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## Science fiction films as *gedanken* experiments

**Abstract:** The paper investigates some features of the science fiction film genre, as seen from a cognitive perspective. Starting from the theoretical framework of Lawrence Barsalou, we consider the concept of SF film to be a radial category that encompasses a wide array of particular instantiations clustered around several generic clusters. The definition of the genre is encyclopedic, and thus it does not require a sufficient and necessary set of distinctive features.

During film experience, the audience will categorize visual elements composing the diegetic setting in a bottom up fashion. These elements are *functional bundles* and form a repertoire. They evoke a representation that includes properties, relations, rules, behavior of objects, agents, settings and a wide variety of internal states such as interoceptions and mentalizing. This representation is a background *situated conceptualization*. This background situation is apprehended in a top down manner as an instantiation of the SF abstract concept, a whole situation category. The overall conception is a familiar landscape that has a more schematic and abstract description, a *descriptive system*, and comprises a collection of different situated conceptualizations.

Conceptually, SF is understood as a thought experiment based on the 'what if' speech act scenario performed by an explicit / implicit narrator. The conceptual description of the counterfactual proposition contains a comparison between an actual situation (the natural world conception) and an alien one (the proposed new situation or event).

**Keywords:** cognition, film analysis, science fiction, situated conceptualization, descriptive system, genre.

*"I was born in a world you may not understand ..."*

*Ultraviolet*, 2006

*"A long time ago, in a galaxy far, far away..."*

*Star Wars*, 1977

*"Here we confront the unknown"*

*Demon Seed*, 1977

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### Introduction

SF is considered a subgenre dependent on basic genre construals: action drama, melodrama, horror, comedy. Each particular film is a construal of the relationship posited be-

tween two elements (*known* and *unknown*) and a dynamic unfolding of a control mechanism of the unknown, inherent in the comparison. In its prototypical instance, this control mechanism is manifested by the narrative extradiegetic explanation which rationalizes the alien and makes an epistemic stance possible. This epistemic stance is maintained with the use of realist cues and elements of known genres: action film, melodrama. Narrative, affect and drama sustain the naturalization of the unknown and represent a kind of epistemic control. The ‘what if’ proposition and the depiction of the encounter between the known and the unknown are appraised as discursive pronouncements on everyday reality. Frequent awe inspiring diegesis – a manifestation of the unknown – is coupled with the distance created by narrative closure and thus gives the viewer a feeling of mastery. The dominant genre grounds perception, cognition and emotion as a particular type of situated conceptualization and enhance, through narrative resolution, the epistemic control of the ‘what if’ scenario instigated by the irruption of the defamiliarizing reality of the unknown.

### Functional bundles

A genre is a composite of schemas abstracted from encountered instances of discourse use. A schema represents a commonality in regard to some facet of the structure of the discourse unit and it contains our expectations about the genre. As such it serves as a template in producing and apprehending new instances. The genre, as a cognitive model, comprises a global organization, local structural properties, ready made sequences and expressive constructions, typical content, specific expressions and matters of style and register (Langacker 2008, 478). The aspects enumerated are features neither necessary nor sufficient in order to categorize a specific instance as belonging to the generic category. Their conglomerate is a fuzzy cluster.

Quite often science fiction films (SF) are categorized by viewers as belonging to the genre once they identify and recognize diegetic elements. The repertoire is ample: “rockets, robots, futuristic cities, alien encounters, fantastic technology, scientists (mad or otherwise)” (Telotte 2004, 4) “[...] various robots, androids, cyborgs, and ‘enhanced’ beings” (14) “[...] televisions, rocket ships, flying wings, ray guns, guided missiles, mind-control machines, flying suits, alien invaders, and especially robots” (92) “[...] ‘mutants, awakened monsters, and world cataclysms [...] space exploration’”(98). For Johnston (2011, 7) iconographic elements such as “flying saucers, robots, ray guns and aliens” are prompts that cue the interpretive stance.

These content elements can be understood as integrated *functional bundles* – a term used by Torben Grodal (2009, 31-35) that designates “mental units that are invented, mind-grabbing, attention-grabbing, and widely communicated”. For example, “the features and functions of children’s stories can often be combined in small sets of functional bundles, such as ‘evil wizard’ or ‘evil witch’ (older man or woman able to perform magical and evil acts), or an object of extreme empowerment such as a magic wand or sword” (33). Salient functional bundles – comparable to objects like spears,

wheels, bridges – perform an “easy-to-grasp function in relation to quasi-universal needs and mental models” (34). For example, shields or protective surfaces are imitated from nature – the shells of turtles – and can be transformed into electromagnetic / force shields that protect against laser beams or rockets.

By resorting to common knowledge of the way objects co-occur in their natural scenes, diegetic elements cue the viewer to categorize the scene in which the item is embedded (Stansbury 2013, 1025). A diegetic object (i.e. a functional bundle) evokes and activates in the mind of the viewer an encyclopedic knowledge base (a *matrix of semantic domains* for Langacker 2008; a *concept* for Barsalou 2011) that has a linguistic labeling (Zwaan 2014). For Barsalou a *concept* “aggregates information about category instances” (Barsalou 2011, 1106) or category knowledge associated with the concept in “some sort of abstraction” (Barsalou 2006, 351).

I have used the term *descriptive system* to refer to this notion (Deaca 2015, 169). The descriptive system, besides providing information about properties, relations, prototypes, rules and exemplars, defines the procedures that have to be followed, the sequence of events, the roles that have to be carried out by the participants and the expectations / inferences implied (see Sharifian 2014, 108). The descriptive system defines the satisfying conditions which are necessary in order to achieve the required performative speech acts. In opposition to the highly abstract *schemas* which are necessary to categorization - which operates unconsciously -, the descriptive systems are more complex, can be explored consciously, and, under the modeling influence of a construal, can be apprehended as a *situated conceptualization* (see Barsalou 2003; Zwaan 2014; Binder 2015). Additionally, descriptive systems, by hypothesis, incorporate elements with different degrees of abstraction and elaboration.

A concept evokes a series of *situated conceptualizations* that represent particular instantiations of a category. Concrete concepts are grounded in situations and thus are represented in meaningful background situations, i.e. *situated conceptualization*, that “include a setting, agents, objects, behaviors, events, and internal states, each represented by relevant concepts” (Barsalou 2011, 1107). It contains “the entities involved as agents, the behavior of objects, the setting, the event and the relevant introspective information – interoceptions and mentalizing – as well as properties and relations that describe instances of concepts tailored for an activity that has to be carried out with a certain purpose” (Barsalou 2005, 156). A concept is an ability to “represent a category by simulating experiences of its members”, i.e. a “situation as a region of perceived space that surrounds a focal entity over some temporal duration, perceived from the subjective perspective of an agent” (Barsalou 2006). Thus, “particular modal areas of the brain store information about the category and can later represent the category in the absence of actual instances” (Barsalou 2011, 1107). The concept contains simulators for settings, events, mental states, and so forth that combine to represent background situations (Barsalou 2006, 353). The viewer has “mental representations of situations (i.e., events, states, and other propositional content)”

and “a situation, in the most general sense, can be thought of as simply a configuration of concepts, generally including entities, actions, properties, and relationships” (Binder 2016, 1099).

Concrete concepts have situated conceptualizations as backgrounds – they refer to part of a situation - and abstract concepts typically refer to entire situation such as an entire situated conceptualization represents them. Abstract concepts are “relational structures that integrate many different concepts in a situated conceptualization” (1107). Furthermore, concept representation has degrees of abstraction (see Binder et al. 2015; Binder 2016; Zwaan 2015) up to a stage of abstract schematic representation - an amodal type of representation that contains predictive associations of events, states and propositional content, a configuration of concepts or a pattern of activation of thematic roles that populate situations (entities, actions, properties, and relationships). The term descriptive system is a description of semantic content situated at this level of abstraction where symbolic representations dominate.

### The Construal

Let us notice that a concept consists of a correlated assembly of perception – cognition – emotion that can either function unconsciously as a descriptive system or be explored consciously as a situated conceptualization through attentional focalizing or memory retrieval. The descriptive system – unconscious – plays a categorizing schematic role for a particular elaboration / instance.

The *construal* represents our capacity to conceive and portray the same situation in various manners (Langacker 2007: 435; Evans 2006; 536; Ungerer 2006: 163; Croft 2004: 40). Attention is differentially focused on a particular aspect of a scene by focal adjustments or imaging systems (Talmy 2000a; 2000b; 2007). By selecting of a particular focal adjustment for a scene, the speaker imposes a unique construal upon it. The construal comprehends aspects of conceptualization that also involve the subject of conceptualization, i.e. frames of knowledge that impose a structure with respect to which the conceived situation is characterized. Main aspects of the construal are: *specificity* (the degree of abstraction involving commonalities, i.e. schematicity and scalar adjustments), *prominence* (the selection of a facet of the situation and figure / ground selection), *perspective* (focal adjustments such as viewpoint, deixis, grounding, and the relationship between subjectivity and objectivity) and *dynamics* (development of conceptualization through processing time) (Verhagen 2007; Croft 2004). Other aspects of construal include: distribution of attention, referent accessibility, judgment/comparison (categorization, metaphor), force dynamics, formation of gestalts in schematic categories as space and time. Involvement of the conceptualizers situated on the ground of the conceptualization and management of multiple epistemic perspectives of a situation are also main aspects characteristic of the construal. In film terminology *variable framing* is a mechanism for changing the viewing position and elaborating construal. Variable framing is implemented by editing, camera movement and

lens movement and support the functions of *indexing* (pointing at something), *scaling* (changing the relative size of something on screen) and *bracketing* (projecting outside the frame elements of the scene) (Carroll & Seeley 2014).

The experience of situated conceptualization – which by now it should be obvious that I equate with the online processing of cinematic scenes and sequences – is an integrated, qualitatively diverse experience of multimodal interactions. Visual perception, as Gallese postulates, is also multimodal and encompasses the “activation of motor, somatosensory and emotion-related brain networks” (Gallese 2016, 128). Setting, agents, objects, behaviors, events and mental states are the multiple dimensions of a descriptive system shaped and understood by the viewer, under the influence of a cinematic construal (i.e. sensory perceptual features, cognitive and affective aspects), as a particular situated conceptualization. Each single dimension is perceived not in isolation but in relation to others and tuned by concurrent dimensions in an “entangled” fashion. Furthermore, previous cinematic experiences (i.e. antecedent sequences of the film) warp present online processing of these dimensions and functions as attractors for the construal. The viewer performs a “walk” that discloses a particular pattern in the multidimensional conceptual space of a situated conceptualization while it incorporates continuously changing sensory inputs (see Pennartz 2009).

### **The top down categorization mechanism**

Perceiving is conceiving in the sense that the viewer “sees” an object as a two-fold entity. One part is present in perception while the other is conceptually present in the mind of the viewer. The situation evoked is the conceptual part. It is the object’s identity. As Noe Alva (2012) mentioned, in a picture of a plate taken from a lateral angle we don’t see an oval plate but we apprehend a round plate. Perceptual cues activate in a bottom-up fashion a set of top-down expectations and inferences that constitute an integrated conceptualization. Temporal interactive processing will confirm or disconfirm the prediction as error (Seth 2014). The slogan is that we see what we conceive.

For Johnston (2011) SF is “a popular fictional genre that engages with (and visualizes) cultural debates around one or more of the following: the future, artificial creation, technological invention, extraterrestrial contact, time travel, physical or mental mutation, scientific experimentation, or fantastic natural disaster” (Johnston 2011, 1). Its characteristic thematic topics are “automation, advanced technology, space travel, scientific progress, invisibility, fantastic explorations, body snatching, radiation anxiety and transformation” (2011, 51) or “potential generic threads around the artificial creation of life, mechanization, bodily transformation, alien invasion, fantastic travel and futurity” (52); “body swapping or brain transplants” (57). Several scenarios are repeated in SF films: the “impact of forces outside the human realm, [...] encounters with alien beings and other worlds, [...] changes in society and culture, wrought

by our science and technology, [...] technological alterations in and substitute versions of the self" (Telotte 2004, 12). Time travel and paradoxes linked to quantum effects and multiverse theory (*Mr. Nobody; The Butterfly Effect*) sustain certain plots. Recurrent themes are the alien infection, the rise of dictatorial societies, surveillance societies and post-apocalyptic survival (93).

These are discursive abstract cultural concepts generated online from the patchwork of background situations. Background situations involve a mix of different concepts in a common frame. They are complete situations that include several elements and their relations in a relational structure (Barsalou 2011, 1107). As abstract concepts they are equated with entire background situations and serve to categorize new instances. They form an open-ended lexicon. Some abstract concepts are more entrenched and conventionalized and others are ad-hoc conceptual hybrids. Recognizing the SF genre involves assumptions and expectations that determine the categorization of the particular diegetic situation by expanding the representation of the attended category at the cost of unattended categories (see the warping by tuning of the semantic representation of a category across the human brain in Gallant 2013). Abstract concepts are schematizations (descriptive systems) conceptualized on the basis of instances of use and serve as categorizing templates to new online situated conceptualizations, i.e. online construed descriptive systems. Stated briefly, for example, an integrated bundle like "space travel" has a schematic representation and a correspondent descriptive system that is abstract enough in order to allow the viewer to categorize different situated conceptualizations as particular instances and members of the category. As such, the template serves as a grammatical rule; a generic rule abstracted from instances of use and is employed by the viewer as a cognitive model. On encountering a blend of features, particular concepts and modalities, during a filmic experience one judges it as an instance of an encompassing category, the genre. The genre contains the semantic pole, i.e. the concept and its descriptive system and the expressive pole, i.e. a type of characteristic construal. In other words, it is not sufficient for the viewer to recognize the conceptual content "space travel" since this can also be used as such in scientific discourse or documentary.

Based on the content cue alone the viewer will not correctly identify SF films. Specific ways of profiling and construal are also necessary. For example Telotte mentions Rick Altman's view that the generic text is, first, "a list of common traits, attitudes, characters, shots, locations, sets, and the like, and, second, a group of certain constitutive relationships ... into which they are arranged" (Telotte 2004, 18). The generic template of SF is not a formal but a conceptual one describable as a general cognitive model, a concept abstracted from particular filmic expressions that contain typical situations / functional bundles and typical cinematographic construals. On one hand we have typical "themes", and on the other typical expressive construals. Different blends of those poles – content and expressive – are categorized as belong-

ing to the SF category. The concept of SF film contains an abstract description based on encyclopedic knowledge that includes not only the list of thematic elements but also the ways of representing them as film. Furthermore, the genre is like a lexicon of particular instances of the descriptive system that are conventional in the cultural cinematographic current usage: "Rather than the category having a conceptual core, a set of situated exemplars represents it that exhibit family resemblance and radial structure, accompanied by limited abstractions" (Barsalou 2011, 1107). The collections of exemplars do not constitute a tight set. The genre is a cluster of exemplars that satisfy the criterion of "family resemblance" (See for example a definition of the abstract concept of art elaborated in similar terms by Gaut 2000, 27). The lexicon is open-ended in the sense that new configurations can be recognized as belonging to the genre and subsequently, by frequent use, become conventionalized. Due to this fact SF is an extremely versatile genre. As we will further elaborate in this paper this ensemble of exemplars is, combined with the construal of a main genre like horror, comedy, thriller, melodrama, to be apprehended as a subgenre.

The new concepts represented by background situations are also radial categories and are modulated by a construal, as for example, "the agent's subjective perspective" and "perceptual construals that underlie goal-related activity in the current situation" (Barsalou 2011, 1107). In other words we have to take in account a narrative role played by a narrator in the cognitive model of SF.

SF is a familiar landscape based on an open-ended list of particular situated conceptualizations (themes and construals) controlled in a top-down fashion by the generic abstract concept. Situated conceptualizations involve the lexicon of SF, i.e. functional bundles, settings, events, situations, agents, mental states represent the genre. Bottom-up cues evoke conventional situations and conventional construals; top-down expectations sanction and adjust the perception of the specific conceptualized situation. The gist of a situation / scene help the process of categorization (Bar 2004, 2007, Barrett & Bar 2009; Binder 2016). Once the viewer recognizes an item of the lexicon or a specific cue, they activate the correspondent top-down generic expectation that will categorize the depicted diegesis as belonging to the semantic realm of SF genre. Diegesis and its components are warped dynamically towards the SF generic conceptual template.

Let us note that once the viewer categorizes the film as SF all other elements are "hooked" by tuning mechanism to this categorization and "entangled" in it in a warped whole. Diegetic elements that are not *per se* classifiable as typical SF functional bundles – e.g. a cowboy in western setting – will be tuned to this generic attractor and all semantic space will be warped towards the SF in that particular situated conceptualization. Thus, in this case the "cowboy" is perceived as a character belonging to the SF genre. For example *Cowboys and Aliens* is based on such a blend. The film fits in a perfectly ambivalent way either in the category of a western in which some characters are aliens or of a SF with cowboys. Once the viewer is cued and applies the ge-

neric conceptual template the online discourse is decoded accordingly. *Alphaville* is another example. The viewer is mostly cued by a voice-over that the film is a science fiction. However, the agents, settings and diegetic behavior do not correspond to the typical SF situation. The narrative construal is based on film noir clichés and the setting is modern times Paris (streets, a hotel and *La Maison de la Radio*). Nevertheless, *Alphaville* is experienced by the audience as an atypical instance of the SF genre. Filmic elements are apprehended as belonging to the generic cognitive model of the SF and their meaning is thus warped by this attractor. The viewer experiences today's Paris – in the sense of Noe Alva's theory of vision – as a SF setting.

### The blend of descriptive systems

Grodal notes that “particular functional bundles or mental models may exist side by side with quite other bundles and models” (2009, 34). For example in *Star Wars* shields and swords “exist side by side with advanced technological gadgets” (34). For him culture is a “toolkit containing very heterogeneous items” and film is also a “bricolage, in the sense that it brings together whatever is at hand and seems to work, even if it is heterogeneous” and has a “local functionality” (35).

In most SF films a *hybrid functional bundle* obtained through the blend of two concepts is present. In some cases, one concept refers to something which is *familiar and known* and the other profiles something that is *unfamiliar and strange*. Features from two alternative descriptive systems are blended. A particular situated conceptualization brings together aspects from two separate semantic domains that, through repeated use, can be conventionalized and apprehended as a new integrated concept. Let us take “the mad scientist” as an example: this bundle incorporates the familiar figure of the “scientist” (and its descriptive system / situated conceptualization) and the concept of “madness” that makes reference to an unfamiliar and alien mental state. The “robot” as well, is a mixture of human and nonhuman.

In other cases both concepts can be familiar but some aspect of the fictional world in which they dwell is unfamiliar. Their conjugation will make reference to an unfamiliar reality and make perceptible something that is impossible to conceptualize directly since it never occurred in experience (a virus). In his analysis of *Moon* Johnston remarks that “costume functions to suggest the future, but also remains tied to the known, creating a world that is different but familiar enough to be recognizable” (Johnston, 15). Archimboldesque costumes invade a number of films (*Blade Runner*, *The Fifth Element*). Final scenes in *2001: A Space Odyssey* bring together classical interior design and the astronaut costume in a new online situated conceptualization. A “starship” is a functional ship in a vacuum substance devoid of viscosity and gravity; it mixes the descriptive system of the “sea ship” with the descriptive system of “interstellar vacuum”. Both definitions are currently in use in our culture. For example we have the case of “man” and “fly” (*The Fly*) or the well known *Alien*: mix of worm and parasite-like qualities with the ferocious behavior of the predator. The novelty



is obtained through blending of two familiar biological descriptive systems. At first glance the hybrid will appear similar to entities belonging to phantasy fictions (the fairy tales entities like the unicorn). But either one element belongs to the SF lexicon (the costume of the astronaut) either the composite fiction is already categorized as SF and thus warps in a top-down dynamically the semantic interpretation of the particular hybrid. As in the fantasy genre (myths, fairy tales), the hybrid entity is conceived as possible – natural - in the diegetic setting even if its exceptional nature is emphasized (*Robocop*). As we will further comment below the viewer apprehension is nevertheless biased, in the SF generic cognitive model, by the construal effect imposed by an epistemic extradiegetic narrative stance. This stance is based on a counterfactual “what if” that concerns the overall filmic diegesis, the entire situation. The hybrid or new conceptualization is an elaboration of a schematic concept that can be labeled as the “unknown”.

Thus a characteristic of the SF cognitive model would be the presence of a hybrid composed of elements not expected to occur together in conventional instances; either as a functional bundle or as an entire new counterfactual situation that instantiate the “unknown”. The two sets of elements can belong to recognizable and familiar situated conceptualizations, e.g. human vs. animal. The hybrid evoked will reconcile the anticipation of unfamiliarity associated to the genre to elements that – in normal contexts - are benign and banal. For example, space travel sometimes gives the familiar impression of gravity-determined motion (the characters in *Star Trek* stand rather than float about in their spaceship). But we readily accept that it is a “voyage in *space*”, not on earth. Science fiction is a genre as remarkable for its “flexibility and genre hybridity as it is for a series of conventions around developing technology or science” (Johnston 2011, 1).

### Intergenre

Science fiction narratives are construed by other genres which function as construals applied on the thematic content elements (functional bundles, hybrids, themes). The construal is a way of modulating or modifying the representation of a concept. Perceptual, emotional and narrative construals are applied to the descriptive system evoked by a concept.

Classic genres – e.g. horror, thriller, action drama, melodrama, comedy - are perceptual, cognitive and emotional devices that, based on a seeking neuroaffective mechanism, tease, sustain and resolve viewers’ interest and curiosity (Panksepp 1998; Tan 1996). Classic genres (comedy, drama, thriller, horror) are biased towards a particular construal. In SF diegetic cues dominate the categorizing process. Main genre keeps alive the affective engagement and emotional involvement of the viewer. In this situation the classic genre has a double function. It teases the interest of the viewer and offers a recognizable depiction of the “unknown” giving access and control of the abstract conceptual entity.

Traditionally, SF films are “dramas about these topics, usually with thrilling and romantic elements and often reliant upon state-of-the-art special effects techniques to create a new, or expanded worldview” (Johnston 2011, 1). For Johnston genres in SF “almost always function as hybrids” (2011, 11), e.g. “science fiction-animation (*Fantastic Planet*, *Wall-E*), science fiction-fantasy (*Avatar*, *The Fountain*, 2006), science fiction-gangster film (*Sky Rocket*, 1936; *The Adventures of Pluto Nash*, 2002), science fiction-Western (*Wild Wild West*, 1999; *Serenity*, 2005), science fiction-sports (*Rollerball*, 1975; *Space Jam*, 1996), science fiction-mystery (*Soylent Green*, *Minority Report*), science fiction-romantic comedy (*Eternal Sunshine of the Spotless Mind*, 2004; *Multiplicity*, 1996), and science fiction epic (2001: *A Space Odyssey*, *Dune*) [...], science fiction-comedy (*Men in Black*, 1997; *The Hitch-Hiker’s Guide to the Galaxy*), the science fiction-drama (*Contact*, 1997; *Gattaca*, 1997), the science-fiction musical (*Just Imagine*, 1930; *The Rocky Horror Picture Show*, 1975), the science fiction-film noir (*Blade Runner*, *Dark City*, 1998), or the science fiction-war film (*Enemy Mine*, 1985; *Wing Commander*, 1999) (24-25). “*The Lake House*, *The Time Traveller’s Wife*, *The Butterfly Effect* (2004), *Next* (2007), and *Déjà Vu* (2006) also combined science fiction conventions with those from the romance, teen-pic, action and thriller movie genres, while *Southland Tales* (2006) merged all of the above with comedy and musical traits, to create an (often unwieldy) generically uncertain concoction” (110). *The Rocky Horror Picture Show*, which combines SF, horror, musical and parody, is a good reference point for the interbreeding of genres. In short, in SF diegetic elements like the functional bundles evoke descriptive systems that provide the nominal autonomous content while classical genres provide the necessary construal, the narrative and emotional modifier.

### The control cycle

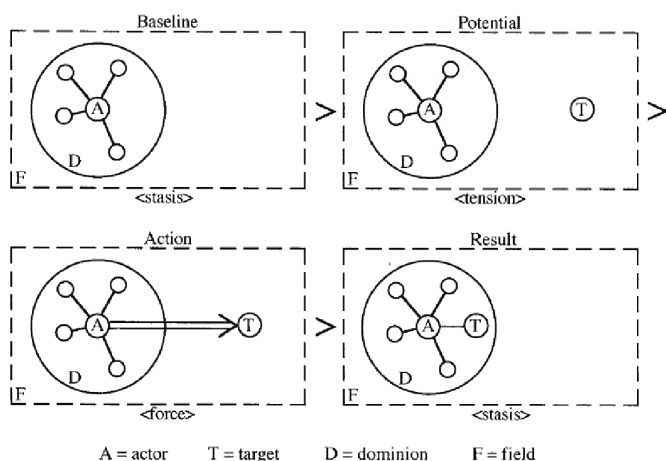
For Telotte “the science fiction narrative typically sets about explaining in a rational manner what, in some contexts, might seem supernatural; that is, it attempts to re-frame some challenging phenomenon in terms of ‘new’ laws of nature” (Telotte 2004, 14). In SF films situated conceptualizations and functional bundles recognized by the viewers are hybrids that – under a metaphoric reading – instantiate an abstract concept that is not perceptible and cognitively accessible otherwise. This is labeled the “unknown”. As a conclusion, one characteristic feature of the SF filmic genre, of the cognitive model of the genre, is the profiling of the conceptual schematic content definable as the “unknown” as an epistemic challenge. Conceptual hybrids and filmic construals are modalities to represent the “unknown” and to control it, i.e. to make it meaningful in familiar terms.

The generic narrative construal of the SF represents an instantiation of a speech act scenario performed by an extradiegetic narrator describable as a counterfactual “what if.... one day, somewhere”. This is a cultural scenario representing a familiar kind of narratorial interaction with an audience. It is a schema that specifies a typical grounding of the counterfactual content in respect to a narrator and an audience

situated in the *here* and *now* of the conception of the natural world.<sup>1</sup> The typical model of SF doesn't challenge the discursive status of the filmic artefact. It only elaborates upon the possible explanation of the unnatural phenomenon dwelling in the fictional world and invites reflection on the conceptions about ourselves and the world, that are taken for granted.

The conceptual model of SF would be thus the appropriation of the *unknown* by the use of the *control cycle*. This appropriation is diegetic, formal-aesthetic, discursive or epistemic. The control cycle is a general cognitive model that comprises some elements in interaction as well as several phases unfolding in time dynamically and can be applied to numerous aspects of human experience: physical, perceptual, mental and social. In the epistemic realm some knowledge is acquired by a conceptualizer (see Langacker 2009, 259, Nakashima 2016). This cognitive model will be immanent in different conceptualizations that provide more detailed representations of the schematic content of the cognitive model.

Langacker describes the abstract cognitive model as follows: "In the static baseline phase, an **actor** (A) (in a broad sense of the term) controls an array of entities (small circles) which collectively constitute its **dominion** (D). In the next phase, some **target** (T) enters the actor's **field** (F), or scope of potential interaction. This creates a state of tension, for the actor has to deal with the target in some manner. The typical means of dealing with it is by somehow bringing it under the actor's control, i.e. exerting force (double arrow) resulting in its incorporation in the actor's dominion. The result of this action is a modified situation that is once more static (a state of relaxation)" (Langacker 2009, 130).



1 "The term **ground** is used in CG to indicate the speech event, its participants (speaker and hearer), their interaction, and the immediate circumstances (notably, the time and place of speaking)" (Langacker 2008, 259).

As Noe Alva (2012) and Anil Seth (2014) note, vision is based on confirmation of a prediction. We see objects and not shapes. When we see a tomato we infer the side of the object that is hidden from view. We see what we know. Human perception is a way of predicting, testing and controlling what we already know about the object of perception. This mechanism works for normal perception and cognition and also for cinematographic diegesis. Based on sensorimotor schemas and abstract descriptive systems we “see” what we assume to be correct apprehension of an entity in its entirety not just a partial view. Particular construals of the entity can be abstracted and integrated in the descriptive system or situated conceptualization of a particular instantiation of the entity.

### **The control mechanism of the unknown. Diegetic control**

Science fiction’s potential as narrative can be exploited along two lines: “its capacity for limitless vision and experience, on the one hand, and the possibility for helping to foster such distance and alienation, on the other” (Telotte 2004, 30). Telotte goes on to comment on the fact that “its lure was in part mythic, and it appealed to a literate audience, one that was open to and even enthusiastic about inventions, science, and the changes that science heralded” (78). It’s attraction is due to “its ability to reproduce what might be, to synthesize a new reality, [...], one closely allied to the attraction bound up in the very technology that makes it possible [...] to hold up that reason–science–technology triad for our inspection” (31-32).

In SF films the control cycle is instantiated at the diegetic, the story events, and at the artefact level. Technology, for example, is the representation of the control mechanism at the diegetic level. Telotte summarizes this idea stating that technology from its vantage point – what we might well think of as its implicitly cinematic nature – situates the individual as a spectator distant and detached from the world in a safe position created by the instrumentality of the scientific devices (Telotte 2004, 20). Hidden behind the window of prosthetic machines, and screens – devices that allow control of the seen but protect the viewer from any direct interference with the distant and potential harmful object – the viewer can be in control. Screen renders the object close for inspection but nevertheless keeps a safe distance. Since Méliès cinema technology and SF imaginary coalesce in a metaphoric form.

The thematic landscape of SF was congruent from the beginning of the genre with cultural scientific discourse. The genre is enmeshed in the intertextuality of scientific experiments and progress, new inventions such as industrial and architectural achievements, medical discoveries, geographical journeys, military and political technologies, communication devices. We can enumerate the conceptual domains that are grounded in particular conceptualized situations: extensions of the known limits of space and time, discovery of alien life forms and mental constructions in one’s own body or in the “Other” (from biological entities and troubles of identity to machine or AI consciousness), confrontation with natural forces (from terrestrial natural phe-

nomena to cosmic and quantum physics realms) and an open-ended list of technological marvels of the scientific progress such as the communication devices.

Overt explanations given by different characters or by extradiegetic means (e.g. voice-over or graphic inserts) are also a manner of taming the unknown and making it describable for the audience. Quite often SF narratives create a strong expectation of the explanation that will rationalize an aberrant behavior, or the mysterious goals and motives of the alien "Other". It is not surprising, therefore, that SF narratives are often unfolding accordingly to the template of the criminal investigation (the mystery plot) (*Blade Runner*).

### Narrative, emotional and stylistic control

Suspense is based on the fear of losing control over the strange entity, i.e. the abstract concept that cannot be understood directly but only in a metaphorical, oblique way. Immersed or engaged viewers in narrative have the satisfaction of being able to master their fear and experience a feeling of "mastering and competence" (Tan 1996, 28). For Tan feature films create and offer a resolution of tension (35). Narrative provokes also a tension – i.e. a disturbance on an orderly state – that through a process of causal unfolding will be finally resolved, and balance will be restored. Narrative closure contains an element of emotional tension reduction and creates a feeling of control. The enemy is defeated or the emotional suspense is resolved. Narrative closure and resolution of the plot is another aspect of the control mechanism. The hero defeats the alien entity (*Alien, Independence Day*) or overcomes the cosmic catastrophe (*Armageddon*). The viewer obtains satisfaction from disclosing the ordered patterns of plot and style as well as from resolution of narrative and diegetic conundrums. Intensifying narrative interest and emotional involvement of the viewer is also one constant trend of SF that creates an enhanced feeling of control. This kind of control is based on an addictive emotional mechanism of interest and wanting to engage in situations that involve anticipation and uncertainty of reward (a *want-go-system*) (see Tan 2008; Berridge 2016).

Tan makes a distinction between *film emotion* (emotion created by immersion in the diegesis through narrative flow and emotional simulation) and *artifact emotion* (the reaction of the viewer confronted with the cinematographic construal: style or recognition of genre) (55). Grasping a particular stylistic pattern is also a way of "tension reduction", and thus a manner of resolving the control cycle. For him "the subject solves the puzzle, which results in aesthetic pleasure. The incongruity may be accompanied by tension or arousal, or any other motivational state that is not directly pleasurable, while the solution always has some positive emotion attached to it, such as the 'aha experience'" (91). Moreover, audiences watching films of this type are actually afraid, but they nevertheless experience the satisfaction of being able to master their fear. Exciting films, such as thrillers and, above all, horror films give viewers the opportunity to experience a feeling of mastery or "competence" (28).

Cognitive and affective concern are formulated, assessed, intensified and finally, through some action, resolved. In order to enhance the experience of the *gedanken* experiment - the thrilling “what if” scenarios, investigative curiosity, narrative suspense, horror emotions and thriller plots are used to create intense background emotions.<sup>2</sup> This tendency is evident in the frequent awe-inspiring sequences that will be mastered under narrative closure or aesthetic enjoyment. Recent blockbusters from the Marvel series are good examples (*Superman, Batman, X-Men, Transformers*) or a cosmic opera like *Interstellar*.

When seen from a different, more distant standpoint, SF narratives serves to illustrate a “what if” scenario : “The film narrative as a whole - of which the ending is only one part - may present a certain vision of the fictional world that is in itself valuable as a pronouncement on everyday reality” (Tan 1996, 97). SF is often linked to allegorical reading and metacinematic interpretations (*La Jetée, The Truman Show* or *Alphaville*).

### Between the sublime and the realism

Awe and special effects sequences are frequent in SF films and constitute a modern version of what Tom Gunning (1990) has labeled a “cinema of attractions”. The representation of the strangeness of the “unknown” and of the “Other” as aesthetic objects refurbished for contemplation is one manifestation of the epistemic control cycle. Strange objects are thus apprehended and controlled in an aesthetic mode. As Johnston points out: “visual spectacle plays a psychological role for the audience, a release that allows them to fantasize about worldwide destruction, or the ability of special effects to tame the sublime and produce ‘cognitive mastery’ of the panoramic and visually spectacular” (Johnston 2011, 46). For Angela Ndalians in her *Neo-baroque aesthetics and contemporary entertainment* (2004), science fiction is a contemporary manifestation of the baroque style and conception that, among other features, offers us the “sensual seduction” of transcendence. Ndalians highlights the inclination of neo-baroque towards excessive display of virtuosity, special effects and intense design of perceptual wonders. Similar predilections appear in contemporary theatre (see Lehman 2006) or in Hollywood films as “intensified continuity” of the classical narrative style (see Bordwell 2006). The exuberant display of cinematic roller coaster of the senses created by enhanced cinematic illusionism provides the audiences with a sentiment of transcendence and “spiritual presence” (Ndalians 2004, 209). Revelatory in this sense is Spielberg’s *Close Encounters of Third Kind*. The spiritual encounter with the sacred is projected in spatial journeys and cyberspace (226). Narrative drama and confrontation with the evil played on this kind of stage give

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<sup>2</sup> We might recall here Darko Suvin’s definition of SF as a “literature of cognitive estrangement”, a genre based on the defamiliarization of reality (Suvin 1979, 4-10; Telotte 2004, 4).

characters mythical proportions. The SF protagonist achieves the dimensions of the mythical hero. Aesthetics of astonishment serve as catalyst for transcendental seduction in SF dramas and conflicts. *Star Wars* is not about some characters engaged in vanity-driven conflicts but about the apocalyptic end of the world, clashes between worlds and encounters with the spiritual essence of the „force“.

Each conceptual domain is exploited in its dual aspect: as a realist grounding element and as a potential instrument for the alien “invasion” of the uncontrollable unknown. This ambivalence is deployed in a narrative template in order to unfold the emotional drama of the known and familiar element that becomes alien and, after a complicating phase, is finally tamed at one level or another of the cinematic artefact. Audiences live the thrill of discovering the alien factor inside the mastered object and subsequently the involvement in the sequence of efforts sustained in order to contain and control the unknown. The initial disturbance and break of balance is diegetic but subsequent reward caused by the release of tension is either lived through character empathy or artefact emotion.

Science fiction exhibits a tendency to depict awe-inspiring realities as well as to outline – as a reference and comparison grounded on the natural world – realist and recognizable elements. Futuristic cities do represent such an intermediary step towards the full unknown. Cities from *Metropolis*, *Blade Runner*, *The Fifth Element* or *Star Wars* are recognizable props, but, at the same time, due to their distorted and hyperbolic design create an alienating effect. Another recurrent motif is an abstract sequence of images destined to offer a glimpse of the “unknown”.

In paradigmatic SF films like *2001: A Space Odyssey* or *Encounters of the Third Kind* awe-inspiring sequences appear in long takes. These sequences, in order to make tangible the unknown, are abstract unfoldings of audiovisual stimuli. They are cinema in its purest form where all diegetic pretensions are left behind for the pure epiphany of the “undescrivable”. On the other hand grounding elements are highlighted, for example, in *2001*. Several scenes insist on the choreographic effects of the lack of gravity (an estrangement of natural movement) and others highlight the technical devices used in order to create artificial gravity (an element of realism). The dual nature of diegetic hybrids resonates with the conceptual balance and alternation between natural movement and patterns and abstract conceptual ones. Characters’ bodies stand upright in gravity-controlled settings and – as a sign of the inhuman intervention – as we advance into Kubrick’s film bodies are turned upside down and tend towards free floating. For Kubrick the perfect floating human body is a dead body falling freely in the cosmic void. Gradually, human bodies lose their material substance and melt in order to let free precisely the ungraspable qualia of movement / spiritual essence. *2001* insists over and over on the aesthetics / mystics of movement in order to make tangible the “unknown”.

Floating bodies are mapped into seamless camera movement. Baroque object movement or camera movements dominate films like *Matrix*, *Transformers*, or the

*Batman* or *Spiderman* series. Complex and dizzying camera movement generates the feeling of the fluid ungraspable qualities detached from the stable substance of objects. Camera movement is, from an explanatory standpoint, diegetically motivated: it describes and mirrors point-of-view shots of characters either endowed with inhuman abilities or inscribed in exceptional contexts. But on the other hand, camera movement metaphorically maps the reality of the unknown; it is an illustration of the strangeness of the unknown. It makes features of the unconceivable salient. An offshoot of this literal depiction of the unknown is the climactic sequence of abstract light and sound show. Thus, SF movies tend to privilege the abstract awe-inspiring sequence. Expectation of this sequence is teased and the audience is prepared for the sublime landscape of the unknown - which is of course an exacerbation of cinema's potential. It is about cinema tricks revealed or cinema in its purest form. In between we find the cosmic spectacle of the intergalactic ships or the black hole (*Interstellar*), the city landscape (*Metropolis*, *Blade Runner*, *Star Wars*) or the natural landscapes of exoplanets (*Star Wars*, *Avatar*).

The viewer's emotional involvement in the abstract sequences generates a feeling of control and pleasure. Fascination and absorption in the abstract flow of aesthetically satisfying images produce a conversion of the fear of the unknown into the feeling of control and tension resolution. Emotion driven by the artefact features is mapped upon the diegetic entity described by the filmic images. The viewer is involved in a "flow" (Tan 1996, 90 / 93), and, as Johnston highlights, inserting the camera in the midst of a special effects sequence, has become more dominant in SF films, thus mirroring the enhanced surrounding effects of sound design and actors' bodily performance in 3D settings (Johnston 2011, 19).

Long scenes of realist settings (the terrestrial infancy of *Superman* or the college life of *Spiderman*) prepare and tease the expectation of the revelatory sequence. These long expository scenes do indeed tease the narrative involvement and interest of the viewer but also ground the unknown to the world in which the audience lives. Excessive realist depiction of human and alien instruments and devices (the functional bundles) is also a characteristic trait of science fiction (*District 9*). Early SF movies had a „clean and glossy“ style of the setting (the theatrical costumes of the 50s). Since *Aliens*, *Blade Runner* or *District 9*, filmic construal focuses upon the aspects of trash, sweat of the characters dressings and on the dirty settings. Quite often, SF diegesis is deictically described as a mere "here" and "now" (*Children of Men*). Insistence on the realistic depiction of the diegesis will allow a better grounding of the speculative proposal of the "what if" speech act. Realism is an interpretive cue inviting the audience to reflect on a proposed conception of reality revolving around the human condition in present times. We can safely conclude at this point that SF is closely related to fabula and philosophical discourse.

SF was a well suited grounding element for communist progressive utopias and propagandistic reference to the industrial and technological achievements of the soci-



ety. Contemporary science fiction is closely linked to popular video discourses of scientific projections and counterfactuals that are circulating on YouTube (*Mr. Nobody*).

*Aelita* (1924), the first soviet SF film, is symptomatic at several levels of the model drawn here. The film is a mixture of genres: romance drama, realist drama with typified characters (the crook, the savant, the cop, the proletarian, the aristocrat), crime investigation of a crime of passion, comic sequences and vaudeville scenes of jealousy, mistaken identity and disguise, space opera, fairy tale elements, fantastic motives, revolutionary propaganda and epic battle. Diegetic emotions are resolved at the romance level (the lovers reunite), through the revolutionary message (the soviet proletarian outlook revolution triumphs), through the theme of the mastering of the technical instrument (the character realizes that a more sober approach to space travel is needed) and at the phantasy level (the character realizes that daydreaming can have dangerous consequences if literally experienced, but can be useful for working hypotheses in order to test reality and beliefs). Explanation and allegorical ground awe-inspiring sequences meant to depict the unknown (the abstract movement of space travel, the architectural wonder of an urban landscape similar to the *Metropolis* paradigm) are grafted into documentary realist sequences of life in 1921 Moscow. The unknown is also made tangible through use of expressionist costumes and setting of the alien life on Mars. Aesthetic pleasure due to enjoyment of spectacle give a sense of control that will allow the acceptance of the didactic coda: science in a proletarian political system will promote welfare. The “what if” caused by the encounter with the unknown serves as a grounding device for an easier acceptance of the propaganda message.

### Science fiction vs. horror

Noël Carroll in *The Philosophy of Horror* (1990) discusses the nature of the monstrous creature that generates fear and disgust in horror literature and film. Following Mary Douglas’s (1966) argumentation he posits that the monstrosity, the indescribable and unconceivable entity is a “violation of schemes of cultural categorization” (1990, 31), i.e. “things that are interstitial, that cross the boundaries of the deep categories of a culture’s conceptual schemes” (32), and “are contradictory, incomplete, or formless” (32). Entities that qualify are frequently encountered in SF films: zombies, robotic mixtures of animate with inanimate features, interspecies, superimposition of distinct individual (possessed-possessor) being with categorical incompleteness, detached body parts, formless creatures or entities that generate phobia. All those instances express the un-natural relative to a culture’s understanding of nature (34). Frequent use of the monstrous entity in SF films is due to the use of the dominant genre of horror. That is to say that the horror genre is used in order to depict the unknowable element and to guide the emotional involvement of the viewer. Carroll notes, as a second distinctive feature of the horror genre, the emotional reaction manifested by characters and solicited from the viewer: visceral revulsion based on fear and repulsion in face of the disgusting and impure nature of the monstrous element.

For my claim prototypical SF elicits not this kind of emotional reaction, but rather an epistemic one. Superman does not elicit disgust. It is obvious that SF is based on a dominant genre and horror scenes will be frequently deployed in the narrative, but its characteristic is the naturalisation of the unknown. I used here the term “unknown” in order to highlight its epistemic nature. At the diegetic level horror is linked to emotional involvement with characters while at the extradiegetic level epistemic control takes over. In SF an epistemic stance prevails.

If we follow the kind of reasoning Danto put forward (1979) we can see that a perceptual entity like the monster will be cognitively categorized and apprehended differently in different genres. In a fantasy fiction the monster is a being natural to the world depicted (*Lord of the Rings*, *Star Wars*) and will not provoke disgust. A unicorn is a monstrous hybrid but doesn't, nevertheless, generate revulsion. In carnival feasts the same entity elicits both fear and spectacular joy. The monsters present in comic genres generate fear and comic relief. In horror, they arouse disgust. Horror elicits curiosity and draws attention to the unknown. SF subgenre modulates the emotional response triggered by the *unknown* with the use of an explanatory speech act scenario. This sequence is verbally or visually instantiated. Prototypical horror does not need this epistemic narrative device. In horror the reaction of the character is indicial of the fear and disgust. In SF the conclusive reaction of the character is one that sustains an explanatory accommodation or mastering of the unknown. The affective reaction of the viewer is cued by the actions and emotional involvement of the diegetic character. Quite often intertextual and generic reading constrains the perceptual-cognitive and emotional categorization of the monstrous entity. In this cases the explicit explanatory sequence is not used since, once the viewer recognizes the SF cognitive model, they will use the conceptual speech act scenario of the “what if”, shorthand for the encounter with the unknown and its subsequent (epistemic) control, in order to generate meaning. The monster is, therefore, appraised as epistemically controllable. The monster in SF is a metaphorical description of an unconceivable / undescribable entity, but which can be virtually controlled one way or another. Since horror cannot be easily read on an allegoric level, SF will use cues for allegorical reading and philosophical discourse (*Solaris*, *Stalker*).

### Conclusion

SF is a subgenre qualified by a main genre that functions as a modifier. The main genre modulates the dominant mood and the control of the tension / resolution of the affective and cognitive cycles. Setting and functional bundles evoke conventionalized situated conceptualizations – that form an open-ended lexicon clustered in a radial fashion based on “family resemblances” - and function as a stage upon which the drama unfolds. Typical situations mixed with the highly abstract conceptual model of the control cycle, the speech act of the counterfactual and the modeling effect of the main genre construal constitute the generic cluster of SF films.

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