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CONCEPTUAL INTEGRATION IN ALTERED CARBON OCCASIONALISMS

Abstract

Since language has to adapt and follow technological advancement, terminology is much different than twenty years ago when *Altered Carbon*, a science fiction novel, was written. This paper explores its occasionalisms through the lens of cognitive linguistics, specifically Fauconnier and Turner's theory of conceptual integration, with the aim of determining the entries' integration network type (simplex, mirror, single-scope, double-scope). Within each, special attention was paid to the recurring blend between the human and the technological. It was assumed and later proven that double-scope is the most frequent network, and that the conceptual meaning of human + machine occurs in every network type, confirming that science fiction requires cognitive blending in order to understand the integration between these frequently reoccurring mental spaces.

Key words: cognitive linguistics, conceptual integration, *Altered Carbon*, science fiction, occasionalisms

1. Introduction

1.1 The study and its aims

In the century that knows nothing if not high technology and its rapid development, we have adapted to the use of new, emerging language

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without a second thought. We have, in fact, become so desensitized to its nuances that expressions such as the ones used in everyday language (and which can even be found below in this paper) – *our brains are hardwired*, or *files and folders of our mental lexicon* – go by undetected, despite their obvious blurred boundaries between the *living* and the *machine*. Not only did the conceptual meaning of the amalgamation between humans and machines gain popularity with the development of technology, but it also flourished in the post-Covid era where almost every aspect of life had to be transformed into virtual.

The constant need for new words as technology advances is even more radical and discernible in the genre of science fiction. Here, the authors need not only to follow technological advancement, but also to invent new words for notions which exist solely in their imagination, otherwise known as *nonce formations* or *occasionalisms*. This setting therefore represents a favorable ground for both novel coinages and the amalgam between the biological and the mechanical.

These contemporary blends were noticed by many linguists, such as Fauconnier and Turner, who interpreted the phenomenon through conceptual integration: “[artificial life] is a dramatic double-scope blend, with one input organized by the frame for a manufactured product, *computer*, and the other organized by the frame *biological virus*. [...] That integration network was rapidly developed to create a much richer category of *computer virus*, with associated categories like *disinfectant*, *vaccine*, *safe interface*, and *computer health maintenance providers*” (2002: 274–5).

The aim of this study is to examine occasionalisms in *Altered Carbon*, a science fiction novel from the beginning of the XXI century (such as *plasma gun*, *tetrameth*, *Real Death*, *Protectorate forces*, *tank flesh*, *cortical stack*), through the lens of Fauconnier and Turner’s four integration network types: simplex, mirror, single-scope, and double-scope, which shall be clearly defined in section 1.3. These conceptual integration networks shall be identified within the sample, and their occurrences shall be quantified. Likewise, another purpose of this paper is to demonstrate that in all integration network types identified and described below, there exists the socio-cultural blend between humans and technology, which manifests itself within the conceptual meaning of the constituents of each respective integration network (*neurachemically speeded vision*, *eleventh body*, *hotel’s memory*, *carbon-reinforced tendons*, etc.).

It is, therefore, assumed that evidence will show that this genre of literature contains human + machine blend at every layer of integration.

Precisely due to the nature of this corpus, and this blurred human-machine distinction in a dystopian, futuristic (and yet almost tangibly close and sociologically relatable) setting, the hypothesis predicted that the double-scope network would be the most frequent one. Another expected outcome was that the simplex integration network would be abundant, purely owing to its defining quality of naming and assigning role values, and qualities to items. All of the aforementioned hypotheses were confirmed.

1.2 Material and Methods

Coincidentally, the same year (2002) Fauconnier and Turner published their integration networks in *The Way We Think*, Richard Morgan first published his novel *Altered Carbon*, which, much like any science fiction novel, is a fertile ground for conceptual integration research due to the expected abundance of novel words and concepts – “The cognitive mechanism of blending can also be found in literary works. As a matter of fact, literature produces a large number of blends, and many of these are of the impossible kind” (Kövecses 2010: 274). The reason for the selection of occasionalisms was their idiosyncrasy and the presumed necessity for engaging the cognitive process of blending. Likewise, language analyses of *Altered Carbon* have yet to be conducted, and as such present a pristine and fertile ground for the exploration of nonce formations. Most comprising elements in the occasionalisms may not be new to the readers, but their blended meaning represents a new concept, whose semantics is unfamiliar to our mental lexicon: “Whereas all abstract and semi-abstract constructions are lexical items, the fully specified forms that arise from these patterns may or may not be stored” (Schlücker 2020: 38).

On the following pages we shall examine the sample of items that have been, and still are, considered occasionalisms, which are identified, predominantly contextually but also morphologically, only within the scope of science fiction, and appear in the novel *Altered Carbon*. The words and multi-word units denoting inexistent notions were carefully selected from the novel, and the ones which made their way into our everyday use were omitted from the sample, since a portion of the concepts made up by Richard Morgan has come into use during global lockdowns (*living virtual*, *virtual psychiatric counselling*, *virtual supermarkets*, *virtual interview*, *virtual practice*). Every individual entry was examined and sorted in accordance with Fauconnier and Turner’s four types of integration

networks, and assigned a value based on these distinct categories defined in the introduction, forming a corpus which shows a list of words and multi-word units restricted to this novel, as well as the integration network they belong to. The corpus was constructed for the purpose of this paper and consists of 888 items in total, which can be used in further research and expanded to show trends in the science fiction register. Corpora is nowadays used in cognitive linguistics increasingly more frequently, since corpora can provide from context a manifold of relevant data for linguists, not only with the potential of storing qualitative data, but also quantifying it, thereby enabling easier statistical analysis (Gries 2014: 280).

Additionally, as it was previously mentioned, the modern blend between the human and the machine is used in its denotative, conceptual meaning now more than ever – we have *virtual meetings*, *internet social gatherings*, *virtual tabletop games*, *online conferences and events*, and *3D museum tours* from the comfort of our homes. Technology has made an impact on the socio-cultural context of our lives, and, as such, it should bring the conceptual meaning of science fiction terms even closer to the present, as hi-tech is becoming necessary for everyday life: “Meanwhile, alien words, technobabble and other SF neologisms are increasingly being incorporated into contemporary discourse” (Shaw 2021: 2). Therefore, in each of the four conceptual integration networks defined by Fauconnier and Turner, examples of this phenomenon are selected and presented as evidence for how widespread the human/machine blend is in this work of science fiction, regardless of the complexity of the integration network.

1.3 Theoretical Framework

Since language is ever-changing, its intricacies challenge language users and researchers to constantly adapt; whether it concerns neologisms and jargon, idiolects, or something as idiosyncratic as occasionalisms, language is inseparable from thought and cognition:

Language, from a psychological perspective, is not simply an expression of human organismic capacity; rather, it is the most important symbolic mediator between developing organism, psychological subjectivity, and culturally evolving surround. It is, in my view, the adequacy with which Cognitive Linguistics addresses this dynamic, processual, relational complex that will be decisive for its lasting disciplinary contribution. (Sinha 2007: 1287)

Certain aspects of meaning had become so subtle that they were undetected even by the most proficient of speakers, and even language theorists according to Fauconnier and Turner, who state that many approaches thus far, which were predominantly analytical, were oblivious to the creativity and the imagination of the semantic construction processes, which happen at the speed of light, completely below the level of consciousness (2002: 15). Fortunately, Cognitive Linguistics provided procedures and techniques which help us keep in mind how our brains are hardwired by using a manifold of different approaches which all have the same language viewpoint and research methodologies in common: “One feature that is shared by all the approaches covered by the umbrella term ‘Cognitive Linguistics’ is that they attempt to ground language description in well-established and well-documented aspects of cognition” (Taylor, Littlemore 2014: 6).

One of the processes that Cognitive Linguistics helped clarify is *conceptual integration*, our mind’s subconscious tendency to combine, extrapolate, and hypothesize: “The essence of the operation is to construct a partial match between inputs, to project selectively from those inputs into a novel ‘blended’ mental space, which then dynamically develops emergent structure” (Fauconnier 2021). The creativity that fuels this process is explicitly obvious in examples of portmanteau words made via the process of morphological blending (1), or even puns (2), because not only do we need language comprehension, but also – basic knowledge of the context where the blends occur enable the aforementioned comprehension. Birdsell emphasized how significant background knowledge and the context of the discourse are, because they combined with the basic cognitive processes provide the reader or listener with the necessary, missing structural elements to complete the blend, like missing pieces of a puzzle (2014: 74).

(1) motel (motor + hotel), smog (smoke + fog), froyo (frozen + yogurt)

(2) What did the prescriptivist owl say? Whom whom.

(Prescriptivism advocates that language should follow strict rules, and ‘whom’ is considered as the correct form when the pronoun is used as an object.)

Nevertheless, one can easily fall into the trap of deeming the most obvious examples of conceptual blending the principal ones, or even the sole representatives. What often seems to go under the proverbial radar is the fact that blending is not merely used to create new words, when need be, or a humorous effect. Without conceptual integration we would

fail to understand many, if not most, mundane expressions, references, collocations, and even compounds. Without the ability to interconnect the files and folders of our mental lexicon, we could not even understand when a reported event took place, since we could not remove someone's account of the story from the present time and place it in a different timeframe: "Human beings go beyond merely imagining stories that run counter to the present story. We can also make connections between different stories, or more generally, between different and conflicting mental spaces" (Turner 2007: 378).

Despite the discrepancy between the available technology in 2002 and the reality imagined by Richard Morgan in *Altered Carbon*, and owing to these cognitive processes, the plethora of blends found in the sample was both imaginable and comprehensible to readers: "People pretend, imitate, lie, fantasize, deceive, delude, consider alternatives, simulate, make models, and propose hypotheses. Our species has an extraordinary ability to operate mentally on the unreal, and this ability depends on our capacity for advanced conceptual integration" (Fauconnier, Turner 2002: 217).

According to Fauconnier and Turner, and hereinafter relevantly for this study, these connections are made below the conscious level, using one of four types of *integration networks*: simplex, mirror, single-scope, and double-scope (2002: 120–135). Simplex networks have fully compatible inputs, e.g., assigning roles to values or naming, such as the type of father in (3). Here we see the compression of a role (father) and the value (whose father) into one, which makes the emergent structure seem so well-blended and renders the integration process subtle. Mirror networks seem compatible because they share a mental space and an organizing frame, but have clashes below the surface – the identified father is not actually the speaker's biological father, despite them defining him as such (4).

(3) Paul is Sally's *father*. Jesus has a mortal *father*.

(4) [to a father-figure] "You are my long-lost *father*."

Unlike them, in single- and double-scope networks, both organizing frames are different, except that in the former one mental space is used to organize the other (5), i.e., the characteristics of one input are projected onto another, thereby personifying them (someone will be taking on the role of someone's father for the day). Unlike in single-scope networks, where the entirety of one frame is projected onto another, in the latter (6) both spaces contribute certain parts to form the blend – parent as a maker combined with something that isn't living and which cannot be fathered.

- (5) “I’ll be your *father* for today.”
(6) Newton is the *father* of physics. (Fauconnier, Turner 2002: 140–145)

As it is obvious in the examples 3–6 found in Fauconnier and Turner: “Blending is not the mere addition of one existing meaning to another to get their sum. Words by themselves give very little information about the meaning they prompt us to construct” (2002: 146). The fact that a seemingly simple word like *father* can denote a variety of different meanings does indicate that the word in isolation – without context, background, or purpose – gives little insight into its true meaning in a specific context.

In contrast, nonce formations only exist with a particular meaning in a given context, and the science fiction register contains an abundance of them. We define occasionalisms as a word or a multi-word unit with a form and meaning that communicates a specific notion, a word or multi-word unit which has not been used or invented previously, and which can be seen and used in writing or speech only in a novel context over time (Igorevna 2015: 26). The fact that these constructions are necessary for the specific context, but completely redundant in everyday language (since they do not denote anything that exists) makes them an interesting research topic, albeit not too frequent: “However, precisely because they are low-frequency, there is often a lack of authentic data substantiating their use” (Ramonda 2014: 70). The context-dependence of occasionalisms in combination with the dynamic nature of cognitive blending provides clear distinctions into four categories of conceptual integration.

The process of cognitive blending, hence, happens when two different, separate *mental spaces* are merged, which by default do not go together. The aforementioned *input spaces*, which exist independently outside of the blend, are integrated into a singular *generic space*. Ungerer and Schmid give the example of the slogan for marketing a car – *Unleash a Jaguar*, which connects the domain of vehicles with the domain of wild animals and “instructs the readers to simultaneously construct two ‘mental spaces’: a ‘car’ space containing associations like powerful engine, high maximum speed, attractive design, etc.; and a ‘wild animal’ space including associations normally attributed to jaguars, such as their ferocity, speed of running, liveness and elegance” (2006: 3). The *generic space* in this blend would be observing the car as a wild cat, which prompts the *emergent structure* of a powerful, strong, fast, cat-like vehicle: “The emergent structure arises as the result of multiple projections of elements from input mental spaces onto the blended space” (Polak 2017: 33).

Another important notion mentioned in this study is *vital relations*, i.e., associations between the elements of the mental spaces which are connected within the blend (cause-effect, change, part-whole, representation, role, analogy, disanalogy, property, category, intentionality, uniqueness, time, space, identity, similarity). These elements are compressed in order to achieve one of the network types listed above by linking input mental spaces and compressing their relations inside the blend itself (Fauconnier, Turner: 92–3).

The mental spaces which contain vital relations may also have concrete *organizing frames*. Frames are categorized structures that consist of all the meaning units with a mutual connection: “Conceptual categories are not only linked in memory with attributes associated with the category members, but also embedded in a huge conceptual network of more or less firmly stored knowledge structures” (Schmid, Ungerer 2011: 613). These frames help better understand the nature of the blend by specifying the nature of the pertaining activities, events, participants, and agents within the organizing frame (Fauconnier, Turner: 104) and are particularly important for the single-scope integration network type.

Since it is our job to scrutinize language phenomena, we must, therefore, backtrack our cognitive processes in search for the *modus operandi* of conceptual integration: “Because we have no awareness of the imaginative work we have done, we hardly even recognize that there was a problem to be solved” (Fauconnier, Turner: 12).

There have been few studies which dealt with the nature of language invented by science fiction writers. Some explore language typology (Shaw 2021), descriptive grammar of invented languages as a whole (Adams 2011), or stylistics (Mandala 2010). None of them, however, scrutinized the conceptual integrations hidden within, especially not through the prism of Fauconnier and Turner’s integration network types, nor did they explore the language of *Altered Carbon*, which has been mostly of interest for literature studies, despite its potential for the exploration of nonce constructions.

2. Research results

After an overview of statistical data in order from most to least abundant in quantity, this section shall cover each integration network, in order

published by Fauconnier and Turner (from simplex, mirror, to single-scope, and ultimately double-scope), alongside several of their most representative examples (and some of the collocations and compounds they produced) extracted from this corpus. Special focus will be placed in each section on those items containing the conceptual meaning which blends the human and the technological, and the integration network they belong to shall be explained in more detail in these particular examples.

Out of the mentioned 888 items in the corpus, it was discovered that there were 422 instances of double-scope networks, which constitute almost half of the sample – 47.5%. The following most numerous network was simplex, with 315 occurrences comprising just over a third (35.5%) of the sample. It is followed by the single-scope network at 15.5%, i.e., 138 cases. The smallest number of entries belonged to the mirror network – only 13 examples making up 1.5% total.

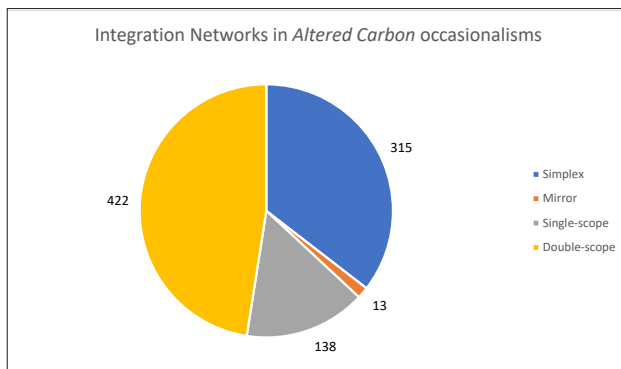


Figure 1: Altered Carbon Occasionalisms: Data Pie Chart

2.1 Simplex

The first integration network type we defined was the *simplex* network, which was shown to be the second most abundant. As explained hitherto, this type has multiple common functions, such as assigning values to roles and naming, which are also visible in the sample. The corpus has a manifold of unique names – of institutions and known locations in the universe (7), science and arts (8), plants and animals (9), weapons (10), and even chemical substances and materials (11), all depicting the simplex network. Aside from the proper nouns and collocations including them,

we also see idiosyncratic collocations which are either unique in the given semantic context, or present an unusual word choice (12). In all the listed examples, to somebody who knows the context these specifications would be as seamless as the previously listed example ‘Sally’s father’. Namely, if we mentioned the inexistent Glimmer System to somebody from the novel’s setting, they would be able to identify which planetary system we are referring to, as opposed to, e.g., the Solar System. They would also be able to conjure up a mental image of a swamp panther, or illuminium, and have attitudes based on someone’s political identification as a Quellist (in-context similar to a disestablishmentarian, or a rebel) or an Envoy, whose characteristics they possess (their wisdom or reflexes). Therefore, all of the constructions below assign values to roles, as simplex networks should.

- (7) Envoy Corps (military unit), Harlan’s World (a planet), Glimmer System
- (8) Empathist work (art movement), Quellist philosopher (anti-eternal life philosopher)
- (9) Songspire tree, bellaweed, mirrorwood, martyrweed, swamp panther (all types of plants and animals unknown to us)
- (10) Philips squeeze gun, plasma gun, frag rifle, shard gun (weapons that shoot special ammunition)
- (11) Tetrameth, betathanatine (both psychoactive substances), illuminium (type of metal)
- (12) Envoy intuition/wisdom (traits belonging to an Envoy)

Interestingly and similarly to Fauconnier and Turner’s example, in certain contexts simplex networks also specify what might in others seem redundant. In a religious surrounding, the example “mortal father” (Fauconnier, Turner 2002: 141) is essential for comprehension, much like certain specifications are required in a science-fiction setting (13). By the same token, the structure consisting of modifiers in front of newly-coined nouns also falls under the umbrella of simplex networks, despite the fact that those nouns themselves might belong to a different integration network entirely (14). In the stated example, both nouns in *italics* fall under the double-scope network domain, but by inserting a modifier in front of them, which serves the purpose of assigning values, the author changed the relationship between the constituents.

- (13) Real Death (after which you cannot be reincarnated, as opposed to *sleeve death*), ground car (the only type of car people can own outside of a sci-fi setting)
- (14) Direct *needlecast* (method of transferring your consciousness to another body), military/cheap *neurachem* (specifies the type of upgrade to the nervous system)

In spite of the fact that in the simplex network there are no clashes between the domains, and therefore the humane cannot clash with the technological, there are still occurrences where the constituents themselves contain both human and machine in one notion (15). In the first example, we see the typical representation of the simplex network – X is the Y of Z, whereby the noun *fear*, an inherent characteristic of living beings, is assigned an identifying component – *of sleeving*, which is the process of changing the denotational casing in which our consciousness is stored, i.e., the physical body. Therefore, it is an optimal example for the conceptual meaning sought after in this paper. The following two examples in (15) also denote the same phenomenon, where Richard Morgan blended the organic (*vision, enzyme*) with artificial. *Neurachemically speeded vision* is indeed an identification of a certain type of vision, which assigns the item to the simplex network, but it also supports the recurring conceptual meaning of technologically augmented humans.

- (15) Fear of sleeving, neurachem-speeded vision, enzyme-triggered explosive

2.2 Mirror

The smallest group in the corpus was shown to be the *mirror* network, with as few as 13 occurrences, which is characterized by the constituents sharing a mental space. Since there are no visible clashes of meaning on the surface, this network has a subtle variable which compresses one of the vital conceptual relations in the perceived occasionalism. Some compress the spatial relation, so in the following example (16) the common noun *colony* in *colony years* does not refer to a country or a territory, but rather the entire planet, but otherwise the organizing frame is the same. Likewise, there are examples in which we find certain analogy or disanalogy with notions that are not within the scope of occasionalisms. Some of them have the exact same structure as existing terms, but the clash is even less conspicuous.

Despite the first impression, they do not refer to a single country serving the role of protector, but rather an interplanetary organization protecting entire planets or systems (17), or to an advertisement broadcast loudly in the middle of the street, but instead projected directly into a person's head and consciousness (18) – however, the organizing frame remains.

The majority of examples from this sample, however, compress the relation of time (19), since the characters (particularly richer ones) are given the option of eternal life through countless incarnations. Despite this being the least abundant network in our sample, even here the conceptual meaning of human + technology is evident in the majority of entries. What would otherwise belong to the simplex network (30 years of marriage, etc.), due to the clash in our cognition within the scope of time, is attributed to the mirror network. The examples denote technology increasing the quantity of human experience, giving people a machine-like longevity. Substantiating this denotation, there are few examples that portray a science-fiction equivalent to a mundane collocation or expression, such as *mind and body* (20). Owing to technology, our minds are transformed into denotational stacks, and our bodies become casings.

- (16) Colony years (a colony can be an entire planet)
- (17) Protectorate forces, Protectorate generals (not a country, but an organization performing the same function)
- (18) Street [broad]cast advertisement (advertisement broadcast in the street, but into a person's consciousness directly)
- (19) 250 years of marriage, 200-year dislocation, 61 children, [his] three and a half centuries, eleventh body (all numbers unreachable by ordinary human beings)
- (20) Stack and sleeve (*mind and body*)

2.3 Single-scope

Single-scope network is the third most frequent network (15.5%) and it is used for source-target metaphors when one frame takes over for the second, differing frame. In spite of comprising less than a fifth of our sample, quite a few examples are recurring, and extremely productive. One of the blends is the name of a narcotic – *Reaper*. The word in itself presents an example of conceptual integration: “The Grim Reaper resides in the blend but cannot reside in any of the input spaces” (Fauconnier, Turner 2002: 293),

but here the writer took the existing concocted frame, and projected its qualities to a drug which induces near-death experiences by slowing down organic functions almost to a halt. This is also an example how an initial double-scope blend such as the Grim Reaper can be used as grounds for a single-scope network, despite it not being the most productive (21).

Single-scope networks in the sample also showed cases of frames used typically for other living organisms being projected onto people. Such is the case with *tank*, where people are kept, grown, and nurtured, much like other species, such as fish, or reptiles (22).

- (21) Reaper, riding the Reaper, Reaper cocktail (a psychoactive sedative)
- (22) Tank grown, tank nutrients, waiting tank, tank flesh (Used for describing organic bodies without a mind or a chip containing human consciousness, which are grown for the purposes of being used as a spare, in case the main one gets damaged.)

We shall see that the double-scope network frequently portrays blurred distinctions between people and objects due to the mix of its separate frames, but the single-scope network often tends to project qualities of physical objects (from one frame) onto people (the other frame). One of those occurrences is *storage*. All the collocations and compounds might exist outside of this particular context, except that the frame of *storage* has a modified purpose – from being used for objects to being used for keeping chips with human consciousness in it. It is even used as a kind of prison, or a punishment for certain crimes, where the individual is just removed from the world and detained without a physical body, like in a deep sleep (23). In addition to this, we notice a second example of using a physical object to mold humanity – the most important occurrence of *stack* may fall under the domain of double-scope networks (the name of the chip that holds an individual's consciousness and personality), but since it is also used in the novel for storing data, this method used in computing is also applied to create the blend (24).

- (23) Storage, storage facility, monitored police storage, re-storage (places where human consciousness is stored, either by police or themselves voluntarily)
- (24) Entertainment stack, on/off stack, colonial stack, central data stack (Computer servers where information is stored, or which serve a specific purpose.)

Since the denotational cross between humans and technology is scrutinized in this paper, it is important to note how the nature of this network (where one frame is used to organize the other) limits us to either human characteristics being projected onto machines, or machine features being attributed to humans. The only case of the former is seen below, where a human concept such as a memory of events is personalized in an artificial intelligence hotel (25). However, the latter was proven more productive in our sample. One of the cases of this conceptual meaning is *freight*, except that under the umbrella of single-scope networks in this novel, it is usually used in the form of a verb to refer to the act of the human personality being transmitted into the consciousness chip (26). Interestingly, one of the most numerous instances is the word *sleeve*, where the author transplanted the notion of sleeves being the container of an item important enough to require protection, and used it in a science-fiction context. Here, it refers to the physical body in which our consciousness is placed, or re-placed, or misplaced, as well as the qualities of that temporary body, and verbs surrounding the process (27). In these occurrences, the mental space of a disposable sleeve (a word often used in collocation with pieces of technology that it contains) is projected onto a human and organizes the frame for the blend. This objectification of the human body enables the fictional humans to live longer, replacing their parts as if they were a machine, and, ultimately, achieving the conceptual meaning of the blend we took interest in.

- (25) Hotel's memory (the entirety of the hotel is run by one AI)
- (26) Freight, re-freighted, freighted off (the process of transferring consciousness)
- (27) Newly sleeved, synthetic/artificial sleeves, re-sleeving, spare sleeve, sleeve transporter, alternate sleeves, temporary re-sleeve, sleeve adjustment

2.4 Double-scope

Lastly, the double-scope integration network, which boasts the largest quantity of items, encompasses instances that take inputs from both frames in order to create a blend. What is interesting is that all examples listed below are, as predicted, a manifestation of the conceptual overlap between humans and machines. They combine features from the domain

of technology with those taken from living creatures in order to create a separate mental space from the amalgamation.

As mentioned in the previous section, *stack* is often seen in an IT context, but it is also part of the blend that signifies the object where the human consciousness is stored, which is surgically inserted into a body, and therefore can be removed and kept for any amount of time. Our brains are transmuted into microchips, denoting a perfect blend of living and technological (28). Likewise, a near-synonym would be a *digital human*, so the following examples include some (but not all) variations of our computerized backup equivalents in *Altered Carbon* (29).

- (28) Cortical stack, stack incision (the universal consciousness chip all humans have), stacked ancestors (ancestors whose bodies are not alive, but their consciousness is), holding stack (police detainment for chips), stacks on ice (chips which are without a body for some reason)
- (29) Digital Human Freight (DHF), freighted minds, digitized minds, digitizing humans, DHF soldiers, digitized rich folks (backed-up humans)

In the section about simplex networks, examples *direct needlecass* and *military neurachem* were mentioned. Much alike our Grim Reaper example, these simplex networks contain another, different integration network, and in both cases, it is the double-scope. The former refers to downloading the digital consciousness and its backups and updates remotely and wirelessly (30), and the latter to technology used to artificially improve the human capabilities (31).

- (30) Needlecass download, hyperspacial/interstellar needlecass, buy a needlecass, needlecass authorization, update needlecass (consciousness download, backup, and update)
- (31) Neurachemical upgrade, neurachemically alert/wired, neurachem system, neurachem brain, neurachem glitch (neurological and physical augmentation)

Since artificial improvement was just mentioned, it is worthy of emphasizing that a significant number of blends denotes the domains of technology and the human body in such a way that the purpose of the blend is to manifest certain upgrades of human physique and abilities in a biotechnological way, or vice versa – the upgrades of technology in a biological way (32). This

directly links back to previous examples of human and machine features being projected onto each other withing the single-scope network (25–27), except that within this network, those features are combined rather than projected. Our fictional augments are the epitome of the conceptual human-machine meaning.

Sleeves were noted as one of the most abundant examples of the previously described integration network. However, they are also one of the most productive double-scope mechanisms, involving our single-scope blend, where human bodies (sleeves) are considered disposable, in combination with economy, transactions, gender, etc., all portraying humans as commodities, objects, or machines (33).

- (32) Implanted knowledge, retinal watch, internal mike/hardware, augmented vision, canine-augmented nostrils, recording implants, carbon-reinforced tendons, marrow alloy bones, synaptic chemical amplifiers (technological body modifications which improve human performance)
- (33) Sleeve lease, black market sleeve, sleeve mortgage, double/cross-sleeved, sleeve policy, sleeve dealers, renting a sleeve, SleeveMart, untenanted sleeves, sleeve tenant (all referring to empty bodies without a consciousness, or even after they are inhabited, as a synonym for a body)

Lastly, a significant number of blends fused technology with sex, which is one of the areas of life where conceptual integration occurs frequently, even outside of our corpus: “The world’s literatures explore the febrile and exquisite sophistications of mental sexual fantasies and their grave consequences in reality” (Fauconnier, Turner 2002: 28). The author used technology to project these double-scope blends as the future of sex work (34). In four final instances below, sexual intercourse is combined with engineering to denote our mixture of technology with one of the most basic biological functions.

- (34) holoporn, holoporn comic (referring to holograms), biocabins (locations similar to cubicles where real sex workers are employed), biocabin whore, aerial whorehouse, virtual brothel, AI whorehouse, virtual whorehouse (locations where virtual sex workers are employed), multiple copy sex (relations with multiple copies of the same person’s consciousness in several sleeves)

3. Conclusion

The aim of the study was to examine and quantify integration network types of nonce formations within the novel *Altered Carbon*. Likewise, another aspect of research was the socio-cultural blend between humans and technology in the science fiction context, and proving the frequency with which it appears. Our corpus analysis confirms the hypotheses: first of all, blending in science fiction does indeed yield numerous manifestations of conceptual meaning that denote an overlap between humanity and machinery within every one of the four integration network types. In the simplex and mirror types, this relation is subtle, noticeable only if we are aware of the context which clarifies there are human and technological elements present in the blend (*fear of sleeving, enzyme-triggered explosive*), or if we inspect the difference between the sample and the human experience (*250 years of marriage*). In the single-scope integration network, an additional organizing frame is introduced, and either the machine is organized by the aspect of humanity (*hotel's memory*), or the living being is changed, augmented, and adapted so that it gains some machine-like features (*re-freighted, re-sleeving*). The double-scope blends epitomize the merge between human and technology by combining elements of both and integrating them. These notions are not merely one organized by the other, but rather interreact to the extent that the resulting structure is in equal parts both biological and technological (*cortical stack, retinal watch, carbon-reinforced tendons*).

Secondly, it was proven that the double-scope network is the most plentiful, due to the mentioned presumption that science fiction is expected to produce novel expressions, and therefore must combine parts of existing entry frames. The simplex network is the runner-up, presumably owing to a simple relation between the constituents of assigning role-value and organizing identity. We have also shown that single-scope blends are far from uncommon in the sample, unlike the mirror integration network, assuming due to the nature of the corpus i.e., the imminent clashes between the frames at a far more conspicuous level than the mirror integration network offers.

These results demonstrate that when engaging in writing science fiction and coining new words, Richard Morgan most frequently uses the process of combining two input spaces to produce a blend, particularly those two input spaces that contain denotational meanings of human and

technology. This investigation could be further expanded to encompass other science fiction writers, implying a trend in the genre as an entirety, as well as discovering how the genre followed the developmental tendencies in the English language. Furthermore, exploring nonce formations, which are essential for the genre, may shed light on the processes behind constructing them, thereby helping both readers' creativity when it comes to understanding them, and writers' creativity for their future coinages.

The development of technology will show us exactly which of these occasionalisms might in the future turn into neologisms, since already a portion of Richard Morgan's coinages became reality over the course of these two decades. Therefore, it would be beneficial for future research to investigate the sample from a lexicological perspective, creating a gradient in order to clarify those language items which are considered neologisms now, which signify notions that are still within the scope of science fiction, and therefore still inexistent, and which signify concepts that have been invented and given a different name: "Although all vocabularies constantly expand to keep pace with technological developments, the process is generally taken for granted" (Adams 2011: 198). The potential status of these words and multi-word units changing from occasionalism to neologism over the twenty-year period between the novel's publishing and now would help us gain proof of the creativity behind the author's processes, and determine which integration network was most applied in those items which made it into everyday use. Those results could imply quality of the emergent meaning, or at the very least, its transparency, which could help us further separate the applicability of each integration network in everyday language use.

Additionally, a corpus analysis of nonce words and multi-word units from *Altered Carbon* as well as its sequels might yield interesting results: by determining the frequency of repetition of occasionalisms found in *Altered Carbon* in its sequels, we could determine their productivity, and then compare it back to the sample from each integration network, in order to specify the potential of every network type in this context.

Evidently, there is an abundance of potential research topics for cognitive linguists involving our sample, and this subconscious operation. Nevertheless, what comes to mind is the famous Dalí-meets-Freud dilemma: if one is aware and actively scrutinizing an aspect of cognition, does that mean it can no longer be deemed subconscious? Does that bring danger to unearthing the omnipresence of blending, since it might make us overthink

and therefore impede the most basic cognitive processes? Fauconnier and Turner did not seem to concern themselves with such anxious thoughts. Rather, it is our job as linguists to explore the unexplored, even if it sometimes means delving into the still-inexistent language of science fiction. However, considering the speed of technological advancement, the time might come soon when even the blends in this paper no longer signify occasionalisms, but rather concepts which made their way into everyday language. This gives the science fiction writer an almost prophetic attribute, whereas the fantasy behind the conceptual integration accurately predicted the course of technology in the future: “It is not just the blends that can be fantastic. Real life, from a certain point of view, can be fantastic, too” (Fauconnier, Turner 2002: 51).

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