The Sensory-Motor Grounding of Abstract Concepts in Two Films by Stanley Kubrick

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Abstract

This article provides an embodied account of conceptual meaning in film. More specifically, it claims that the sensory-motor system plays a constitutive role in the cinematic characterisation of abstract concepts. Firstly, we briefly discuss the standard disembodied view of first-generation cognitive science according to which the mental representations of concepts are primarily symbolic and abstract. Secondly, we argue against this view by discussing an embodied theory of concepts based on recent neuroscientific evidence and results from cognitive linguistics. Lastly, we consider the implications of the latter for the study of visual representations of abstract conceptual meaning in film. Using Stanley Kubrick's *2001: A Space Odyssey* (1968) and *Eyes Wide Shut* (1999) as examples, we make the case that sensory-motor structures play a crucial role in the representation of abstract concepts in cinema.

The Standard Disembodied View of Concepts

It has been a common theoretical position in early cognitive science to consider mental representations of concrete (e.g., CHAIR) and abstract concepts (e.g., TIME) from the perspective of abstract formal models.[1] According to these first-generation theories of cognition, which are rooted in the analytic tradition of philosophy of language, concepts are analysed on the basis of representational schemes that are wholly detached from our sensory-motor systems. They are disembodied or amodal in that the internal structures of the mental representations are not related to the sensory-motor states that produced them.

Consider, for example, the disembodied symbol system that underlies the mental representations of concrete concepts, as discussed by Lawrence Barsalou.[2] At

[1] See for example Jerry Alan Fodor, *The Language of Thought*, Harvard University Press, Cambridge (MA) 1975; Zenon Pylyshyn, *Computation and Cognition*, MIT Press, Cambridge (MA) 1984.
[2] Lawrence Barsalou, "Perceptual Symbol Systems," in *Behavioral and Brain Sciences*, no. 22, 1999, pp. 578-579.

first the amodal system assumes that during perceptual experience perceptual states arise in sensory-motor systems. These perceptual states can be processed either consciously by experience or unconsciously by the activation of neural representations. When these perceptual states occur, a selection is transduced into an entirely new representation system that describes these states amodally, that is, in the absence of the perceptual states that produced these symbols. Once transduced, they enter into larger representational structures containing feature lists, semantic networks, and frames that have no similarity to the initial perception states. For this reason amodal systems and their characteristics are often described by means of language. Just as words are arbitrary linked to their corresponding referents in the world, amodal symbols of concepts are arbitrary linked to their perceptual states. Like the word "chair" bears no correspondence to physical chairs, the amodal mental representation of the concept CHAIR bears no correspondence to perceived chairs. In this view meaning is referential. Symbols get their meaning solely by virtue of their capacity to correspond to things, properties, and relations, existing objectively in the world.[3]

Consequently, as Mark Johnson has pointed out, arts or aesthetics have never been regarded as very important in the discussion of conceptual knowledge and meaning.[4] Because painting, film, music, architecture, and so on, are not regarded as primarily conceptual and propositional in nature, they are thought not to have meaning in its proper sense. According to this view, which Johnson rejects, art can only have meaning to the extent that it can be structured in terms of a linguistic model of meaning, that is, according to representational schemas that are similar to words, phrases, and sentences in language. For instance, post-structural film theorists, such as Christian Metz and Colin MacCabe, have regarded film primarily as a hermetically-sealed linguistic discourse, arguing that film can only have meaning if it is seen to be a type of language ("the language of film," or "film-as-language").[5] On this view, no recourse to a referent outside of itself is necessary (e.g., the intention of the filmmaker(s), the life of the body).

In this article we are discussing a radically different view of the analysis of conceptual meaning in cinema. Following grounded theories of cognition, in particular conceptual metaphor theory, we will argue that the representation of abstract concepts in cinema is grounded metaphorically in embodied knowl-

[3] Following a convention in Cognitive Linguistics, concepts and image schemas are written in small capitals (e.g., the concept CHAIR), while quotes will be used to indicate linguistic manifestations (words, sentences). This convention is necessary to maintain the distinction between the conceptual level, on the hand, and the linguistic expression level, on the other hand.

[4] Mark Johnson, *The Meaning of the Body: Aesthetics of Human Understanding*, University of Chicago Press, Chicago 2007, pp. 207-208; see also Mark Johnson, *Identity, Bodily Meaning, and Art*, in Tone Roald, Johannes Lang (eds.), *Art and Identity: Essays on the Aesthetic Creation of Mind*, Rodopi, Amsterdam-New York 2013, pp. 15-38.

[5] Christian Metz, *Film Language: A Semiotics of the Cinema*, University of Chicago Press, Chicago 1974; Colin MacCabe, *Tracking the Signifier: Theoretical Essays on Film, Linguistics, Literature*, University of Minnesota Press, Minneapolis 1985.

edge. More specifically, we will illustrate by means of a specific case-study how the sensory-motor system structures the expression of conceptual content in cinema. First of all, however, it is necessary to clarify the role of the body in conceptual knowledge, that is, we have to discuss how the mental representation of concepts is grounded in sensory-motor processing, before we can relate it to the question of *filmic* representation.

Towards an Embodied Theory of Concepts

Over the last years the disembodied standard view of concepts has been challenged by various accounts of grounded cognition.[6] Although different in scope and form, these accounts generally share the same embodied view according to which conceptual content is not (exclusively) a matter of amodal symbol systems. Rather, they argue that concepts are primarily constituted by knowledge that is represented within our sensory-motor system.

One influential view of grounded cognition has been Barsalou's theory of perceptual symbol systems.[7] The basic assumption underlying this theory is that cognition is inherently grounded in perception. During experience (e.g., easing into a chair) the brain captures perceptual states. These states, belonging to sensory-motor systems, are in turn stored permanently in long time memory in the form of multimodal representations, which Barsalou calls "perceptual symbols." Later, when information is needed to represent a concept, these symbols are once more retrieved. More specifically, perceptual knowledge captured during experience is activated again to re-enact or to simulate the initial perceptual states acquired during actual experience and interaction with the world. On this view, mental representations are not formed by abstract and amodal symbols, but by modal and analogical perceptual symbols. They are analogical in the sense that the structure of the cognitive representations corresponds in some way to the perceptual system that underlies it.[8]

A similar theory of concepts that is grounded in the sensory-motor system has been proposed by Vittorio Gallese and George Lakoff.[9] Using neuroscientific

[6] Lawrence Barsalou, "Perceptual Symbol Systems," cit.; Id., "Grounded Cognition," in *Annual Review of Psychology*, no. 59, 2008, pp. 617-645; Lawrence Barsalou, Katja Wiemer-Hastings, *Situating Abstract Concepts*, in Diane Pecher, Rolf A. Zwaan (eds.), *Grounding Cognition: The Role of Perception and Action in Memory, Language, and Thought*, Cambridge University Press, New York 2005, pp. 129-163; Vittorio Gallese, George Lakoff, "The Brain's Concepts: The Role of the Sensory-Motor System in Conceptual Knowledge," in *Cognitive Neuropsychology*, no. 22, 2005, pp. 455-479; George Lakoff, Mark Johnson, *Metaphors We Live By*, University of Chicago Press, Chicago 1980; George Lakoff, Mark Johnson, *Philosophy in the Flesh: The Embodied Mind and its Challenge to Western Thought*, Basic Books, New York 1999.

[7] Lawrence Barsalou, "Perceptual Symbol Systems," cit.

[8] *Ivi*, p. 578.

[9] Vittorio Gallese, George Lakoff, "The Brain's Concepts: The Role of the Sensory-Motor System in Conceptual Knowledge," cit.

research results showing that mental representations have similar features as perception and action, they suggest that the sensory-motor system has the right kind of information structure to characterise the structure of concepts. Consider, for example, the concrete concept of GRASPING. According to Gallese and Lakoff this action concept gets its meaning via our ability to imagine, perform, and perceive grasping.[10] More specifically, they argue that in order to understand the concept GRASPING one must be able to imagine oneself or somebody else grasping an object. On this view, imagining is considered to be a sort of mental simulation in that it shares the same neural substrate as doing or perceiving.

The action concepts of EASING INTO A CHAIR or GRASPING AN OBJECT are concepts for literal sensory-motor actions. As such, it is plausible to assume that they entail, in a constitutive way, embodied information. Lakoff calls this approach "literal" in that "the concepts for what the physical body is and does are embodied."[11] There is a physical correspondence between the concept, on the one hand, and the actual physical experiences it draws upon, on the other hand. This, however, is not the case with abstract concepts such as JUSTICE, BEAUTY or TIME, "entities that are neither physical nor spatially constrained."[12] For it is much harder to see how these entities could be embodied, as there is no physical experience that can be related in a direct way to their meaning.[13] The crucial question, then, is to ask how these abstract concepts can be grounded in sensory-motor processing?

One proposal that has received much scholarly attention in the last three decades has been Conceptual Metaphor Theory (CMT), as originated in cognitive linguistics.[14] The underlying idea behind CMT is that our abstract concepts are defined by systematic mappings of attributes and relations from bodily-based, sensory-motor source domains onto abstract target domains. More specifically, CMT claims that we employ the logic of our sensory-motor experience (i.e. image schemas) to draw inferences about abstract concepts. Consider, for example, the conceptual metaphor UNDERSTANDING IS GRASPING, as analysed by Johnson.[15] In this metaphor elements of the source domain (GRASPING) are mapped onto the target domain (UNDERSTANDING) as follows:

[10] *Ivi*, p. 456.
[11] George Lakoff, "Explaining Embodied Cognition Results," in *Topics in Cognitive Science*, no. 4, 2012, p. 775.
[12] Lawrence Barsalou, Katja Wiemer-Hastings, *Situating Abstract Concepts*, cit., p. 129.
[13] Bradford Z. Mahon, Alfonso Caramazza, "A Critical Look at the Embodied Cognition Hypothesis and a New Proposal for Grounding Conceptual Content," in *Journal of Physiology - Paris*, no. 102, 2008, p. 60.
[14] George Lakoff, Mark Johnson, *Metaphors We Live By*, cit.; George Lakoff, Mark Johnson, *Philosophy in the Flesh: The Embodied Mind and its Challenge to Western Thought*, cit.
[15] Mark Johnson, *The Meaning of the Body: Aesthetics of Human Understanding*, cit., p. 166.

Source domain (GRASPING)	**Target domain** (UNDERSTANDING)
Object grasped	Idea/concept understood
Grasping an object	Understanding an idea
Strength of grip	Depth of understanding
Losing one's grip	Failing to understand
Object out of reach	Idea that cannot be understood

More specifically, Johnson argues that when we conceptualise the act of intellectual understanding in terms of the UNDERSTANDING IS GRASPING metaphor, we are activating the GRASPING schema, as discussed by Gallese and Lakoff.[16] For example, when an object is out of reach. Similarly, if you lose your grip on an object, you drop it. These kind of inferences provide us then with the necessary information to reason about what it means to understand an idea. They are carried over in a metaphorical way from the source domain into the target domain. Thus, if you lose your grip on an idea, it follows that you will not understand the idea.[17]

However, an important question that enables us to make the transition from the mental representation of concepts to the filmic representation, regards the question of non-linguistic evidence of conceptual metaphor.[18] Proponents of CMT claim that the systematic processing of image schema mappings for abstract thinking provides evidence that metaphors are primarily conceptual rather than linguistic. Linguistic metaphors are only the expression of underlying conceptual metaphors in a person's conceptual system. This, however, raises the following issue: if our thinking about abstract concepts activates image schematic logic

[16] *Ibidem*.

[17] The crucial question that remains, however, concerns the question of empirical evidence. Can we actually connect these image schemas and conceptual metaphors to the workings of our brains? Do we, as Johnson writes, "use our sensory-motor neural circuitry for abstract reasoning, via metaphorical structures?". See Mark Johnson, *The Meaning of the Body: Aesthetics of Human Understanding*, cit., p. 167. Although the answer to this question is still unclear, there seems to be an interesting line of evidence coming from cognitive neuroscience. Narayanan, for example, has suggested that these metaphorical mappings are not only conceptual, but also neural. In constructing computational neural models of target and source domains he demonstrated that these mappings reflect patterns and neural connections between and among various functional parts of the brain. See Srinivas Narayanan, *Embodiment in Language Understanding: Sensory-Motor Representations for Metaphoric Reasoning about Event Descriptions*, PhD dissertation, Department of Computer Science, University of California, Berkeley 1997. The result, according to Gallese and Lakoff, is a "neural theory of conceptual metaphor" according to which the conceptual mappings that constitute conceptual metaphors are grounded in neural mappings. See Vittorio Gallese, George Lakoff, "The Brain's Concepts: The Role of the Sensory-Motor System in Conceptual Knowledge," cit., p. 469.

[18] See also Charles Forceville, *Non-verbal and Multimodal Metaphor in a Cognitivist Framework: Agendas for Research*, in Charles Forceville, Eduardo Urios-Aparisi (eds.), *Multimodal Metaphor*, Mouton de Gruyter, Berlin 2009, pp. 19-42; Diane Pecher, Inge Boot, Saskia Van Dantzig, *Abstract Concepts: Sensory-Motor Grounding, Metaphors, and Beyond*, in Brian Ross (ed.), *The Psychology of Leaning and Motivation*, Academic Press, Burlington 2011, vol. 54, p. 240.

directly, and language is merely an expression of such activation, not the cause, then it is plausible to assume, as some studies already have demonstrated, that other (non-verbal) modes of expression reflect this activation as well.[19] Abstract meaning in film can indeed be analysed in terms of structures of sensory-motor experience. This will be the subject of the third and final part of our article.

The Role of the Sensory-Motor System in the Filmic Representation of Abstract Meaning

CMT describes the relationship between language and thought in a derivative way. By placing meaning on a higher psychological level (i.e. above the arbitrary linguistic rules of syntactic and semantic categories), it instigates a distinction between a conceptual level, on the one hand, and a formal expression or manifestation level (linguistic or otherwise), on the other hand. In doing so it places itself among other theories of meaning that are primarily psychological rather than linguistic or semiotic. It recalls, for example, Paul Grice's inferential model of communication, John Searle's theory of speech acts, and more recently Wilson and Sperber's relevance theory.[20]

Consequently, when considering the distinction between mental content (i.e. conceptual metaphors, image schemas, etc.) and representational form from the perspective of film, not language, the following question arises: can the filmic mode of expression provide some evidence that conceptual metaphors and image schemas are activated when abstract concepts are processed non-linguistically? In other words, do filmmakers make use (consciously or unconsciously) of embodied structures of meaning-making to convey abstract concepts to the viewer?[21]

[19] See Alan Cienki, Cornelia Müller, *Metaphor, Gesture, and Thought*, in Raymond W. Gibbs Jr. (ed.), *The Cambridge Handbook of Metaphor and Thought*, Cambridge University Press, Cambridge (MA) 2008, pp. 483-501; Maarten Coëgnarts, Peter Kravanja, "Embodied Visual Meaning: Image Schemas in Film," in *Projections: The Journal of Movies and Mind*, no. 6 (2), 2012, pp. 84-101; Maarten Coëgnarts, Peter Kravanja, "Towards an Embodied Poetics of Cinema: The Metaphoric Construction of Abstract Meaning in Film," in *Alphaville: Journal of Film and Screen Media*, no. 4, 2012, pp. 1-18; Maarten Coëgnarts, Peter Kravanja, "From Thought to Modality: A Theoretical Framework for Analysing Structural-Conceptual Metaphors and Image Metaphors in Film," in *Image & Narrative*, no. 13 (1), 2012, pp. 96-113; Charles Forceville, *The Journey Metaphor and the Source-Path-Goal Schema in Agnès Varda's Autobiographical Gleaning Documentaries*, in Monika Fludernik (ed.), *Beyond Cognitive Metaphor Theory: Perspectives on Literary Metaphor*, Routledge, London 2011, pp. 281-297; Charles Forceville, Marloes Jeulink, "The Flesh and Blood of Embodied Understanding: The Source-Path-Goal Schema in Animation Film," in *Pragmatics & Cognition*, no. 19 (1), 2011, pp. 37-59; María J. Ortiz, "Primary Metaphors and Monomodal Visual Metaphors," in *Journal of Pragmatics*, no. 43, 2011, pp. 1568-1580.

[20] Paul Grice, *Studies in the Way of Words*, Harvard University Press, Cambridge (MA) 1987; John Searle, *Mind, Language and Society*, Basic Books, New York 1999; Deirdre Wilson, Dan Sperber, *Meaning and Relevance*, Cambridge University Press, Cambridge (MA) 2012.

[21] One of the pioneers to study this possible link between the bodily origins of our thinking and

In what follows, we will explore this question by means of a concise case study. Using two scenes from *Eyes Wide Shut* (Stanley Kubrick, 1999) and one scene from *2001: A Space Odyssey* (Stanley Kubrick, 1968) as examples, we will demonstrate how sensory-motor structures play a fundamental part in the filmic representation of higher disembodied meaning. We have chosen these two particular films by Stanley Kubrick because they are usually considered as art house films. They combine, to use Torben Grodal's characterisation, "stylistic innovation with a claim to higher meaning."[22] They provide a concrete perceptual level of style while at the same time offering an abstract level of meaning. As such, they strongly mirror the distinction between form and content, which, as we have seen, is intrinsic to CMT. Therefore, it is plausible to assume that the formal skills of Kubrick's films reflect an underlying conceptual and metaphorical design which is inherently embodied.

Eyes Wide Shut *(1999)*

The first scene we want to address from the perspective of embodied cognition concerns the bedroom confession scene from *Eyes Wide Shut*. In this scene Alice (Nicole Kidman) confesses to her husband Dr. Bill Harford to have been so attracted to a naval officer the previous summer in Cape Cod that she was ready to give up everything. The film shows the couple lying on the bed. They are smoking marihuana together. Alice is questioning Bill about a couple of models that he was "hitting on" last night at Ziegler's Christmas Party. When Bill bluntly states that it is understandable for guys to want to have sex with his wife for the only reason that she is beautiful, Alice hastily stands up (see fig. 1). Irritated by his remark, she repositions herself in the opening of the bathroom door, thus leaving her husband behind on the bed. This concrete bodily gesture on the ante-filmic level is accentuated by another additional element on the filmic level. As Alice is standing still in the opening of the door, the camera moves subtlety towards her. As a result, the distance between the camera and Alice is reduced, causing Bill in the foreground to disappear off-screen (see fig. 2). By means of a single movement of the camera the film establishes a perceptual distinction between IN and OUT (of frame), between Alice and Bill. The CONTAINER schema, which manifests itself in multiple sensory-motor experiences from the experience of being in something to the act of placing something within another thing, attaches itself onto the scene, thus allowing

the visual arts has been the famous Gestalt-psychologist of art Rudolf Arnheim. He expressed the non-dualistic view according to which thinking is grounded in patterns of perceptual experience (hence, his concept of "visual thinking"). See Rudolf Arnheim, *Visual Thinking*, University of California Press, Berkeley-Los Angeles 1969; Rudolf Arnheim, "A Plea for Visual Thinking," in *Critical Inquiry*, no. 6 (3), 1980, pp. 489-497.

[22] Torben Grodal, *Embodied Visions: Evolution, Emotion, Culture, and Film*, Oxford University Press, Oxford-New York 2009, p. 208.

the filmmaker and his team to highlight the emotional shift of balance between the two characters.[23] While the couple was at first repeatedly shown together, they are now separated throughout the rest of the scene via montage.

Similarly, when Alice actually recounts her sexual attraction to the naval officer, and the scene reaches its emotional pinnacle, the visual form is adjusted to the content once more. In order to evoke the psychological effect of Alice's monologue on her husband's state of mind, the film shows Bill no longer in a medium shot, but in a close-up. The basic schema underlying this transition is that of CENTER-PERIPHERY.[24] This schema finds its physical roots in the experience of the body as a centre and the perceptual field as the periphery and states that an observed object gains intensity as it approaches the centre. The smaller the distance towards the centre, the greater the potential for interaction and intimacy (and vice versa). From this basic perceptual experience, the film then moves metaphorically to a more abstract reading of the schema. More specifically, the heightening of the psychological tension caused by the content of the monologue is rendered visually by narrowing the edges of the film frame in relationship to the front side of Bill's face (the centre). When her confession is interrupted by a telephone call, the pressure is temporally released, and Bill is shown again through a medium shot.

Fig. 1 – *Eyes Wide Shut* (Stanley Kubrick, 1999).

[23] For a discussion of the CONTAINMENT schema see for example Mark Johnson, *The Body in the Mind: The Bodily Basis of Meaning, Imagination, and Reason*, University of Chicago Press, Chicago 1987, p. 21.
[24] For a discussion of the CENTER-PERIPHERY schema see Mark Johnson, *The Body in the Mind,* cit., pp. 124-125.

Fig. 2 – *Eyes Wide Shut* (Stanley Kubrick, 1999).

The metaphorical extension of the CONTAINMENT schema is even more apparent in the following scene with Marion Nathanson (Marie Richardson). In this scene Bill tries to console Marion for the death of her father. The film shows Bill as he enters the residence of the Nathansons. The camera tracks Bills backside as he walks through the entrance hall towards the door of the apartment. It is a fluid steadicam camera shot, reminiscent of similar shots from *The Shining* (Stanley Kubrick, 1980). Once inside he meets Marion. This encounter is caught in one single static shot. Both are occupying the same visual space (CONTAINER). However, in the subsequent shots they are shown separately. Marion and Bill are sitting each on a chair in front of the dead body of Marion's father. Their faces are turned to each other. On the one hand, the separation is highlighted in one single establishing shot by the ante-filmic presence of a lamp which is placed symmetrically between the two parties. On the other hand, the division (and by extension the CONTAINER schema) is established cinematically via shot-reverse-shot where shots of Bill are alternated with shots of Marion. Each character dominates his/her own private visual space. The film carries on with this visual strategy of division until Bill tilts his head somewhat below, a compassionate token of empathy towards Marion's grief. As a result, his head enters for the first time Marion's frame from the left side, thus interrupting her visual space. The visual separation is brought to an end. It is at this moment, when the barrier between the two (containers) falls apart, that Marion, in an outburst of emotion, declares her love to Bill, and she starts kissing him. The next shot shows both faces together again in profile (see fig. 3). The eyeline match has disappeared. But then again, as in the confession scene, the emotional climax is disturbed, this time by a doorbell. Carl, Marion's

friend, is arriving at the apartment. His entrance is filmed in the same visually striking way as Bill's. The space that was taken in by Bill some moments earlier, is now occupied by Carl. This presumption of a distortion of Bill's dominance over the visual space comes to a conclusion in the upcoming shot. As Carl enters the room, the *mise en scène* changes again. The film shows both parties separated by the central background figure of the dead body of Marion's father (see fig. 4). Carl and Marion are occupying the left side of the body, whereas Bill is occupying the right side. Thus, the order is restored again. Bill and Marion are brought back to their initial places. The scene ends up with Bill leaving the room.[25]

Figs. 3-4 – *Eyes Wide Shut* (Stanley Kubrick, 1999).

[25] For a similar application of the CONTAINMENT schema in Stanley Kubrick's *Spartacus* (1960) see Maarten Coëgnarts, Peter Kravanja, "Embodied Visual Meaning: Image Schemas in Film," cit., pp. 89-90.

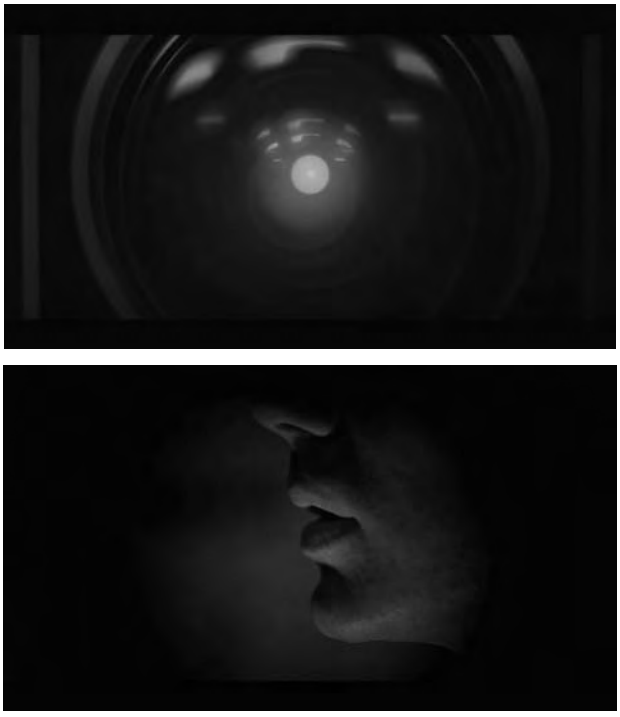
2001: A Space Odyssey *(1968)*

The third and last scene we would like to discuss in terms of embodiment regards the crucial scene from *2001: A Space Odyssey* in which HAL 9000, the computer of the space ship Discovery, becomes aware of Dave and Frank's plans to disconnect "him." In this scene the film offers an embodied solution to the following abstract problem of filmic representation: how can the filmmaker and his team communicate without resorting to dialogue the idea of HAL 9000 *knowing about* the astronauts' plans to shut him down?[26]

In order to convey this crucial piece of narrative information, which coincides with HAL's point of view, namely his cognitive state of mind, the film makes use of the conceptual metaphor KNOWING IS SEEING, together with the UNDERSTANDING IS GRASPING metaphor, one of the dominant metaphorical conceptions for understanding.[27] Let us consider the scene in detail. The scene consists of five shots. The first shot involves a static long take lasting almost two minutes. It shows the two astronauts on the foreground, seated and facing each other inside the pod. They are symmetrically divided by HAL's eye, which is visible in the centre background of the shot, outside the sound-proof container where Dave and Frank, respectively on the right and left side of the computer, are having a conversation. They are talking about a navigational failure that HAL may have made, and the possibility of disconnecting him. As the conversation continues, apparently outside HAL's notice, the film cuts to a closer shot of the computer's eye (shot two), followed by a return to the initial framing of the first shot (shot three). By shifting from the CENTER (the astronauts) to the PERIPHERY (HAL), the computer's presence is reminded.[28] HAL now takes over the CENTER (i.e. the entity that is the closest to the viewer's point of view) from the astronauts who are now abandoned to the PERIPHERY (i.e. the off-screen space). In this way the film prepares the viewer for the upcoming shift of balance between the two men and HAL. In the next shot the schema is intensified. The film cuts to an extreme close-up of HAL's eye (shot four) (see fig. 5). But contrary to the previous cut, the shift is now also accompanied by the additional and monotonous sound of airwaves. As such, the film indicates that the camera is no longer physically present inside the silent space of the pod, but outside closer to HAL. Then, the camera cuts to the final shot: a silent extreme close-up of Frank's moving lips, screen right, from the perspective of HAL

[26] This formulation in terms of (abstract) problems and (embodied) solutions recalls other problem-solving approaches to cinema, notably Jacques Aumont, *À quoi pensent les films?*, Nouvelles Editions Séguier, Paris 1996 and David Bordwell, *Poetics of Cinema*, Routledge, New York 2008.
[27] See George Lakoff, Mark Johnson, *Philosophy in the Flesh: The Embodied Mind and its Challenge to Western Thought*, cit., pp. 393-394; Mark Johnson, *The Meaning of the Body: Aesthetics of Human Understanding*, cit., p. 166; Ning Yu, "Chinese Metaphors of Thinking," in *Cognitive Linguistics*, no. 14 (2/3), 2003, p. 149.
[28] See also Mario Falsetto, *Stanley Kubrick: A Narrative and Stylistic Analysis*, Praeger Publishers, Westport 2001, p. 109.

(shot five) (see fig. 6). For the first time, the camera brings movement to the scene by panning left to Dave's lips, back right to Frank, and finally left again to Dave. Thus, the film shifts to the computer's point of view. By making the viewer share HAL's perception, the audience is made aware of the astronauts' plans to shutting him down. In other words, HAL's perceptual state of mind (his point-of-view) is used as a means (i.e. source domain) to reach HAL's cognitive state of mind, namely, his knowledge concerning the astronauts' motives (i.e. target domain).



Figs. 5-6 – 2001: *A Space Odyssey* (Stanley Kubrick, 1966).

Notice that HAL's perception, although used as a concrete source domain, is rendered in a metaphorical way as well. After all, HAL's perception belongs to the realm of subjectivity. As such, it cannot be represented directly.[29] In order to overcome this problem, the film makes use of what Grodal labels the representation of subjectivity by means of "deviant or distorted enactional or perceptual access to a represented space," that is "the ways in which special

[29] Language forms an exception in that the subjective activity of "seeing" can be rendered symbolically by means of words, as in the following sentences: "I see what you're saying" or "I don't see the point." Spoken or written signs are, by virtue of their arbitrary nature, the only mode being capable of expressing the abstract and generic quality of target domains. See also Maarten Coëgnarts, Peter Kravanja, "From Thought to Modality: A Theoretical Framework for Analysing Structural-Conceptual Metaphors and Image Metaphors in Film," cit., p. 102.

or deviant relationships between the viewer-protagonist and a given space can create feelings of subjectivity."[30] When regarding *2001: A Space Odyssey*, this deviation is elicited by limiting the view of the audience to that of HAL. More specifically, the viewer's subjective feeling (i.e. the feeling of viewing through HAL's eyes) results from restriction. The blocking of information, caused by HAL's subjective point of view, makes the viewer feel that he or she has no control over the diegetic world. This restriction is highlighted in two ways. Firstly, there is the use of an extreme close-up, combined with the use of a (non-moving) circular mask to emphasize the movement of the astronauts lips. These formal choices provoke a sense of subjectivity in that the blocking and selective quality of these strategies reflect the distinction-making nature of observation itself.[31] Secondly, there is the panning movement of the camera from right to left and back again, which additionally enhances the viewer's feeling of not having access to an objectively given space.[32] By applying these filmic devices HAL's perception is represented to the viewer, and by metaphorical extension his cognitive state of mind as well.

Conclusion

In this article we have presented an embodied approach to the representation of abstract concepts in two films by Stanley Kubrick. Following recent theories of embodied cognition, notably conceptual metaphor theory, we have shown that both films make use of the same sensory-motor dimensions and metaphorical elements that operate at the heart of what is commonly considered to be the prototypical and exclusive bearer of meaning, namely language. More specifically, our analysis indicates that the sensory-motor system that structures the expression of conceptual content in language also plays a crucial role in the expression of abstract meaning in film. As such, our analysis supports the claim of Johnson according to which "the processes of embodied meaning in the arts are the very same ones that make linguistic meaning possible."[33] Furthermore, by providing a non-verbal account of conceptual metaphor in film, our analysis helps to validate CMT's dictum that metaphor is primarily a matter of thought, and only derivatively a matter of form. Equally, CMT has some important merit for film studies as well. As a theory concerned with the bodily underpinnings of meaning-making, CMT can provide important insights into the question as to how meaning is constructed in film, that is, how, to cite Pudovkin, filmmakers and

[30] Torben Grodal, *Embodied Visions: Evolution, Emotion, Culture, and Film*, cit., p. 239.
[31] See for example George Spencer-Brown, *Laws of Form*, Allen & Unwin, London 1969.
[32] Another strategy to enhance subjectivity by blocking information through movement would be the zoom-in. For an application of this technique in relation to Kubrick's *Barry Lyndon* (1975), see Maarten Coëgnarts, Peter Kravanja, "Towards an Embodied Poetics of Cinema: The Metaphoric Construction of Abstract Meaning in Film," cit., pp. 8-11.
[33] Mark Johnson, *The Meaning of the Body: Aesthetics of Human Understanding*, cit., p. 209.

their entourage can express their concepts "in clear and vivid visual images."[34] Because CMT aims to consider the connections between conceptual content and formal issues, it is well-suited to enlighten the relationship between a film's thematic content and its style of presentation of which Kubrick himself once said, that if you can combine both, "you have the best of all possible films."[35]

[34] Vsevolod I. Pudovkin, *Film Technique And Film Acting - The Cinema Writings Of V.I. Pudovkin*, Sims Press, Peterborough 2008, p. 31.
[35] Stanley Kubrick as quoted in Thomas Allen Nelson, *Kubrick: Inside a Film Artist's Maze*, Indiana University Press, Bloomington 2000, p. 7.