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The Control Cycle Cognitive Model in Biology, Film and Culture

Abstract: The focus of the present study is the **Control Cycle** (CC), a seldom discussed cognitive model that is yet to be applied in film theory. The CC is grounded in bodily experience and is related to image-schematic thinking. The CC is based upon the **Tension Cycle**, consisting of four successive stages: an initial stage of relaxation; next a stage of increasing tension followed up by a force-dynamic event which releases the built-up pressure; and finally, resulting from the event, another stage of relaxation. The proposal of this article is that the CC takes a wide array of manifestations in biological cycles, brain processes, epistemic and cognitive phenomena, vision, culture, linguistic predication and semantic constructions. Cinematic conceptualizations are no exceptions. Editing constructions, camera movement, conceptual metaphor and metonymy, emotion mechanics, narrative interest and narrative absorption instantiate the phases of the Control Cycle.

Keywords: film, control cycle, cognitive model, metaphor, metonymy, narration, Bayesian inference, categorization, attention schema.

General description of the cognitive model

The focus of the present study is the **Control Cycle** (CC), a seldom discussed cognitive model that is yet to be applied in film theory. The CC is a cognitive model elaborated in Cognitive Grammar that can be applied to a wide range of human experiences (Langacker 2002; 2009; 2014, 46; Dik 1997a; 1997b).

“By its very nature, life is force-dynamic (Talmy 1988). We use the term *life force* in reference to organisms expending energy

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to acquire resources, minimally for growth, renewal, and self-maintenance. Life is inherently dynamic. Permanent stasis is *death*.” (Langacker 2009, 260).

“The **control cycle** (Langacker 2002) has the basic form sketched in Figure 5.5. In the static baseline phase, an **actor** (A) (in a broad sense of the term) controls an array of entities (small circles) which collectively constitute its **dominion** (D). In the next phase, some **target** (T) enters the actor’s **field** (F), or scope of potential interaction. This creates a state of tension, for the actor has to deal with the target in some manner. The typical means of dealing with it is by somehow bringing it under the actor’s control, i.e. exerting force (double arrow) resulting in its incorporation in the actor’s dominion. The result of this action is a modified situation that is once more static (a state of relaxation)” (Langacker 2009, 130, 306) (Figure 1).

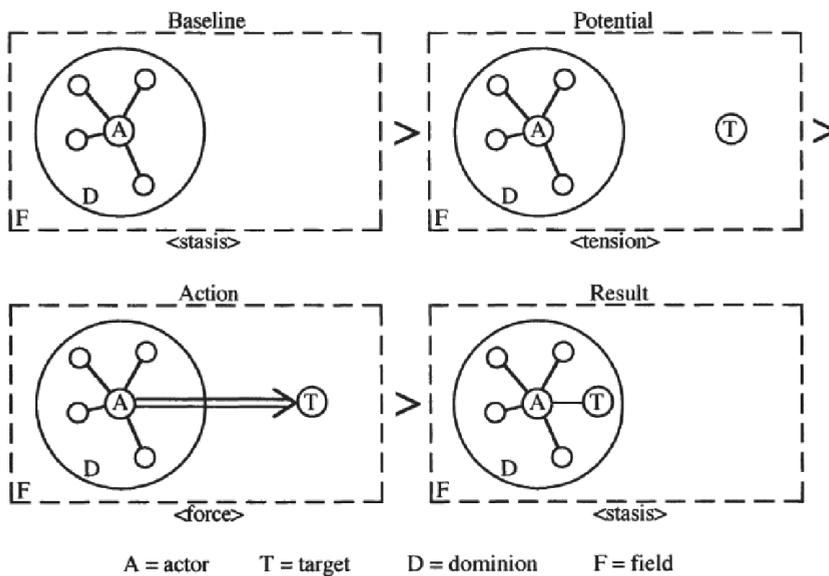


Figure 1. Langacker 2009, 130.

The CC is also grounded in bodily experience and is related to image-schematic thinking (Ruiz 2014, 78). The notion of control arises from “our need to keep balance and our ability to hold (and therefore to manipulate) physical entities that are within reach” (79). The model of control also applies to mental states, configurations and entities during dynamic thinking processes.

The inner structure of the control cycle in the linguistic domain

The cognitive model is structured around a few basic elements. More specifically, the CC aggregates several **image schemas**. Langacker retains several schematic building blocks such as: **continuity vs. change** (where, from the processing standpoint,

the detection of contrast can be regarded as a kind of change), and **change through time** in episodes of limited duration, with a period of continuity at either end that gives rise to **bounded events**. When the same phenomenon occurs at different moments in time, separated by periods of absence, it generates a **cycle** (Langacker 2009, 305). Equally fundamental is the notion of force and the force-dynamic interactions. Force occurs in bounded episodes and causes observable changes. The correlation of force and change yields the notion of force-dynamic event (arguably the prototype for verbs and clauses (305). Just as fundamental is **tension**, the steady force that does not lead to change (305) (Figure 2).

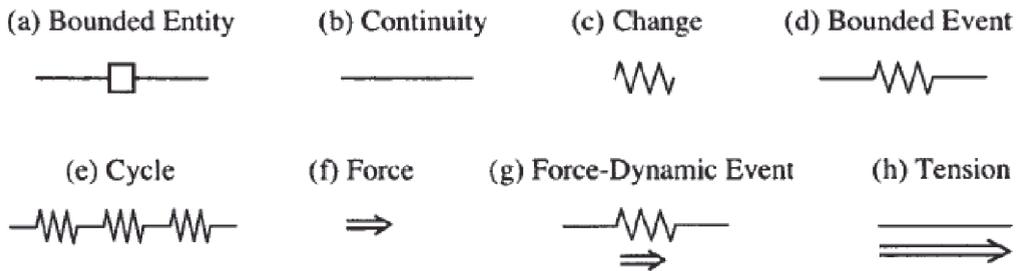


Figure 2. Langacker 2009, 305.

The CC is based upon the **Tension Cycle**, consisting of four successive stages: “an initial stage of relaxation (i.e. non-force-dynamic continuity); next a stage of increasing tension; then a force-dynamic event which has the effect of releasing the built-up pressure; and finally, resulting from the event, another stage of relaxation” (306).

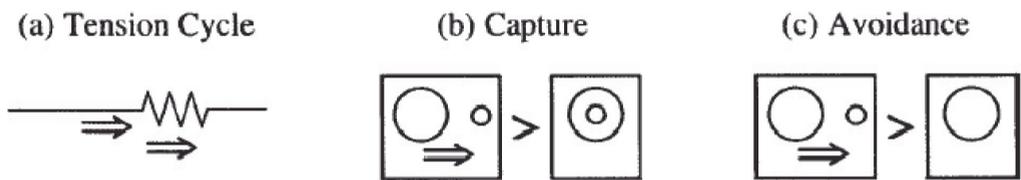


Figure 10.9

Figure 3. Langacker 2009, 306.

“The Control Cycle combines the Tension Cycle with the notion of capture (or alternatively, avoidance) [...] When a target enters the actor’s field, it creates a state of tension, for it has to be dealt with in some manner; this is the **potential** phase. This leads to the **action** phase, where the potential for interaction is realized, typically by **capture**. In the **result** phase, where the target is under the actor’s control, the tension has been resolved, and the actor is once more in a state of relaxation” (306) (Figure3).

Domains of the instantiation of the cognitive model

Langacker claims that the CC applies to events unfolding in physical, perceptual, mental and social domains. It includes activities like “eating, focusing attention, acquiring possessions, and establishing social relationships. And crucially, at the mental level, it includes our ongoing effort to build up a coherent conception of ‘the world’ ” (Langacker 2009, 201). The CC corresponds to the focusing of attention at the perceptual and mental levels. At the social level tension is created when some new entity is encountered and tension is resolved through interactions that establish a stable relationship of control (307).

The physical level and the brain

At the physical level, the CC describes the cat and mouse scenario: a cat encounters a mouse, catches it and puts it under its control. At the level of cell activity the CC manifests as cellular homeostasis (Damasio 2018) and cellular prediction of a state of the environment, i.e. anticipatory responses to their environment. Cells exhibit behaviors of exploration and exploitation of the environment. Biological life exhibits a balance between “our need to learn by exploring new information and our need for certainty afforded by seeking the familiar” (Bar 2009, 1240).

As Freddolino and Tavazoie (2012) emphasize, “the organization of microbial regulatory networks, in large part, represents the physical instantiation of a probabilistic, dynamic model of the environment” (374). Biological agents actively resist the natural tendency towards disorder and entropy increase. Thus biological agents are “essentially inference machines that model their sensorium to make predictions” (Friston 2011, 89). The CC instantiates the continuous characteristic of living structures that oppose a spontaneous organization, a stable state to unorganized, unstable states, dissipation and disorder or entropy in what Schrodinger (1967 [1944]) called “negative entropy”. The CC is a permanent balance between stasis and tension or difference and integration (See Tononi 2012). CC directs the behavior of neuronal populations that work together in order to control other groups of neurons in cognitive task oriented coalitions (Cerf and Mackay 2011).

Brains are considered inference generating organs that work by “predictive coding, according to which perceptions are driven by your own brain and corrected by input from the world” (Seth 2016). Predictive coding models describe counter flowing top-down prediction/expectation signals and bottom-up prediction error signals. Successful perception, cognition and action are associated with successful suppression (“explaining away”) of prediction error (Seth 2012, 1; Bar 2007; Bar 2008). When the sensory information that comes in does not match your prediction you either change your prediction – or you change the sensory information that you receive (Seth 2012).

Brains, it has recently been argued, are essentially prediction machines. They are bundles of cells that support perception and action by constantly attempting to

match incoming sensory inputs with top-down expectations or predictions. This is achieved using a hierarchical generative model that aims to minimize prediction error within a bidirectional cascade of cortical processing. Such accounts offer a unifying model of perception and action, illuminate the functional role of attention, and may neatly capture the special contribution of cortical processing to adaptive success (Clark, 2013). The goal is to “minimize the difference between the way the world is represented as being, and the way it actually is. The better the fit, the lower the information-theoretic free energy” (186).

For Clark perception and action are in some deep sense computational siblings: “you treat the desired (goal) state as observed and perform Bayesian inference to find the actions that get you there” and “action is engaged to resample the world to fulfill these expectations” (186). In this framework, brains are Bayesian control cycles. We have to note that a single principle is operating at varying time-scales and at different biological scales. As Clark remarks the same principle operates also at the level of the cultural biological niche: “structuring our worlds genuinely continuous with structuring our brains and sculpting our actions” (194).

Attending and focusing

At the perceptual level seeing or hearing something is a matter of bringing it under perceptual control. A salient target that appears in the field of view – at the periphery of the visual field – creates a state of tension that is resolved by shifting the gaze and focusing on the target that is brought under perceptual control in the focal region (Langacker 2009, 307) (Figure 4). For Langacker, directing and focusing of attention is another manifestation of the CC. Attention is both dynamic and force-dynamic. The action of shifting the focal region in order to encompass or capture a visual target is a result phase of the action of focusing (168). Detection of “a bounded entity which contrasts with a broader expanse that includes it – in perception this is the basis for figure/ground organization – also takes place in the case of apprehending physical objects (bounded entities in space) and events (bounded occurrences in time)” (304).

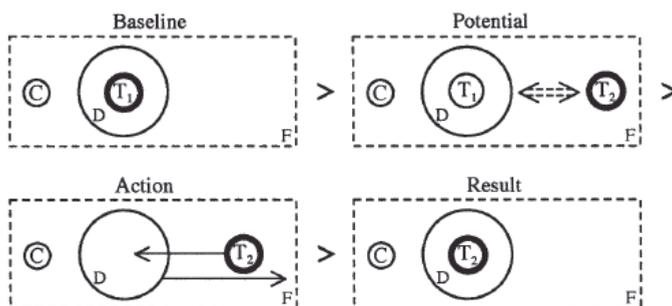


Figure 6.7

Figure 4. Langacker 2009,169.

Perception of an object pertains to an object's identification at the effective level of linguistic interaction grounding based on joint attention: "the speaker's objective in striving for effective control is the situation where both interlocutors momentarily direct their attention to the same referent" (167) (See also Tomasello 1999; Tomasello 2008).

Vision is also considered by Noe and O'Regan (2001) a mode of exploration of the world where to see "is to explore one's environment in a way that is mediated by one's mastery of sensorimotor contingencies, *and* to be making use of this mastery in one's planning, reasoning, and speech behavior" (944).

For the Embodied Simulation theory (ES) advocated by Gallese and Guerra "the perception of an object, through Embodied Simulation, can be nothing but a preliminary form of action, which regardless of whether we actually interact with the object or not, gives it to us as something present-at-hand (*zu-handen*, in Heidegger's terms" (2012, 197). ES constitutively shapes the content of perception, characterizing the perceived object in terms of the potential for motor acts – even in the absence of any effective movement.

If one is to apply ES to films, a first observation one arrives at is that films are basically action-based and action-packed. The movement normally implies a story developed in space and time and a goal to be reached. What we assume is that "this kind of elementary structure contacts us at a pre-verbal level rooted in ES [...] Both our beliefs and our ability to infer the meaning of the action we stare at depend on the 'we-centric space'" (197).

Perception and conception

In Lisa Barrett's theoretical framework past memories issued from "direct encounters, from photos, from movies and books" give meaning to present sensations (Barrett 2017, 26). Humans are born with the ability to learn from regularities and probabilities, construct models of the world, and "like little statisticians, they form hypotheses, assess probabilities based on their knowledge, integrate new evidence from the environment, and perform tests" (95-96).

Encountering a stimulus – for example an apple – triggers a mental process in which the brain combines "bits and pieces of knowledge of previous apples you've seen and tasted", and "changes the firing of neurons in your sensory and motor regions to construct a mental instance of the concept 'Apple' ". In short, "your brain uses your past experiences to construct a hypothesis – the simulation" (27). Simulation is also known by other labels such as "perceptual inference" and "perceptual completion" (Pessoa *et al.* 1998), "embodied cognition," and "grounded cognition" (Barsalou 1999; Barsalou 2008; Barsalou 2009 – "modal re-enactments") (370).¹

The brain has a mental model of the world as it will be in the next moment, built from past experience (125). When the brain's predictions match the sensory input, this constitutes a model of the world in that instant, just like a scientist judges that a

correct hypothesis is the path to scientific certainty (125). As Barrett explains:

“You build concepts for the smallest physical details, like fleeting bits of light and sound, and for incredibly complex ideas like “Impressionism” and “Things Not to Bring on Airplane Rides.” (The latter includes loaded guns, herds of elephants, and your boring Aunt Edna.) Your brain’s concepts are a model of the world that keeps you alive, serves to meet your body’s energy needs, and ultimately determines how well you propagate your genes” (285).

Concepts (i.e., predictions) are the brain’s hypothesis of the cause. The sensory inputs or visual cues are the effects. The brain is trying to explain the cause of sensory inputs using its internal mental model, fueled by past experience. This is what predictions and concepts are: the brain’s internal model of world generated from past experiences conceived from the perspective of an agent with a body. Predictions anticipate sensory input and explain it (59). As stated by Barrett: “once the prediction is confirmed by an actual apple, the prediction has, in effect, explained the visual sensations as being an apple prediction” (60). Once the visual input confirms the prediction is correct the input will not travel any further in the brain (60). This mechanism computes prediction errors by comparing the prediction to actual sensory input. As a result the prediction error is reduced by revision of the mental model of the world (62). The brain continually creates and revises the mental model of the world: “you experience a world of your own creation that is held in check by the sensory world” (66). CC involves the integration of visual cues as targets in conceptualizations understood as field of control.

Linguistic predication

Based on their semantic values, complement taking predicates can be characterized in terms of how the profiled relationship maps onto the CC. Predicates can be “partially” characterized semantically in terms of how the profiled relationship maps onto the CC. Langacker proposes five types of predicates, depending on the phase each cognitive verb maps onto. Therefore “Some predicates profile bounded actions in which the actor establishes control over the target. Others profile stable situations which result from such actions. Other predicates designate the activity of maintaining epistemic control once it has been achieved. Still others indicate preparatory activities which can lead to the act of acquisition” (Langacker 2009, 131, 309-310). The five types are result (*know*), action (*learn*), formulation (*imagine*, *conceive*), assessment (*consider*) and inclination (*suspect*) (Nakashima 2016, 58). Linguistic predication is one manifestation of the epistemic capture.

Linguistic modality

Clausal grounding is based on the epistemic CC. Modality can also be characterized in terms of the CC: “the absence of a modal indicates that the profiled process is

accepted by the speaker as real (the result phase), and the presence of a modal, that it is not" (Langacker 2009, 162). With respect to time, "immediacy vs. non-immediacy translates into occurrence at the moment of speaking vs. occurrence prior to speaking, i.e. present vs. past" (163). On the other hand a modal places the profiled process outside reality, as a target for potential inclusion. A model can express the degree of reality or irrealty of the profiled process (163; 202).

Effective and epistemic levels of identification

At the epistemic level, CC describes the stages of the acquisition of propositional knowledge by the conceptualizer. At the mental level "we formulate and evaluate propositions, and in some cases we accept them as part of the dominion comprising our view of reality" (Langacker 2009, 131).

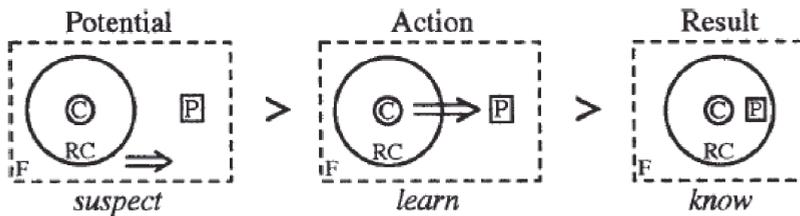


Figure 5. Langacker 2009: 309.

At the epistemic level propositional knowledge is acquired by a conceptualizer. As shown in Figure 5, the actor is a conceptualizer (C); the target is a proposition (P); and the dominion is the conceptualizer's view of reality (epistemic dominion), that is, the set of propositions that the conceptualizer currently assumes to be valid. First, in the **formulation** phase, P exists in C's field of awareness. At this phase C is only aware of the propositional knowledge but has not yet assessed its validity. Next, in the **inclination** phase, through assessment, C arrives at some sort of inclination regarding P, which is represented by the discontinued arrow. Langacker points out that, depending on degrees of force, P could be either accepted as "part of C's view of reality" or rejected, as in the case of the verb *doubt*, for example (2009, 133). Finally, in the **result** phase, P is contained as C's view of reality in its dominion (Nakashima, 58) (Figure 6).

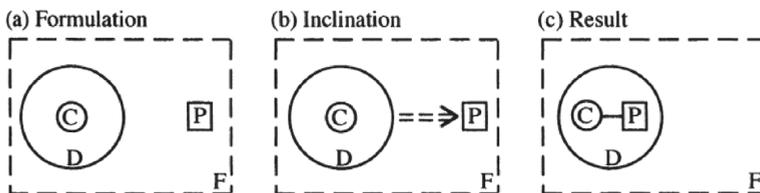


Figure 6. Langacker 2009: 133.

Epistemic identification implies a conception of reality, a stable knowledge used by a subject. Conceived reality has content – objects, enduring relationships and events – and a structure. Epistemic identification of an object inside a conceptual domain is a “matter of acquiring knowledge and building up a conception of reality” (174). An object is epistemically identified when it has an established place in this structure.

In the case of a phrase such as *Jane’s iguana*, “I know there is one [iguana] uniquely identifiable as *Jane’s iguana*. Jane’s relationship vis-a-vis this creature ties it into the network of relationships constituting my conception of reality. I can therefore “reach” this individual by tracing a mental path through reality, the last segment of which is its connection to Jane” (174). In other words, “an object is identified by virtue of being incorporated in our evolving conception of reality, where it has an established place distinguishing it from other instances of its type. This constitutes the result phase of the epistemic control cycle” (175).

Conceptualization is a skill that manifests the CC (See Barsalou 2003). It brings together a series of elements in a region, i.e. a conceptual construction. All elements are tuned and biased in order to cohere in the conceptual sphere of control (See Prinz 2012a, 156).

Location and possession

Typically a locative expression identifies the delimited region where an entity can be found by invoking a **reference object**. The reference object functions as a **spatial landmark**, with respect to which it specifies a **domain of search**. Possessives and locatives share an abstract conceptual characterization based on the reference point ability. This abstract commonality is the link permitting locative constructions to be used for possession, and conversely (Langacker 2009: 103).

Imaginative capacities

“Also fundamental to cognition are various capacities reasonably described as **imaginative**: metaphor, blending, mental space configurations, fictivity (Fauconnier 1985, 1997; Fauconnier and Turner 1998, 2002; Kovecses 2000; Lakoff 1987; Lakoff and Johnson 1980; Lakoff and Nunez 2000; Langacker 1999d, 2005b; Matsumoto 1996; Talmy 1996)” (Langacker 2009, 342). Humans have the predisposition to perceive the world the way they expect to perceive it. As a rule, the phenomenal reality is a blend of the objective external world and the subjective internal world that constructs expectations of possible interactions and behavior (See Cerf and Mackay 2011).

Social and moral level

At the social level “we encounter new individuals and achieve a kind of social control by establishing stable relationships entailing definite expectations and obligations” (Langacker 2009, 131). Family or political relationships instantiate situated conceptualizations that instantiate the CC.

Emotional level

We can understand different emotions as based on different stages of the CC model. For example, inability to control something external to the dominion of the agent can be appraised as sadness. The agent cannot exert a modifying force on the external element – a force dynamic event – and there is “recognition of helplessness” (Prinz 2012a: 263). The agent is subject to an external control. Surprise arises when the agent detects an unexpected external target. Anger arises when tension cannot be resolved by action and controlled force dynamic events. Repeated action does not lead to success and relaxation. Avoidance grounds disgust. Fear involves expectancy of an inevitable bad outcome. The agent predicts that he will be unable to control and so end up being the one controlled. On the other hand, joy is triggered when a state of control and relaxation is achieved.

Different phases of the CC are construed as emotions. Prinz (2012b: 305) highlights the link between moral disgust as a response to acts that “violate the body” (acts that do something deviant, unnatural or contaminating to the body: bestiality, sex slavery, cannibalism or axe murders). On the other hand, Prinz notes, unfair or unjust acts that do not violate the body provoke anger.

People might feel entitled to a position in a queue, free speech rights or simply material possession. A situation where an external element disrupts the stasis of the CC (the dominion and the relationship of possession) provokes an emotional construct of anger. In cases where the irremediability of the situation is apprehended, a lyrical-passive position is adopted. The apprehension of the fact that neither the character nor the viewer cannot change the outcome of a tragic event evokes a melancholic emotion (See Grodal 1997).

Displays of norm violations and harmful actions towards others affect the dominion of social bonds (“the integrity of the community”) (Prinz 2012b: 306). The emotional category is contempt, i.e. a blend of anger and disgust in which anger makes us want to confront the aggressive agent and disgust makes us withdraw for the source of aggressive behavior (306). For Prinz disgust is more related to feelings of personal body integrity violation and anger is focused more towards group and social integrity. Something offensive to others triggers an angry reaction.

In my view, disgust is linked to situations of body disruption or contamination. The apprehension of the inevitability of a body violation, i.e. an external agent provokes irreparable and uncontrollable harm. Anger is linked to situations where the controller apprehends the offensive action as remediable by counteraction. Potential for action is envisioned and expected. Disgust can be an emotion without other emotional after-effects or can be the prerequisite for anger. Disgust is the end result of a harmful event and the potential for action. Disgust can be associated with withdrawal (flee or freeze) or with coping with the external threat (fight). Reparatory action or fight imagined / constructed is anger.

Narration

Narrative schema and the control cycle – the static aspect

Narrative schema displays an event with limited development potential. A story develops starting from an initial state of equilibrium, followed by a state of disequilibrium which in turn is redeemed by a (series of) reparatory action leading to a new state of equilibrium. The four stages are instantiated by the four phases of the CC.

Narrative and goals – the dynamic aspect

Narrative interest display the dynamics of the CC cognitive model. Tan (1996) theorizes the grounding of spectatorial narrative interest in the continuous interplay and balance between tension building and satisfaction and control.

„Frustration results from the prevention or postponement of the preferred final situation, whereas reward is associated with the enhancement and promotion of the desired final situation“ (Tan 1996, 98).

The “desire for closure” represents the viewer’s striving for control at the perceptual, epistemic-cognitive and emotional levels. At the discursive level narratives acknowledge sympathies and values entertained by the viewer. Tan notices the dynamic and sensory-motor oriented character of “interest”, i.e. the mental exploration of situated conceptualizations that are operated by the viewer and are driven by a “family of anticipatory emotions” (See Prinz 2012a: 164).

„The action tendency associated with interest is the inclination to devote more attention to the stimulus and a willingness to make a further investment in order to follow that stimulus“ (Tan 1996: 111).

Suspense is a form of anxiety caused by a lack of sufficient prediction and an overflow of prediction error („With insufficient prediction, you don’t know what’s coming around the next corner, and life contains a lot of corners. That’s classic anxiety“) (Barrett 2017, 212-213). On the other hand Tan’s notion of “interest” is an umbrella term for a class of “epistemic emotions” - e.g. curiosity, interest, awe, wonder, familiarity, confusion, surprise - that belong to the category of propositional attitudes included by Langacker in the tension phase of the epistemic CC (See Prinz 2012a, 164; Langacker 2009, 311).

The work on filmic narrative of Torben Grodal (1997) is especially relevant to this topic. His typology of fiction genres is based roughly on the difference between “narratives that emphasize the dimension of action, as opposed to those that emphasize the axis of passivity and passion (like the classical tragedy, or a modern melodrama of the passive kind)” (1997, 161). Different genres instantiate forms of enactive flow by emphasizing either the active control of events or the passive position where the agent is controlled by events or counter agents.

Narrative interest at the perceptual level

In a film each shot in a metonymic way draws attention to an aspect of the overall scene / situation that controls by top-down prediction but is continuously challenged by prediction error correction bottom-up from each shot.

An off-frame **modal** tension is permanently present (Figure 7). A metonymic shot builds up a pressure that is released once the viewer can evoke the overall scene.

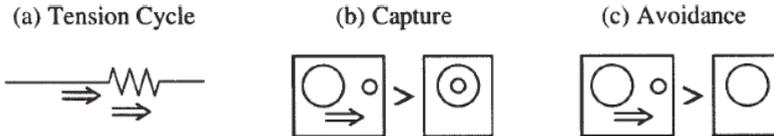


Figure 10.9

Figure 7. Langacker 2009, 306.

Metonymic shots exploit the reference point ability, i.e. “our capacity for invoking one conceived entity as a reference point (R) in order to establish mental contact with another, i.e. to **mentally access** one conceived entity **through** another. The entity accessed in this way is called the **target** (T) in the reference point relationship. The set of entities accessible through a given reference point (the set of potential targets) are collectively referred to as its **dominion** (D)” (Langacker 2009, 46) Figure 8).

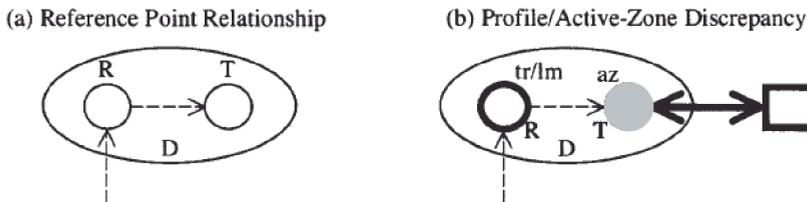


Figure 8. Langacker 2009: 46.

Conceptualizers

As we strive for epistemic control, we build up a conception of reality that has multiple levels. The epistemic CC comes into play at all these levels.

At the lowest level the **conceived reality** is simply the set of **realized occurrences**, i.e. what the conceptualizer accepts as having happened or obtained up through the present moment, which constitutes the basic **reality**. This level corresponds to the direct apprehension of (typically physical) occurrences, events and situations per se. Occurrences are also **imagined** at a higher level. This capacity defines what can be called **elaborated reality**. This conceptual construction consists of a set of **propositions** pertaining to occurrences, including an assessment of their epistemic status. Elaborated reality can itself be articulated into “several levels based on our

capacity to further conceptualize other conceptualizers as well as the content of their conceptualizations [...] there can in principle be any number of such levels (*Chris knows Bill thinks Alice caught a mouse, Dave said Chris knows Bill thinks Alice caught a mouse, etc.*), producing mental space configurations of indefinite complexity" (Langacker 2009, 160-161). In short a proposition – the grounded process expressed by a finite clause – can be apprehended by any number of conceptualizers, each with their own vantage point and epistemic stance regarding it" (Langacker 2008, 445). The CC comes into play in this series of embedded configurations.

„[...] we accept as real the existence of other conceptualizers each of whom engages in conceptualization and builds up their own conception of reality. We thus have configurations like Figure 7.10, where C_0 accepts as real the proposition that C_1 accepts as real the proposition that X is accepted as real by C_2 . In this case X does figure in C_0 's reality conception (R_0), but is only indirectly accessible within it. To "reach" X , C_0 has to trace along a multistep epistemic path leading through other conceptualizers and their own conceptions of reality" (Langacker 2009:201-206) (Figure 9).

Cheney knows that Rice is convinced that Bush is a genius.

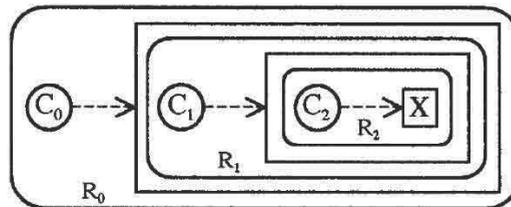


Figure 7.10

Figure 9. Langacker 2009, 206.

"Reality, then, is a complex affair involving often elaborate mental space configurations, with any number of hierarchical levels. Among the requisite spaces are those corresponding to mental constructions like schedules, scripts, and structural generalizations. These are virtual entities comprising virtual (representing) events. Their existence as such is nonetheless part of reality, as defined. Being based on accepted validity, real vs. unreal is not the same as actual vs. virtual, since even virtual entities can be accepted as valid" (Langacker 2009, 206).

Any occurrence of an event can be located in time as past, current, or future or in imagined time, in which case it forms a centering point that constitutes the **joint attentional scene** (the ongoing speech event), i.e. the "intersubjective context within which the symbolization process occurs" (Tomasello 1991, 154; 96). The conceptualizers are entities apprehending the event from within their particular attentional scenes.

Narrators

Langacker posits four linguistic **functional levels of apprehension of a conceptual content**: [Usage Event [Statement Scenario [Grounding [Objective Content]]]]. Each involves a conceptualizer with a distinct role in regard to the expression's overall import.

For example in the sentence *I like it* we have:

1. **The objective content**, the level overtly expressed, that comprises the profiled process and its participants. *Like* designates a mental relationship in which an experiencer (*I*) has a positive attitude toward a stimulus (*it*). (Langacker 2008, 483) **C = the role of experiencer in the profiled relationship.**
2. **The objective content is grounded** to form a finite clause. Zero grounding indicates that the profiled relationship is immediate to the ground and accepted by C as real. Recall that C, intrinsically, is only a virtual conceptualizer and is not invariably identified with the actual speaker (it cannot in general be identified with any particular individual). The grounded process does not represent any particular speech act; intrinsically, it is merely a **proposition**, with the potential to be used in different ways. **C = C in the grounding element.**
3. When used for a **speech act**, a proposition is embedded in the appropriate scenario (here the statement scenario), which – as an abstracted linguistic unit – invokes the interlocutors in generalized fashion. **C = the role of speaker in the statement scenario.**²
4. Only in the context of an **actual usage event** that the virtual speaker and hearer are identified with specific individuals. **C = the actual speaker** (484).

The same levels of narrative epistemic control are at work in film.

- (C⁴/X) The **occurrence** (X), i.e. the event or situation in which a diegetic entity is profiled as an **experiencer** (C⁴).
- (C³) The **profiler**, i.e. a construal that grounds the occurrence – the profiled event or situation marked as **p** - in a diegesis. It is “a view attached on the object”. The profiling is virtual and occurs in the here and now of the diegesis (Langacker 2009, 268).
- (C²) The **narrator** elaborates a construal that manifests an epistemic evaluation of the reality conception purported by C³. A virtual speech act scenario is involved. As an elaborated reality, its target is the basic reality of X/C⁴, i.e. a reference point to a domain matrix or descriptive system / situated conceptualization (It has as target a proposition **P** expressed by the profiled / diegetically grounded occurrence) (Langacker 2009: 260).
- (C¹) The **storyteller** is a discursive level that is elaborated by a second speech act targeted at C². Each C has a reality conception – from basic to elaborated.
- (C⁰) The **author** is a biographical instance. It is accessible via communicative devices external to the film artifact.

C⁴ experiencer = X , occurrence Effective level	OCCURRENCE: profiled entity in diegesis experiencer • A process profiled p: situation or event, the ground is virtual
C³ of grounding element – construal epistemic that is immediate – real	PROFILER: virtual, unprofiled • Grounds in diegesis an occurrence <i>here</i> and <i>now</i> (real, immediate) • Basic expression of a proposition P
C² of the speech act scenario, – epistemic level	NARRATOR (cinematic narrator): extra-diegetic • Grounds the basic expression in a speech act scenario • Elaborate expression • Contains modals (real vs unreal), time (immediate vs non-immediate), perspective and an illocutionary act.
C¹ of the actual usage event – discursive level / second order epistemic stance	STORYTELLER (filmic narrator): extra-fictional (explicit / implicit) (embrace or assert / formulate) (entertain) the proposition (modal = real vs unreal), complex scenario
C⁰ of the creation/ production of the film artifact	AUTHOR

The route of access to the profiled entity in diegesis can occur via each conceptualizer or via a direct path. In the schemas below, R is a conception of reality (Figure 10 and Figure 11).

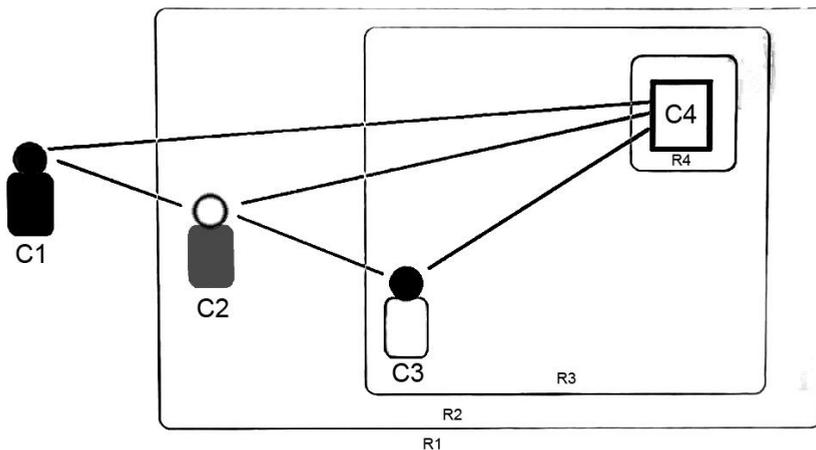


Figure 11.

Filmic constructions

One shot

The filmic instance of a perceptual capture is the shot. When looking at an image, one categorizes the object viewed and the corresponding concept and evokes the semantic domains to whom it belongs (Langacker 1987a, 63, 147- 82; Langacker 2008, 44). A **domain matrix** is a set of cognitive domains evoked by an expression that represents the base for its meaning and a domain is “any kind of conception or realm of experience”. An image is an expression that designates an entity in all domains of

the matrix (Langacker 2008, 48, 66). This entity is the expression's profile that stands out as the specific focus of attention within the scope of the expression (Figure 12).

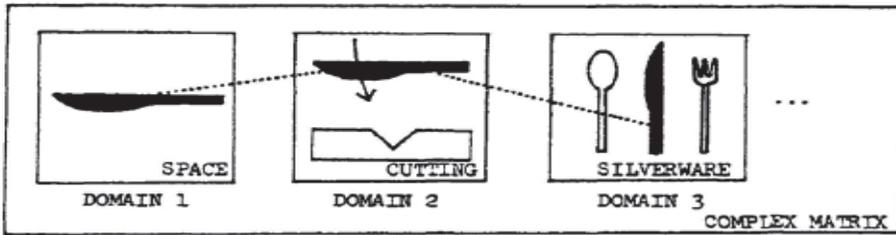


Figure 2.

Figure 12. Langacker 1991, 102.

The entity perceived is an instantiation or an elaboration of the schematic concept of the entity, a type (Langacker 1991, 102; Langacker 1987, 91; Tuggy 2007, 83). The instantiation evokes a simulation of the entity in a situated conceptualization – a structured mental assembly of modal simulations – and a descriptive system that encompasses with degrees of specificity associative conceptual chains based on encyclopedic knowledge, inferences and linguistic patterns of association. The perceived entity profiles a particular substructure in this conceptual base. The conceptual base (consisting of domain, simulation and descriptive system) is a specialized kind of schema with no profiling specified (Tuggy 2007, 104). For example in the case of *wheels vs vehicle*, the common base would be a *vehicle* with its wheels, but it would be a vehicle which is neither profiled itself nor has any subpart profiled. Such a concept could still be claimed to be activated as a **schema** for the two metonymically related meanings, but the meaning *vehicle*, which profiles the whole, is a different concept precisely because it is profiled (Tuggy 2007, 105).

In this framework, words are “symbolic representations [which] function as placeholders, pointers in working memory that are part of a network of semantic associations that will be fleshed out with sensorimotor representations once sufficient context has been accumulated” (Zwaan 2015).

In Lawrence Barsalou’s framework the concept evoked by the perceptual categorization of an entity aggregates information about cars into a loosely organized representation that includes properties (e.g., engine), relations (e.g., drivers operate cars), prototypes (e.g., the typical car is a sedan), rules (e.g., for something to be a car, it must use an engine that drives four wheels to transport a small number of people along a road), and exemplars (e.g., instances of sedans, coupes, station wagons, etc.). In his own words: “Once an entity has been categorized, categorical inferences follow, including inferences about how the entity is likely to behave, how one can best interact with the entity, the likely value to be obtained from interacting with the entity, and so forth [...] Such inferences result from accessing category

knowledge associated with the concept used to categorize the current instance, and then generalizing this knowledge to the instance” (Barsalou, 2003b, 1107; Barsalou 2008c). We have to note that for Barsalou there is no unique schema that serves as a template for the categorization: “Rather than the category having a conceptual core, a set of **situated exemplars** represents it that exhibit family resemblance and radial structure, accompanied by limited abstractions”. Nevertheless, he accepts that simulations contain schematic conceptual regions that can be elaborated by pattern completion. These are **goal-derived categories** that prompt the mappings between roles in event sequences and instantiations in the environment. For example, in a particular simulation of a scene occurring in a room where one needs something upon which he can stand in order to change a lightbulb, “one can imagine standing on a large sturdy object without knowing exactly what it is – one simply knows that it can be stepped onto safely and extend one’s reach significantly” (Barsalou 2003, 549). In short, situated conceptualizations or simulations give structure to an ensemble of schematic conceptual elements. Categorizing a perceptual input is based on a mechanism of pattern completion.

We have to take a step further and consider that a given concept is a construction of a multitude of schemas or summaries bounded as a situated conceptualization. Recognizing a familiar object is a construction in which several schematic elements concur to pattern completion (See Barrett 2017, 25, 308) (Figure 13).



Figure 13. Barrett 2017, 308.

As some aspect of experience is perceived, it projects onto all concepts in parallel, with concepts competing to categorize the aspect, with the best-fitting concept winning (McClelland & Rumelhart, 1981). As Barrett (2017) states, simulation is a top-down model of the world, which is constantly checked by bottom-up correction error.

“[...] your brain models your world through simulation. Your brain issues a storm of predictions, simulates their consequences as if they were present, and checks and corrects those predictions against actual sensory input [...] Your brain continually **predicts and simulates all the sensory inputs from**

inside and outside your body, so it understands what they mean and what to do about them. These predictions travel through your cortex, cascading from the body-budgeting circuitry in your interoceptive network to your primary sensory cortices, to create distributed, brain-wide simulations, each of which is an instance of a concept" (153)

In this theoretical approach an image is an expression that exhibits a perceptual construal – a reference point in the array of multimodal conceptual domains evoked – of the entity profiled. Devoid of profile, the situated conceptualization and the descriptive system seem schematic but can be explored consciously under attentional mechanisms since they are accessible (See Prinz 2012a). The mechanism of pattern completion is an instantiation of the CC in which an input is, after a period of tension, included in the array of the elements under the control of a central concept-attractor. This concept is schematic and exercises control in a top down manner.

Two shots

A conceptual unit

A typical filmic construction is the juxtaposition of two shots that form a conceptual unit. In cognitive grammar a *head* is the profile determinant at a given level of the construction's organization, a **complement** is a component structure which *specifies* a schematic substructure of the head (for example the door in *near the door*). The head of the construction – *near* – contains a schematic element describable as a schematic "something" and the complement – **the door** – specifies and elaborates this schematic abstract substructure. On the other hand, a **modifier** is a component structure in which a schematic substructure is *specified by the head* (**pink fish**). Pink, the modifier contains an abstract schematic conceptual element (something has to be pink) that is elaborated by the head of the overall construction. The profile determinant, in clear cases, is fully (or very nearly fully) schematic for the structure of which it is a component. It thus sanctions the formation of the composite structure. Profile determinacy amounts to a **schematicity relationship** in which the composite structure elaborates the profile determinant component but non-profile determinant components also sanction particular substructures or aspects of the composite structure (Tuggy 2007, 107).

For Langacker it is typical in a construction for one component structure to contain a schematic substructure which the other component serves to **elaborate**, i.e. characterize in finer detail. The schematic element of one substructure elaborated by another component is called an elaboration site or an **e-site** (Langacker 2008,198; Verhagen 2007,105). The schematic element is immanent in its instantiation and categorizes it. This process can be labeled as „Experience. Perception. Conceptualization. Pattern completion. Perceptual inference. Memory. Simulation. Attention. Morality. Mental Inference.“ (Barrett 2017, 125).

In a typical filmic instance of a juxtaposition of shots the first one will direct attention to a profiled entity. Thus by directing attention to the nominal profile, an

array of associated entities are activated or made accessible, which constitute the reference point's **dominion**. The task is then to find a target which can serve as its **active zone** for participating in the profiled relationship.

The metonymy

Let us imagine a filmic sequence in which the first shot A depicts a plane in the sky and the second shot B depicts the active zone of the plane, e.g. the interior of the plane. Shot A evokes the conceptual domain of "flight" and profiles the "plane". Shot B elaborates as an active zone the e-site included in the conceptual dominion of shot A, i.e. the "interior of a plane". The relationship is one of pattern completion or categorization from the e-site to the active zone elaboration (Figure 14).

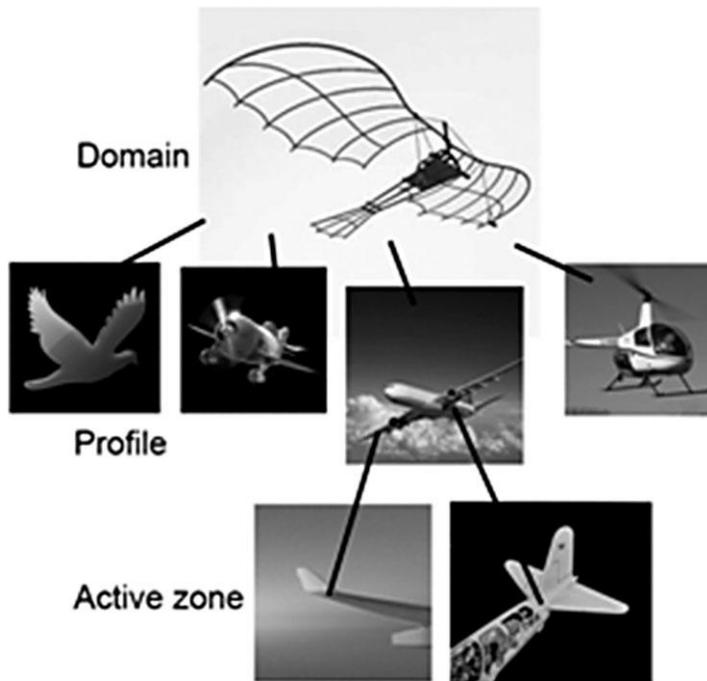


Figure 14.

Metonymy consists in naming one entity as a way of mentally accessing some other entity within the conceptual complex it evokes, the dominion. In **metonymy**, the metonym reference point stands for (is conceived through the mapping of features **from the target's profile** (*the soup is at the restaurant's door*; soup β client). In the case of **metaphor**, the direction of categorization is reversed, i.e. the target is conceived through the profile of the source: *the client is a sour soup*; soup α client).

When I make reference to a client in a restaurant situation as „the soup that sits near the door is not content” I apply a metonymic use of the profiled entity. The *soup*

is part of the simulation (situated conceptualization) the “client in a restaurant”, and a type of [ALIMENT]. The particular use or construal displaces the source element inside the conceptualization as a type of [CONSUMER] --> [CLIENT AT A RESTAURANT], a kind of [CLIENT]. A shift in profile inside a semantic domain, the dominion, is mediated by a simulation that establishes the connection “affording mental access” (See Langacker 2013, 69). The affordance of access is based on the goal derived category, the client, which subsumes as a dominion the array of entities in the region of control of a central entity. The process configures a different trajectory inside the descriptive system of the /client at the restaurant/ in which the source of the metonymy soup is fulfilling the role and benefits of the target entity, the client (See Tuggy 2007, 104-105; Langacker 2008, 250; Langacker 2009, 107; Peirsman & Geeraerts 2006; Ruiz de Mendoza 2014a, Ruiz de Mendoza 2014b).

In the *client in a restaurant* dominion, the client is an e-site that categorizes by pattern completion the perceptual source or reference point in the concerned simulation. Other metonymic uses allow generalizations and use of descriptive systems.

In a short sequence from *Breathless* (Jean-Luc Godard, 1960) each metonymic shot is a reference point for the overall scene. The scene is the dominion / concept that controls by top-down prediction while also continuously challenged by bottom-up prediction-error correction from each shot. This manifestation of the CC displays a bidirectional control, i.e. a top-down prediction and a bottom-up prediction error. The metonymic source (the metonymic shot) retains its conceptual features and implicatures and projects them on the target. The metonymic shot is a dynamic process and contains an off-frame control tension (Figure 15).

In the hotel sequence in *Alphaville* (Jean-Luc Godard, 1965) the shots of the character, Lemmy Caution, are metonyms that give access to the profiled entity of the journalist integrated in the situated conceptualization of the journalist present at an event. This event mixes elements from a firing squad executing revolutionaries *and* the show of an aquatic ballet. The character is a metonym of the individual inserted in a political event and in an entertainment event. The concept of *journalism* belongs to the descriptive system of *artist, art or free expression* as opposed to *capitalism* (instantiated by political repression and media entertainment) (Figure 16). The CC is also bidirectional. The metonym is a reference point to the descriptive system and the situated conceptualization operates a categorization process.



Figure 15.



Figure 16.

The metaphor

Some shots are construed as metaphoric mappings. **Metaphor** is a conceptual phenomenon independent of particular expressions. It consists in a set of mappings connecting a **source** domain and a **target** domain partially understood in terms of former. The result is a **blend**. In metaphor, we invoke one domain of experience, a source domain, to apprehend another, the target domain (Langacker 2009, 342; Lakoff 1990).

The thought just flew right out of my head.

The thought (the target) is a bird in a cage (source)

The **source** or the **standard** (*flight of a bird*) categorizes the **target** (*the thought*) by using a common schematic pattern (an abstracted profile = the designated cognitive configuration). This mechanism is based on “the extraction of a coherent schema with both literal and figurative senses (standard and target) as subcases” (Tuggy 2007, 103).

In the example extracted from *Alphaville* the target of the metaphor is *art* and the source is the *journalist*. The particular simulation depicted by the cinematic shots allows us to understand the abstract domain of the concept *art* by mapping features from the concept *journalist*. The source domain is a categorizing modifier. The direction of the CC is from source to target.

A shot extracted from Michael’s Haneke film *The seventh continent* (1989) depicting a couple inside a car is the standard, the source of the metaphor (Figure 17: shots A and B), that will prompt the apprehension – the conceptual construction – of the target, i.e. the concept of cinema (Shot C).



Figure 17.

Let us consider a face-to-face dialogue. In this case, the head of the construction is the reciprocal act of seeing. The **head** designates a relationship between a subject (a **trajector**) and an object (a **landmark**): *Jennifer*^{trajector} **sees**^{head} *George*^{landmark} (Figure 18). The relationship profiled by the head is an attention schema – an act of visual perception – is a situation where an X interacts with a Y. The cinematic construal directs the viewer’s attention to the active zone of the scene.

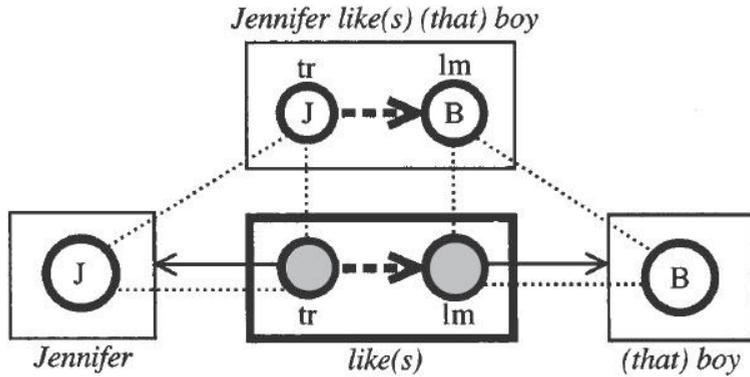


Figure 18. Langacker 2009, 29.

The Jennifer / George shots (Figure 19: shots A and C) elaborates in detail or instantiates a schematic trajector (subject) / landmark (object) relation implicit in the schematic act of attention – the head profiled by the construction (Shot B).



Figure 19.

Let us consider a juxtaposition of two shots. A depicts a woman with an impassible face that can express an emotional state of fatigue, indifference, despair, nervous breakdown, anxiety, mind-wandering, etc. Shot B elaborates the schematic emotion expressed in A as a state of despair. At the same time, the direction of the instantiation of a schematic element can be reversed from B to A. Shot A elaborates in more detail the simulation of desperation (Figure 20).



Figure 20. Shot extracted from *Jeanne Dielman, 23 Commerce Quay, 1080 Brussels* (Chantal Akerman, 1975).

The emotion perceived by the viewer is influenced by the context, e.g. body postures, vocalizations, situational descriptions, and even other people. Let us consider the following sequence of shots: A: a close-up of an ambiguous emotional expression and B: a medium shot of the character in a sports contest winning situation (Figure 21). The editing construction has a bidirectional vector of control and elaboration. In the first interpretation the emotion expressed in A is a modifier that has an e-site that is elaborated and specified by the winning scene. The emotion specified is dependent on the emotional value specified by the gist of the scene. In the second interpretation the direction of categorization / pattern completion is reversed. The emotional content displayed in shot A is a complement that specifies the subject of a contest relationship.



Figure 21. Barrett 2011, 287.

The deictic gaze and the Kuleshov effect

The cognitive model of the CC takes place in short sequences that illustrate the Kuleshov cinematic construction (Figure 22).

In a first direction of control a schematic emotion is evoked as an e-site included in the dominion of elements in the situated conceptualization / simulation of a scene in which a woman regards her offspring compassionately (A.1) or a woman is lusciously sitting on grass (A.2). The *compassion / lust* e-site is elaborated by the expression of Hitchcock's face in shot B. The shot A (*compassion / lust*) is a modifier that contains as an e-site a compassionate / lustful agent. Shot B instantiates the emotional category carried by the schematic agent of shot A. The emotional evaluation is the equivalent of the categorization of a construal as a particular emotion (Barrett 2014, 294). The viewer sees emotion: "a person's affective state has a top-down influence in normal object perception" (Barrett 2009b, 1331).

The schematic affect is associated with a schematic conceptualizer – a virtual one – and can be metonymically elaborated in a B shot. This pattern implies interaction and social affiliation (Barrett *et al.* 2016, 11-12).

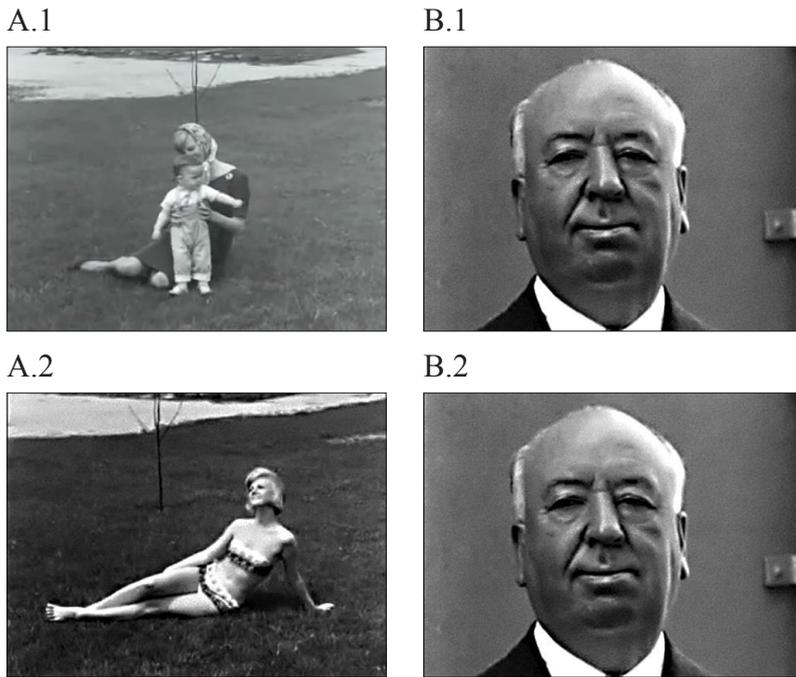


Figure 22.

„So every single experience of emotion, or perception of emotion, necessarily involves invoking shared meaning, even if there is no one there to explicitly share with in the immediate moment.” (Barrett 2014, 294).

According to the **Conceptual Act Theory of Emotion** elaborated by Barrett and Barsalou, the situated conceptualization used to construe a situation determines the emotion experienced. Different situated conceptualizations produce different forms of the same emotion in different situations: “the integrated representation of diverse concepts into a situated conceptualization constitutes an instance of fear, including associated internal experience and action” (Barsalou 2011, 1108). Fear can look and feel quite differently in different instances.

In the **conceptual act theory** advocated by Barrett (2017) perception, cognition and emotion are meaning-construction acts and are governed by a similar mechanism. Following the line of argument developed by this paper, one could state that this mechanism is an instance of the CC.

The cinematic construction illustrated here has a bidirectional direction of control. The second direction of control is oriented from shot B to shot A. In shot B, an agent (trajector) orients his attention to something schematically represented in the semantic description of the attention schema, i.e. a landmark or an object. The woman in shot A elaborates the schematic e-site of the landmark of the attention relationship (Figure 23).

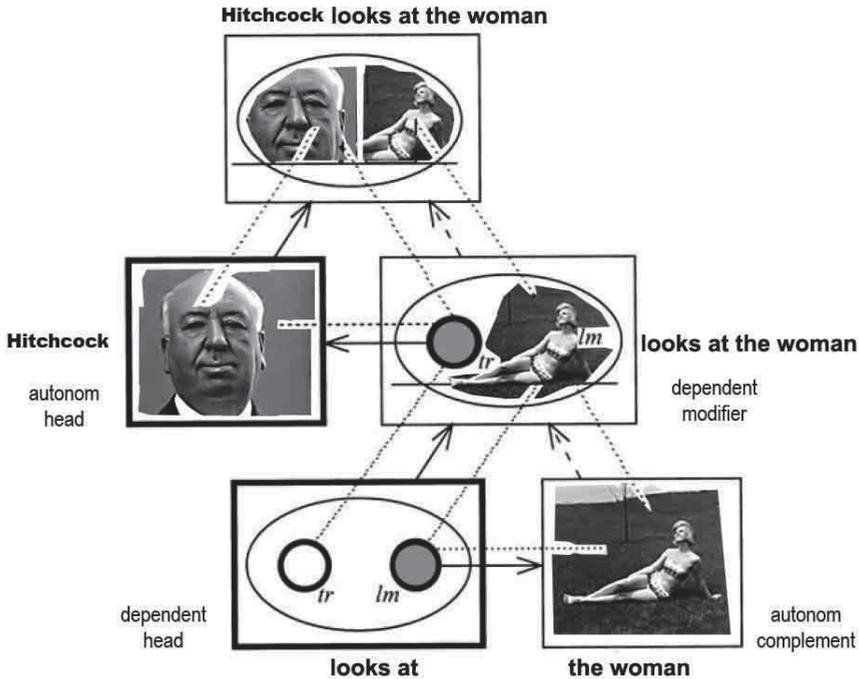


Figure 23.

Camera movement

Looking in a shot A towards an object situated off frame is an instance of perceptual capture. The tension inherent in the CC is released when shot B elaborates the object of the attention relationship. Camera movement can mimic the potential action of capture. Camera movement embodies the dynamic unfolding of the force dynamic interactions between an actor and a target in a force dynamic event (schematized as the Tension cycle). In other words “rather than think of vision as a passive picture-making process, think of it as active, predictive, and distributed.” (Zacks 2014, 70).

This mechanism can be illustrated with two sequences also extracted from Hitchcock’s filmography (Figure 24). In *Shadow of a Doubt* (Alfred Hitchcock, 1943) shots B and C elaborate the schematic object of the attention schema and the mental content of the character-viewer. In the sequence extracted from *Notorious* (Alfred Hitchcock, 1946) the character does not move but camera movement (Shots E and F) elaborate the mental content of the character, i.e. an imaginary spatial displacement towards the object of the attending act. Camera movement renders in a dynamic manner the tension (potential), force dynamic (action) and stasis (result) phases. Shot F elaborates the result phase where the target is under the actor’s control.³

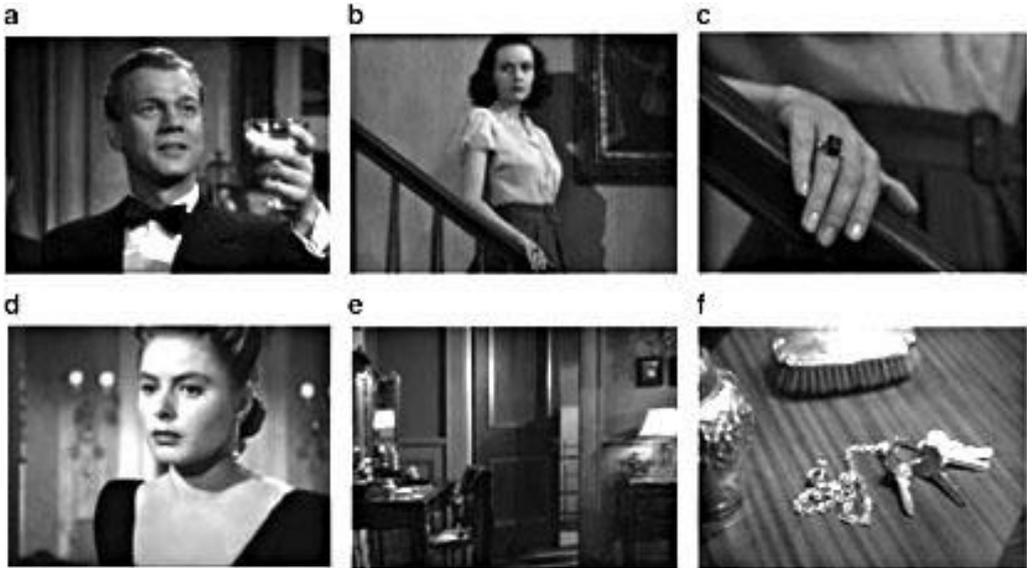


Figure 24.

Music and emotion concepts

A similar mechanism is at work in musical constructions between a sound design and a visual profile. Music profiles an affective valence (euphoric / disphoric) and an arousal degree that represents an e-site that is further elaborated by a visual profile. Conversely, the visual profile (and the scene depicted) includes an emotional e-site that is further elaborated by sound design. A bidirectional direction of control is established.

Viewer and film

Film prompts an embodied relationship between the viewer and the filmic artifact. As Balint and Tan (2015) highlight: “Viewers may indeed be aware of a dynamic balance between attraction and repulsion forces in a most complex construal of their experience of absorption” (2015, 75). The viewer experiences the relationship as one of containment in a field or region of control. Balint and Tan indicate that the experience of containment in fiction can be construed in a “passive” way as the element contained or controlled or in an “active” perspective in which the viewer is the controlling actor (See Balint & Tan 2015, 76-77 and Dewell 2005).

Zacks (2014, 87) mentions the viewers’ preference for the scrambled version of *Memento* and not the chronological order of the story “suggesting that working on the puzzle and experiencing the suspense was more valuable to them than learning all the facts” (See the experiment done by d’Ydewalle & Sevenants 2006). For Hasson (2008, 2) some films have the potency to “control” viewers’ neural responses. By “control” it is simply meant that “the sequence of neural states evoked by the movie

is reliable and predictable / controlling viewers' brain states, for our purposes, is the same as controlling their mental states including their percepts, emotions, thoughts, attitudes, etc." (2). As already mentioned for Balint and Tan (2015) narrative absorption experience is done through use of image schemas that structure patterns of absorption, i.e. relevant mental schemata of absorbed narrative experiences.

The viewer's pleasure is derived from the balance between the passive position of control (i.e. suspense and tension) and the active one where the viewer achieves a state of relaxation after an active phase of perceptual, emotional and cognitive involvement.

From self to culture

Each agent construes a model of itself as part of the environment in order to cope with disorder and surprise. As stated by Friston "heuristically, if I am a model of my environment and my environment includes me, then I model myself as existing" (Friston 2011, 89). Perceptual, emotional and cognitive controls are self-specifying (Thompson Evan 2011; Rutherford 2003). Biological forms that conserve their structure have to sample expectations about the environment under a model of its world and a model of self in the world. Humans have models of the self meant to control the self in the environment. They acquire self-consciousness through "the sense of ownership and identification with the body as a whole (phenomenally experienced 'mineness'), self-location (centeredness of the conscious model of reality) and the first-person perspective" (Blanke & Metzinger 2009, 7).

For Graziano (2013, 31) humans use a model of attention in order to understand and predict another person's behavior (including gaze direction). They compute a description of someone else's state of attention. This model of an attending and aware mind is a type of social thinking and a case of attributing awareness (73). Awareness built on the attention schema is a "mental seizing of something" (110). For the present purpose "mental seizing" will be understood as based on the model of control. As Barrett states "the brain creates the experience of control like any other experience: you have a concept for "Agency," and you apply it as a prediction to a bunch of sensations" (Barrett 2017, 397). The model of attention as a control model help understand and model another person's attentional state and is also used to model in a performative way one's own attentional state (Graziano 2013, 31) (Figure 25).

The metaphorical system of the divided self done by Lakoff (1996) where the notion of control plays an important role is another manifestation of the CC. The metaphor of the divided self is based on the distinction between *subject* (the experiencing consciousness) and *self* (bodily and functional aspects of a person). A person is an ensemble of subject and self and their relationship is depicted in spatial terms. Several metaphors are based on this structure, e.g. "the loss of self (*He lost himself in reading*), the split self (*I hate myself*), the scattered self (*He's all over the place*), the true self (e.g. *I am not myself today*), the absent subject (*I am beside myself*)" (Ruiz 2014: 79).

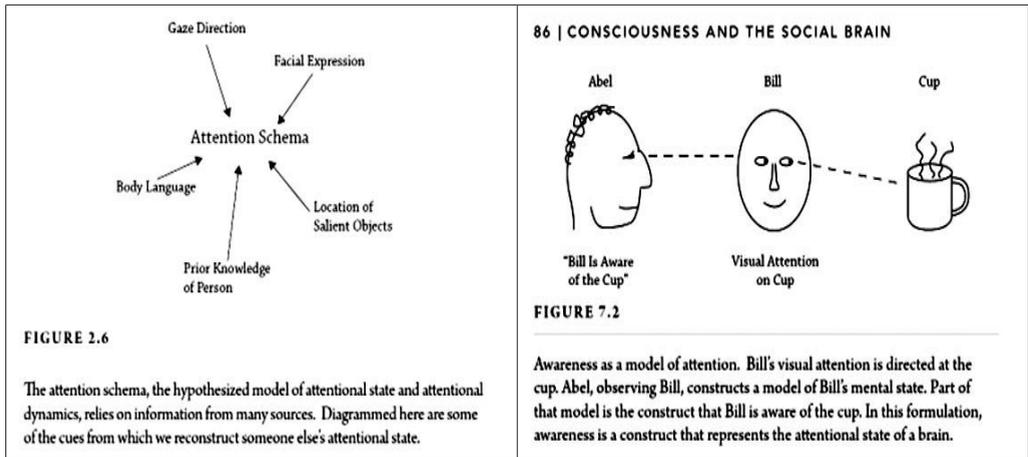


Figure 25. Graziano 2013: 31, 86.

The experience that two or more people share a focus of attention and agree on this grounding of experience is a foundation of human culture and civilization (Barrett 2017, 99). Grodal (2017, 12) argues that often films cue this audience centered experience in shared focus of attention in order to articulate emotional bonds and emotional regulation, experienced from a first person plural position. In short, a model of control encompasses both the *I* and *you* in a common field of joint attention and awareness (See also Tomasello 1999; Tomasello 2008). Culture can be described as a series of practices and regimes of shared attention.

“Your brain is also surrounded by other brains in other bodies. Whenever you speak or act, you influence the predictions of others around you, who in turn influence your predictions right back. A whole culture collectively plays a role in the concepts you build and the predictions you make, and therefore in your behavior” (Barrett 2017: 230).

Following Tomasello’s theory of shared attention and shared intentionality Ramstead (2016) considers that cultural content and normative social practices are “built on a foundation of contentless basic mental processes that acquire content through immersive participation of the agent in social practices that regulate joint attention and shared intentionality” (Ramstead 2016, 1). Social norms are, in this framework, devices that reduce mutual uncertainty and entropy minimizing processes (16).

Conclusions

The cognitive model of the CC is based on a tension cycle emergent between a bounded entity, the actor itself, the actor’s dominion, i.e. the set of entities under the actor’s control, a region of potential interaction, and an external target that provokes a state of tension by intruding in this field. One basic way to resolve the tension is capture, i.e. taking control of the external entity via a force-dynamic event. Bodily

functions like breathing or eating instantiate the CC as well as, at the mental levels, the focusing of attention at the perceptual, emotional and cognitive domains of instantiation.

A similar mechanism is in a fractal manner manifest at different levels of complexity and in different domains of instantiation (Figure 26). It is a graded phenomenon. At the cellular level the intentionality of exploration-exploitation of the environment by mastery of sensorimotor contingencies is devoid of conceptual and semantic content. It is just a form of suppression of prediction error instilled by the environment in order to preserve negative entropy, i.e. a self replicating bounded structure. As Ramstead indicates, it is “contentless direct coping” (Ramstead 2016, 16).

In complex biological structures (e.g. the brain) the CC has a bidirectional direction of fit and incorporation (change and maintenance of structure). The CC acts in a top-down manner as a prediction based on a model of control and is also exercised in a bottom-up fashion as prediction error by populations of neuronal cells that fire and wire together.

At the conceptual level, the CC is a mechanism of recognizing the pattern of the source in the target. The epistemic CC is a process of approaching or apprehending in a dynamic manner, categorization and possession of a domain. Epistemic control is a way of incorporating events in conceptions of reality and is articulated in filmic artifacts through the use of narrators. The CC drives mental „travels” inside a concept space of thoughts as „rodents navigate the world in a maze” (See Cerf and Mackay 2011, 139).

At the social and cultural level we find human shared regimes of control manifested in the domain of symbolic artifacts and operations that involve contents of shared intentionality.

Thus a common schematic structure based on a Bayesian error prediction reduction in bounded regions of space (entities) and time (events) structure dynamic processes in biology, ceremonials, narration, epistemic, perceptual and emotional realms. Applied in a performative way to cortical states the CC instantiated as the attention schema gives rise to awareness.

Film experience is based on a hide and seek process, i.e. a multimodal wickerwork of CCs based on perceptual cues that is performed at multiple levels, domains, modalities and temporal spans. These dynamic unfoldings are modulated by attention and glued by attractors in cognitive maps. Different attractor schemas – narrative, action, event schemas, frame composition, emotional conceptualizations, diegetic scenes – are instantiated in different situated conceptualizations, simulations, that bind together disparate elements in coherent wholes. The film artifact provokes the viewer’s absorption in the dynamic roller coaster unfolding of the control mechanism situated between the extremes of radical suspense due to excessive error prediction and uncertainty, and lyrical dream-like reveries due to scarce error prediction.

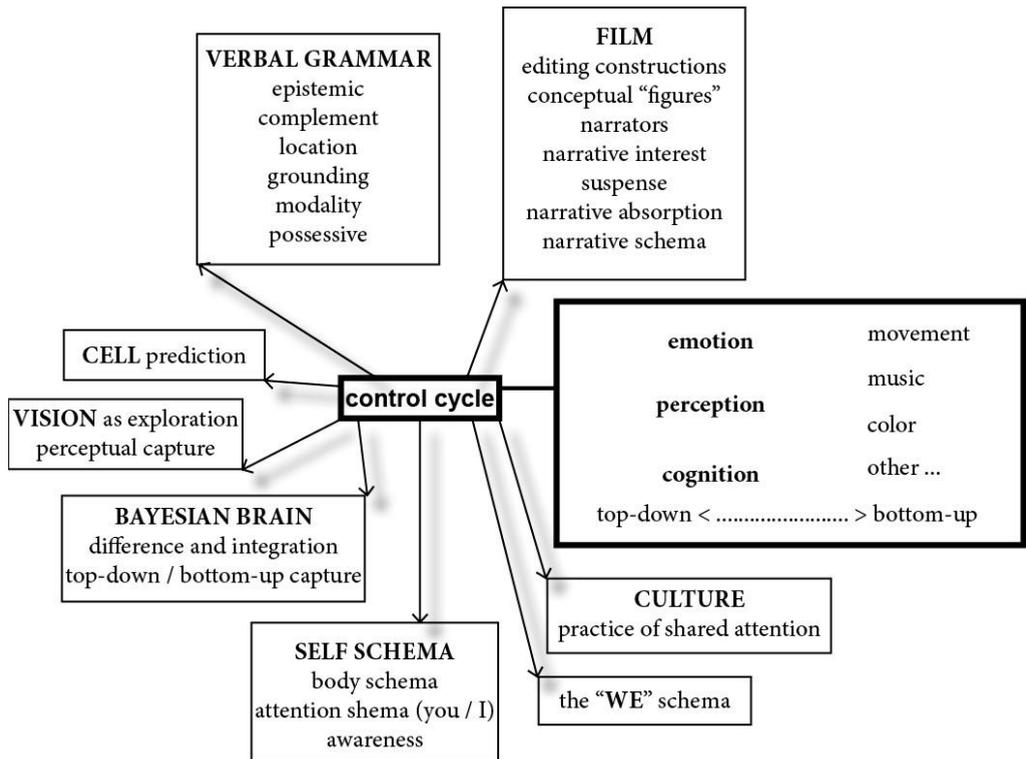


Figure 26.

End Notes

- 1 "Simulation is the re-enactment of perceptual, motor and introspective states acquired during experience with the world, body and mind" (Barsalou 2009, 1281); "Simulations represent a category's instances in their absence during memory, language and thought. Simulations produce inferences and predictions about a category's perceived instances using the pattern completion inference mechanism described later. Simulations combine productively to produce infinite conceptual combinations. Simulations represent the propositions that underlie type-token predication and complex propositional structures. Simulations represent abstract concepts" (1283).
- 2 Performatives – actions like stating, ordering, asking, requesting, promising, vowing, proclaiming, and christening – are known as **speech acts**. "**Speech acts** are based on standard cultural models. As recognized ways of interacting in the society, these models are invoked as cognitive domains for various linguistic purposes.... The cultural models invoked by speech acts are familiar scenarios of social and linguistic interaction. (...). As part of an abstracted cognitive model, the speech act and its participants are of course only virtual entities—like the referents of *I* and *you* or the conceptualizer in a grounding element (§12.3.2)" (Langacker 2008, 470-1).
- 3 The example is commented on at large in the Embodied Simulation theory by Coegnarts (2017, 9) and Gallese and Guerra (2012, 201).

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