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FEATURE ARTICLE

*Analogic and Metaphoric Mapping in Blended Spaces:
Menendez Brothers Virus*

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Analogic and Metaphoric Mapping in Blended Spaces: Menendez Brothers Virus

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Abstract: This paper concerns the interaction of frame semantics and the use of blended spaces (Fauconnier & Turner, 1994) in the meaning construction invoked to understand a joke about a computer virus which shares certain properties with Erik and Lyle Menendez. We suggest that the purpose of the analogical mappings in the virus joke is to highlight one particular construal of the controversial source domain and discuss how this occurs. Mechanisms include: (i) the importation of one particular framing of the source domain into the blended space; and (ii) the projection of structure from a well-developed blended space back onto the source. We argue that there is nothing inherent to the process of analogical mapping which mandates mapping from the source to the target, and suggest that the traditional emphasis on source to target mappings is a by-product of standard examples of analogy and metaphor. The analysis of the Menendez Brothers Virus joke suggests how the conceptual integration which occurs in blended spaces can afford the linguistic representation of a dynamic conceptual system.

MENENDEZ BROTHERS VIRUS: Eliminates your files, takes the disk space they previously occupied, and then claims that it was a victim of physical and sexual abuse on the part of the files it erased.

1. Introduction

This description of the Menendez Brothers Virus (MBV) is a joke which relies upon the reader's knowledge of the trial of Erik and Lyle Menendez, two young men who confessed to murdering their parents. The case achieved a certain degree of notoriety due to the brothers' legal defense in which they claimed that their parents had repeatedly abused them both physically and sexually since childhood, and, moreover, that their actions against their unarmed parents were motivated by self-defense. One way of explaining the process of meaning construction in the MBV joke is as a metaphoric or analogical mapping of the event scenario associated with the Menendez Brothers' trial onto the domain of computer viruses.

American culture members with even passing familiarity with the Menendez Brothers' affair will intuitively note the parallels which exist between the actions of the Menendez Brothers Virus and those of Erik and Lyle Menendez. The Menendez Virus erases files, whereas the Menendez brothers killed their parents; the Menendez virus takes disk space once occupied by the erased files, whereas the Menendez brothers acquired their parents' 15 million dollar mansion; and, finally, the Menendez Virus claims to be the victim of physical and sexual abuse perpetrated by the erased files, whereas the Menendez brothers pleaded self-defense motivated by years of physical and sexual abuse on the part of their murdered parents.

The target domain of computer viruses thus shares a system of relations with the source domain of the Menendez brothers. Moreover, objects in the target have been placed into correspondence with objects in the source, based on similar roles in their shared relational structure. However, it is clear that whatever else it might be doing, the mapping in the Menendez Brothers Virus example does not elucidate the target domain by leading to productive inferences about computer viruses. If anything, it leads to fallacious inferences about the target domain. What then is the purpose of the analogical mapping done in the MBV joke?

We argue that this puzzle stems from limitations in the current conception of analogical mapping. These include:

(i) the idea that analogical mapping is one-way: from source to target; and,

(ii) underestimation of the importance of frame semantics, especially the role of alternative construals of the same objective scenario.

Further, we point to an alternative account of analogical mapping which involves the construction of blended spaces (Fauconnier & Turner, 1994). Below we discuss the interaction of frame semantics and the use of blended spaces in the Menendez Brothers Virus joke. What follows is a short discussion of the nature of blended spaces, and a demonstration of the use of blended spaces in the meaning construction process invoked to understand the joke. We then contrast the blended space account with more traditional accounts of analogical mapping and explore the implications of blending for conceptual structure and analogical mapping.

2. Computer Viruses and Blended Spaces

2.1 Mental Spaces

Mental space theory (Fauconnier, 1994) is a theory of meaning construction which crucially involves partitioning the representation of sentence meaning into domains or spaces. Although motivated by linguistic data, mental spaces are not specifically linguistic in nature. Rather, they reflect the operation of more general cognitive processes. Mental spaces can be thought of as partial possible worlds which speakers construct when talking about the entities and relations of perceived, imagined, or otherwise hypothetical worlds. Spaces are created to handle discourse which concerns people's beliefs, hopes, fears, desires, past, and future, and can be thought of as containers for information about their particular domain.

Although the discourse as a whole may contain contradictory information, each space functions as a distinct and logically coherent knowledge base. For example, partitioning a statement like 'Six months ago Julio was in perfect health, but now he's on the brink of death' would start by dividing its information into two spaces: one for six months ago and one for the present (base) time. Each space is internally coherent and together they function to represent all of the information contained in the sentence. In contrast to traditional approaches to meaning construction, the bulk of the cognitive work involves mappings and correspondences between domains rather than the derivation of a logical representation of sentence meaning.

2.2 Blended Spaces

Fauconnier and Turner (1994) suggest that metaphoric mappings are one manifestation of a more general mapping process which crucially involves the construction of blended spaces. Blended spaces are mental spaces (Fauconnier, 1994) which are built up on-line in order to incorporate elements from both generic frames and local contextual information. Because blended spaces can contain elements from a number of different domains, they often have a rich counterfactual feel to them. Although the structure of blended spaces contains information which would be inconsistent if incorporated into other spaces, blended spaces are internally consistent.

One example of a concept which results from a conceptual blend (Fauconnier & Turner, to appear) is that of the computer virus itself. Computer viruses are programs written for the express purpose of damaging other people's computational resources. The way a virus works is to attach itself to another

program where it replicates and spreads to other programs. Although some viruses are relatively benign, interrupting processes and printing humorous messages to the user's screen, others are designed to destroy data and/or cause harm to the system.

As in conventional accounts of analogical mapping, counterparts map to distinct elements whose attributes are licensed by the structure of the inputs. For example, in the case of the computer virus, particular programs in the domain of computers are picked out as counterparts to viruses in the health domain. Moreover, the choice of counterparts is not arbitrary, but motivated by each element's role in abstract structural schemas. Fauconnier and Turner (to appear) note the generic schema common to both the computer virus and its biological counterpart. This is represented schematically below:

Invades (virus, host)
 Infects (virus, host)
 Unwanted (virus)
 Replicates (virus)
 Resources-used (Belong-to (host))
 Results ((More (viruses)) &
 (Diminished-capacity (host)))

The existence of integrated schemas which can be abstracted from both domains enables us to map elements from both source and target domains into the blended space. Schemas from the health domain of biological viruses are projected from the source space into the blend. Meanwhile, elements from the target space are projected into the blend in order to fill the slots of the virus schema.

Although the mapping which occurs is *systematic*, it is not *comprehensive*. There are many aspects of the health domain conceptualization of viruses which are not mapped into the domain of computer viruses. Further, although the blend receives only selected structure from its input spaces, the resultant blend can contain structure which was not present in either of the inputs. Properties unique to the blend emerge when background knowledge is activated in order to provide a coherent blending of projected aspects of the inputs. The resultant blend contains both more and less structure than the inputs: less, because only selected structure in the inputs is projected into the blend, and more, because the overall blend can contain novel structure which is unavailable from the inputs (Fauconnier & Turner, 1994).

3. Blended Spaces and the Menendez Brothers Virus

Earlier we noted the intuitive parallels between the actions of the Menendez Brothers Virus and those of the real Menendez brothers. However, in this section we discuss the mapping in terms of blended spaces in more detail. The chart below lists the named elements in the source domain of the Menendez brothers and their corresponding elements in the target domain of the computer viruses. To say this is just to say that in the domain of the Menendez brothers' affair, three salient elements were the brothers, their parents, and the Menendez family's property. Similarly, in the target domain of computer viruses, common elements include viruses, affected files, and disk space.

Source	Target
<i>Elements</i>	<i>Elements</i>
a • Menendez Brothers	a' • Computer Virus
b • Mr. & Mrs. Menendez	b' • Affected Files
c • Property	c' • Disk Space

As in conventional accounts, (e.g. Gick & Holyoak, 1980; 1983; Holland et al. 1986), the blended spaces account of analogical mapping includes a *generic*, or schematic, space which is structured by the abstract relational schemas common to both source and target spaces. In the case of the Menendez Brothers Virus, the generic space would contain the following information:

Generic
<i>Elements</i>
a" • Agent
b" • Patients
c" • Transferred Entity
<i>Relations</i>
Eliminates (a", b")
Takes (a", c")
Previously Occupied (b", c")

Given the existence of a shared relational schema a fourth space may be set up in which blending of the two input domains may occur. The blended space contains elements linked to counterparts in the other spaces:

Blend

Elements

- aa • Menendez Brother Virus
- bb • Affected Files
- cc • Disk Space

Note that the blended counterpart of a and a' is not just an abstract computer virus, but a particular virus named the Menendez Brothers Virus. Because the Menendez Brothers Virus (aa) is linked to the Menendez brothers (a) in the source domain, the computer virus (a') in the target domain, and the agent (a'') in the generic domain, it can inherit properties from any of these spaces. Moreover, the correspondence between the relational structures in the source and target spaces – the same correspondences which structure the generic space – are used to import structure from the target space into the blended space.

The following chart (next page, top) lists the corresponding relations which exist between elements in each of the four spaces. We have tried to employ predicates which are most appropriate to the domain in question. For example, the term *kill* is used to refer to the social source domain, while the term *erase* is used to refer to the technical target. However, the language user is not similarly constrained. Once elements in two or more domains have been linked, the access principle (Fauconnier, 1994) can be invoked to refer to corresponding elements in either of those domains. Similarly, predicates which are customarily associated with one particular domain can be applied to refer to counterpart relations in linked domains.

It is important to note that, out of the context of the joke, the predicates which have been equated involve quite disparate concepts. Objectively, killing people and erasing files have almost nothing in common. Acquiring property and taking disk space are markedly distinct actions. Moreover, the concept of property ownership in the social source is a very different thing from occupying disk space in the technical target. However, once the context of the joke has been set up, linking the disparate properties in the social source and the technical target proceeds quite naturally.

The text of the joke utilizes terms from the generic domain (*viz. eliminates, takes, occupied*) perhaps to facilitate mapping from the input domains into the blended space. The blended space itself concerns the Menendez Brothers computer virus and is structured

Source	Blend	Generic	Target
<i>Relations</i>	<i>Relations</i>	<i>Relations</i>	<i>Relations</i>
Kill (a, b)	Erases (aa, bb)	Eliminates (a", b")	Erases (a', b')
Acquire (a, c)	Takes (aa, cc)	Takes (a", c")	Takes (a', c')
Owned-previously (c, b)	Occupied-prev. (cc, bb)	Occupied-prev. (c", b")	Occupied-prev. (c', b')

by schemas from the target domain (viz. erasing files, taking over disk space) which are shared by counterparts in the other spaces. Moreover, the existence of links between the source and the blended spaces also enables the importation of structure from the source which has no counterpart in the target. The blended spaces framework is unique in its capacity to explain asymmetric projections which occur in the MBV joke.

In the chart below, we can see the projection of an entire event scenario from the source domain of the Menendez brothers' murder trial into the imaginary scenario associated with the blended space. Because the event is extended in time, the representation of the source domain includes three mental spaces: one for each of the relevant time periods.

Source	Blend
<i>Event Scenarios</i>	<i>Event Scenarios</i>
<u>T₀ < T₁ < T₂</u>	<u>T₀ < T₁ < T₂</u>
Base T ₂	Base T ₂
• a	• aa
Accused (a)	Accused (aa)
Claim T ₀	Claim T ₀
• a	• aa
• b	• bb
<i>Relations</i>	<i>Relations</i>
Abused (b, a)	Abused (bb, aa)
Victim (a)	Victim (a)
T ₁	T ₁
• a	• aa
• b	• bb
Killed (a, b)	Erased (aa, bb)

Each of the underlined time steps in the above

chart (T₀, T₁, and T₂) represents a mental space. The base space in the source domain is the time at which the Menendez brothers have been accused of murder (T₂). At this time they offer a claim about the events of their childhood. The content of this claim is represented in the structure of the claim space which occurs at T₀. Moreover, the content of the claim space is offered as an explanation of the murder of Mr. and Mrs. Menendez, which occurred at T₁: *after* the purported child abuse and *before* the accusation of murder. The entirety of this event scenario gets mapped into the blended domain. Because the target domain contains a counterpart relation for *killed*, *killed* maps onto *erased* in the blend. However, because there are no target counterparts for the *abuse* and *victim* predicates, these schemas are mapped directly into the blend, their slots filled by elements in the blended domain. The result is a blend in which the contribution of the inputs is particularly asymmetric.

Partial structures from the source and from the target have been integrated into a single structure in the blended domain. The blended space omits many salient aspects of both the source and the target domains. In particular, the familial relationship between the murderers and their victims was not imported into the blend. However, blending results in the local creation of a new concept of the computer virus. In this blended joke space, computer viruses can make excuses for their behavior -- something which neither biological nor computer viruses ever do!

Further, the blended joke space motivates humor which is absent in both the source and the target input spaces. This exemplifies the point made by Fauconnier and Turner (1994) that one function of blended spaces is to enable different emotional responses to a given scenario. One might surmise that the humorous nature of the MBV joke is the result of linking disparate domains in the blended space. However, we argue below that the humorous nature of the MBV joke goes beyond the mere juxtaposition of disparate concepts. Rather, humor results from the way in which the fantastic world of

the blended space accentuates a particular framing of the source domain in which the mitigating claims of the Menendez Brothers appear ridiculous.

4. MBV and Conventional Accounts of Mapping

4.1 Conventional Accounts

Conventional accounts of analogical mapping involve knowledge mapped from a relatively well-understood source domain onto a less well-understood target domain (see e.g. Gentner, 1980-90; Gick and Holyoak, 1980, 1983; Holland et al. 1986; Holyoak, 1985; Lakoff & Johnson, 1980; Lakoff, 1986). Mapping involves first, noticing a shared system of relations which hold in both source and target domains; and, second, placing objects from the two domains into correspondence with one another, based on common roles in the shared relational structure. In this way, reasoners can begin with a partial mapping of components which play similar roles, and later extend the mapping in order to import novel inferences from the source domain to the target.

Lakoff (Lakoff and Johnson, 1980; Lakoff, 1986) has demonstrated the generative capacity which these sorts of metaphoric mappings entail for language. Early work pointed to the pervasive and systematic nature of entrenched metaphoric mappings in everyday language, while later work has focused on the identification of idealized cognitive models (ICMs) which are mapped from the source domain to the target and the role which these ICMs play in reasoning about the target domain. Mapping is generative because linguistic constructions (lexical items, syntactic constructions, idiomatic expressions, etc.) used to describe the source domain can also be imported to describe the target domain. Moreover, inferences generated by schemas in the source domain can, after mapping, be generated by shared schemas in the target domain.

A key emphasis in mapping research, then, involves the implications which conceptual structure in the source domain have for the way in which the target domain will be conceptualized. Analogical or metaphoric mapping is chiefly done to structure a less well-understood target domain by importing schemas from a better-understood source domain. Occasionally, however, mapping is done purely to highlight a schema which is shared by both the source and the target domains.

Gentner, for example, contrasts *pure matching*, mapping which occurs when the learner has knowledge of both domains, to *pure carryover*,

mapping which occurs when the learner is quite familiar with the source domain, but has little knowledge of the target. In carry-over, mapping systems of relations from the source to the target serves to produce novel information about the target domain. In pure matching, analogical mapping serves only to focus attention on the matching systems rather than to convey new knowledge.

4.2 Menendez Brothers Virus

However, the nature of the analogical mapping in the Menendez Brothers Virus is such that it undermines the distinction between matching and carry-over analogies. The point of mapping in the MBV example is neither to produce novel information about the target domain, nor to point to pre-existing similarities between the source and the target. Rather, the purpose of the mappings employed in computer virus jokes is to highlight a particular construal of the *source* domain. This occurs in two ways: first, by importing one particular framing of the source domain into the blended domain; and, second, by projecting structure from a well-developed blended domain back onto the source.

The blended joke space imports a framing of the source domain which accentuates the degree to which the Menendez brothers profited from their actions. Recall that the framing of the (real) Menendez brothers' actions in the source space was itself quite controversial. Besides being televised on Court TV, the brothers' trial was the subject of countless news reports, several books, and no less than three made-for-TV movies. Moreover, the outcome of the trial was a hung jury. At the center of the controversy was the issue of who played the role of the evil agents, and who the role of innocent victims. Below we sketch two contrasting framings of the Menendez brothers' affair: the first is labeled the conspiracy framing, the second is dubbed the victim framing.

Conspiracy Framing

Brothers plan to acquire parents' possessions by committing homicide.
Brothers shoot parents and inherit their possessions.
When arrested, claim long-term physical and sexual abuse as a mitigating factor.

Victim Framing

Kitty and Jose Menendez physically, sexually, and psychologically abuse their two sons.
Brothers sense imminent escalation of parents' abuse.
Brothers shoot parents in self-defense.

In order to further appreciate the extent to which the Menendez Brothers Virus joke involves a controversial framing of the source domain, one need

only contrast the sequence of events stated explicitly in the joke with other possible sequences, given the same sort of mapping. The sequence in the MBV joke involves:

- (i) Elimination of files
- (ii) Taking of disk space
- (iii) Claim of physical and sexual abuse.

However, consider the following alternative 'joke' which employs a different mapping of relations from the source.

MENENDEZ BROTHERS VIRUS DOPPEL-GANGER: Suffers for many years of physical and sexual abuse from the .com files on your hard drive; finally decides to get revenge and escape abuse by deleting the offending files.

Whereas in the original MBV scenario, the "claim" is an excuse whose validity was questionable, the same claim in the MBVD scenario serves as a justification whose validity is taken for granted. In the MBV scenario, the brothers themselves are framed in an agentive manner as agents motivated by greed. By contrast, the MBVD scenario frames the Menendez brothers as victims of their circumstances, motivated by fear, revenge, and/or self-defense.

Thus the original joke relies upon the conspiracy framing of the source domain in which the Menendez brothers are (agentive) greedy conspirators in pursuit of their parents' multi-million dollar home and attendant riches. Moreover, this framing of the source space is reinforced in the joke space by background knowledge imported from the target domain. Computer viruses are customarily construed as agentive and never as victims. Moreover, the suggestion that a computer virus could be the victim of physical and/or sexual abuse is patently absurd. The absurdity of the claim in the target domain thus reinforces the framing of the claim in the source domain as a highly questionable excuse.

Although the initial structuring of the blended space was quite consonant with the target domain of computer viruses (viruses often delete files, occupy disk space, and even have colorful names¹ such as

the Menendez Brothers Virus), the structure contributed by the social source domain is incoherent with respect to the technical target. The mapping in this instance cannot be said to structure the target domain. Nor can it be said to point to pre-existing similarities between the source and the target. While one might sensibly argue that the sequence of elimination of files/parents and subsequent confiscation of disk space/property is a pre-existing similarity, it is much harder to maintain the same for the virus's/brothers' claim of physical and sexual abuse.

The notion of an abused computer virus (in the sense intended) is incoherent in the target domain, and fantastic in the blended domain. The possibility of an abused virus arises only in the blended space where it enjoys a short-lived existence, confined to local purposes, forever forbidden access to the target domain of real computer viruses. However, its access is *not* similarly forbidden to the source domain. In particular, the inference that the virus's claim is ridiculous and false gets transferred *back* to the source domain where it triggers a similar inference for the MBV's source counterparts.

At this point, one might question why the MBVD joke, which imports the Victim Framing into the blend, does not project the construal of the Menendez brothers as innocent victims back onto the source. This is because the coherence of the blended domain ultimately depends upon how well the particular framing imported from the source resonates with the logic of the target space. In the case of the MBV joke, the construal of computer viruses as agentive reinforces the Conspiracy Framing which has been imported into the blend; however, in the case of the MBVD joke, the agentive construal of computer viruses actually undermines the Victim Framing imported into the blend.

Consequently, the blended domain built to understand the MBV joke is structured in such a way as to promote the transfer of inference schemas regarding linked elements in the blend and the source. However, the blended domain built to understand the MBVD joke provides a context which makes the imported Victim Framing appear implausible. Besides blocking transfer of schemas, this might be why the MBVD joke is less funny.

5. Conclusions

The point of the mappings in the virus jokes is

computer will display the message, "Your PC is now Stoned."

¹ Viruses are often given colorful names by computer users based on the nature of the disruption they cause to the infected system. For example, the Stoned virus relocates and overwrites the PC's boot sector and partition table, and writes itself to floppies which are inserted into the drive. On startup, the infected

not to provide structure for the target domain -- as in the conventional account of analogical mapping -- but rather to highlight one particular construal of the source domain, perhaps over competing construals. According to traditional accounts of analogy, these virus jokes constitute instances of pure matching analogies. On the conventional accounts, the analogical mapping which occurs in the computer virus jokes would contrast with the sort of analogies deemed useful for problem solving (viz. that of the pure carry-over analogy), falling instead into the category of pure matching.

However, if we take seriously the import of accepting one framing of the source domain over other competing framings, then we must realize that the nature of the framing/construal process undermines any sharp distinction between matching and carry-over analogy. Because the mapping operation involves integrated frames as opposed to isolated predicates, the choice of one particular framing over another necessarily results in a different set of attendant inferences. Even in the pure matching cases, then, the choice of exactly which similarities are highlighted by the mapping has inferential ramifications.

The blending which occurs in the MBV joke is not isolated to jokes, but rather occurs in meaning construction more generally. The fantastic world of jokes such as the MBV often present clear instances of phenomena such as asymmetric mapping and conceptual blending. Just as the psychophysicist investigating vision concentrates on visual illusions in order to better elucidate the processes which underlie normal, veridical visual processing, the cognitive semanticist often concentrates on verbal flourishes to better elucidate the processes which underlie normal language processing.

Although the virus we examined is not real, people do employ names such as the Menendez Brothers Virus to serve ends which we usually talk about in the context of analogical mapping. For example, suppose a Menendez Brothers Virus really did exist. We might use the name MBV in order to quickly access one of the schemas associated with the Menendez Brothers from our long term memory, and thereby quickly convey the nature of this particular virus's activities. However, independent of any functional utility the mapping might serve in the target domain, a blend of this nature will nonetheless reinforce the existence of a particular construal of the source domain.

We suggest that the emphasis in traditional accounts of analogical and metaphoric mapping on the mappings from source to target is a by-product of the examples of analogy and metaphor which have

traditionally been examined. If your purpose in drawing an analogy is to map schemas from a well-defined source onto an ill-defined target, then it makes perfect sense to map schemas from the source to the target with minimal (or no) alteration in the blend. If, however, your purpose in metaphoric or analogical mapping is to say something nasty about the source domain, then it might make more sense to map schemas from the blend into the source.

There is nothing inherent to the process of analogical mapping which mandates mapping from the source to the target. The ability to link counterparts across disparate domains based on shared relational schemas is a fundamental cognitive process. Moreover, the mapping of inference schemas and the conceptual integration which can occur in the blend are similarly basic abilities which we actively exploit to suit our needs. Ultimately, it is the purpose of the mapping which determines the direction of the inference schema transfer.

Overall, one might question what it means to say that the source domain structures the target in analogical and metaphoric mappings. For example, in the Menendez Brothers Virus joke, the source domain of the Menendez Brothers has been used to structure the target domain of computer viruses. The end result is to anthropomorphize the computer virus as an entity which commits crimes, and which feels the need to create excuses to escape responsibility and censure. Does the use of social schemas (take, for example, that associated with responsibility) to generate inferences about a technical target imply some sort of deep connection between conceptual structure in the social and target domains?

The blended spaces framework employed in the explication of the Menendez Brothers Virus joke suggests that the answer to this question is *no, not necessarily*. The blended space, like any other mental space, involves representations in working memory which are exploited in on-line interpretation of discourse. Thus the fact that shared schemas are exploited temporarily in the blended space need not have any ramifications for the organization of general knowledge in long-term memory. The conceptual integration which occurs in blended spaces may be used to form new concepts, or it might just as likely be employed to generate a disposable concept for some local, often rhetorical, purpose.

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