized author (Nehamas, 1981). Second, our statements about fiction are true because they are made from a suppositional state: from the suppositional state of the author of a fiction, statements like “Reckall Brown is an art dealer”, which would otherwise be false or nonsense, become true. It is the context of utterance, rather than the semantics, that makes sense of our fictional discourse. This framework has the distinct advantage of being able to account for not just what is true in a fiction, but also what interpretations of fictions are acceptable: to determine an adequate interpretation, we can also simulate the idealized author, to see what interpretations she authorizes, and utter those interpretations from a suppositional state.

From subjectivity to subjunctivity in children's performatives

Peirce's endoporeutic principle

Donna E. West

State University of New York at Cortland

This inquiry examines the semiosis of children's performatives, informed by experimental findings and Peirce's treatment of Index as Seme, PHEME, Delome. Evidence tracing the ontogeny of gestures will demonstrate progression from gestures as imperatives for self benefit (Cameron-Faulkner, Theakston, Lieven, and Tomasello, 2015), to those employed for endoporeutic purposes. Children's performatives begin with instrumental and social pointing (Cameron-Faulkner, 2014) and culminate in more iconic gestures which resemble action templates (Özçalışkan, Gentner, & Goldin-Meadow, 2014; West, 2017). Interpretants of initial gestures are imperative-like, benefiting self, whereas interpretants of later iconic gestures carry subjunctive meanings/effects. While the imperative meaning of deictic gestures compels recognition of propositions/claims, more iconic gestures "submit" claims for potential integration into another's logical system (1905: CP 8.338). The subjunctive character of the latter makes possible renovations in complexions of mind by encouraging, not forcing, consideration of a claim which has assertory status (1903: 5.543) for the agent.

A key operator is the degree to which performative gestures reveal the information packaged within Index. From shape and movement trajectories (Indexical representations), interlocutors can infer assertions or arguments, providing gestures with performative status. At the outset, Index "asserts nothing" (1885: 3.361) when it exclusively has an individuating function. In this capacity, it does not imply relations, nor does it convey information. Afterward, in the PHEME and in the DICSIGN, when Index informs icons, it gains the power to assert. Here PHEMES as INDICES compel attention to and define images (1898: MS 485); and DICISIGNS imply arguments. Later, enactments which imply arguments convince others to engage in similar behavior with "positively possible" solutions. These arguments compel others to adopt new habits of mind and action.

Peirce endowed Index with the means to have others notice invisible relations by highlighting icons (1898: MS 485; 1904: EP2: 307); otherwise the intended interpretant might not be shared by both parties. The icon which Index underscores, ultimately provides sign users with a "common place to stand" for sign receivers (1908: MS 614) making especially relevant Peirce's endoporeutic principle. Here Index saves the icon from obscurity, from not being noticed by the interlocutor; and as such, it supplies the informational components necessary to establish, maintain and expand upon sign meaning/effects. In 1906 (4.538), Peirce amplifies Index's power to imply more than a subject of discourse. It can convert simple signs (SEMES) to Delome status by suggesting predicates. Here gestures become enactments, endowed with subjunctive force—influencing another's disposition and habits of self-control.

The semiotics of stereotypes

Hongbing Yu

Nanjing Normal University

As a ubiquitous human phenomenon, stereotyping is considered one of the biggest issues in contemporary social psychology, and widely covered in textbooks and scholarly studies. However, only a woefully limited number of works have touched on why and how stereotypes happen (e.g. McGarty et al., 2002), and still little is known about the inner mechanism of stereotyping. It is in this context that the present paper argues for a semiotics of stereotypes, aiming to shed some critical new light on the workings of stereotypes. Although it has been grossly understudied as such, stereotyping deserves to be an inherently proper subject matter of semiotic inquiries, for it stands as a perfect example of social semiosis, in which process stereotypes, functioning as fixed mental models (Sebeok & Danesi, 2000), are associated with objects, events, individuals and groups. These fixed models allow people the ease of modeling the world in which they are involved, and provide a window through which human semiosis can be observed from a cognitive semiotic perspective. One of the advantages of the semiotics of stereotypes is that it can easily enable us to straddle the two major yet long-alienated traditions of contemporary studies of the sign: Saussurean semiology and Peircean semiotics. The main reason lies in the fact that stereotypes can be thought of as a specific type of model (Yu & Zhang, 2016), which, by means of various multimodal external forms and corresponding internal forms, are considered the building blocks of cognition (Sebeok & Danesi, 2000). The concept of model not only works well in linking dyadic Saussurean relations, for instance signifier vis-à-vis signified, but also fits into the overall scheme of the Peircean triad of semiosis. Stereotypes, as special models that are as much culturally based as they are psychologically grounded, can work as a good illustration of the above-mentioned integrative power of models. For further elucidation, this paper also analyzes a number of classic examples found in literature, movies, real-life cases of communication and social psychology, among which are Snow White, vampire stories and social stigma, to name just a few. All these analyses, as well as the general argument in this paper, lead to a conclusion that supports the rightful place of the semiotics of stereotypes in the broader domain of cognitive semiotics, which in turn takes its own place in general semiotics.

From life to language

The Semiotic Hierarchy in the light of phenomenology

Jordan Zlatev

Lund University

The paper re-thinks a proposal for a unified cognitive semiotic framework, the Semiotic Hierarchy (Zlatev, 2009a, 2009b), in explicitly phenomenological terms, following above all (Merleau-Ponty, 1962, 1963). I focus on the following four issues. (1) The central claim of the model that the multi-faceted concept of meaning can be understood as the value-based relationship between the experiential subject and the world of experience, corresponds to the most fundamental concept of phenomenology: intentionality. However, the subject is not a pre-given transcendental ego, but an embodied self that is constituted in the process. This in effect turns the “arrow” of meaning/intentionality into a bidirectional relation, albeit an asymmetric one. (2) The rather strict “implicational” nature of the hierarchy of meaning levels made the original model rather static and one-directional, thus resembling an old-fashioned *scala naturae*. Reformulating the relationship between the levels in terms of the dynamical notion of *Fundierung* avoids this pitfall. (3) The phenomenological analysis allows, somewhat paradoxically, both a greater number of levels and less discrete borders between these. For example, the conflation of intersubjectivity and sign use can be untangled, as there are social meanings such as joint action, types/categories and even conventions that are not strictly speaking signs (Sonesson, 2015). (4) Methodologically, the analysis follows the basic phenomenological principle to “look at” and examine the phenomena without theoretical preconceptions, and without premature explanations. This implies that the argumentation should focus on human experience, even when dealing with the “biological” level of meaning, with the possibility of extending the analysis to non-human subjects through empathy. Unlike in the original proposal, “third-person” evidence deriving from evolutionary theory and neuroscience is therefore not considered, even though it could possibly be integrated in a more encompassing framework, such as that of Thompson (2007).

5. Poster Session & Student Exhibits

Translating from unisemiotic to polysemiotic narratives

A study of Finnish speech and gestures

Karoliina Louhema, Jordan Zlatev and Maria Graziano

Lund University

Human communication is both polysemiotic, i.e. it combines ensembles of representations from different semiotic systems such as language, gestures and pictures, and multimodal, i.e. its uses different sensory modalities (Kendon, 2004; Sonesson, 2014; Zlatev & Devylder, forthcoming). Each semiotic system has its unique storytelling potentials (Kress, 2010; Green, 2014), which makes translations across them challenging (Jakobson, 1959). We investigated the influence of the source semiotic system on the way a story is translated either from unimodal narratives in speech (using only the auditory modality) or a sequence of pictures (using only the visual modality) to polysemiotic narratives consisting of speech and co-speech gestures.

Two groups of 19 Finnish native speakers were each presented with the story in the children's picture book *Frog where are you?* (Mayer, 1969). One group just heard the story (speech-only condition), the other group looked at the pictures (pictures-only condition). Then each participant retold the story to an addressee. These narratives were video-recorded, transcribed and coded for gestures, story structure (Berman & Slobin, 1994), connectives and ideophones. Gestures were divided into iconic, deictic, emblematic and pragmatic. Due to the higher degree of iconicity present in the semiotic system of pictures compared to that of language (as realized in speech), we hypothesised a higher number of ideophones and iconic gestures (especially enactments performed from a first-person perspective) in the narratives translated from the pictures-only condition compared to the speech-only condition. In the latter case, we expected greater narrative coherence, as reflected in a more diverse use of connective devices and a higher number of plot elements.

Contrary to expected, more iconic gestures (“enactments” and “representations”) were found in the narratives translated from the speech-only condition. However, in line with the hypothesis, enactments and ideophones were more frequent in the narratives of the participants who had experienced the story through pictures. Also as expected, a greater variety of coherence devices was found in the narratives produced by participants who had only heard the story. The results indicate that a story given in different unimodal semiotic systems may indeed lead to different polysemiotic narratives.

An evolving multimodal sign system for the non-visual and non-aural soccer spectator

Felipe Sarmiento and Peter W. Coppin

OCAD University

This paper reports on an emerging tactile gestural sign system that employs non-visual, non-aural techniques to enable a blind and deaf individual to participate as a spectator in a soccer game. Our ongoing observations and interviews reveal how tactile signs are evolving between an interpreter and spectator (who is both legally blind and deaf) to produce a capability that “translates” a soccer game in real time. We focus on three gestures that represent (a) spatial and topological relations among the ball and key players, (b) in-game faults and (c) the whistle blow.

The centerpiece is a board with the same proportions as a standard soccer field. The spectator



and translator face each other with the wooden board between them (Figure 1). The positions of the translator’s index fingers on the board show the position of the two closest players to the ball (one from each team). The spectator wraps his fingers around the translator’s index fingers (Figure 2), thus perceiving relations among the ball and players through negative space.

Figure 1: The translator (right) faces the spectator (left). The translator faces the game to interpret the game. A wooden board with raised lines depicts the soccer field and its boundaries.

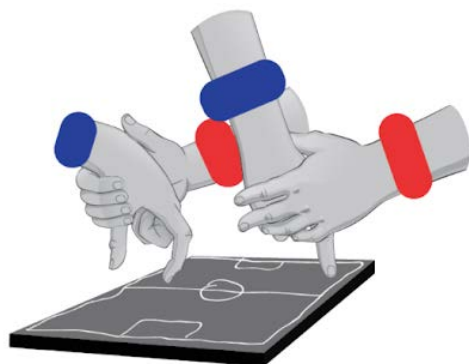


Figure 2: The spectator (red) wraps his hands around the translator’s hands (blue) using his index fingers as guidelines. The translator is able to represent the movement of the closest player to the ball (one hand per team).

(from actual blowing) simplified to more efficient air blows that freed the use of fingers and where the strength of the blow adds meaning.

Although our observations are ongoing, we consider how pressures to communicate different properties of the game (such as player-ball position versus a fault) is driving the evolution of system components in divergent directions. Building on prior work on the affordances of external

Additional information (such as faults and referee decisions) originally required the translator to shift from their topological interpretation to sign language, encouraging gesture evolution. A gesture that represents faults resembles real faults (like shirt pulling). What began as a tactile whistle-blow-shaped gesture with air pressure

representations and signs (Coppin, 2014, 2015; Coppin, Li, & Carnevale, 2016) and informed by work on artifact (Kirsh, 2010) and language evolution (Imai & Kita, 2014; Senghas, Kita, & Özyürek, 2004) we will discuss how physical constraints interact with affordances of different types of signs. Specifically, we will discuss how on the one hand, communicating topological relations among players and the ball is driving evolution toward more iconic gestures that resemble the unfolding concrete situation on the field, while on the other hand, communicating such aspects of game play as player faults or whistle blows encourage more conceptual specificity, driving evolution away from more iconic gestures to more symbolic ones that correspond to more abstract categories that many concrete situations can fall under.

A cognitive semiotic approach to multimodal metaphor in *WeChat* advertisements

Song Hong and Ying Pan

Northeast Normal University

WeChat, as one of the most popular mobile messaging applications in the world, creates a new platform of advertisement by constituting a body of texts, as well as voice, photo, video and animation.

The thesis adopts both qualitative and quantitative methods to conduct an analysis of multimodal metaphor from the perspective of cognitive semiotics. The study analyzes 50 cases of WeChat advertising discourses to examine the metaphors of both verbal and non-verbal signs, and makes questionnaires and interviews to investigate the recipients' cognitive process, acceptance, understandings and their attitudes to the multimodal metaphors in ads. It makes a further discussion on how mappings of domains between target and source from different modes, e.g. visual and verbal, or visual and acoustic, are created and recognized, and how the comprehension of conceptual metaphors may affect their possible validity in ads.

Grounding abstract concepts through bridging and mapping in the processing of polysemy

Tinghao Zhao

Case Western Reserve University

A question raised by the symbol grounding problem is how abstract concepts, which do not refer to concrete (i.e. having sensory-motor features) beings, can be grounded in the sensory and motor systems. While previous accounts such as the conceptual metaphor theory (Lakoff & Johnson, 1980) and the primary metaphor theory (Grady, 1997) have suggested groundings through cross-domain mappings or inter-concept associations, in this paper, I provide a complementary account that focuses on on-line processing. In particular, I propose that during online processing, there are two ways in which an abstract concept can be grounded in a related concrete concept—bridging and mapping, both of which are exemplified in the processing of polysemy. “Bridging” refers to the co-activation of an abstract concept and a concrete concept using one coherent representation (a bridging representation), which can be considered a perceptually-salient manifestation of the abstract concept that, at the least, may facilitate the retrieval, maintenance, and manipulation of its content. In polysemy, when both an abstract sense and a concrete sense can be activated to interpret the same language use (e.g. “the roads connect the village to the rest of the country” can refer to functional or physical connection), a bridging representation may be constructed. Depending on which sense is the focus, this representation can (1) ground the abstract sense in a concrete background or (2) extend the concrete sense to further abstract implications. Through bridging and/or encounters of the underlying experiential correlation, the two senses may become associated with each other. This association then allows one to establish metaphorical mappings or conceptual blends that ground the abstract sense in separate concrete/blended representations when a bridging representation is not available/tractable (e.g. interpersonal connection conceptualized as people physically connected by lines, made possible by the association between physical and more abstract types of connections).

IMA 310 Student Gallery

no maybe yes

Talia Eylon

Ryerson University

no maybe yes is a three-channel video installation which explores how behaviours, customs and conceptions of sexual consent were depicted and represented in popular and critically acclaimed fictional entertainment in the year 2016. Through appropriation and postproduction art practices, this hybrid documentary project addresses the subject of sexual consent and asserts that popular media can be understood as an archival time-based cultural artifact, relevant to sociological, research-based and artistic study.

The artist reviewed and catalogued 20 feature films and 22 TV shows (full seasons) that were primarily created in North America and/or were from western cultures. The work consists of multiple video compositions. Each video vignette is comprised exclusively of appropriated footage from the reviewed films and television programs. The topics of the video chapters include contraceptives, verbal prompts, non-verbal and verbal rejection, bystanders, touch and apologies.

Balancing investigation with creation, this work aims to discover what mainstream fictional entertainment might reveal about societal ideologies and attitudes. Through appropriation and remixing, the work challenges popular media's power through deconstruction, decontextualization, and removal of some of its seductive qualities.

Shkakamikwe Kido

Natasha Naveau

Ryerson University

Shkakamikwe Kido in Anishinaabemowin (Ojibwe language) translates to *It Comes Through The Land*. The 5 channel video installation invokes an immersive experience where composite video, ambient sound, and Indigenous knowledge of land and water intersect. The installation is held within a replicated Anishinaabe style teaching lodge, where visitors can enter the space, and viscerally connect to the land through sight, smell, sound, and movement.

The premise for this installation came from the rise of land stewardship along the Humber River among local residents interested in revitalizing local Indigenous cultural practices and re-learning land-based teachings to reconnect through kinship and placemaking on the land. In pre-colonial times the Anishinaabe did not have the need to write down language, the oral passing of knowledge held its own power and meaning. The inclusion of Anishinaabemowin and syllabic text alongside the shared teachings, is a way of 're-presencing' identity and culture within colonial spaces.

The lodge, in this instance, occupies an institutional space, speaks to a colonial legacy while drawing on Indigenous frameworks of process. Entering the space, visitors are offered a relational experience towards revitalizing one of many Indigenous ways of knowing and living on the land in urban centres.

5. References

- Aarseth, E. (2001). Allegories of space: The question of spatiality in computer games. In M. Eskelinen & Koskimaa R. (Eds.), *Cybertext Yearbook 2000* (pp. 152–171). Jyväskylä: Research Centre for Contemporary Culture, University of Jyväskylä.
- Accessibility for Ontarians with Disabilities Act, S.O. 2005, c. 11. Retrieved from <https://www.ontario.ca/laws/statute/05a11>
- Adams, M. & Koke, J. (2008). Comprehensive Interpretive Plans: A framework of questions. *Journal of Museum Education*, 33(3), 293–299. Retrieved from <http://jstor.org/stable/40479684>
- Ahlner, F. & Zlatev, J. (2010) Cross-modal iconicity: A cognitive semiotic approach to sound symbolism. *Sign System Studies*, 38 (1/4), 298–348.
- Americans With Disabilities Act of 1990, Pub. L. No. 101-336, § 35 (1990). Retrieved from https://www.ada.gov/regs2010/titlell_2010/titlell_2010_regulations.htm
- Apresjan, J. D. (1992). *Lexical Semantics: User's Guide to Contemporary Russian Vocabulary*. Ann Arbor: Karoma.
- Armstrong, A. H. (1988). *Plotinus: Enneads* vols. 1–7. Loeb Classical Library. Cambridge: Harvard.
- Arnab, S., Lim, T., Carvalho, M. B., Bellotti, F., Freitas, S., Louchart, S., ... & De Gloria, A. (2015). Mapping learning and game mechanics for serious games analysis. *British Journal of Educational Technology*, 46(2), 391–411.
- Arnheim, R. (2004). *Art and visual perception*. University of California Press, 2nd edition.
- Atkinson, D. (2010). Extended, embodied cognition and second language acquisition. *Applied Linguistics*. 31(5), 599–622.
- Attardo, S. (1994), *Linguistic Theories of humor*. Berlin, Mouton de Gruyter.
- audiogames.net. (2018). *AudioGames, your resource for audiogames, games for the blind, games for the visually impaired!* Retrieved from <http://audiogames.net/>
- Baby, B., Srivastav, V., Singh, R., Suri, A., & Banerjee, S. (2016). Serious games: An overview of the game designing factors and their application in surgical skills training. In *3rd International Conference on Computing for Sustainable Global Development (INDIACom)*. Retrieved from <https://ieeexplore.ieee.org/document/7724725/>
- Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using Self-Report Assessment Methods to Explore Facets of Mindfulness. *Assessment*, 13(1), 27–45.
- Baker, G. R. (2004). The Canadian Adverse Events Study: The incidence of adverse events among hospital patients in Canada. *Canadian Medical Association Journal*, 170(11), 1678-1686. <https://doi:10.1503/cmaj.1040498>
- Balan, O., Moldoveanu, A., & Moldoveanu, F. (2015). Navigational audio games: An effective approach toward improving spatial contextual learning for blind people. *International Journal on Disability and Human Development*, 14(2), 109–118. <https://doi.org/10.1515/ijdh-2014-0018>
- Ballora, M. (2017). *Seeing with your ears: Data sonification*. DC Art Science Evening Rendezvous. Retrieved from <https://www.youtube.com/watch?v=FL12-ldxJ0w>
- Balkaran, R. (2015). *Mother of Power, Mother of Kings: Reading Royal Ideology in the Devī Māhātmya*. University of Calgary.
- Balkaran, R. (2018). The Safeguard of Sovereignty: Focusing the Frame of the *Devī Māhātmya*. In *Proceedings of the 16th World Sanskrit Conference*. Delhi: Motilal Banarsidass.

- Barthes, R., & Heath, S. (2010). *Image, Music, Text*. Fontana Press, HarperCollins Publishers.
- Bartlett, F. C. (1932). *Remembering: A study in experimental and social psychology*. Cambridge: Cambridge University Press.
- Bateson, G. (1955). A theory of play and fantasy. *Psychiatric Research Reports*, 2, 39–51.
- Bengtson, P. (2018). Street art and the nature of the city, in *Bild och natur. Tio konstvetenskapliga betraktelser*, p. 125–138.
- Benjamin, W. (2008). *The work of art in the age of its technological reproducibility, and other writings on media*. Harvard University Press.
- Bergen, B., & Binstead, K. (2004). To awaken a sleeping giant: Blending and metaphor in editorial cartoons after September 11. In M. Achard & S. Kemmer (Eds.), *Language, Culture, and Mind*. Stanford, CA: CSLI Publications.
- Bergen, L., & Goodman, N. D. (2015). The strategic use of noise in pragmatic reasoning. *Topics in Cognitive Science*, 7 (2), 336–350.
- Berman, R., & Slobin, D. I. (1994). *Relating Events in Narrative: a crosslinguistic developmental study*. New Jersey: Lawrence Erlbaum Associates, Inc., Publishers.
- Bertolet, R. (1987). Speaker reference. *Philosophical Studies*, 52(2), 199–226.
- Billow, R. (1975). A Cognitive Developmental Study of Metaphor Comprehension. *Developmental psychology*, 11(4), 415–423.
- Black, M. (1962). *Models and metaphors*. Ithaca, NY: Cornell University Press.
- Bliss, L. (2015). Maps that you can hear and touch. Retrieved from <https://bit.ly/2FugPke>
- Blooper Team. (2016). *Layers of Fear* [Microsoft Windows, Linux, OS X, PlayStation 4, Xbox One, Nintendo Switch]. Poland: Aspyr.
- Bogdashina, O. (2010). *Autism and The Edges of The Known World: Sensitivities, Language, and Constructed Reality*. London: Jessica Kingsley.
- Boroditsky, L. (2000). Metaphoric structuring: Understanding time through spatial metaphors. *Cognition*, 75(1), 1-28. doi:10.1016/s0010-0277(99)00073-6
- Bouchard, D. (2010). From Neurons to Signs. In A. D. M. Smith, M. Schouwstra, B. de Boer, & Smith, K. (Eds.), *The Evolution of Language: Proceedings of the 8th International Conference (EVOLANG8)* (pp. 42–49). Hackensack, NJ: World Scientific.
- Brandt, L. (2013). *The Communicative Mind. A Linguistic Exploration of Conceptual Integration and Meaning Construction*. Newcastle u. Tyne: Cambridge Scholars Publishing.
- Brandt, L., & Brandt, P. A. (2005). Making sense of a blend: A cognitive-semiotic approach to metaphor. *Annual Review of Cognitive Linguistics Published under the Auspices of the Spanish Cognitive Linguistics Association Annual Review of Cognitive Linguistics*, 3, 216-249. doi:10.1075/arcl.3.12bra
- Brandt, P. A. (2014), “Meaning Production, Modelling Mental Architecture and Blending”, in Conde, J. A. (ed.), *Ensayos semióticos II*, 17–39, Bogota, Universidad de Bogota Jorge Tadeo Lozano.
- Brazil, E., & Fernström, M. (2011a). Auditory icons. In T. Hermann, A. Hunt & J. Neuhoff (Eds.), *The Sonification Handbook*. Berlin: Logos Publishing House. Retrieved from <https://bit.ly/2INcnkc>
- Brazil, E., & Fernstrom, M. (2011b). Navigation of data. In T. Hermann, A. Hunt & J. Neuhoff (Eds.), *The sonification handbook*. Berlin: Logos Publishing House. Retrieved from bit.ly/2u0eSDx

- Brennan, S. E., & Clark, H. H. (1996). Conceptual pacts and lexical choice in conversation. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 22, 1482–1493.
- Brenzinger, M., & Kraska-Szlenk, I. (2014). The body in language: An introduction. In M. Brenzinger & I. Kraska-Szlenk (Eds.), *The Body in Language: Comparative Studies of Linguistic Embodiment* (pp. 1–10). Leiden: Brill.
- Bressemer, J. (2013). A linguistic perspective on the notation of form features in gestures. In C. Müller, S.H. Ladewig, E. Fricke, D. McNeill, & T. S. (Eds.), *Body - Language - Communication: An International Handbook on Multimodality in Human Interaction*, 1079–1098. Berlin: De Gruyter Mouton.
- Brier, S. (2010). The Cybersemiotic Model of Communication. In D. Favareau (Ed.), *Essential Readings in Biosemiotics: Anthology and Commentary*, 697–729. Dordrecht; New York: Springer.
- Brock, A. M., Truillet, P., Oriola, B., Picard, D., & Jouffrais, C. (2015). Interactivity improves usability of geographic maps for visually impaired people. *Human-Computer Interaction*, 30(2), 156–194. <https://doi:10.1080/07370024.2014.924412>
- Bundgaard, P. F., Heath, J., & Østergaard, S. (2017). Aesthetic perception, attention, and non-generativity: How artists exploit the automatisms of perception to construct meaning in vision. *Cognitive Semiotics* 10(2), 91–120
- Bussanich, J. (1994). Plotinus's Metaphysics of the One (pp. 38–65). in *A Cambridge Companion to Plotinus*. Cambridge.
- Butler, C. & González-García, F. (2014). *Exploring Functional-Cognitive Space*. Amsterdam: John Benjamins Publishing Company.
- Carelman, J. (2003), *Catalog d'objets introuvables*, Paris, Editions Du Cherche Midi.
- Carriedo, N., Corral, A., Montoro, P. R., Herrero, L., Ballestrino, P., & Sebastián, I. (2016). The development of metaphor comprehension and its relationship with relational verbal reasoning and executive function. *PLOS ONE*, 11(3), e0150289.
- Carroll, N. (2014), *Humor: A Very Short Introduction*. Oxford: Oxford University Press.
- Casasanto, D. (2009). When is a linguistic metaphor a conceptual metaphor? In Vyvyan Evans & Stéphanie Pourcel (eds.), *New Directions in Cognitive Linguistics*. Amsterdam/Philadelphia: Benjamins.
- Casasanto, D., & Gijssels, T. (2015). What makes a metaphor an embodied metaphor? *Linguistics Vanguard*, 1(1). doi:10.1515/lingvan-2014-1015
- CD Projekt RED. (2015). *The Witcher 3: Wild Hunt* [Microsoft Windows, PlayStation 4, Xbox One]. Poland: CD Projekt.
- Chao, H.-Y., & Kennedy, J. M. (2015). Metaphoric Car Drawings By a 12-Year-Old Congenitally Blind Girl. *Perception*, 44(12), 1349–1355.
- Chapdelaine-Feliciati, C. (2010). Les droits de l'homme de la femme: polysémie ou androcentrisme?. *International Journal For The Semiotics Of Law - Revue Internationale De Sémiotique Juridique*, 23(4), 451-474. doi: 10.1007/s11196-010-9166-9
- Chomsky, N. (1965). *Aspects of Syntax*. Cambridge MA: MIT Press. Halliday, M. 1983. *Introduction to Functional Grammar*. London: Arnold.
- Chrzanowska-Kluczevska, E. (2011). Catachresis—A metaphor or a figure in its own right? In *Beyond Cognitive Metaphor Theory: Perspectives on Literary Metaphor* (ed. M. Fludernik) [eBook]. New York: Routledge. Retrieved from <https://bit.ly/2KsbkFm>

- Chun, W. (March 13, 2018.) "Shame, Shame, Shame (refresh)." Seminar presented at *MSunderstanding Media* conference,, McLuhan Centre for Culture and Technology. University of Toronto, Toronto, ON.
- Cienki, A. (2013). Image schemas and mimetic schemas in cognitive linguistics and gesture studies. *Review of Cognitive Linguistics*, 11(2), 417-432. doi: 10.1075/rcl.11.2.13cie
- Clark, A., & Toribio, J. (1994). Doing without representing? *Synthese* 101, 401–431.
- Clark, H. (1992). *Arenas of language use*. Chicago: University of Chicago Press; Center for the Study of Language and Information.
- Clark, H. H. (1996). *Using language*. Cambridge: Cambridge University Press.
- Commission, E. (2017). *European accessibility act*. Retrieved from <https://bit.ly/2z0vO2u>
- Contini-Morava, E. (1995). Introduction: On Linguistic Sign Theory. In E. Contini Morava, B. Sussman Goldberg, & R. S. Kirsner (Eds.), *Meaning as Explanation: Advances in Linguistic Sign Theory* (pp. 1–39). Berlin: Mouton de Gruyter.
- Cope, A. C., Mavroveli, S., Bezemer, J., Hanna, G. B., & Kneebone, R. (2015). Making meaning from sensory cues: A qualitative investigation of postgraduate learning in the operating room. *Academic Medicine*, 90(8), 1125–1131.
- Coppin, P. W. (2014). Perceptual-cognitive properties of pictures, diagrams, and sentences: Toward a science of visual information design. University of Toronto, PhD Dissertation.
- Coppin, P. W. (2015). What is lost in translation from visual graphics to text for accessibility. In D. C. Noelle, R. Dale, A. S. Warlaumont, J. Yoshimi, T. Matlock, C. D. Jennings, & P. P. Maglio (Eds.), *Proceedings of the 37th Annual Cognitive Science Society* (pp. 447–452). Austin, TX: Cognitive Science Society. Retrieved from <https://bit.ly/2NlobGT>
- Coppin, P. W., Li, A., & Carnevale, M. (2016). Iconic properties are lost when translating visual graphics to text for accessibility. In J. Zlatev, P. Konderak, & G. Sonesson (Eds.), *Meaning, mind, and communication: Explorations in cognitive semiotics* (pp. 279–295). Frankfurt am Main, Germany: Peter Lang.
- Coulson, S. (2003). Reasoning and rhetoric: Conceptual blending in political and religious rhetoric. In Elzbieta H. Oleksy & Barbara Lewandowska-Tomaszczyk (Eds.) *Research and Scholarship in Integration Processes*. Lodz, Poland: Lodz University Press, pp. 59–88.
- Coulson, S. (2005). What's so funny? Cognitive semantics and jokes. *Cognitive Psychopatologia Cognitive*, 2(3), 67–78.
- Coulson, S. (2009). Conceptual blending in thought, rhetoric, and ideology. In: Gitte Kristiansen, Michel Achard, René Dirven and Francisco Ruiz de Mendoza Ibañez (eds.) *Cognitive Linguistics: Current Applications and Future Perspectives*. Berlin/New York: Mouton de Gruyter, pp. 379–402.
- Cowley, S. J., Moodley, S., & Fiori-Cowley, A. (2004). Grounding Signs of Culture: Primary Intersubjectivity in Social Semiosis. *Mind, Culture and Activity*, 11(2), 109–132.
- Crafting Kingdom (2018). *MetalPop Community Forum*. Retrieved from <https://bit.ly/2tRKZpF>
- Croft, W. (2008). On iconicity of distance. *Cognitive Linguistics*, 19(1), 49–57.
- Croft, W., & Cruse, D. (2004). *Cognitive linguistics*. New York: Cambridge University Press.
- Crowley, T. (1982). *The Paamese language of Vanuatu* (No. 87–89). Dept. of Linguistics, Research School of Pacific Studies, Australian National University.

- Crowley, T. (1996). Inalienable possession in Paamese grammar. In Chappell, H., & McGregor, W. (Eds.) *The grammar of inalienability: A typological perspective on body part terms and the part-whole relation* (Vol. 14) (pp. 383–432). Berlin: Walter de Gruyter.
- Dancygier, B. (1998). *Conditionals and prediction: time, knowledge and causation in conditional constructions*. Cambridge University Press.
- Dancygier, B. and Sweetser, E. (2014). *Figurative language*. Cambridge University Press
- Deacon, T. (1997). *The Symbolic Species: The Co-Evolution of Language and the Brain*. New York: W.W.Norton.
- Debras, C. (2017). The shrug: Forms and meanings of a compound enactment. *Gesture*, 16(1), 1–34.
- Delillo, D. (1985). *White Noise*. New York: Viking.
- Dell'Aversana, P., Gabbriellini, G., & Amendola, A. (2017). Sonification of geophysical data through time-frequency analysis: Theory and applications. *Geophysical Prospecting*, 65(1), 146–157. <https://doi.org/10.1111/1365-2478.12402>
- Derrida, J. (1982). White mythology. In *Margins of philosophy* (A. Bass, Trans.), p. 207–271. Chicago: The University of Chicago Press.
- Devylde, S. (2014). *Paamese Language and Culture* (SD1), Digital collection managed by PARADISEC. [Open Access] DOI: 10.4225/72/58ab0479d6eeb
- Devylde, S. (2016). *The PART-WHOLE schema we live through: A cognitive linguistic analysis of part-whole expressions of the Self* (Doctoral dissertation). Retrieved from theses.fr. (Accession No. s73829)
- Devylde, S. (2018). Diagrammatic iconicity explains asymmetries in Paamese possessive constructions. *Cognitive Linguistics*, 29(2), 313–348. doi:10.1515/cog-2017-0058
- Dodd, J. & Sandell, R. (1998). *Building bridges: Guidance for museums and galleries on developing new audiences*. London, UK: Museums and Galleries Commission Publications.
- Donaldson, M. S., Corrigan, J. M., & Kohn, L. T. (Eds.). (2000). *To err is human: Building a safer health system* (Vol. 6). National Academies Press.
- Dorfman, E. (1969). “Chapter One. Function and Structure in the Literary Analysis.” *The Narreme in the Medieval Romance Epic*.
- Douglas, M. (1986). *How institutions think*. Syracuse, NY: Syracuse University Press.
- Douglas, M. (2010). *Thinking in circles: An essay on ring composition*. New Haven: Yale University Press.
- Dryer, M. S. & Haspelmath, M. (eds.) (2013). *The World Atlas of Language Structures Online*. Leipzig: Max Planck Institute for Evolutionary Anthropology. (Available online at <http://wals.info>, Accessed on 2017–05–10.)
- Dubremetz, M. (2017a). Marie’s corpus. stp.lingfil.uu.se/~marie/corpus/quote_chiasmus.txt
- Dubremetz, M. (2017b). *Detecting Rhetorical Figures based on repetition of words: Chiasmus, epianaphora, epiphora* [a doctoral dissertation]. *Studia Linguistica Upsaliensia* 18. Uppsala: Acta Universitatis Upsaliensis.
- Duffley, P. J. (2013). How creativity strains conventionality in the use of idiomatic expressions. In Borkent, Mike, Dancygier, Barbara and Jennifer Hinnell (eds.), *Language and the Creative Mind*. Stanford: CSLI Publications, 49–62.
- Dumas A. (1849). *Les Trois Mousquetaires*. Paris: Dufour & Mulat.

- Eardley, A. F., Mineiro, C., Neves, J., & Ride, P. (2016). Redefining access: Embracing multimodality, memorability and shared experiences in museums. *The Museum Journal*, 59(3), 263–286. doi:0.1111/cura.12163
- ECHO [Microsoft Windows, PlayStation 4]. (2017). Copenhagen: Ultra Ultra.
- Eco, U. (1976). *Theory of Semiotics*. Bloomington: Indiana University Press.
- Eco, U. (1994). *Six walks in the fictional woods*. Cambridge, MA: Harvard University Press.
- Eco, U. (1997). Function and Sign: The Semiotics of Architecture. In N. Leach (Ed.), *Rethinking Architecture: A Reader in Cultural Theory* (pp. 173–193). London: Routledge.
- Eco, U. (1999). *Kant and the Platypus: Essays on Language and Cognition*, London, Secker and Warburg.
- Eco, U. (1999). *Semiotics in the next millennium*. (Lecture given at the 7th International Congress of the IASS-AIS, October 6, 1999).
- Eco, U. (2014). The dog that barked (and other zoosemiotic archaeologies). In: Eco, U., *From the Tree to the Labyrinth: Historical Studies on the Sign and Interpretation*. Cambridge: Harvard University Press, 171–222.
- Ekman, P. (1979). About brows - emotional and conversational signals. In: M. von Cranach, K. Foppa, W. Lepenies and D. Ploog, ed., *Human Ethology*. Cambridge: Cambridge University Press, pp.169–248.
- Ellen, R. F. (1977). Anatomical classification and the semiotics of the body. In J. Blacking (Ed.), *The Anthropology of the Body* (pp. 343–373). New York: Academic Press.
- Ellis, N. & Robinson, P. (2008). An introduction to cognitive linguistics, second language acquisition, and language instruction. In *The handbook of cognitive linguistics and second language acquisition*. (pp. 3–24). New York: Routledge.
- Enfield, N., Majid, A., & Van Staden, M. (Eds.). (2006). *Parts of the Body: Cross-Linguistic Categorisation (Language Sciences 28.2–3)*. Amsterdam: Elsevier.
- Enfield, N., Majid, A., & Van Staden, M. (2006). Cross-linguistic categorisation of the body: Introduction. *Language Sciences*, 28(2–3), 137–147.
- Eriksson, M. (2009). Referring as interaction: On the interplay between linguistic and bodily practices. *Journal of Pragmatics*, 41(2), 240–262.
- Evans, V. (2017). *The Emoji Code*. North America: MacMillan Picador
- Everett, C., & Madora, K. (2011). Quantity Recognition Among Speakers of an Anumeric Language. *Cognitive Science*, 36(1), 130–141. doi: 10.1111/j.1551-6709.2011.01209.x
- Èverett, D. (2012). *Language: The Cultural Tool*. London: Profile Books.
- Èverett, D. (2016). *Don't Sleep, There Are Snakes: Life and Language in the Amazonian Jungle*. Russian version consulted: *Ne spi-krugom zmei! Byt i jazyk indejcev amazonskix džunglej*. Jazyki slavjanskoj kul'tury.
- Fauconnier, G. & Turner, M. (2002). *The Way We Think: Conceptual Blending and the Mind's Hidden Complexities*. New York: Basic Books.
- Fahnestock, J. (1999). Antimetabole. In *Rhetorical figures in science* (pp. 122–155). Oxford: Oxford University Press.

- Favareau, D. (2015). Symbols are grounded not in things, but in scaffolded relations and their semiotic constraints (Or how the referential generality of symbol scaffolding grows minds). *Bio-semiotics*, 8(2), 235–255.
- Feld, S. (1981). 'Flow like a waterfall': The metaphors of Kaluli music theory. *Yearbook for Traditional Music*, 13, 22–47. Retrieved from JSTOR.
- Feyaerts, K., Brône, G., & Oben, B. (2017). Multimodality in Interaction. In B. Dancygier (ed.), *The Cambridge Handbook of Cognitive Linguistics* (pp. 135–156). Cambridge: Cambridge University Press.
- Flin, R., Yule, S., Paterson-Brown, S., Rowley, D., & Maran, N. (2006). The non-technical Skills for Surgeons (NOTSS) system handbook v1. 2. *University of Aberdeen, Scotland*.
- Flowers, J., Turnage, K., & Buhman, D. (2005). Desktop data sonification: Comments on flowers et al., icad 1996. *ACM Transactions on Applied Perception (TAP)*, 2(4), 473–476. <https://doi.org/10.1145/1101530.1101545>
- Fodor, J. (1975). *The Language of Thought*. New York: Thomas Y. Crowell.
- Forceville, C., Urios-Aparisi, E. (2009). *Multimodal Metaphor*. Berlin: Mouton de Gruyter.
- Frankl, Viktor Emil. *Man's Search for Meaning: An Introduction to Logotherapy*. Simon & Schuster, 1962. Print.
- Fraser, J. T. (1999). *Time, Conflict, and Human Values*. Urbana: University of Illinois Press.
- Frege, G. (1892). On sense and reference. Reprinted in A.P. Martinich and D. Sosa (Eds.), *The Philosophy of Language*. (pp. 35–47.) New York: Oxford University Press.
- Freire, P. (1970). *Pedagogy of the oppressed*. London, UK: Continuum.
- Friberg, J., & Gärdenfors, D. (2004). Audio games: New perspectives on game audio. In *Proceedings of the 2004 acm sigchi international conference on advances in computer entertainment technology* (pp. 148–154). ACM. <https://doi.org/10.1145/1067343.1067361>
- Fuoli, M. (2015). A step-wise method for annotating APPRAISAL. *Functions of Language*, 25(2).
- Geeraerts, D. et al. 1994. *The Structure of Lexical Variation*. Berlin: Mouton.
- Galantucci, B., & Garrod, S. (2011). Experimental Semiotics: A Review. *Frontiers In Human Neuroscience*, 5(11), 1-15. doi: 10.3389/fnhum.2011.00011
- Gallud Jardiel, E. (2016). *Teoría y mecanismos del humor*. Madrid: Carpe Noctem.
- Gaver, W. (1986). Auditory icons: Using sound in computer interfaces. *Human-Computer Interaction*, 2(2), 167–177. https://doi.org/10.1207/s15327051hci0202_3
- Gibbs, R. W., Jr. (2005). *The psychological status of image schemas*. In B. Hampe (ed.), 113–135.
- Gibbs, R. W. (2008). *The Cambridge Handbook of Metaphor and Thought*. Cambridge University Press.
- Gibbs, R. W. & Colston, H. L. (2012). *Interpreting Figurative Meaning*. Cambridge: Cambridge University Press.
- Gibson, J. (1982). *Reasons for realism*, Reed, E. & Jones, R. (eds.). Hillsdale, NJ: Lawrence Erlbaum.
- Groupe µ. 1992. *Traité du signe visuel*. Paris: Seuil.
- Goldberg, A. (1995). *Constructions: A Construction Grammar Approach to Argument Structure*. Chicago: University of Chicago Press.

- Grady, J. E. (1997). *Foundations of meaning: Primary metaphors and primary scenes* (Unpublished Doctoral dissertation). University of California at Berkeley, Berkeley, CA.
- Lakoff, G., & Johnson, M. (1980). *Metaphors we live by*. Chicago: University of Chicago Press.
- Green, A. E., Spiegel, K. A., Giangrande, E. J., Weinberger, A. B., Gallagher, N. M., & Turkeltaub, P. E. (2016). Thinking Cap Plus Thinking Zap: tDCS of Frontopolar Cortex Improves Creative Analogical Reasoning and Facilitates Conscious Augmentation of State Creativity in Verb Generation. *Cerebral Cortex*, 27(4), 2628–2639.
- Green, J. (2014). *Drawn from the Ground: Sound, sign and inscription in Central Australian sand stories*. Cambridge: Cambridge University Press.
- Greenberg, C. C., Regenbogen, S. E., Studdert, D. M., Lipsitz, S. R., Rogers, S. O., Zinner, M. J., & Gawande, A. A. (2007). Patterns of communication breakdowns resulting in injury to surgical patients. *Journal of the American College of Surgeons*, 204(4), 533–540.
- Greimas, A. J. (1987). *On Meaning: Selected Writings in Semiotic Theory*. Univ. of Minnesota Pr.
- Gries, S. (2003). *Multifactorial Analysis in Corpus Linguistics: A Study of Particle Placement (Open linguistics series)* (pp. 377–388). London: Continuum International Publishing Group Ltd.
- Grice, H.P. (1969). Utterer's Meaning and Intentions. *The Philosophical Review* 78, 147–177.
- Grice, H. (1989). *Studies in the way of words*. Cambridge, Mass.: Harvard University Press.
- Haiman, J. (2008). In defence of iconicity. *Cognitive Linguistics*, 19(1), 35–48.
- Halliday, M. A. K. (1978). *Language as Social Semiotic*. Edward Arnold: London.
- Halliday, M. A. K. (1994). *An Introduction to Functional Grammar*. Arnold: London.
- Hampe, B. (2005). *From Perception to Meaning*. Berlin, New York: Mouton de Gruyter.
- Harnad, S. (Ed.). (1987). *Categorical Perception: The Groundwork of Cognition*. New York, NY, US: Cambridge University Press.
- Harris, R. A. (2001). Review of Rhetorical Figures in Science by Jeanne Fahnestock. *Rhetoric Society Quarterly* 31(4), 92–104.
- Harris, R. A., Di Marco, C., Mehlenbacher, A. R., Clapperton, R., Choi, I., Li, I., & O'Reilly, C. (2017). A cognitive ontology of rhetorical figures. *Cognition and Ontologies* 2, 18–21.
- Haspelmath, M. (2008). Frequency vs. iconicity in explaining grammatical asymmetries. *Cognitive Linguistics*, 19(1), 1–33.
- Hein, G. E. (1999). Is meaning making constructivism? Is constructivism meaning making? *The Exhibitionist*, 18(2), 15–18. Retrieved from <https://name-aam.org>
- Heine, B. (1997). *Cognitive Foundations of Grammar*. Oxford: Oxford University Press.
- Herodotus & De Sélincourt, Aubrey, 1894-, (tr.) (1954). *Herodotus : the Histories*. Penguin, Harmondsworth.
- Hoffmeyer, J. (1993). *Signs of Meaning in the Universe*. Bloomington and Indianapolis: Indiana University Press.
- Kristeva, Julia 1986. *The Kristeva Reader*. New York: Columbia University Press.
- Hoffmeyer, J. (2007). Semiotic Scaffolding of Living Systems. In M. Barbieri, *Introduction to Biosemiotics - The New Biological Synthesis* (pp. 149–166). Dordrecht: Springer.
- Hoffmeyer, J. (2010). A Biosemiotic Approach To The Question Of Meaning. *Zygon*®, 45(2), 367-390. doi:10.1111/j.1467-9744.2010.01087.x
- Hoffmeyer, J. (2015). Semiotic Scaffolding: A Unitary Principle Gluing Life and Culture Together. *Green Letters*, 19(3), 243–254.

- Hooper-Greenhill, E. (2000). *Museums and the interpretation of visual culture*. New York, NY: Routledge.
- Hribar, A., Sonesson, G., & Call, J. (2014). From sign to action. *Studies in chimpanzee pictorial competence*. *Semiotica*, 198, 205–240.
- Huffman, A. (2002). Cognitive and Semiotic Modes of Explanation in Functional Grammar. In W. H. Reid, R. Otheguy, & N. Stern (Eds.), *Signal, Meaning, and Message: Perspectives on Sign-Based Linguistics* (pp. 311–337) Amsterdam: John Benjamins Publishing Company.
- Husserl, E. (i.1898-1925/1980). *Husserliana: Vol. XXIII. Phantasie, Bildbewusstsein, Erinnerung: Zur Phänomenologie der anschaulichen Vergegenwärtigungen* [Phantasy, image consciousness, and memory: On the phenomenology of intuitive re-presentations]. The Hague: Nijhoff.
- Hutchinson, B. (2015). BC man survives violent encounter with RCMP. *National Post* (26 July). A15, A17.
- Hutto, D. & Myin, E. (2012). *Radicalizing Enactivism. Basic Minds without Content*. The MIT Press.
- Ibarretxe-Antuñano, I. (2017). Basque ideophones from a typological perspective. *Canadian Journal of Linguistics*, 62(2):196–220.
- Ico [PlayStation 2, PlayStation 3]. (2001). Tokyo: Team Ico/SIE Japan Studio.
- Imai, M. & Gentner, D. (1997). A cross-linguistic study of early word meaning: Universal ontology and linguistic influence. *Cognition* 62, 169–200.
- Imai, M., & Kita, S. (2014). The sound symbolism bootstrapping hypothesis for language acquisition and language evolution. *Philosophical Transactions of the Royal Society B*, 369.
- Jackson, F. (1982): “Epiphenomenal Qualia”, *The Philosophical Quarterly*, 32(127), 127–136.
- Jafri, R., & Ali, S. A. (2015). Utilizing 3D printing to assist the blind. In *Proceedings of the 2015 international conference on health informatics and medical systems (hims 2015), July* (pp. 27–30). Retrieved from <https://bit.ly/2LLDhZQ>
- Jakobson, R. (1959). *On Translation*. Brower, Reuben Arthur (Eds.). Harvard University Press. DOI: <https://doi.org/10.4159/harvard.9780674731615.c18>
- Jeffries, L. (2010). *Critical Stylistics: The Power of English*. Basingstoke: Palgrave Macmillan
- Jeon, M. (2015). Exploration of semiotics of new auditory displays: A comparative analysis with visual displays. In *Proceedings of the 21st International Conference on Auditory Display*. Graz, Austria: Institute of Electronic Music and Acoustics.
- Jimenez, J. (2018). *Semiology for artists and designers*. USA: Zona Limite
- Johnson, M. (1987). *The Body in the Mind: The Bodily Basis of Meaning, Imagination and Reasoning*. Chicago UP.
- Jung, C. (1969). *The Archetypes and the Collective Unconscious*. Princeton NJ: Princeton University Press, Print.
- Kahn, C. H. (1979). *The Art and Thought of Heraclitus*. Cambridge.
- Kärkkäinen, S. (2018). Touch mapper. Retrieved from <https://touch-mapper.org/>
- Kashima, Y. & Haslam, N. (2007). Explanation and Interpretation: An Invitation to Experimental Semiotics. *Journal of Theoretical and Philosophical Psychology*, 27–28(2–1), 234–256.
- Kay, P. & Kempton, W. (1984). What is the Sapir-Whorf Hypothesis? *American Anthropologist* 86, 65–79.

- Keller, P. & Stevens, C. (2004). Meaning from Environmental Sounds: Types of Signal-Referent Relations and Their Effect on Recognizing Auditory Icons. *Journal of Experimental Psychology: Applied*, 10(1), 3–12, doi:10.1037/1076-898X.10.1.3.
- Kendon, A. (1964). The distribution of visual attention in two-person encounters. *Report to Dept. of Scientific and Industrial Research, London*. (1967) "Some functions of gaze direction in social interaction" *Acta Psychologica*, 26, 1971.
- Kendon, A. (1997). Gesture. *Annual review of anthropology*, 26(1), 109–128.
- Kendon, A. (2004). *Gesture: Visible action as utterance*. New York: Cambridge University Press.
- Kennedy, J.M. & Juricevic, I. (2006) Blind man draws using convergence in three dimensions. *Psychonomic Bulletin and Review*, 13(3), 506–509.
- Kirby, S., Griffiths, T., & Smith, K. (2014). Iterated learning and the evolution of language. *Current Opinion in Neurobiology*, 28, 108–114.
- Kirsh, D. (2010). Explaining artifact evolution. In L. Malafouris & C. Renfrew (Eds.), *The cognitive life of things: Recasting the boundaries of the mind* (pp. 121–144). Cambridge, UK: University of Cambridge.
- Klatzky, R. L., & Lederman, S. J. (1987). The intelligent hand. In G. H. Bower (Ed.), *The psychology of learning and motivation* (Vol. 21, pp. 121–151). San Diego: Academic Press.
- Klatzky, R.L., & Lederman, S.J. (1999). The haptic glance: A route to rapid object identification and manipulation. In D. Gopher & A. Koriats (Eds.) *Attention and Performance XVII. Cognitive regulations of performance: Interaction of theory and application*. (pp. 165–196). Mahwah, NJ: Erlbaum
- Kogan, N., Connor, K., Gross, A., & Fava, F. (1980). *Understanding visual metaphor: Developmental and individual differences*. Monographs of the society for research in child developmental serial, No. 183, Vol. 45 (1).
- Kövecses, Z. (2000). Force and emotion. In Albertazzi (Ed.) *Meaning and Cognition: A multidisciplinary approach*. 2. 145–168.
- Kramer, G. (1994). An introduction to auditory display. In Gregory Kramer (Ed.), *Auditory display: sonification, audification, and auditory interfaces* (pp. 1-77). Reading, MA: Addison-Wesley.
- Kress, G. and Van Leeuwen, T. (2001) *Multimodal Discourse: The Modes and Media of Contemporary Communication*, London: Edward Arnold.
- Krauss, R. M. & Weinheimer, S. (1964). Changes in reference phrases as a function of frequency of usage in social interaction—a preliminary study. *Psychonomic Science*, 1(5), 113–114.
- Kress, G. R., & Van, L. T. (1996). *Reading images: The grammar of visual design* (1st ed.). London: Routledge.
- Kress, G., & Leeuwen, T. . (2006). *Reading images: The grammar of visual design* (2nd ed.). London: Routledge.
- Kress, G. (2010), *Multimodality: A Social Semiotic Approach to Contemporary Communication*. Routledge: London
- Krygier, J. B. (1994). Sound and geographic visualization. In *Modern cartography series* (pp. 149–166). Academic Press: 2. Retrieved from <https://bit.ly/2MGYQpP>

- Kull, K. (2012). Semiosis Includes Incompatibility: On the Relationship between Semiotics and Mathematics. In: *Semiotic and Cognitive Science Essays on the Nature of Mathematics*. [Bockarova, M.; Danesi, M.; Núñez, R. (eds.)]
- Kull, K. (2015). Evolution, Choice, and Scaffolding: Semiosis is Changing its Own Building. *Biosemiotics* 8, 223-234.
- Kull, K. (2015). *Semiosis stems from logical incompatibility in organic nature: Why biophysics does not see meaning, while biosemiotics does*. *Progress in Biophysics and Molecular Biology* 119(3): 616–621.
- Kull, K. (2018). On the logic of animal umwelten: The animal subjective present and zoosemiotics of choice and learning. In: Marrone G.; Mangano, D. (eds.), *Semiotics of Animals in Culture: Zoo-semiotics 2.0*. (Biosemiotics 17.) Cham: Springer, 135–148.
- Lacan, J. (1988). *The Seminar of Jacques Lacan, Book II: The Ego in Freud's Theory and in the Technique of Psychoanalysis 1945–1955*, ed. J.A. Miller, trans. S. Tomaselli, Cambridge: Cambridge University Press.
- Lacan, J. (2001). The Mirror Stage as Formative Function of the I as Revealed in Psychoanalytic Experience. In J. Lacan, *Écrits - A Selection*. Abingdon: Routledge.
- Lakoff, G., & Johnson, M. (1980). *Metaphors we live by*. Chicago: University of Chicago Press.
- Lakoff, G. (1987). *Women, Fire, and Dangerous Things*. Chicago: University of Chicago Press.
- Lakoff, G. & Johnson, M. (1999). *Philosophy in the flesh*. New York: Basic Books.
- Langacker, R. W. (1987). *Foundations of Cognitive Grammar. Volume I: Theoretical prerequisites*. Stanford: Stanford University Press.
- Langacker, R. W. (2006). *Foundations of Cognitive Grammar. Volume 2: Descriptive Applications*. Stanford: Stanford University Press.
- Langacker, R.W. (2016). Working towards a synthesis. *Cognitive Linguistics*, 27(4), 465–478.
- Langlois, G. (2011). Meaning, Semiotecnologies And Participatory Media. *Culture Machine* 12, 1-27.
- Langlotz, A. (2006). *Idiomatic Creativity: A Cognitive Linguistic Model of Idiom- Representations and Idiom-Variation in English*. Amsterdam: John Benjamins.
- Lanham, R. (1991). *A Handlist of Rhetorical Terms*. University of California Press, Berkeley, CA.
- LeBaron, C., & Streeck, J. (2000). Gestures, knowledge and the world. In D. McNeill (Ed.), *Language and Gesture*, 118–138. Cambridge, UK: Cambridge University Press.
- Leonard, M., Graham, S. & Bonacum, D. (2004). The human factor: The critical importance of effective teamwork and communication in providing safe care. *Quality Safety Health Care*, 13(1), 85–90. DOI: 10.1136/qshc.2004.010033
- Levent, N. & McRainey, D. L. (2013). Touch and narrative in art and history museums. In N. Levent & A. Pascual-Leone (Eds.), *The multisensory museum: Cross-disciplinary perspectives on touch, sound, smell, memory, and space* (pp. 68–84). Blue Ridge Summit, PA: Rowman & Littlefield.
- Levi-Strauss, C. (1955) *The Structural Study of Myth*. S.n.
- Levinson, S.C., Kita, S., Haun, D.B.M., Rasch, B.H. (2002). *Returning the tables: language affects spatial reasoning*. *Cognition* 84, 155–188.
- Lewis, V., Boucher, J., & Astell, A. (1992). The assessment of symbolic play in young children: A prototype test. *European Journal of Disorders of Communication*, 27(3), 231–245.

- Li, P., Arbabanell, L., Gleitman, L., & Papafragou, A. (2011). *Spatial Reasoning in Tenejapan Mayans*. *Cognition* 120: 33–53.
- Li, P., & Gleitman, L. (2002). Turning the tables: language and spatial reasoning. *Cognition*, 83, 265–294.
- Limasse Five. (2014). *NaissanceE* [Windows]. France.
- Lingard, L. (2004). Communication failures in the operating room: An observational classification of recurrent types and effects. *Quality and Safety in Health Care*, 13(5), 330–334. doi:10.1136/qhc.13.5.330
- Lissner, P. A. (2007). Chi-thinking: Chiasmus and cognition (Ph.D. dissertation). University of Maryland, College Park.
- Little, H., Eryilmaz, K., & de Boer, B. (2017). Signal dimensionality and the emergence of combinatorial structure. *Cognition*, 168, 1–15.
- Livingstone, M. (2014). *Vision and Art*. USA: Harry N. Abrams; Expanded, Revised edition.
- Loar, B. (1990). Phenomenal States. *Philosophical Perspectives*, 4, 81–108.
- Lotman, J. (1977). *The Structure of the Artistic Text*. Ann Arbor: University of Michigan Press.
- Lou, Adrian. 2017. Multimodal simile: the “when” meme in social media discourse. *English Text Construction* 10(1), 106–131.
- Lucy, J. A. (1996). *Grammatical Categories and Cognition: A Case Study of the Linguistic Relativity Hypothesis*. Cambridge: University Press.
- Luria, A. R. (1990). The Problem of Verbal Communication. In J. Steele (Ed.), *Meaning- Text Theory: Linguistics, Lexicography, and Implications* (pp. 273–325). Ottawa: University of Ottawa Press.
- Majid, A. (2010). Words for Parts of the Body. In Barbara Malt and Phillip Wolff (Eds.), *Words and the Mind: How words capture human experience* (pp. 58–71). Oxford: Oxford University Press.
- Majid, A. & Staden, M. (2015). Can nomenclature for the body be explained by embodiment theories? *Topics in cognitive science*, 7(4), 570–594.
- Maslow, A. H. (1967). Isomorphic Interrelationships Between Knower and Known. In F. W. Matson & A. M. (Eds.), *The Human Dialogue; Perspectives on Communication* (pp. 195–205). New York, NY: Free Press.
- Mayer, M. (1969). *Frog where are you?* New York: Dial Books for Young Readers.
- Maynard, S. K. (1993). *Discourse Modality: Subjectivity, Emotion and Voice in the Japanese Language*. Amsterdam/Philadelphia: John Benjamins.
- Maynard, S. K. (2002). Linguistic Emotivity: Centrality of place, the topic-comment dynamic, and an ideology of pathos in Japanese discourse. Amsterdam; Philadelphia; John Benjamins.
- Mccune-Nicolich, L. (1981). Toward Symbolic Functioning: Structure of Early Pretend Games and Potential Parallels with Language. *Child Development*, 52(3), 785–797. doi:10.2307/1129078
- McGookin, D. & Brewster, S. (2011). Chapter 14 earcons. In H. Hermann T. (Ed.), *The sonification handbook*. Berlin, Germany: Logos Publishing House. Retrieved from <https://bit.ly/2INQx07>
- McNeill, D. & Duncan, S. D. (2000). “Growth Points in Thinking-for-Speaking.” In *Language and Gesture*, edited by David McNeill, 141–61. Cambridge: Cambridge University Press.
- Merleau-Ponty, M. (1962). *Phenomenology of perception* (Taylor and Francis e-Library, 2005. ed.). New York: Taylor & Francis Group .

- Mel'čuk, I. A. (1988). *Dependency Syntax: Theory and Practice*. Albany: State University Press of New York.
- Mel'čuk, I. A. (1993). *Cours de morphologie générale: Théorique et descriptive, volume 1. Introduction et première partie: le mot*. Montréal: Presses de l'Université de Montréal.
- Merleau-Ponty, M. (1963). *The Structure of Behaviour* (A. Fisher, Trans.). Pittsburgh, PA: Dusquene University Press.
- Miller, P. L. (2010). Truth in conflict. *The Immanent Frame*. Retrieved from <https://bit.ly/2u0u5Vl>
- Miller, P. L. (2012). *Becoming God: Pure reason in early Greek philosophy*. London: Bloomsbury.
- Minagawa, H. (2016). Submergence of lexically encoded egocentricity in syntax: The case of subjective emotion predicates in Japanese. *Journal of Japanese Linguistics*, 32(1), 3–27.
- Mitchell, L., Flin, R., Yule, S., Mitchell, J., Coutts, K., & Youngson, G. (2013). Development of a behavioural marker system for scrub practitioners' non-technical skills (SPLINTS system). *Journal of evaluation in clinical practice*, 19(2), 317–323.
- Mittelberg, I. (2006). Peircian semiotics meets conceptual metaphor: Iconic modes in gestural representations of grammar. In Alan Cienki and Cornelia Müller (Eds.), *Metaphor and Gesture*, (pp. 115–154). Amsterdam: John Benjamins.
- Mittelberg, I. (2010). Geometric and image-schematic patterns in gesture space. In V. Evans & P. A. Chilton (eds.), *Language, Cognition, and Space: The State of the Art and New Directions*, 351–385. London: Equinox.
- Mittelberg, I. (2013). Balancing acts: Image schemas and force dynamics as experiential essence in pictures by Paul Klee and their gestural enactments. In M. Borkent et al. (eds.), *Language and the Creative Mind*, 325–346. Stanford: CSLI Publications.
- Mittelberg, I. (2018a). Gestures as image schemas and force gestalts: A dynamic systems approach augmented with motion-capture data analyses. *Cognitive Semiotics*, 11(1). doi:10.1515/cogsem-2018-0002
- Mittelberg, I. (2018b). *Peirce's Universal Categories: On their potential for gesture theory and multi-modal analysis*. Semiotica. Manuscript submitted for publication.
- Monelle, R. (1991). *Linguistics and semiotics in music*. London: Routledge.
- Moore, A. R. (2011). Surgical teams in action: a contextually motivated view of interpersonal engagement and body alignment. *Baldry/Montagna (eds)*.
- Moore, A., Butt, D., Ellis-Clarke, J., & Cartmill, J. (2010). Linguistic analysis of verbal and non-verbal communication in the operating room. *ANZ journal of surgery*, 80(12), 925–929.
- Morin, V. (1966), “L’histoire drôle”. In *L’analyse structural du récit. Communications 8*. Paris, Seuil.
- Morreall, J. (ed.) (1987), *The Philosophy of Laughter and Humor*, New York, State University of New York Press.
- Norman, D. (2014), *The Psychology of Everyday Things*. New York, Basic Books.
- Niño, D. (2015), *Elementos de semiotica agentiva*, Bogotá, Universidad de Bogotá Jorge Tadeo Lozano.
- Norris, S. (2004). *Analyzing multimodal interaction: A methodological framework*. Routledge.
- Nunberg, G. (1979). The non-uniqueness of semantic solutions: Polysemy. *Linguistics and Philosophy*, 3, 143.

- Oakley, T. & Coulson, S. (2008). "Connecting the dots: Mental spaces and metaphoric language in discourse". In Oakley, T. & A. Hougaard (eds.), *Mental Spaces in Discourse and Interaction*, 27–50. Amsterdam, Philadelphia: John Benjamins.
- Obama, B. (2012). Remarks by the First Lady and the President at Final Campaign Rally -- Des Moines, IA. obamawhitehouse.archives.gov
- Ochs, E. & Schieffelin, B. (1989). Language has a heart. The pragmatics of affect. In Ochs, E. (Ed.) *Text 9: 1*, 7–25.
- Ogden, C. K., & Richards, I. A. (1923). *The meaning of meaning: A study of the influence of language upon thought and the science of symbolism*. London: Routledge.
- Ord, M. (2017). Song, sonic metaphor, and countercultural discourse. In *Music as Multimodal Discourse: Semiotics, Power and Protest* (eds. L.C.S. Way & S. McKerrell), p. 201–222. London: Bloomsbury Academic
- Orsborn, M. B. (2012). *Chiasmus in the Early Prajñāpāramitā: Literary Parallelism Connecting Criticism & Hermeneutics in an Early Mahāyāna Sūtra*. University of Hong Kong.
- Peachum, H. (1593.). The Garden of Eloquence. Retrieved from <https://bit.ly/2ILKgv3>
- Pederson, E., Danziger, E., Levinson, S.C., Kita, S., Senft, G., Wilkins, D.P. (1998). Semantic typology and spatial conceptualization. *Language* 74(3), 557–589.
- Peirce, C. S. (1866–67): "Appendix #2", MS 740, in: De Tienne, André (ed. and intr.), *Transactions of the Charles S. Peirce Society*, 1993, 29.4: 637–673.
- Peirce, C. S. (1868): "Some Consequences of Four Incapacities", *Journal of Speculative Philosophy* 2, 140–157. (Reprinted in: Peirce Edition Project (eds.), *Writings of Charles S. Peirce: A Chronological Edition*, vol. 2, Bloomington: Indiana UP, 1984, pp. 211–242.)
- Peirce, C. S. (1892): "The Law of Mind", *The Monist* 2, 533–59. (Reprinted in: Houser, Nathan – Kloessel, Christian (eds.), *Essential Peirce*, vol. 1, Bloomington: Indiana UP, 1992, pp. 312–333.)
- Peirce, C. S. (1902). *Logic as semiotic: The theory of signs*. Retrieved from <http://theory.theasintheas.org/wp-content/uploads/2013/02/Peirce-C-S-Logic-Semiotic.pdf>
- Peirce, C. S. (1903): "The Seven Systems of Metaphysics", in: Peirce Edition Project (eds.), *Essential Peirce*, vol. 2, Bloomington: Indiana UP, 1998, pp. 179–195.
- Peirce, C. S. (1903): "Pragmatism as the Logic of Abduction", in: Peirce Edition Project (eds.), *Essential Peirce*, vol. 2, Bloomington: Indiana UP, 1998, pp. 226–241.
- Peirce, C. S. (1931–1958). *Collected Papers of Charles Sanders Peirce*. Cambridge: Harvard University Press [Hartshorne, Charles; Weiss, Paul; Burks, Arthur W. (eds.).
- Peirce, C. S. (1998). *The essential Peirce: Selected philosophical writings. Vol. 2, (1893–1913)*. Bloomington: Indiana University Press.
- Pelkey, J. (2013a). Cognitive chiasmus: Embodied phenomenology in Dylan Thomas. *Journal of Literary Semantics*, 42(1), 79–114. doi:10.1515/jls-2013-0005
- Pelkey, J. (2013b). Chiastic Antisymmetry in Language Evolution. *The American Journal of Semiotics*, 29(1), 39–68. doi:10.5840/ajs2013291-43
- Pelkey, J. (2016a). Analogy Reframed: Markedness, Body Asymmetry, and the Semiotic Animal. *The American Journal of Semiotics*, 32(1), 79–126. doi:10.5840/ajs2016101113

- Pelkey, J. (2016b). Symmetrical reasoning in language and culture: On ritual knots and embodied cognition. In J. Zlatev, G. Sonesson, & P. Konderak (Eds.), *Meaning, Mind and Communication: Explorations in Cognitive Semiotics* (pp. 239–250). Frankfurt am Main: Peter Lang.
- Pelkey, J. (2017). *The semiotics of X: Chiasmus, cognition, and extreme body memory*. London: Bloomsbury Academic.
- Pelkey, J. (2018). Upright posture and the meaning of meronymy: A synthesis of metaphoric and analytic accounts. *Cognitive Semiotics*, 11(1), 1–18. doi:10.1515/cogsem-2018-0003
- Pérez-Sobrino, P. (2014). “Multimodal cognitive operations in classical music”. *Vigo International Journal of Applied Linguistics* 11, 137–168.
- Petrilli, S. and Ponzio, A. (2010). ‘Semioethics’ in Paul Cobley (ed), *The Routledge Companion to Semiotics*. London: Routledge.
- Petrilli S., Ponzio A. (2015). Language as Primary Modeling and Natural Languages: A Biosemiotic Perspective. In Velmezova E., Kull K., Cowley S. (Eds), *Biosemiotic Perspectives on Language and Linguistics* (pp. 47-76).
- Piaget, J. & Inhelder, B. (1963 [1948]) *The Child’s Conception of Space*. London: Routledge and Kegan Paul.
- Pöppel, E., Bao, Y. (2014). Temporal windows as a bridge from objective to subjective time. In: Arstila, V.; Lloyd, D. (eds.), *Subjective Time: The Philosophy, Psychology, and Neuroscience of Temporality*. Cambridge: MIT Press, 241–262.
- Prinz, J. J. (2012). *The Conscious Brain: How Attention Engenders Experience*, Oxford: Oxford University Press.
- Propp, V. (1968). *Morphology of the folktale* (L. Scott, Trans.). Austin: University of Texas Press.
- Putnam, H. (1984). After Ayer, after empiricism. *Partisan Review*, 51(2), 265. In J. Rajchman, & West, C. (1985). *Post-analytic philosophy*. New York: Columbia University Press
- Radday, Y. T. (1981). Chiasmus in Hebrew Biblical Narrative. In J. W. Welch (Author), *Chiasmus in antiquity: Structures, analyses, exegesis* (pp. 50-117). Hildesheim: Gerstenberg.
- Read, J. & Carroll, J. (2012). Annotating expressions of Appraisal in English. *Language Resources and Evaluation*, 46, 421–447. DOI: 10.1007/s10579-010-9135-7
- Rober, N. & Masuch, M. (2005). Leaving the screen new perspectives in audio-only gaming. In: Georgia Institute of Technology. <https://doi.org/http://hdl.handle.net/1853/50168>
- Roberson, D., Davies, I. & Davidoff, J. (2000). Color Categories are not Universal: Replications and New Evidence from a Stone Age Culture. *Journal of Experimental Psychology*, 129(3), 369–398.
- Rohrer, T. (2004) Race-baiting, Cartooning and Ideology: A conceptual blending analysis of contemporary and WW II war cartoons. In: Steffen Greschonig, Christine S. Sing (Hrsg.) *Ideologien zwischen Lüge und Wahrheitsanspruch*. Deutscher Universitäts, pp.193–216
- Rowlands, M. (2010). *The New Science of the Mind*, MIT Press.
- Russell, B. (1905). On denoting. Reprinted in A.P. Martinich and D. Sosa (Eds.), *The Philosophy of Language*. (pp. 105–113). New York: Oxford University Press.
- Sag, I. A. (2012). Sign-Based Construction Grammar: An Informal Synopsis. In H. C. Boas & I. A. Sag (Eds.), *Sign-Based Construction Grammar* (pp. 69–202). Stanford: CSLI Publications.

- Sainsbury, R. M. (2008). The essence of reference. In LePore, E., & Smith, B. (Eds.). *The oxford handbook of philosophy of language* (Oxford handbooks in philosophy). Oxford: Oxford University Press.
- Sanders, E. B. N., & Stappers, P. J. (2014). Probes, toolkits and prototypes: three approaches to making in codesigning. *CoDesign*, 10(1), 5–14.
- Sandler, W., Aronoff, M., Meir, I., & Padden, C. (2011). The gradual emergence of phonological form in a new language. *Natural language & linguistic theory*, 29(2), 503.
- Sarker, S. K., & Vincent, C. (2005). Errors in surgery. *International Journal of Surgery*, 3(1), 75-81. doi:10.1016/j.ijssu.2005.04.003
- Saussure, F. D., Bally, C., Sechehayé, C. A., Urbain, J., & Riedlinger, A. (2016). *Cours de linguistique générale*. Paris: Payot.
- Scherer, K. R. (2005). What are emotions? And how can they be measured? *Social Science Information*, 44(4), 695-729. doi:10.1177/0539018405058216
- Schmitz, H. C. (2008). *Accentuation and interpretation*. New York: Palgrave MacMillan.
- Schoonjans, S. (2014). *Modalpartikeln als multimodale Konstruktionen: Eine korpusbasierte Konkurrenzanalyse von Modalpartikeln und Gestik im Deutschen*. (PhD), KU Leuven.
- Schott, R. L. (1992). Abraham Maslow, Humanistic Psychology, and Organization Leadership. *Journal of Humanistic Psychology*, 32(1), 106-120. doi:10.1177/0022167892321008
- Searle, J. (1958). Proper names. In A.P. Martinich and D. Sosa (Eds.), *The Philosophy of Language*. New York: Oxford University Press.
- Sebeok, Th. A. (1991). *A Sign is Just a Sign*. Bloomington: Indiana University Press.
- Senghas, A., Kita, S., & Özyürek, A. (2004). Children creating core properties of language: Evidence from an emerging sign language in Nicaragua. *Science*, 305(5691), 1779–1782.
- Safavi, S. G. & Weightman, S. C. R (2009). *Rūmī's Mystical Design: Reading the Mathnawī, Book One*. Albany: SUNY Press.
- Shannon, C. E., & Weaver, W. (1949). *The mathematical theory of communication*. Champaign, IL: University of Illinois Press.
- Shimojima, A. (1999). The graphic-linguistic distinction: Exploring alternatives. *Artificial Intelligence Review*
- Short, T. L. (2007). *Peirce's Theory of Signs*. Cambridge: Cambridge University Press.
- Siabra-Fraile, J. (2009). Manic Miner under the Shadow of the Colossus: A Semiotic Analysis of the Spatial Dimension in Platform Video Games. *E|C, Anno III* (5), 67–74.
- Siu, Y. T. (2014). 3D printing for accessible materials in schools - final report. Retrieved from http://diagramcenter.org/wp-content/uploads/2014/06/3D_FinalReport_SIU_3.docx
- Slobin, D. I. (1987). "Thinking for Speaking." In *Papers from the 13th Annual Meeting of the Berkeley Linguistics Society*, edited by J. Aske, N. Beery, L. Michaelis, and H. Filip, 435–45. Berkeley, CA: BLS.
- Sonesson, G. (2003). Über die Möglichkeit von bildhaften Metaphern. *Zeitschrift für Semiotik: Metaphern in Bild und Film, Gestik, Theater und Musik*, 5(1-2), 25–38.
- Sonesson, G. (2005). De la métaphore à l'allégorie dans la sémiotique écologique. *Protée*, 33(1), 77–92.

- Sonesson, G. (2008). Prolegomena to a general theory of iconicity. Considerations on language, gesture, and pictures. In K. Willems & L. De Cuypere (eds.) *Naturalness and iconicity in language* (pp.47–72). Amsterdam: John Benjamins.
- Sonesson, G. (2010). Rhetoric from the standpoint of the Lifeworld. *Nouveaux Actes Sémiotiques [en ligne]. Actes de colloques, 2008, Le Groupe μ. Quarante ans de rhétorique – Trente-trois ans de sémiotique visuelle*. Disponible sur le site <http://epublications.unilim.fr/revues/as/3106> (consulted on 26/07/2010).
- Sonesson, G. (2013). The natural history of branching: Approaches to phenomenology of Firstness, Secondness and Thirdness. *Signs and Society, 1*(2), 297–326.
- Sonesson, G. (2015a). Bats out of the belfry: The nature of metaphor, with special attention to pictorial metaphors. *Signs and Media, 11*, 74–104.
- Sonesson, G. (2015b). Le jeu de la valeur et du sens. In A. Biglari (Ed.), *Valeurs: Aux fondements de la sémiotique*. Paris: L'Harmattan.
- Sonesson, G. & Lenninger, S. (2015). The psychological development of semiotic competence: From the window to the movie by way of the mirror. *Cognitive Development, 36*, 191–201.
- Sonesson, S. (2014). Translation and other acts of meaning: In between cognitive semiotics and semiotics of culture. *Cognitive Semiotics, 7*(2), 249–280.
- Stampoulidis, G. (2016). Rethinking Athens as Text: The Linguistic Context of Athenian Graffiti during the Crisis. *Journal of Language Works – Sprogvidenskabeligt Studentertidsskrift, 1*, 10–23.
- Steen, F. & Turner, M. (2013). Multimodal construction grammar. In M. Borkent, B. Dancygier, & J. Hinnell (Eds.), *Language and the Creative Mind* (pp. 255–274). Stanford, CA: Centre for the Study of Language and Information.
- Stevens, J. (2016). Focus games. *Linguistics and Philosophy, 39* (5), 395–441.
- Stites, L. J. & Özçaliskan, S. (2012). On Learning to Draw the Distinction between Physical and Metaphorical Motion: Is Metaphor an Early Emerging Cognitive and Linguistic Capacity? *Journal of Child Language, 32*, 291–318.
- Stjernfelt, F. (2014). *Natural Propositions: the actuality of Peirce's doctrine of signs*. Boston: Docent Press.
- Stoljar, D. (2005). “Physicalism and Phenomenal Concepts”, *Mind and Language, 20*(5), 469–494.
- Strawson, P. F. (1960). On referring. Reprinted In A.P. Martinich and D. Sosa (Eds.), *The Philosophy of Language*. (pp. 121–135.) New York: Oxford University Press.
- Studieren, I. I., Koutny, R., Miesenberger, K., & Linz, U. of. (2012). *Accessible maps*. W3C: Research and Development Working Group Wiki. Retrieved from <https://bit.ly/2KFvieV>
- Suzuki, S. (2006). Emotive communication in Japanese: An introduction. In Suzuki, S. (Ed.), *Emotive Communication in Japanese*. Amsterdam, Netherlands: John Benjamins, 1–13.
- Sweetser, E. (1990). *From Etymology to Pragmatics: Metaphorical and cultural aspects of semantic structure*. Cambridge, UK: Cambridge University Press.
- Sweetser, E. (2006). “Looking at Space to Study Mental Spaces: Co-speech Gesture as a Crucial Data Source in Cognitive Linguistics.” In *Methods in Cognitive Linguistics*, edited by Monica Gonzalez-Marquez, Irene Mittelberg, Seana Coulson, and Michael J. Spivey, 203–226. Amsterdam: John Benjamins.

- Tabacaru, S. & Lemmens, M. (2014). Raised eyebrows as gestural triggers in humor. The case of sarcasm and hyperunderstanding. *European Journal of Humour Research*, 2(2), 11–31.
- Talmy, L. (1988). Force Dynamics in Language and Cognition. *Cognitive Science*, 12(1), 49–100.
- Talmy, L. (2000). *Toward a Cognitive Semantics, Volume I: Concept structuring systems*. Cambridge: MIT Press.
- Talmy, L. (2007). Attention Phenomena. In the *Oxford Handbook of Cognitive Linguistics*. Oxford University Press.
- Terashita, Y. (1982). Management of Astronomical Data at Kanazawa Data Center. *International Astronomical Union Colloquium*, 64, 21-25. doi:10.1017/s0252921100082610
- Thibault, P. J. (2000). The dialogical integration of the brain in social semiosis: Edelman and the case for downward causation. *Mind, Culture and Activity*, 7(4), 291–311.
- Thompson, E. (2007). *Mind in life: Biology, phenomenology and the sciences of mind*. Cambridge, MA: Harvard University Press.
- Thompson, E. & Varela, F. (2001). Radical embodiment: Neural dynamics and consciousness. *Trends in Cognitive Science*, 5, 418–425.
- Tønnessen, M. (2015). Umwelt and Language. In E. Velmezova, K. Kull, & S. J. Cowley (Eds.), *Biosemiotic Perspectives on Language and Linguistics* (pp. 77–96). New York: Springer.
- Trevarthen, C. (1979). Communication and cooperation in early infancy: A description of primary intersubjectivity. In M. Bullowa (Ed.), *Before Speech*, 321–347. Cambridge: Cambridge University Press.
- Trevarthen, C. (1998). The concept and foundations of infant intersubjectivity. In S. Bråten (Ed.), *Intersubjective Communication and Emotion in Early Ontogeny*, 15–46. Cambridge and Paris: Cambridge University Press and Editions de la Maison des Sciences de l’Homme.
- Tsakona, V. (2009). Language and image interaction in cartoons: towards a multimodal theory of humour. *Journal of Pragmatics* 41: 1171–1188.
- UN General Assembly. (1948). *Universal declaration of human rights* (217 [III] A). Paris.
- Upton, B. (2015). *The aesthetic of play*. Cambridge, Mass: MIT Press.
- Ushaw, G., Eyre, J., & Morgan, G. (2017). A paradigm for the development of serious games for health as benefit delivery systems. In *Serious Games and Applications for Health (SeGAH), 2017 IEEE 5th International Conference on*(pp. 1–8). IEEE.
- Van Leeuwen, T. (1999). *Speech, Music, Sound*. Basingstoke: Palgrave Macmillan.
- Van Leeuwen, T. (2005). *Introducing social semiotics*. Psychology Press.
- Varela, F. J. (1999). The specious present: A neurophenomenology of time consciousness. In: Petitot, J.; Varela, F. J.; Pachoud, B.; Roy, J-M. (Eds.), *Naturalizing Phenomenology: Issues in Contemporary Phenomenology and Cognitive Science*. Stanford: Stanford University Press, 266–314.
- Varma, R., Tarczy-Hornoch, K., & Jiang, X. (2017). Visual impairment in preschool children in the united states: Demographic and geographic variations from 2015 to 2060. *JAMA Ophthalmology*, 135(6), 610–616. <https://doi.org/10.1001/jamaophthalmol.2017.1021>
- Vygotsky, L. S. (1986[1934]) *Thought and Language*. Cambridge, MA: MIT Press.
- Wagoner, B. (2017) What makes memory constructive? A study in the serial reproduction of Bartlett’s experiments. *Culture & Psychology*, 23(2), 186–207.

- Walker, B. N. (2013). Sonification: Multimodal and auditory displays of data. *SID Symposium Digest of Technical Papers*, 44(1), 137–138. <https://doi.org/10.1002/j.2168-0159.2013.tb06161.x>
- Walker, B. N., Lindsay, J., Nance, A., Nakano, Y., Palladino, D. K., Dingler, T., & Jeon, M. (2013). Spearcons (speech-based earcons) improve navigation performance in advanced auditory menus. *Human Factors: The Journal of Human Factors and Ergonomics Society*, 55(1), 157–182. <https://doi.org/10.1177/0018720812450587>
- Walker, B. N., & Mauney, L. M. (2010). Universal design of auditory graphs: A comparison of sonification mappings for visually impaired and sighted listeners. *ACM Transactions on Accessible Computing (TACCESS)*, 2(3), 1–16. <https://doi.org/10.1145/1714458.1714459>
- Walker, B. N. & Nees, M. A. (2011). “Theory of sonification.” In Hermann, T., Hunt, A., Neuhoff, J. G., editors, *The Sonification Handbook*, chapter 2, pages 9–39. Logos Publishing House, Berlin, Germany.
- Ware, C. (1993). The Foundations of Experimental Semiotics: a Theory of Sensory and Conventional Representation. *Journal of Visual Languages and Computing*, 4(1): 91–100.
- Watson, S. (2007). *Museums and their communities*. London, UK: Routledge.
- Wehling, E. (2017). Discourse management gestures. *Gesture*, 16(2), 245–276.
- Weizsäcker, V. von 1940. *Der Gestaltkreis: Theorie der Einheit von Wahrnehmen und Bewegen*. Leipzig: Georg Thieme Verlag.
- Whorf, B. L. (1956). *Science and Linguistics*. In *Language Thought and Reality: Selected Writings of Benjamin Lee Whorf*, John B. Carroll (ed). NY: MIT Press Pp. 207–19. (Original work published 1940)
- Wierzbicka, A. (1992). *Semantics, Culture and Cognition: Universal human concepts in culture-specific configurations*. Oxford University Press.
- Wierzbicka, A. (2007). Bodies and their parts: An NSM approach to semantic typology. *Language sciences*, 29(1), 14–65.
- Winawer, J., Witthoft, N., Frank, M. C., Wu, L., Wade, A. R., & Boroditsky, L. (2007). *Russian Blues Reveal Effects of Language on Color Discrimination*. *Proceedings of the National Academy of Sciences* 104(19): 7780–7785.
- Windeyer, R. C. (2017) *Sonification Prototype 2.0: A binaural translation of Charles Minard’s infographic depiction of Napoleon’s Russian campaign* [Video file]. Retrieved from <https://vimeo.com/255957888>
- Wilson, R. A. (1994). Wide computationalism. *Mind*, 103, 351–372.
- Wiseman, B., & Paul, A. (Eds.). (2014). *Chiasmus and culture*. Oxford: Berghahn Books.
- Wnuczko, M. & Kennedy, J. M. (2014) Pointing to azimuths and elevations of targets: Blind and blindfolded-sighted. *Perception*, 43, 117–128.
- Wollheim, R. (1987). *Painting as an art*. NJ: Princeton University Press.
- Xiao, Y., Seagull, J. F., Mackenzie, C., Ziegert, J., & Klein, K.J. (2003). Team communications Patterns as Measure of Team Process: Exploring the Effects of Task Urgency and Shared Team Experience. *Proceedings of the Human Factors and Ergonomics Society 47th Annual Meeting*, p. 1502–1506.
- Zbikowski, L. M. (2002). *Conceptualizing music: Cognitive structure, theory, and analysis*. Oxford, UK: Oxford University Press.

- Zhao, H., Plaisant, C., Shneiderman, B., & Lazar, J. (2008). Data sonification for users with visual impairment: A case study with georeferenced data. *ACM Transactions on Computer- Human Interaction (TOCHI)*, 15(1), 1–28. <https://doi.org/10.1145/1352782.1352786>
- Zlatev, J., (2007). Intersubjectivity, Mimetic Schemas and the Emergence of Language. *Intellectica*, 2(3), 123–151.
- Zlatev, J. (2009a). Levels of meaning, embodiment, and communication. *Cybernetics and Human Knowing*, 16, 149–174.
- Zlatev, J. (2009b). The semiotic hierarchy: Life, consciousness, signs and language. *Cognitive Semiotics*, 4(Supplement), 169–200.
- Zlatev, J. (2011). What is Cognitive Semiotics? *Semiotix* XN-6.
- Zlatev, J. (2014). Image schemas, mimetic schemas, and children’s gestures. *Cognitive Semiotics*, 7(1), 3–29.
- Zlatev, J. (2017). The sedimentation and motivation model in an ecological theory of metaphor. *CCS Seminar: Litomyšl, Czech Republic*.
- Zlatev, J. & Devylder, S. (forthcoming). Polysemiotic communication: The interaction and integration of language, gestures and pictures.
- Zlatev, J., Faur, E., & Sonesson, G. (2017). There are no purely conceptual metaphors: A cognitive semiotic account of metaphor. Paper presented at *the 6th conference of the Scandinavian Association for Language and Cognition*, at the Centre for Languages and Literature at Lund University, Sweden on 20–22 April 2017.
- Zlatev, J., Madsen, A., Lenninger, S., Persson, T., Sayehli, S., Sonesson, G., & van de Weijer, J. (2013). *Understanding communicative intentions and semiotic vehicles by children and chimpanzees. Cognitive Development*, 28, 312–329.
- Zlatev, J., Sonesson, G., & Konderak, P. (Eds). (2016). *Meaning, Mind and Communication: Explorations in Cognitive Semiotics*. Frankfurt am Main: Peter Lang.
- Zwaan, R. 2014. Embodiment and language comprehension: reframing the discussion. *Trends in Cognitive Science*, 18(5). <http://dx.doi.org/10.1016/j.tics.2014.02.008>

7. Author Index

Abdalla, Jamal Gaber	44	Fernández-Stoll, Diego	63
Abe, Sayaka	45	Fortney, Mark	64
Alagic, Mara	90	Fultner, Barbara	65
Al Maamari, Shaikha	44	Giraldo, Verónica	21
Al-Namer, Rahaf	44	Grausso, Christine	35
Anderson, Myrdene	46	Graziano, Maria	110
Aroni, Gabriele	47	Hammo, Nour	44
Arous, Amira	48	Harris, Randy Allen	34, 89
Aucoin, Pauline McKenzie	49	Hart, David	66
Balkaran, Raj	38	Hinnell, Jennifer	67
Bennett, Tyler James	50	Hraiz, Safa	44
Biggs, Brandon	19	Iantorno, Mathew	36
Black, Tyler William	89	Jackson, Bradley	68
Bott, Sarah	89	Jarque, Maria Josep	69
Bracks, Christoph	60	Jones, Don	70
Brown, Amanda	51	Jordan, Cait	71
Bruche-Schulz, Gisela	52	Juneviciene, Skirmantas	73
Bundgaard, Peer F.	23, 28	Junevicius, Skirmantas	73
Chapdelaine-Feliciati, Clara	53	Kamiya, Masaaki	51
Chernouski, Libby	54	Karła, Michal	74
Chrisomalis, Stephen	55	Kennedy, John	11
Coletta, W. John	56	Khuzae, Shatha	75
Coppin, Peter	18, 20, 25, 111	Konderak, Piotr	76
Dancygier, Barbara	57	Kozai, Soichi	60
Danesi, Marcel	104	Kull, Kalevi	12
Danziger, Eve	10	Lenninger, Sara	31
Denroche, Charles	58	Leon, Salvador	77
Devylde, Simon	59, 60	Levy, Annie	25
Diaz, Cesar Augusto	61	Lidov, David	78
Duffley, Patrick	62	Lisinski, Michael	36, 41
Eylon, Talia	115	Little, Hannah	79, 93

Lou, Adrian	57	Sellen, Kate	71
Louhema, Karoliina	110	Shank, Gary	98
Ma, Kay	80	Sheets-Johnstone, Maxine	14
Makolkin, Anna	81	Shimotori, Misuzu	60
Martin, George	82	Shirmahaleh, Shekoufeh M.	99
Melanson, Sophia	83	Siahaan, Poppy	60
Meyer, Rebecca	40	Smith, Melissa	26
Miller, Patrick Lee	39	Sonesson, Göran	15, 32
Mittelberg, Irene	13	Song Hong	113
Morrissey, Christopher	84	Stampoulidis, Georgios	29
Naveau, Natasha	116	Stevens, John	94
Newhams, Kevin	85	Švantner, Martin	100
Ngouo, Herbert Rostand	86	Tabacaru, Sabina	102
Niño, Douglas	87	Thompson, Robin	93
Oakley, Todd	30, 88	Tu, Katherine	89
O'Reilly, Cliff	89	Tunç, Duygu Uygun	101
Orel, Tatiana	90	Vahedi, Zahra	36
Orsborn 慧峰, Matt	37	Van Der Mark, Sheena	102
Osborne, Dana	91	Velmezova, Ekaterina	103
Pacheco, Paulo	89	Walsh Matthews, Stéphanie	36, 104
Park, Sari	36	Wang, Yetian	89
Pascual, Esther	69	Weinstein, Zach	105
Pelkey, Jamin	36, 42	West, Donna E.	106
Pérez, Carlos Andres	92	Windeyer, Richard C.	18
Perlman, Marcus	93	Ying Pan	113
Pettinen, Katja	46	Yu Hongbing	107
Roberts, Gareth	94	Yusim, Lena	19
Rosenbaum, Richard	96	Zhao, Tinghao	114
Sarmiento, Felipe	71, 111	Zlatev, Jordan	21, 108, 110
Schoelzel, Connor L.	56		
Scott, Penelope	97		

8. List of Participants

Contact Information and Institutional Affiliation for Fully Registered Participants of IACS3

Participant	Email	Institution	Country
Abdalla, Jamal Gaber	j.gjaber@uaeu.ac.ae	UAE University	UAE
Abe, Sayaka	sayabe2007@gmail.com	Middlebury College	United States
Abraham, Dominique	dominique.abraham@kuleuven.be	KU Leuven	Belgium
Aird, Ali	aaaird@ryerson.ca	Ryerson University	Canada
Anderson, Myrdene	myanders@purdue.edu	Purdue University	United States
Aroni, Gabriele	gabriele.aroni@ryerson.ca	Ryerson University	Canada
Arous, Amira	amiraarous@gmail.com	University of Paris 8	France
Aucoin, Pauline McKenzie	pauline.aucoin@uottawa.ca	University of Ottawa	Canada
Balkaran, Raj	raj.balkaran@gmail.com	University of Toronto	Canada
Barnes, John	john.barnes@ryerson.ca	Ryerson University	Canada
Beekhuizen, Barend	barendbeekhuizen@gmail.com	University of Toronto	Canada
Bennett, Tyler James	tyler.bennett1984@gmail.com	University of Tartu	Estonia
Biggs, Brandon	3164451@student.ocadu.ca	OCAD University	United States
Black, Tyler William	twblack@edu.uwaterloo.ca	University of Waterloo	Canada
Bruche-Schulz, Gisela	gibrushu@gmail.com	HKB University (ret.)	Germany
Bundgaard, Peer F.	sempb@cc.au.dk	Aarhus University	Denmark
Chapdelaine-Feliciati, Clara	cchapdel@yorku.ca	York University	Canada
Chernouski, Libby	lchernou@purdue.edu	Purdue University	United States
Chrisomalis, Stephen	chrisomalis@wayne.edu	Wayne State University	United States

Coletta, W. John	jcoletta @uwsp.edu	U Wisconsin-Stevens Point	United States
Coppin, Peter	pcoppin @faculty.ocadu.ca	OCAD University	Canada
Dancygier, Barbara	barbara.dancygier @ubc.ca	University of British Columbia	Canada
Danziger, Eve	ed8c @eservices.virginia.edu	University of Virginia	United States
Denroche, Charles	denrocc @westminster.ac.uk	University of Westminster	Great Britain
Devyllder, Simon	simon.devyllder @gmail.com	Lund University	Sweden
Diaz, Cesar Augusto	cesara.diazr @utadeo.edu.co	Universidad de Bogotá Jorge Tadeo Lozano	Colombia
Donald, Merlin	donaldm @queensu.ca	Queens University	Canada
Donald, Thais	-	Northumberland Opera Guild	Canada
Duffley, Patrick	Patrick.Duffley @lli.ulaval.ca	Université Laval	Canada
Evans, Calla	c2evans @ryerson.ca	Ryerson University	Canada
Eylon, Talia	teylon @ryerson.ca	Ryerson University	Canada
Fernández-Stoll, Diego	diegofstoll @gmail.com	Pontificia U. Católica del Perú	Peru
Fortney, Mark	mark.d.fortney @gmail.com	The University of Toronto	Canada
Franciose, Jeanne	monicajeannefrancoise @gmail.com	Indonesia Defense University	Indonesia
Fultner, Barbara	fultner @denison.edu	Denison University	United States
Ghodke, Uttara	uttaraghodke11 @gmail.com	OCAD University	Canada
Giraldo, Verónica	veronica.giraldo88 @gmail.com	Lund University	Sweden
Grausso, Christine	s1600686 @sms.ed.ac.uk	University of Edinburgh	Great Britain
Harris, Randy Allen	raha @uwaterloo.ca	University of Waterloo	Canada
Hart, David	david.hart @ryerson.ca	Ryerson University	Canada
Hinnell, Jennifer	hinnell @ualberta.ca	University of Alberta	Canada

Jackson, Bradley	bradley.jackson @carleton.ca	University of British Columbia	Canada
Johnstone, Albert A.	albert @uoregon.edu	University of Oregon	United States
Jones, Don	donjones @ucf.edu	University of Central Florida	United States
Jordan, Cait	cait.j.jordan @gmail.com	OCAD University	Canada
Junevicius, Skirmantas	sk.junevicius @gmail.com	Independent Scholar	Lithuania
Kamiya, Masaaki	mkamiya @hamilton.edu	Hamilton College	United States
Karla, Michal	michal.karla @gmail.com	Charles University in Prague	Czech Republic
Kemp, Dave	dkemp @ryerson.ca	Ryerson University	Canada
Kennedy, John	kennedy @utsc.utoronto.ca	University of Toronto	Canada
Khuzae, Shatha	u1357781 @hud.ac.uk	University of Huddersfield	Great Britain
Kiyoko, Toratani	ktora @yorku.ca	York University	Canada
Konderak, Piotr	kondorp @bacon.umcs.lublin.pl	Maria Curie-Sklodowska University	Poland
Kull, Kalevi	kalevi.kull @ut.ee	University of Tartu	Estonia
Lenninger, Sara	sara.lenninger @hkr.se	Kristianstad University	Sweden
Leon, Salvador	esavsal @gmail.com	ESAV University	Mexico
Levy, Annie	annie.c.levy @gmail.com	OCAD University	Canada
Lidov, David	lidov @yorku.ca	Toronto Semiotic Circle	Canada
Lisinski, Michael	michael.lisinski @ryerson.ca	Ryerson University	Canada
Little, Hannah	richard.marwood @uwe.ac.uk	University of the West of England	Great Britain
Lou, Adrian	adrianlou23 @hotmail.com	University of British Columbia	Canada
Louhema, Karoliina	karoliina.louhema @gmail.com	Lund University	Finland
Ma, Kay	shuikay.ma @gmail.com	Independent Scholar	Canada

Makolkin, Anna	anna.makolkin @utoronto.ca	University of Toronto	Canada
Martin, George	gmyorku @yorku.ca	York University	Canada
Melanson, Sophia	smelan1 @yorku.ca	York University	Canada
Meyer, Rebecca	rmeyer @ryerson.ca	Ryerson University	Canada
Miller, Patrick Lee	millerp2212 @duq.edu	Duquesne University	United States
Mittelberg, Irene	mittelberg @humtec.rwth-aachen.de	RWTH Aachen University	Germany
Morrissey, Christopher	morec @icloud.com	Semiotic Society of America	Canada
Murgaski, Steve	steve.murgaski @gmail.com	Consultant	Canada
Naveau, Natasha	nnaveau @ryerson.ca	Ryerson University	Canada
Newhams, Kevin	kevinnewhams @gmail.com	Case Western Reserve University	United States
Ngouo, Herbert Rostand	rostandngouo2000 @yahoo.fr	University of Maroua	Cameroon
Niño, Douglas	edison.nino @utadeo.edu.co	Universidad de Bogotá Jorge Tadeo Lozano	Colombia
Oakley, Todd	todd.oakley @case.edu	Case Western Reserve University	United States
Olalemi, Adekunle	amontourtt @gmail.com	Tedelsfield Publishing	Nigeria
Orel, Tatiana	tatiana.orel @gmail.com	Carleton University	Canada
Orsborn 慧峰, Matt	shihweifeng @gmail.com	Fo Guang University	Taiwan
Osborne, Dana	dana.osborne @ryerson.ca	Ryerson University	Canada
Ostyn, Stephane	stephane.ostyn @kuleuven.be	KU Leuven	Belgium
Park, Sari	sari.park @ryerson.ca	Ryerson University	Canada
Pascual, Esther	esther @estherpascual.com	Zhejiang University	China
Pelkey, Jamin	jpelkey @ryerson.ca	Ryerson University	Canada
Pérez, Carlos Andres	carlos.perez @utadeo.edu.co	Universidad de Bogotá Jorge Tadeo Lozano	Colombia

Pruska-Oldenhof, Izabella	i2pruska @ryerson.ca	Ryerson University	Canada
Raza, Sahar	sahar.raza @ryerson.ca	Ryerson University	Canada
Roberts, Gareth	gareth.roberts @ling.upenn.edu	University of Pennsylvania	United States
Rosenbaum, Richard	rr1979 @yorku.ca	York University	Canada
Sarmiento, Felipe	fs11kk @student.ocadu.ca	OCAD University	Canada
Scott, Penelope	Penelope0783 @gmail.com	Xi'an Jiaotong- Liverpool University	China
Shank, Gary	garyshank @comcast.net	Duquesne University	United States
Sheets-Johnstone, Maxine	msj@ uoregon.edu	University of Oregon	United States
Shirmahaleh, Shekoufeh Mohammadi	shekufe @hotmail.es	U. Nacional Autonoma de Mexico	Mexico
Shivakumar, Hamsini	hamsini6 @gmail.com	Leapfrog Strategy Consulting	India
Smith, Melissa	Melissa_Smith @ago.net	Art Gallery of Ontario	Canada
Sonesson, Göran	goran.sonesson @semiotik.lu.se	Lund University	Sweden
Song Hong	shclass @163.com	Northeast Normal University	China
Spence, Jeanine	jeanine @currentassociates.com	Be Curious With Us	United States
Stampoulidis, Georgios	georgios.stampoulidis @semiotik.lu.se	Lund University	Sweden
Švantner, Martin	svantner.m @seznam.cz	Charles University	Czech Republic
Tabacaru, Sabina	sabina.tabacaru @univ-paris8.fr	Université Paris 8	France
Tu, Katherine	ktu @uwaterloo.ca	University of Waterloo	Canada
Tunç, Duygu Uygün	duygu.uygun @outlook.com	Heidelberg University	Germany
Vahedi, Zahra	zahra.vahedi @psych.ryerson.ca	Ryerson University	Canada
Van Der Mark, Sheena	sheenavdm @uic.edu.hk	United International College	China

Velmezova, Ekaterina	ekaterina.velmezova @unil.ch	University of Lausanne	Switzerland
Vigor, Jana	j2vigor @ryerson.ca	Ryerson University	Canada
Walsh Matthews, Stéphanie	swalsh @arts.ryerson.ca	Ryerson University	Canada
Wang, Yetian	yetian.wang @uwaterloo.ca	University of Waterloo	Canada
Weinstein, Zach	zachary.weinstein @mail.utoronto.ca	University of Toronto	Canada
West, Donna	westsimon @twcny.rr.com	State University of New York, Cortland	United States
Windeyer, Richard C.	r.windeyer @mail.utoronto.ca	University of Toronto	Canada
Wnuczko, Marta	m.wnuczko @gmail.com	OCAD University	Canada
Yolleck, Joan	jyolleck @aol.com	Ryerson University	Canada
Yu Hongbing	njnubrandon @126.com	Nanjing Normal University	China
Yusim, Lena	lena.yusim @gmail.com	OCAD U, MDes INCD	Canada
Zhao, Tinghao	txz99 @case.edu	Case Western Reserve University	United States
Zlatev, Jordan	jordan.zlatev @ling.lu.se	Lund University	Sweden

IACS-2018 Toronto, Project Partners

We gratefully acknowledge the support of those who made IACS-2018 possible.



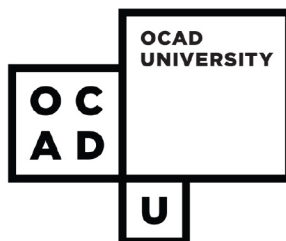
Faculty of Arts



Office of the Vice-President, Research & Innovation



Languages, Literatures & Cultures
Faculty of Arts



COLLEGE OF ARTS AND SCIENCES
CASE WESTERN RESERVE UNIVERSITY

B L O O M S B U R Y



DE GRUYTER MOUTON

