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Perceiving Causality in Character Perception: A Metaphorical Study of Causation in Film

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ABSTRACT

This article aims to show how the metaphorical and metonymical portrayal of character perception in film can give rise to two distinct but interrelated percepts of causality in the viewer, namely (1) the percept that the viewer *sees* that an object perceived by a character *causes* the character's perception of that object and (2) the percept that the viewer *sees* that character perception in turn *causes* a change of state in the perceiving character's mind (e.g., knowing, remembering). We start our discussion with a brief epistemological overview. Thereby two questions are central: (1) How do people *conceptualize* perception and causality? and (2) When do people *perceive* causality in perception? Answers will be given, respectively, by considering insights from cognitive linguistics and experimental psychology. In the next section, then, we bring the theoretical discussion to the foreground of Film Studies by showing how the conceptual solutions, as suggested in the prior part, can manifest themselves in cinematic terms. It is through the forced movements of film making (e.g., framing, editing and camera movement), that, we will argue, the viewer is encouraged to see a causal relationship between (1) the object perceived and the character's visual experience and (2) the character's visual experience and the change of mental state in the perceiving character.

Introduction

In recent years cognitive literary scholars and cognitive film scholars have been increasingly adopting the theoretical framework of Theory of Mind (ToM) to investigate how, for instance, stylistic devices in films or novels help viewers or readers ascribe mental states (e.g., thoughts, feelings, beliefs, desires) to characters in fictional narratives (e.g., Bernaerts, De Geest, Herman & Vervaeck 2013; Herman, 2011; Palmer, 2004; Zunshine, 2006). A large amount of concepts have been introduced to label this (human) cognitive capacity of reading fictional minds. To name but a few of them: central imagining (Choi, 2005; Smith, 1995), imagining from the inside (Smith, 1997), secondary imagining (Currie, 1995), and consciousness-enactment (Caracciolo, 2012). While all these accounts point to external and observable signs that enable viewers and readers to infer characters' mental states (e.g., the point-of-view shot in film, henceforth POV shot), attention has rarely been directed toward the *metaphorical/metonymical* and *causal* underpinnings of these signs. Attributing significance to both notions, however, is important for at least two reasons. Firstly, if (1) humans are capable of investing fictional characters with mental states of their own and (2) mental states are not spatially constrained (i.e., they are abstract), then (3) it is plausible to assume that these mental states are somehow made perceptual accessible, for it is only when they are bodily motivated, for example by conceptual

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mappings occurring within the same experiential source domain (metonymy) or across different experiential source domains (metaphor), that observers are able to infer them in the first place.¹ Secondly, if we indeed assume (1) that mental states are spatialized for the reason mentioned above, and (2) spatial interaction is conditional for perceiving causality, then (3) it is also plausible to assume that the spatial grounding of these states can give rise to percepts with high-level properties such as causality.

The present article sets out to explore this dual hypothesis of embodied cognition with respect to the characters' mental function of seeing. More specifically, we will show (1) how this mental function is metaphorically and metonymically embodied in film and (2) how this embodiment can give rise to two distinct but interrelated percepts of causality in the viewer, namely (1) the percept that the viewer *sees* that an object perceived by a character *causes* the character's perception of that object² and (2) the percept that the viewer *sees* that character perception in turn *causes* a change of state in the perceiving character's mind (e.g., knowing, remembering).

The central propositions underlying this argument are complex and rely on insights from both cognitive linguistics and experimental psychology. For sake of clarity, we therefore propose to organize the first two sections of our article around two questions that are vital to our argument, namely: (1) How are the abstract concepts of perception and causation conceptualized metaphorically and/or metonymically? and (2) Which conditions have to be fulfilled in order to perceive causality in relation to perception (i.e., to see perception as both effect and cause)? The first question adheres to the conceptualisation thesis of embodied cognition, in particular Conceptual Metaphor Theory (CMT), as advocated by George Lakoff and Mark Johnson (1980, 1999). The second question touches on the field of experimental psychology, in particular Albert Michotte's (1946) pioneering work on perceptual causality.

In the third section, then, we bring our conceptual framework to the foreground of Film Studies by showing how the metaphors and metonymies of perception, as discussed in the prior part, can manifest themselves in the cinematic mode of expression.³ Through a discussion of several concise film examples, we will show how the forced movements of film making (e.g., framing, editing, or camera movement) prompt the viewer to infer a causal relationship between (1) the object perceived and the character's visual experience and (2) the character's visual experience and the change of state in the perceiving character.

We conclude our article with a summary and a brief discussion of related issues and limitations.

Conceptualizing perception and causation

Metaphors and metonymies of perception

How do people talk about perception? In answering this question cognitive linguistics have emphasized at least five embodied conceptual structures: the conceptual metonymy (1) "*BODY PART FOR ITS TYPICAL (MENTAL) FUNCTION*" (Barcelona, 2002, p. 265–266), the conceptual metaphors (2a) "*PERCEPTION IS RECEPTION*" and (2b) "*PERCEPTION IS TOUCHING*" (both subsumed under the general metaphor (2) "*PERCEPTION IS CONTACT BETWEEN PERCEIVER AND OBJECT PERCEIVED*") (Lakoff, 1995; Yamanashi, 2010; Yu, 2004), the conceptual metaphor (3) "*VISUAL FIELD IS A CONTAINER*" (Lakoff & Johnson, 1980; Yamanashi, 2010); and the conceptual metaphors (4) "*KNOWING IS SEEING*" (e.g., Gibbs, 2005, p. 97; Johnson, 2007,

¹Few studies to date have attempted to explore the role of metaphor in the audio-visual portrayal of characters' mental states. In addition to our own writings on this subject, we refer the reader to Chattah (2015), Fahlenbrach (2008, 2014, 2016) and Ortiz (2011, 2014, 2015).

²The claim that an external object O is causally responsible for a subject S's perceptual experience of O adheres to the Causal Theory of Perception as advocated by such analytic philosophers as Herbert Paul Grice ([1961] 1989), Peter Frederick Strawson (1974), and more recently John Searle (2015).

³This question can be situated within a larger framework of studies that apply insights from CMT to the field of visual and multimodal discourse analysis. For a good state-of-the-art overview, see the contributions in Coëgnarts and Kravanja (2015a), Fahlenbrach (2016) and Forceville and Urios-Aparisi (2009).

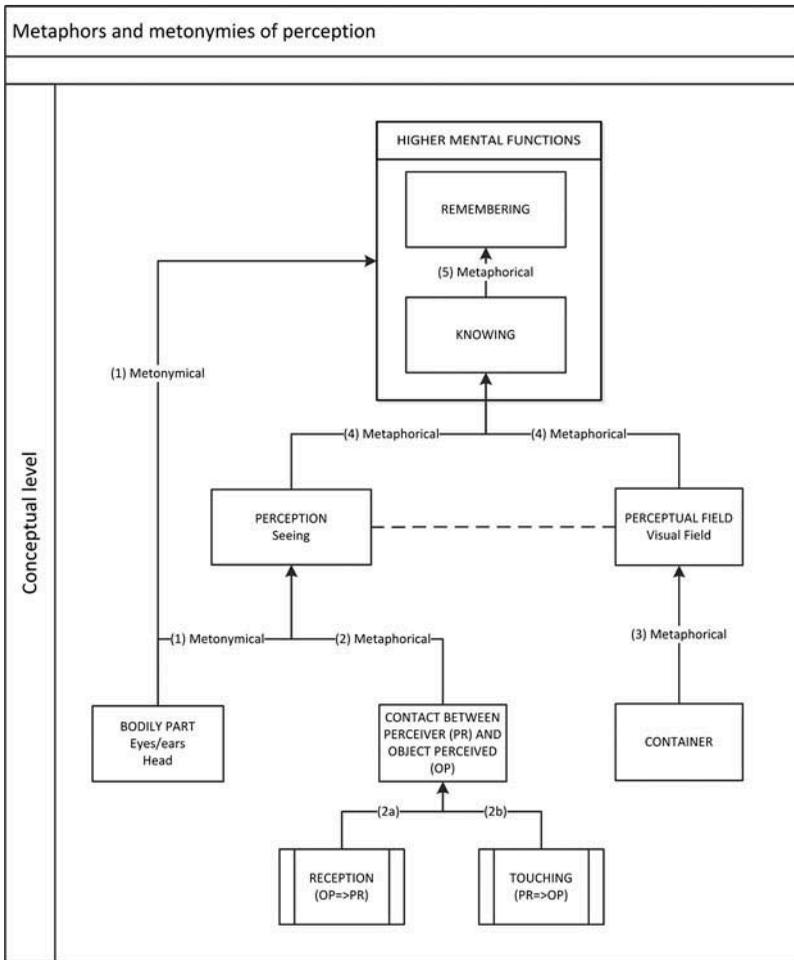


Figure 1. Metaphors and metonymies of perception.

p. 165; Lakoff & Johnson, 1999, pp. 393–399) and (5) “REMEMBERING IS SEEING” (as specific case of the more general metaphor “TIME IS SPACE” [e.g., Boroditsky, 2000; Evans, 2003; Gentner, 2001; Gentner, Imai, & Boroditsky, 2002; Lakoff & Johnson, 1980, 1999; Núñez & Sweetser, 2006]). Schematically these mappings can be summarized as in Figure 1.

- (1) In the first conceptual mechanism the mental function (perceiving, knowing, remembering) is understood *metonymically* in terms of conceptual mappings that occur within the *same* experiential domain: one entity in a schema (i.e., the body part, the instrument) is taken as standing for the schema as a whole (i.e., the mental function, the activity). In his work on the meaning of human facial expressions, Scherer (1992), for example, has demonstrated that the facial musculature is able to express not only emotions, but also cognitive processes such as perceiving and thinking. He suggests that, “while we cannot look inside the head, we can look at it, particularly at the face,” that is, “we can use facial expressions to infer some ongoing cognitive processes” (p. 141). This metonymy further designates such specific entailments as “EYE FOR WATCHING” (Hilpert, 2006), “PERCEPTUAL ORGAN FOR PERCEPTION” (Yu, 2004), or “HEAD FOR MENTAL ABILITIES” (Piriz, 2008).

- (2) By contrast, in the second conceptual mechanism perception is understood *metaphorically* in terms of the *different* experiential domain of contact. It considers a distinction made by Lakoff (1995, p. 139) between two special cases: (2a) “*PERCEPTION IS RECEPTION*” and (2b) “*PERCEIVING IS TOUCHING*” (see also Yu, 2004, p. 676). In the first conceptual metaphor perception occurs “when the thing perceived moves to the perceiver’s organs of perception” (Lakoff, 1995, p. 139). Examples include such expressions as “*A comet came into my sight*” or “*The noise came through the walls*” (Lakoff, 1995, p. 139). In both sentences, perception is construed in terms of perceptual sense impressions which reach the perceptual organs. By contrast, in the second conceptual metaphor perception occurs “when the perceiver moves his organs of perception to the thing perceived and touches it” (Lakoff, 1995, p. 139). Examples include such expressions as “*My eyes picked out every detail of the pattern*” or “*My gaze is out over the bay*” (Lakoff, 1995, p. 133). As Lakoff points out, the words “gaze” and “eyes” are conceived metaphorically as visual limbs that can reach out and touch things.
- (3) The third conceptual mechanism relates to the perceptual mode of vision and states that we conceptualize human visual fields *metaphorically* in terms of containers, that is, when we look at some object or entity, we conceptualize what we see as being something inside it. As Lakoff and Johnson (1980, p. 30) argue, this metaphorical concept emerges naturally in that when we look at some territory, our field of vision automatically defines a bounded physical space (i.e., the part that we can see). Examples include such English expressions as “*The ship is coming into view*,” “*That’s in the centre of my field of vision*” or “*There’s nothing in sight*” (Lakoff & Johnson, 1980, p. 30).
- (4–5) The fourth and fifth conceptual mechanisms are motivated by the observational claim of cognitive linguistics according to which perception further supports the existence of two widespread metaphorical systems in everyday language, namely the “*KNOWING/UNDERSTANDING IS SEEING*” metaphor and the “*REMEMBERING IS SEEING*” metaphor. Both cases adhere to the more general metaphor “*MENTAL FUNCTION IS PERCEPTION*” (Yu, 2004, p. 672) or “*MIND IS A BODY*” (Lakoff & Johnson, 1999, p. 235; Sweetser, 1990) and retain the concept of seeing as a source domain for the purpose of expressing other abstract target domains, in particular human mental functions (i.e., knowing, thinking, remembering). In the first metaphor the object seen is mapped onto the thought or idea and gives rise to such linguistic expressions as “*I see what you mean*,” or “*Could you shed some light on chaos theory for me?*” Similarly, in the second metaphor time is structured in terms of spatial knowledge including our knowledge about perception. For instance, many scholars have pointed out that humans, when talking about the past or future, tend to map the space in front of the observer onto the time event (past or future). Núñez and Sweetser (2006) have labeled this metaphorical model, in which the location of the observer specifies the now, the system of Ego-Reference-Point (Ego-RP) metaphors. Linguistic examples include such expressions as “*Christmas is approaching*” or “*We are approaching the end of the year*.” Moreover, as Figure 1 shows and Núñez and Sweetser (2006, p. 438) have pointed out, it is important to note that vision, knowing, and remembering are correlated. Given that people generally share the understanding that (1) we can only know what we have seen and (2) the past is known and the future is unknown, it follows (3) that the known (the object seen) can be correlated with the past as well.

Metaphors of causation: The “EVENT-STRUCTURE” metaphor

Let us now raise the same question with respect to the concept of causation. In their book *Philosophy in the Flesh*, George Lakoff and Mark Johnson (1999) developed the argument that there are at least two important metaphorical systems by way of which certain types of causation can be

Table 1. The “*LOCATION EVENT-STRUCTURE*” metaphor (after Lakoff & Johnson, 1999, p. 179).

Source domain [Motion in Space]	Target domain [Events]
Locations in Space	States
Movements from one location to another	Changes of states
Physical forces	Causes
Forced movement	Causation
Self-propelled movements	Actions
Destinations	Purposes
Paths to destinations	Means to ends
Impediments to motion	Difficulties

Table 2. The “*CAUSATION IS FORCED MOVEMENT*” metaphor (after Lakoff & Johnson, 1999, p. 185).

Source domain [Forced movement]	Target domain [Causation]
The application of the force precedes or accompanies the movement.	The occurrence of the cause precedes or accompanies the change of state.
The movement would not have occurred without the application of a force.	The change of state would not have occurred without a cause.
The force impinges on the entity that moves.	The cause impinges on the entity that changes state.

conceptualised, namely the “*LOCATION EVENT-STRUCTURE*” metaphor and the “*OBJECT EVENT-STRUCTURE*” metaphor (p. 196) (see also Johnson, 2007, 2008). For the purpose of our argument, we limit ourselves to a discussion of the first structure. The “*LOCATION EVENT-STRUCTURE*” metaphor involves the metaphorical conception of events in terms of motion in space and can be structured according to a vast complex system of several submappings, one of them being the metaphorical concept of causation, namely that of “*CAUSATION AS A PHYSICAL FORCE*” (see Table 1).

Each of these submappings underlies a large number of linguistic expressions whose metaphorical constitution goes largely unnoticed in our ordinary day-to-day conversations. For example, the conceptual metaphor “*CHANGE OF STATE IS MOVEMENT*” supports expressions such as “*The water went from hot to cold,*” or “*The system is moving toward homeostasis*” (Johnson, 2008, p. 41). The submapping “*CAUSATION IS FORCED MOVEMENT*” becomes manifest in such sentences as “*The fire brought the soup to a boil,*” or “*The candidate’s speech threw the crowd into a frenzy*” (Johnson, 2008, p. 41). In all these linguistic examples, then, causation is not conceptualized literally—it does not represent an objective feature of the world—but metaphorically by way of extending knowledge from various everyday bodily experiences such as *bringing, throwing, driving, pulling, pushing, propelling, and moving*. Thereby inferential evidence is provided by systematic correlations between the concrete source domain of forced movement and the abstract target domain of causation, some of which have been summarized by Lakoff and Johnson (1999, p. 185) as in Table 2.

The degree of overlap between perception and events

Where does perception fit into the “*EVENT-STRUCTURE*” metaphor? Given that (1) causes are physical forces and (2a) outer events can be seen as causes of perceptual states and (2b) perception of outer events can be seen as causes of higher-order mental states (remembering, thinking), one can characterize the degree of their overlap as follows. First, the outer event can be seen as the physical force that causes a change from a state of non-seeing to a state of seeing. Second, the change from a state of non-seeing to a state of seeing, in turn, can be seen as the physical force that causes a change from a state of non-high-order mental activity (not knowing, not remembering) to a state of high-order mental activity (knowing, remembering). Adopting Kövecses’ (2000, p. 55) way of putting causal relations in a schematic way, we can now rephrase both ideas as follows (where the double-line arrow indicates “causes, leads to”):

- (1) (Entity/Event) = > Change [Entity, State of Not Seeing; Entity, State of Seeing].
- (2) Perception (Entity/Event) = > Change [Entity, State of Non-High-Order Mental Activity; Entity, State of High-Order Mental Activity].

In addition, perception has a considerable degree of overlap with regard to the two other mappings of the “state” part of the “EVENT-STRUCTURE” metaphor. First, the “VISUAL FIELDS ARE CONTAINERS” metaphor corresponds to the “(MENTAL) STATES ARE LOCATIONS IN SPACE” metaphor. Second, the “PERCEPTION IS RECEPTION” metaphor and the “PERCEPTION IS TOUCHING” metaphor both correspond to the “CHANGE OF (MENTAL) STATE IS CHANGE OF LOCATION” or “CHANGE IS MOTION” metaphor (see, e.g., Radden, 1996, p. 425). Moreover, since perception can be metaphorically extended toward the conceptual domains of knowing and remembering, this further entails that both overlaps can be mapped onto these domains as well. First, the “VISUAL FIELD IS LOCATION IN SPACE” metaphor can be mapped onto the known, on the one hand, and the past, on the other hand. Second, the “PERCEIVING IS CHANGE OF LOCATION” metaphor can be mapped onto the change from a mental state of not knowing to knowing, on the one hand, and the change from a mental state of not remembering to remembering, on the other hand.

Perceiving causality in perception

Perceptual causality

If CMT deals with the question of *conceptualizing* causation, then perceptual causality deals with the question of *perceiving* causation as such: when do people conceptually link two events as being respectively a cause and its effect? One attempt to answer this question has been provided by the pioneering experiments of the Belgian psychologist Albert Michotte (1946). In his landmark work on the perception of causality Michotte tried to show how certain simple visual displays consisting of moving 2-D geometric shapes can give rise to percepts with high-level properties such as causality. One of these demonstrations is known as the “launching effect,” which can be visualized as in Figure 2. Imagine a naïve observer viewing a simple film of two small triangles that are drawn on a line, separated by several inches. (I) The first triangle A moves in a straight line until (II) it approaches the second triangle B, whereupon (III) A stays in its place and B starts moving away in the same direction. Objectively speaking, the film has nothing to do with causation. All that is happening are the events described above. Perceptually, however, something remarkable occurs: the naïve observer tends to perceive a succession of events in terms of a cause–effect relationship, that is, the naïve observer sees triangle A *cause* the motion of triangle B (see also Radden, 1985, p. 186; Scholl & Tremoulet, 2000, p. 299).

From this simple experiment, then, it is possible to infer, following Radden (1985, p. 187), three sufficient conditions of perceptual causality, that is,

- (P1). Two events are perceived as being respectively a cause and its effect if:
- (a) one of the events temporally precedes the other event,
 - (b) the two events interact and,

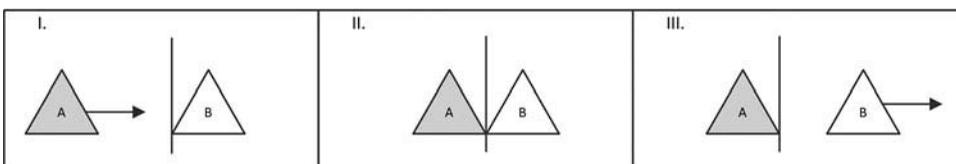


Figure 2. The launching effect.

- (c) there is a noticeable change in the second event, immediately following its interaction with the first one⁴

Perceptual causality and perception: The pairing problem

Given the two causal relations of perception, as mentioned in the previous section, we can now turn toward their intersection:

- (P2). An observer X will likely perceive an outer event O and a person S's perceptual experience of O as being respectively a cause and its effect if,
- (a) the appearance of O temporally precedes S's perceptual experience of O,
 - (b) the appearance of O and S's perception of O interact and,
 - (c) there is a noticeable change in S, immediately following its interaction with O (i.e., S's perceptual change from a state of not seeing O to a state of seeing O).
- (P3). An observer X will likely perceive S's perceptual experience of O and S's higher-order mental change as being respectively a cause and its effect if,
- (a) S's perception of O temporally precedes S's higher-order mental change,
 - (b) S's perception of O and S's higher-order mental state interact, and,
 - (c) there is a noticeable change in S, immediately following its interaction with S's perception of O (i.e., S's mental change from a state of non-high-order mental activity [not knowing, not remembering] to a state of high-order mental activity [knowing, remembering]).

Relating both causal relations of perception to the spatial conditions of perceptual causality, however, confronts us with a further metaphysical problem, namely that S's perception of O and S's higher-order mental state are two *non-spatial* entities. They both describe two inner mental events of a person S. Hence, in virtue of what, then, can (1) S's perception of O interact with the outer event O, and (2) S's perception of O interact with S's higher-order mental state? Indeed, if both entities were spatially constrained (like the two triangles A and B in the launching effect), causal interaction could be easily achieved by the relative spatial locations of the substances. But if both entities are non-spatial, relative spatial locations are unavailable to attain interaction. Consequently, in order to overcome this problem (which in the philosophy of mind is known as the "pairing problem" [Kim, 1973, 2005, 2006]), both entities have to be spatialized⁵. It is here that we claim that the conceptual mechanisms of metaphor and metonymy can be relied on to fulfill this task. As outlined in the previous part of our article both entities can be grounded spatially by conceptually linking them to concrete source domains. Once the spatial locations of S's perception of O and S's higher-order mental state are metaphorically and/or metonymically satisfied, the observer will be able to pair them perceptually. Having already formulated solutions at the *conceptual* level, the question left to be answered, then, is how these conceptual solutions manifest themselves at the *cinematic formal* level?

⁴Perceiving causality, however, does not always guarantee causality *an sich*. Consider, for example, the following succession of events: (1) a person is waiting for a bus, (2) the person sees the bus moving toward him, (3) the person waves with his arm, (4) the bus stops. Can we speak of causality with respect to the relation between (3) and (4)? Did the bus stop due to the person's waving hand, or did the bus stop because the bus driver was planning to stop anyhow notwithstanding the person's waving hand? This is undecidable.

⁵Kim (2006, pp. 44–45) illustrates the "pairing problem" as follows: "A gun, call it A, is fired, and this causes the death of a person, X. Another gun, B, is fired at the same time, and this results in the death of another person, Y. What makes it the case that the firing of A caused X's death and the firing of B caused Y's death, and not the other way around? That is, why did A's firing not cause Y's death and B's firing not cause X's death? What principle governs the 'pairing' of the right cause with the right effect? There must be a relation R that grounds and explains the cause-effect pairings, a relation that holds between A's firing and X's death and also between B's firing and Y's death, but not between A's firing and Y's death or between B's firing and X's death. What is this R, the 'pairing relation,' as we might call it?"

Filmed events of character perception as facilitators of perceptual causality

From concept to form: Embodying character perception in film

To answer this question we would like to draw on our earlier work on cinematic subjectivity (Coëgnarts & Kravanja, 2014, 2015b, 2015c). In these publications we argued that a character's S mental function of seeing an outer event O can be elicited cinematically by relating the conceptual structures, as outlined in Figure 1 of this article, to the visual content of the filmic frame.

(1) The conceptual metonymy "*BODY PART FOR ITS TYPICAL MENTAL FUNCTION*" can manifest itself on-screen in a relatively uncomplicated manner by showing enough distinctive bodily features of the character so as to enable the viewer to recognize or infer the body part (i.e., head, eyes, ears) that is crucial for the mental function (i.e., thinking, remembering, perceiving). Consequently, achieving this goal primarily requires a mode of representation that serves the purpose of what Noël Carroll (2007) labels the "visible intelligibility of physical processes": the idea that a theme or concept is successfully initiated to the audience insofar the viewer is capable of grasping it visually. One parameter in particular presents itself as the ideal means by which the body part can be elicited or inferred in film, namely shot size: the distance between the camera and the character's bodily features in front of the camera. However, showing the character's locus of the mental function in a clear manner is not sufficient to evoke the idea in the viewer that a character S is carrying out a certain mental function (i.e., seeing, thinking or remembering something O). Indeed, the character's body in front of the camera has to be *intentionally* directed at O, namely the object of the mental function. In case of "seeing," this object is located outside the character, that is, either inside or outside the frame that contains the perceiving character. This evocation of a directedness toward X can be gestured in front of the camera by the bodily behavior of the character (e.g., the direction of eyes, head). By contrast, in the case of "remembering" or "thinking," the object of mental activity is located inside the character's mind itself. Unless the inside object is externalised, there is no object located outside the character. Here, the relation between S and O describes a loop (it points to S itself) rather than a straight line. This is often gesticulated on-screen by showing characters having an "empty" stare to nowhere.

(2) To address the manifestation of the conceptual metaphor "*PERCEPTION IS CONTACT BETWEEN PERCEIVER AND OBJECT PERCEIVED*" in film, we have distinguished between four major strategies. Depending on the choice of cinematic technique, a filmmaker can *force* an interaction between S and O either on the level of the individual shot or on the level of two shots. On the level of the single shot, S and O can be spatially related to each other homospatially by way of framing or composition and non-homospatially by way of moving the camera from S toward O (or vice versa)⁶ Similarly, on the level of two shots, character perception can be imposed on the viewer homospatially via split screen or superimposition (i.e., each entity occupies a different space in a different shot, albeit in the same larger frame) or non-homospatially via editing, the latter including the POV structure (Coëgnarts & Kravanja, 2015b, p. 231).⁷ In each case, a skeletal, pre-linguistic pattern of human sensory-motor experience—what Lakoff (1987) and Johnson (1987) have defined an "image schema"—can be extended metaphorically to express the perceptual relationship between S and O. For instance, camera movement expresses the underlying SOURCE-PATH-GOAL image schema in that the camera moves from a starting point (i.e., the character position) via a pathway toward an ending point (i.e., the object position). Other schemas that are physically instantiated in the filmic frame to capture the contact between S and O visually are LEFT-RIGHT and DOWN-UNDER in the case of split-screen (horizontal division vs. vertical division, respectively) or framing and FRONT-BACK in the case of superimposition or framing.

⁶We use the term "homospatial" here to denote whether or not both entities are simultaneously visible on-screen.

⁷For a discussion of filmic examples within each category we refer to Coëgnarts and Kravanja (2015b).

(3) The conceptual metaphor VISUAL FIELD IS A CONTAINER can be elicited cinematically by the perception shot or the POV shot. Embedded in the level of two shots (cf. editing), it involves a relation between an objective shot of a character (the subject) looking at something, and the actual subjective POV shot showing what the character is looking at (represented through the camera). Similarly, the POV shot is spatially grounded in that the inside of the CONTAINMENT schema, physically instigated in the filmic frame, is mapped onto the visual content of the character's visual experience (i.e., the character's visual field), and the outside is mapped onto the part in space that the character cannot see (e.g., the space that coincides with the character's own eyes). The various properties of the POV shot, then, become, as Branigan (1984, p. 81) already pointed out, analogous to the inferential logic of the character's perceptual state (e.g., change in light as analogous to the character's blurred vision, zoom-in as analogous to the character's sudden discovery of an object, etc.)

(4–5) Once character perception is spatially grounded in film through one or more of the cinematic strategies described above, one can easily map the location of the object seen by the character (i.e., the space in front of the character's eyes) onto the known and by further extension onto the present time. However, in order to correlate the character's visual field (i.e., the known) to the *past*, further information is needed. Indeed, the viewer cannot *know*, for example, that the location of the object seen by the character belongs to the past, if the viewer has not seen or heard the object seen during events that took place earlier in the film (and that are stored in working memory). Hence, in order for the viewer to map the content of the object seen by the character onto the past, one has to include *prior knowledge* about the perceptual event. That is, because the viewer has perceived the content of the object perceived before (equally through a prior filmed event or, differently, through textually channelled information), the viewer is able to *infer* that the object perceived belongs to the past. Or, to put it in a metaphorical way, the viewer is able to *map* the spatial location of the object perceived by the character (i.e., the known) onto the abstract concept of the past.

Having discussed some of the cinematic strategies of embodying character perception in film, we are now able to answer the following twofold question:

- (1) When does the viewer perceive an outer event O as cause of the character S's visual experience of O?
- (2) When does the viewer perceive the character S's visual experience of O as cause of the character S's higher-order mental change?

Perceiving an outer event as cause of character perception

The first question can be answered by recalling proposition (P2) and by combining it with the film theoretical argument as elucidated in paragraphs (1–3) of the previous section, that is:

- (P4). The viewer will likely perceive the object perceived by the character (O) and the character S's visual experience of O as being respectively a cause and its effect if (1) the conditions of (P2) are satisfied and (2) in order to satisfy these conditions S's visual experience of O is spatialized either metonymically and/or metaphorically through the forced movements of film making (e.g., framing, editing, camera movement, etc.).

To illustrate this proposition we now briefly consider two examples of character perception in film: one in which the interaction between S and O is elicited by means of framing, and one in which their interaction is elicited through a combination of editing and camera movement (i.e., zoom-in).

L'Année Dernière à Marienbad (1961)

For our first example we would like to consider a brief scene from Alain Resnais' *L'Année Dernière à Marienbad* in which the man (Giorgio Albertazzi) "makes eye contact" with the woman (Delphine Seyrig). The scene is remarkable for the way in which this contact is elicited cinematically to the

<p style="text-align: center;">Filmed event <i>(L'Année Dernière à Marienbad, Alain Resnais, 1961)</i></p>			
		(a)	
		Frame-within-frame configuration	
Image schemas	FRONT-BACK	Front	Back
	LEFT-RIGHT	Left	Right
Abstract concepts	PERCEPTION	Character who sees	Object seen

Figure 3. The “FRONT-BACK” and “LEFT-RIGHT” image schemas as elicited by framing (homospaciality, single shot).

viewer. The film shows a static medium shot of the man’s face in profile, screen left. He is standing next to a mirror, screen right. His eyes are aligned in a straight horizontal line with the right side of the frame. Then, he suddenly breaks this alignment by moving his head slightly toward the camera, thus directing his eyes toward the space in front of him that is being reflected in the mirror next to him (i.e., a corridor). His visual experience is expressed metonymically through the conceptual metonymy “EYES STAND FOR SEEING”. As he moves his head, the object of his perception becomes simultaneously visible to the viewer. From the right side of the frame, the woman appears on-screen by moving into the mirror (see Figure 3a). Using the “CONTAINMENT” image schema, we can now infer the following logic: if the mirror is *in* the screen, and the woman is *in* the mirror, it follows, that the woman is *in* the screen (i.e., the woman is on-screen). Moreover, the movement in the static shot describes a dynamic instance of what Dewell (2005) has called “ENTRY” in that the frame-within-frame configuration describes a static location (i.e., the mirror within the frame) (landmark—LM) with an entity (i.e., the woman) (trajectory—TR) going into that basic location.

Thus, the contact between S and the O is elicited in one single image through the homospacial device of framing. Both entities are spatially related to each other by extending the logic of “FRONT-BACK” and “LEFT-RIGHT” to the domain of character perception, that is, their spatial features are mapped onto the location of the perceiving character (the man) and the object perceived by the character (the woman), respectively.

Moreover, the viewer perceives that the woman *causes* the man’s visual experience because the conditions are fulfilled with respect to proposition (P2). Inferential evidence for this claim is provided by the systematic correlations between the logic of forced interaction and the logic of causation. For instance, as the application of the force (i.e., framing) accompanies the interaction, the occurrence of the cause (i.e., the woman) accompanies the character’s change of state (i.e., the man’s change of state from not seeing the woman to seeing the woman). Similarly, as the interaction would not have occurred without the application of framing, the man’s visual experience of the woman would not have occurred without the appearance of the woman.

The Shining (1980)

The second example we would like to analyze involves the scene from Stanley Kubrick’s *The Shining* (1980) in which Wendy’s eyes “are drawn” toward the mirror reflection of the word “REDRUM” (i.e., “MURDER” written in reverse order) on the door of her bedroom. Her visual experience is

Filmed event <i>(The Shining, Stanley Kubrick, 1980)</i>					
		(a)	(b)	(c)	(d)
		Objective shot [close-up]	POV shot [long shot]	POV shot [zoom-in]	POV shot [close-up]
Image schemas	SOURCE-PATH-GOAL	Source	Source	Path	Goal
	CONTAINER	Outside	Inside	Inside	Inside
Abstract concepts	PERCEPTION	Character who sees	Visual field of the character	Visual focusing	Object of visual focus

Figure 4. The “CONTAINER” and “SOURCE-PATH-GOAL” image schemas as elicited by editing (non-homospatality, two shots) and zoom-in camera movement (non-homospatality, single shot), respectively.

structured as follows. First, the film zooms hastily in on Wendy as she holds her son Danny in her arms. Danny has just entered the room, thus waking his mother up from her sleep. The camera swiftly moves from a long shot towards a medium shot showing her facial expression of fear (see Figure 4a). The conceptual metonymy “EYES STAND FOR SEEING” imposes itself onto the image. The film, then, cuts to a POV shot showing the content of her visual field: a long shot of the reflected door in the mirror of her bedroom (see Figure 4b). The inside of the “CONTAINER” schema is metaphorically extended to structure the space that the character sees (i.e., the space in front of her), while the outside of the schema is mapped onto the part of the space that she cannot see (e.g., her own eyes). Thus, S is brought closer to O by virtue of the non-homospatial solution of editing.

From the POV shot, the camera, then, rapidly zooms in on a part of her visual field: the reflection of the word “REDRUM” in the mirror (see Figure 4d). By decreasing the distance between the camera and the mirror, the viewer is given the impression that Wendy’s eyes are brought closer to the reflection of the written word on the door. The schema underlying this movement is that of “SOURCE-PATH-GOAL” in which the camera moves from a starting point (i.e., the location of Wendy) via a pathway toward an ending point (i.e., the object of her visual focus).

Likewise, then, the metaphorical and metonymical rendering of Wendy’s visual experience prompts the viewer to produce the high-level percept according to which the word “MURDER” on the door (O) causes Wendy’s visual experience of that word. Similarly, inferential evidence is offered by the conceptual metaphor “CAUSATION IS FORCED MOVEMENT”. The metaphorical mapping from forced movement to causation maps each of the inference forms characteristic of forced movement into the corresponding inference forms true of causation. For example, the idea of forced movement that the contact between Wendy and the word “MURDER” (i.e., S’s visual experience of O) would not have occurred without the forces of editing and camera movement, corresponds to the idea of causation that the change of state would not have occurred without a cause.

Perceiving character perception as cause of higher-order mental functions

Having answered and illustrated the first question, we are now able to address the second question by merging propositions (P3) and (P4) and complementing them with the film theoretical argument as elucidated in paragraph (4–5) of the previous section.

- (P5). The viewer will likely perceive the character S’s visual experience of O and the character’s higher-order mental function (knowing, remembering) as being respectively a cause and its effect if (1) the conditions of (P3) are satisfied, (2) the conditions of (P4) are satisfied, and (3) this satisfaction is aided by (narrative) information that was already stored in working memory.

In what follows, we will consider two concise film examples in which the viewer is further encouraged to causally map the character's visual experience (the change from a state of not seeing to a state of seeing) onto two higher instances of change in the character's mind, namely the change from a state of not knowing to a state of knowing, and the change from a state of not remembering to a state of remembering.

"KNOWING IS SEEING": 2001: A Space Odyssey (1968)

Our first example involves a scene in which the underlying metaphorical and metonymical structure of character perception in the visual content of the scene prompts the viewer to *see* that S's visual experience *causes* a mental change in S from a state of *not knowing* to a state of *knowing*. It describes the moment from *2001: A Space Odyssey* in which the viewer *comes to know* that the character of HAL *knows* that the astronauts have the intention to disconnect him.

The scene is segmented into five static shots. The opening shot involves a static sequence shot lasting almost 2 minutes. The film 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 center 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. The "FRONT-BACK" schema is spatially grounded in the visual content of the frame to block the characters' positions. Dave and Frank 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 moves 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). The distance between the camera and HAL's eye is reduced even more in the following shot as the film cuts to an extreme close-up of HAL's eye (shot four) (see Figure 5a). Thus, the conceptual metonymy "EYE STAND FOR SEEING" is further intensified to the viewer. The camera's change of location from inside the pod to outside the pod also resonates on the aural level as the inside silence of the sound proof container is now replaced by the outside sound of airwaves. From the extreme close-up of HAL's eye the camera, then, cuts to the final shot: a silent extreme close-up of Frank's moving lips, screen right (shot five) (see Figure 5b). The conceptual metonymy underlying this image is that of "MOVING LIPS STAND FOR TALKING". The film now turns over to the computer's point of view. As in our previous example from *The Shining*, the image schema at work here is that of "CONTAINMENT" with the inside being mapped onto what HAL sees (i.e., Frank's lips) and the outside being what Hal does not see (e.g., his own eye). Still in the same shot, the camera, then, for the first time, brings movement to the scene by panning left to Dave's lips (see Figure 5c), back right to Frank, and finally left again to Dave. Camera movement is forced onto the visual content of the scene to further connect the two objects of HAL's visual experience.

Filmed event <i>(2001: A Space Odyssey,</i> Stanley Kubrick, 1968)				
		(a)	(b)	(c)
		Objective shot [close-up]	POV shot [extreme close-up]	POV shot [extreme close-up]
Image schemas	CONTAINER	Outside	Inside	Inside
Abstract concepts	PERCEPTION	Character who sees	Object seen	Object seen
	KNOWING	Character who knows	Idea/concept	Idea/concept

Figure 5. The "KNOWING IS SEEING" conceptual metaphor in Stanley Kubrick's *2001: A Space Odyssey*.

It is due to the forced contact elicited by, respectively, editing and camera movement that the conditions of perceptual causality are satisfied, and that as a result the viewer comes to see that the objects perceived by HAL (i.e., the astronauts) cause HAL's visual experience of those objects. Moreover, by making the viewer share HAL's perception, the audience is made aware of the astronauts' plans to shut him down. That is, the embodied structure underlying the cinematic expression of HAL's perceptual state of mind (his POV) is used as a source domain to understand HAL's cognitive state of mind, namely the change of mental state from not knowing the astronauts' motives (i.e., target domain) to knowing them.

However, in order for the viewer to *see* that HAL's visual experience *causes* this mental change, additional information is needed. Indeed, the viewer cannot map the object perceived by HAL onto the propositional content of the idea (i.e., "Dave and Frank have the intention to shut down HAL"), if the viewer has not heard this content before. It is here that we touch upon a crucial difference between the mapping of image schemas onto perception, on the one hand, and the mapping of perception onto the higher mental function of knowing, on the other hand. In the first mapping, no additional knowledge is required. Consider again, for example, [Figure 3](#). The audience can immediately verbalize their viewing experience as "We see a man who is seeing a woman." We arrive at this conclusion by virtue of the contact between the two persons that is cinematically instigated by framing and the underlying embodied knowledge of "*LEFT-RIGHT*" and "*FRONT-BACK*". In the second mapping, by contrast, this direct access to the target domain is more complicated. Through editing and the underlying "*CONTAINMENT*" schema we instantly see that HAL is observing two astronauts, but we cannot directly *see* that HAL *knows* that they are planning to disconnect him. In order to come to this verbalization, we have to rely on knowledge that was already communicated prior to the cinematic manifestation of the character's visual experience. It is only because the viewer has heard the talk between the astronauts that the viewer is able to map the object perceived by HAL (i.e., the talk) onto the idea of disconnecting HAL. This mapping would not have been possible if, for example, the audience would only have seen the astronauts talking with the sound of their dialogue switched off. As we shall see in our next example, this condition also applies to the mapping of perception onto the character's mental function of remembering.

"REMEMBERING IS SEEING": *Come Back to the Five and Dime, Jimmy Dean, Jimmy Dean* (1982)

For our second example we would like to consider a scene in which the metaphorical and metonymical structure of the character's visual experience in the visual content of the scene prompts the viewer to *see* that the character's visual experience *causes* a mental change in the perceiving character from a state of *not remembering* to a state of *remembering* (i.e., recalling a past event).⁸ One such flashback scene is provided by Robert Altman's film adaptation of Ed Graczyk's 1976 homonymous play *Come Back to the Five and Dime, Jimmy Dean, Jimmy Dean*. The film tells the story of an all-female fan club who reunite inside a small Woolworth's five-and-dime store in a small Texas town to celebrate the twentieth anniversary of the actor James Dean's death. Through a series of flashbacks, the Disciples, as the members call themselves, reveal memories dating back to 1955, the year the actor died in a car accident. Some of them are instigated by the memory of Mona (Sandy Dennis) who, at various moments in the film, recalls events that have happened in the store, some 20 years ago. Often these recollections are triggered by verbal cues, as, for example, in the scene where she utters the words "I'm sure they all remember what it was like in here, in the five and dime." While she utters these words, she turns her face in profile to the right (left side of the frame) (see [Figure 6a](#)), thus triggering the conceptual metonymy "*EYES STAND FOR SEEING*". This intentional act further activates a horizontal camera movement to the left, from Mona's physical self (the source) to her reflection in the mirror (the goal or ending point) (see [Figure 6b](#)). Through the underlying image schema of "*SOURCE-PATH-GOAL*" the camera moves from the perceiving character in the present to the

⁸This section can be related to our earlier work on character perception and time in film (Coëgnarts & Kravanja, 2015c).

Filmed event <i>(Come Back to the Five and Dime, Jimmy Dean, Jimmy Dean, Robert Altman, 1982)</i>				
		(a)	(b)	(c)
Image schemas	SOURCE-PATH-GOAL	Source	Goal (1)	Goal (2)
	FRONT-BACK	Front (1)	Front (1) (= Back)	Front (2)
Abstract concepts	PERCEPTION	Character who sees	Object seen	Object seen
	KNOWING	Character who knows	The known	The known
	REMEMBERING	Present	Present	Past

Figure 6. The “REMEMBERING IS SEEING” conceptual metaphor in Robert Altman’s *Come Back to the Five and Dime, Jimmy Dean, Jimmy Dean*.

object perceived in the present, thus encouraging the viewer in turn to perceive both entities as being respectively an effect and its cause.

Gradually the static image of her reflection dissolves into another image of the store owner Juanita: the present gradually disappears while the past (i.e., the known) gradually appears (see Figure 6c). For a moment the two images (i.e., the two times) blend in superimposition. Thereby, the camera still focuses on the same location (i.e., the inside of the shop, the space in front of Mona’s eyes), except that now the figure of Mona’s reflection is replaced by the figure of Juanita. Thereby, the change in time is emphasized by the use of contrast within both identical grounds (e.g., changes in setting and lightning). More specifically, the scene describes a static Ego-Reference-Point model of time in which the space in front of Mona’s eyes is mapped onto the past. Similarly, the viewer is able to infer this mapping because s/he knows already from previous verbal and visual cues in the film that the appearing image belongs to the past. Moreover, the viewer is encouraged to see this mapping as causal: it is by virtue of the underlying metaphorical structure of Mona’s perception (i.e., the elicited contact between S and O) that the viewer is further encouraged to perceive Mona’s visual experience of O and Mona’s mental change from a state of not remembering to a state of remembering as being, respectively, a cause and its effect.

Concluding remarks

This article shows how film can produce two distinct but interrelated percepts of causality in the viewer, namely (1) the percept that one sees that the object perceived by the character causes the character’s perception of that object and (2) the percept that one sees that character perception in turn causes a change of state in the perceiving character’s mind (e.g., knowing, remembering). We have reached this twofold conclusion by first examining how the propositional content of character perception (“a character S sees an external object O”) is metaphorically embodied in film by means of extending the inferential logic of sensory-motor patterns (i.e., image schemas) onto the inferential logic of (character) perception. More specifically, we have argued that it is through the forced movements of film making (e.g., framing, editing, camera movement) that the viewer is prompted to see S and O as spatially related to each other, and by further metaphorical extension that S sees O. Analysing the underlying metaphorical structure of character perception has thus enabled us to relate character perception to perceptual causality. Indeed, if (1) spatial interaction between two entities is conditional for the success of perceptual causality, as Michotte’s experiments so eloquently show, and (2) this condition, in turn, is satisfied by the metaphorical portrayal of character perception in film, then it follows (3) that perceptual causality is also satisfied by filmed events of character perception (given the correspondence between (1) and (2)).

Our study, however, is not without its limitations. It raises several important issues that have not been addressed sufficiently enough in the course of this article, but which do deserve some further attention. First, there is the issue of effortlessness: cognitive psychologists have often stressed the “ease” with which humans infer fictional minds (Zunshine, 2006, pp. 13–16). How does this effortlessness, then, relate to the conceptual tools of metaphor and metonymy? Although the conceptual complexity of our study may suggest the opposite, we believe that the cognitive-unconscious mechanisms of metaphor and metonymy are exactly what makes the process of mindreading for a significant part effortless. It is because the mental states of *characters* are cinematically grounded in cognitive principles that depend for their working on patterns of *human* sensory-motor experience that viewers can intuitively connect cinematic behavior (e.g., camera movement, framing, editing) to characters’ mental states. The viewer can infer these states because there is a distinctive matching or correspondence between his own experience world and the way the characters’ mental activities are embodied in film. As such our analysis seems to accord well with Gallese and Goldman’s (1998) simulation account of mind-reading according to which humans’ mind-reading abilities rely on the capacity “to replicate, mimic, or impersonate the mental life of the target agent” (p. 497). We are able to infer and represent characters’ mental states because the embodied principles of metaphor and metonymy enable us to “adopt their perspective: by tracking or matching their states with resonant states of one’s own” (p. 493). Our study thus not only shows how filmmakers and their entourage unconsciously rely on patterns of their sensory-motor experience to generate meaning in film. It simultaneously shows how viewers, exactly because of this embodiment of the artistic process, can “read” the meaning. Viewers are able to infer characters’ mental states, because they embody the knowledge that is used to impose those states artistically.

This brings us to the second issue: to what extent do viewers always assign metaphorical meaning to particular events on-screen? To answer this question it is vital to stress again the significance of cinematic form. In order to identify metaphorical extensions of image schemas in film, such as characters’ mental states, it is important that the concrete and fuzzy nature of the reality in front of the camera is somehow “flattened” in favor of a more concentrated, less holistic and denser structure that can be analyzed. Considering the examples of our own study, one might argue that this unity, or “formal precision” as Arnheim (1957, p. 200) would call it, goes hand in hand with the application of various cinematic devices (e.g., camera movement, editing). It is by virtue of the forces of filmmaking that the structural elements of image schemas attach themselves onto the surface reality in front of the camera and that the filmed event obtains a formal coherence. We believe that this formal coherence is conditional for instigating metaphorical thought processes in the viewer. A tentative answer on the above question, then, would be to claim that the stronger the formal unity, the stronger the potential for metaphorical extensions, and the more likely it will be that the viewer will assign metaphorical meaning to the filmed event. To evaluate this formal and thus metaphorical strength, we also think it is fruitful to consider the amount of underlying mappings that the expression exhibits. In other words, a filmed event will be conceived (unconsciously) more in metaphorical terms insofar it expresses a high degree of mappings between the inferential logic of the image schemas unfolded in the cinematic form and the inferential logic of the abstract concept. This is the reason, for example, why a POV shot, combined with a dynamic zoom-in (e.g., Figure 4), can be considered as a stronger visual metaphor of character perception than for example a single static object shot in which both entities, perceiver and object seen, are simply connected to each other through framing (e.g., Figure 3).

Third and last, there is the issue of empirical evidence. Although our study depends on the experiments of Michotte, we do not provide experimental evidence for the central theoretical hypothesis of our article that viewers indeed see causality in filmed events of character perception. Hence, it would be worthwhile to investigate whether the assumptions raised in this article would hold in an experimental situation with real film viewers.

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