

Premonitory urges and Touretting volcanoes

Force construal in personal narratives on Tourette Syndrome

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Causative meaning including, but not limited to, causation, prevention, and enabling is realized in language use through force construal. Force is explored in this article through consideration of narratives on Tourette Syndrome, a disorder that is largely characterized by its constitutive actions (vocal and motor tics). To account for force construal, the article proposes a merger of a vector model for the description of force in language and cognition and a lexical semantic model of ontologies and construals. Force is accounted for in terms of a number of configurations (CAUSE, ENABLE, PREVENT, WITHSTAND, and DESPITE) that are realized through construal operations. This merger of explanatory models allows nuanced and flexible description of forceful meaning in actual language use.

Keywords: force construal, vectors, causation, causative configurations, Tourette Syndrome

1. Introduction

This article explores construal of force in written accounts of Tourette Syndrome (TS). Narrative accounts of TS are well suited for an investigation of force because they prominently portray this disorder relative to a force domain (e.g. Gärdenfors, 2014) in terms of the actions and events through which it manifests. Urges, suppression of urges, vocalizations, and movements are construed in the narratives as forceful transactions. Through adoption of *the dynamics model* (e.g. Wolff & Zettergren, 2002; Wolff & Song, 2003; Wolff, 2007) and in line with a cognitive semantic perspective (e.g. Langacker, 1987; Talmy, 2000; Croft & Cruse, 2004; Gärdenfors, 2014), in particular *Lexical meaning as ontologies and construals* (LOC) (e.g. Paradis, 2005), this article considers force in terms of a number of configurations for the structuring of events along with the construals through which they are put to use.

Section 1.1 briefly introduces Tourette Syndrome. Section 2 presents LOC and the dynamics model for the representation of force in language and cognition. In this article, these two models are merged – force concepts as substantiated by the dynamics model are considered in terms of LOC to be schematic configurations realized through construal operations. The dynamics model is advantageously situated within a semantic framework like LOC. The joining of explanatory models allows nuances of linguistic meaning in use to be captured through attention to not only configurational structures, but also contentful meaning and modes of perspectivization (i.e. construal). After the theoretical preliminaries of Sections 1 and 2, Section 3 describes the data used, and Section 4 presents a discussion of force construals of TS. The principal aim of the article is to assess the utility of the explanatory model for the description of the data. In addition, however, Section 5 considers examination of force construal as a potential route to increasing our understanding of TS experiences; it discusses ways in which the explanatory model proposed in the article can provide flexible and precise accounts of disorder experiences. Section 6 concludes the article and suggests some avenues for future research.

1.1 Tourette Syndrome

Tourette Syndrome is a neurodevelopmental disorder characterized by motor and vocal tics that “wax and wane” (e.g. Leckman, 2002, p. 1577; Singer, 2005, p. 150). Tics are “broadly defined (involuntary, sudden, rapid, repetitive, non-rhythmic, stereotyped) movements or vocalizations (phonic productions)” that can “have different degrees of severity and duration” (Singer, 2005, p. 149). Individuals with TS tend to experience “urges that incessantly prompt tics and feelings of momentary relief that follow the performance of a tic” (Leckman, 2002, p. 1577). Tics generally first appear at a young age and motor tics often precede vocal tics. Symptoms often, but not always, reduce in severity and/or occurrence by early adulthood. A significant number of individuals with TS also experience problems associated with Obsessive-Compulsive Disorder (OCD), Attention-Deficit Hyperactivity Disorder (ADHD), depression, and/or non-obsessive-compulsive anxiety disorder (Singer, 2005, p. 151). Tourette Syndrome is characterized primarily in terms of the actions through which it manifests (i.e. vocal and motor tics). The first two diagnostic criteria for TS (out of four) in the DSM-V, the American Psychiatric Association’s *Diagnostic and statistical manual of mental disorders*, concern the presence, features, and persistence of tics. This makes actions (and more broadly events) central to characterizations of this disorder.

2. Ontologies and construals

In accordance with a cognitive semantic outlook, it is assumed in this article that language in use invariably involves *construal*. Construal represents the fundamental potential of language to impose structure on situations and entities, cast them in different lights, view them from alternative vantage points, and represent them in greater or lesser detail. Langacker notes, by way of a visual metaphor, that “[i]n viewing a scene, what we actually see depends on how closely we examine it, what we choose to look at, which elements we pay most attention to, and where we view it from” (Langacker, 2008, p. 55). Through language the same situation can be represented in alternate ways. While, for instance, *have Tourette’s*, *be a Tourettic*, *suffer from Tourette’s*, *battle Tourette’s*, and *live as a Ticcer* all potentially describe the same situation, these expressions are not semantically equivalent in that they reflect different perspectives on the relationship between an individual and TS. In doing so, they mirror and construct modes of organizing and structuring perception and understanding. As Verhagen (2012, p. 1) puts it, “There is no linguistic meaning without some form of construal.”

Construal should be separated from the mental constructs (e.g. event structures) that underpin the use of language (e.g. Langacker, 2008, pp. 43–44; Gärdenfors, 2014, p. 159). Paradis (e.g. 2005, 2008) suggests a model of lexical meaning as ontologies and construals (LOC) that captures this distinction between conceptual structures and their construal in language use. Paradis (2008, p. 319) describes the construction of linguistic meaning as necessarily involving “two types of knowledge structures: CONTENT STRUCTURES and CONFIGURATIONAL STRUCTURES.” Both types of structures are “conceptual in nature and mirror our perception of the world” (Paradis, 2008, p. 319). Content structures involve “meaning proper, i.e. meaning structures pertaining to CONCRETE PHENOMENA, EVENTS, STATES, ABSTRACT PHENOMENA” (Paradis & Willners, 2011, p. 374) while configurations are schematic templates of varying complexity like PART-WHOLE and SCALE. These knowledge structures are realized in language use through construal operations (e.g. profiling, metaphorization, foregrounding/backgrounding). In terms of LOC, force is considered in this article in terms of five causative configurations: CAUSE, ENABLE, PREVENT, DESPITE and WITHSTAND that have been shown to have cognitive psychological basis (e.g. Wolff & Song, 2003; Wolff, 2007). These configurations and their constitutive binary dimensions are described in more detail in Section 2.1.

2.1 Force in language and cognition: The dynamics model

Various approaches to the notion of force in language and cognition have been suggested. Talmy's (1988, 2000) *force dynamics* is one approach that has greatly influenced later proposals. Talmy introduces two force-interactive participants using terminology from physiology: an Agonist and an Antagonist. The Agonist is the focal participant and "the salient issue in the interaction is whether this entity is able to manifest its force tendency" or not (Talmy, 2000, p. 413). The Antagonist, on the other hand, "is considered for the effect that it has on the [Agonist], effectively overcoming it or not" (Talmy, 2000, p. 413). Recent treatments of force in language and cognition utilize force vectors to represent force dynamics. Wolff and colleagues (e.g. Wolff & Zettergren, 2002; Wolff & Song, 2003; Wolff, 2007) propose the *dynamics model* that represents force in terms of vectors. Gärdenfors (2014) likewise proposes a vector model of force in cognition and language use, one that is based on *conceptual spaces*. Chilton (2014) develops a framework to account for linguistic meaning, including forceful meaning, based on coordinate vector geometry in his *Deictic Space Theory* (DST). The specific formalizations of the vectors differ in significant ways between these models (see also Zwarts, 2010 for a vector approach to prepositions, and additional papers in Evans & Chilton, 2010).

This article draws upon the dynamics model, which captures force-interactive properties of events through representation of a patient, an affector, and associated force vectors. Supported by results from various experiments (e.g. Wolff & Zettergren, 2002; Wolff & Song, 2003), the dynamics model proposes that causation, along with related concepts like enabling and preventing, is conceptualized according to three dimensions (Wolff, 2007, p. 87):

- I. The *tendency* of the patient for the endstate,
- II. The presence or absence of *concordance* between the affector and the patient,
- III. *Progress toward the endstate*.

These dimensions are considered binary and can be given values of Y (= yes) or N (= no). The following examples are used to illustrate the binary dimensions in Wolff and Song (2003, p. 283) and in Wolff (2007, pp. 87–88):

- (a) Wind caused the boat to heel.
- (b) Vitamin B enables the body to digest food.
- (c) Rain prevented the tar from bonding.

In example (a) "the patient (the boat) does not have tendency for the endstate (heeling). The affector (wind) is not concordance with the patient and the result occurs" (Wolff, 2007, p. 87). In enabling, as in (b), there is concordance between the affector (vitamin B) and patient (the body) and the patient has a tendency for

the result, which can therefore be approached. In preventing, as in (c), there is no concordance between the patient (the tar) and the affector because “the affector (the rain) opposes the tendency of the patient and the result does not occur” (Wolff, 2007, p. 87). In addition, Wolff (2007, p. 88) uses the example *The river flooded the town despite the dikes* to illustrate a situation in which there is no concordance between the patient (the river) and the affector (the dikes), but where the result (flooding) does occur and the patient can fulfill its tendency toward the endstate despite the affector’s influence (i.e. DESPITE in Table 1). Wolff and Song (2003) also note that yet another constellation is lexicalized in English vis-à-vis the dimensions, one that they call “FAIL TO CAUSE,” illustrated by the example *The house withstood the hurricane’s winds* (Wolff & Song, 2003, p. 320); in Table 1 the corresponding configuration is referred to as WITHSTAND.

Based on the binary dimensions, the dynamics model illustrates differences and similarities between the causal concepts CAUSE, ENABLE, PREVENT, DESPITE and WITHSTAND as in Table 1 (adapted from Wolff, 2007, p. 88 to include WITHSTAND and to illustrate configurations rather than concepts).

Table 1. Representations of CAUSE, ENABLE, PREVENT, DESPITE, and WITHSTAND (adapted from Wolff, 2007)

Configuration	Patient tendency for endstate	Affector-patient concordance	Result: Endstate approached
CAUSE	N	N	Y
ENABLE	Y	Y	Y
PREVENT	Y	N	N
DESPITE	Y	N	Y
WITHSTAND	N	N	N

Note. Y = yes; N = no

CAUSE, ENABLE, and PREVENT have lexicalized meanings as verbs (e.g. *cause*, *enable*, and *prevent*). DESPITE can be expressed by verbs like *overcome*, *surmount* and *prevail* or by prepositions like *despite* and *in spite of* (Wolff & Song, 2003, p. 320). WITHSTAND can be expressed by verbs like “resist, withstand, and survive” (Wolff & Song, 2003, p. 320). DESPITE and WITHSTAND have in common that the patient is construed as stronger. For CAUSE and PREVENT the affector is stronger. Only ENABLE involves affector–patient concordance.

The dynamics model makes an explicit “distinction between vectors in the world and vectors in people’s minds” (Wolff, 2007, p. 88). This distinction is also upheld by Gärdenfors, who writes that “forces as represented in our minds are psychological constructs and not Newton’s scientific concept” (Gärdenfors, 2014, p. 61; cf. also Chilton, 2014, e.g. pp. 95–96). Wolff argues that vector constructs (i.e.

in people's minds) are "more qualitative" than vectors in the world and are relatively "imprecise with respect to ... magnitude" (Wolff, 2007, p. 88). They can, however, represent "the relative magnitude of two vectors, that is, that one is greater than another" (Wolff, 2007, p. 88; see also Zwarts, 2010, p. 199).

As mentioned, this article incorporates the causal concepts proposed by the dynamics model into LOC. Causal concepts like CAUSE, ENABLE and PREVENT are considered within the semantic framework of LOC to be configurations. As such, they are realized through construal operations. An important construal operation for the realization of configurations like CAUSE and ENABLE is *profiling*, through which elements of a configuration can be singled out for focus and prominence. Whereas examples like those in (a)–(c) explicitly introduce and profile all or most elements of a force configuration, many construals explicitly evoke and profile only a part of a force configuration, while implicitly evoking the rest.

3. Data and method

3.1 Written accounts of Tourette Syndrome

This article considers written personal narratives on TS. The narratives present an experiential perspective on the disorder through language use that is often quite distinct from biomedical explanations and criteria as presented in the DSM-V. For the purpose of this article, a corpus of TS narratives was compiled and tagged in *Sketch Engine* (Kilgariff et al., 2014). Google was used to pin down urls for pages including such narratives (based on searches for e.g. *Tourette Syndrome*, *Tourette's*, *tic*, *ticcer*). Only first-person narratives were included and the pages were checked for content manually before adding them to the corpus. The corpus is made up of 155,868 words from 90 websites. Frequencies of force-dynamic patterns in the texts are not provided in the discussions; instead the corpora are used to substantiate claims about the existence of patterns in the texts. The discussions are example-driven and illustrate the instantiation of a range of force construals in the texts. All examples given in the discussions have been taken from the Tourette corpus. For comparative purposes, a corpus of TS medical information was also compiled. This corpus consists of 111,893 words from 95 websites and is made up of information on TS written for patients and education specialists.

3.2 Expressions of force

Force construal can be cued linguistically in many different ways, for example, through conjunctions like *because* (e.g. Stukker, Sanders, & Verhagen, 2008), prepositions like *against* and *into* (e.g. Zwarts, 2010; Gärdenfors, 2014, Chapter 11), or verbs that potentially incorporate result meanings like *roast* and *stew* (e.g. Goldberg, 2010; Gärdenfors, 2014, pp. 188–189). Force construal can also be cued through, so called, periphrastic causative verbs like *cause*, *enable*, and *prevent* (e.g. Verhagen & Kemmer, 1997; Wolff & Zettergren, 2002; Wolff & Song, 2003; Gärdenfors, 2014, Chapter 10). Wolff and Song write that “[s]yntactically, periphrastic causative verbs can be used as the matrix verb of a sentence containing an embedded clause,” while “semantically” they “encode the notion of cause, broadly construed ... while the verb in the embedded clause encodes a particular result” (Wolff & Song, 2003, p. 286–287). In other words, periphrastic causative verbs occur in expressions like *he forced me to go*, *she stopped me from leaving*, and *she allowed me to flourish* where the causative verbs combine with another verb (*go*, *leaving*, and *flourish* in the examples) to express cause (including prevention and enabling) and result. In an experimental study, Wolff and Song explored whether the dynamics model, as described in Section 2.1, could “capture the underlying meanings of our linguistic expressions of causation” (Wolff & Song, 2003, p. 286). Based on corpus work (described in Wolff, Song, & Driscoll, 2002), they accumulated a list of 23 periphrastic causative verbs that could “be used to describe interactions involving either sentient or non-sentient patients” (Wolff & Song, 2003, p. 286): *allow*, *block*, *cause*, *enable*, *force*, *get*, *help*, *hinder*, *hold*, *impede*, *keep*, *leave*, *let*, *make permit*, *prevent*, *protect*, *restrain*, *save*, *set*, *start*, *stimulate*, and *stop*. With support from sorting and rating studies, Wolff & Song showed that these verbs map onto the three causative concepts CAUSE, ENABLE and PREVENT.

The discussions of force construal in Section 4 take periphrastic causative verbs as their point of departure because expressions that include these verbs can explicitly cue all elements of the configurations (i.e. affector, patient, and endstate). The discussions do, however, branch out to include additional expressions that, in some cases, less explicitly cue these elements. Whereas CAUSE, ENABLE and PREVENT can be expressed through periphrastic causative verbs, DESPITE and WITHSTAND are cued through other means (cf. Section 2.1).

The discussions are limited to *telic* construals; CAUSE, ENABLE, PREVENT, DESPITE and WITHSTAND involve an endstate, which can be reached/approached or not. The TS narratives also feature *atelic* construals (i.e. construals that do not profile an endstate). Note that telicity is prompted through construal of event structures in use. Event structures alone cannot account for telicity (cf. Chilton, 2014, Chapter 4). Force vectors can also be used to represent atelic construals. While it

is beyond the scope of this article to provide an account of atelic force construals in the narratives, I will mention a couple of examples.

- (1) So instead of **fighting** it, I **celebrate** my Tourette's.

No endstate is salient in (1), which instead profiles a shift in the relative directions of affector-patient forces, from lack of concordance (*fighting* →←) to concordance (*celebrate* →→). This shift is similar to one from WITHSTAND to ENABLE, except the force construal in (1) is atelic and singles out the dimension of affector-patient concordance for prominence through profiling. In Example (2), the use of *against* evokes opposing forces.

- (2) I closed my eyes **against** the sight of our congregation standing and waving their arms.

The preposition *against* evokes forceful meaning; closing *my eyes* counteracts the opposing force of *the sight of our congregation*. Through metaphorization, the *eyes* are construed as making contact with *the sight* through “horizontal force exertion” (Zwarts, 2010, p. 194). For atelic construals, the position vectors can be further elaborated to capture the relative directions of forces (cf. Zwarts, 2010; Wolff, 2012, pp. 243–244).

3.3 Psychological force

Along with, for instance, Talmy (2000) and Gärdenfors (2014), the dynamics model proposes that “people’s mental notion of force vectors includes not only physical forces but also social and psychological forces” (Wolff, 2007, p. 88). It is assumed that “physical causation is cognitively more basic than nonphysical causation” and that “nonphysical causation is in some way modeled after physical causation” (Wolff, 2007, p. 86). There are a number of prominent types of force construal in the narratives, but this article focuses primarily on the construal of psychological force. Portrayal of urges and resistance vis-à-vis actions constitutive of TS (i.e. vocal and motor tics) is principally realized in the narratives through such construal. Psychological force is conceptualized as internal to a single sentient being who can also be construed as a locus of competing forces. This type of construal can be effected through words like *refrain*, as in *I refrained from speaking*, or through expressions like *I held myself back* (both cueing PREVENT, cf. Table 1). Talmy (2000, pp. 431–432) refers to this type of construal as a “divided self” configuration. He writes that expressions like *I held myself back* display grammaticalization of a relationship whereby the central (affected) part of the self is “syntactically realized as the reflexive direct object representing Patient status” (*myself*) and the more

peripheral (affecting) part stands as “the Agent subject” (*I*) (Talmy, 2000, p. 460). This article considers construal of a divided self, but also discusses additional modes of construal involving psychological force.

4. Communicative coordination: Painting a forceful picture of Tourette

There are different modes of communicative coordination. People can “negotiate the meanings of words (labels) and other communicative elements” (Gärdenfors, 2014, p. 182) in order to reach consensus with regard to their uses. This mode of coordination is prevalent in TS medical information, which saliently coordinates meanings and structures information on a concept level. Coordination of meanings in TS information takes the form of, for instance, definitions of key terms, as in (3) or generics, as in (4):

- (3) **Coprolalia** – The involuntary use of obscene language.
Copropraxia – The involuntary display of unacceptable/obscene gestures.
- (4) **Compulsions** are repetitive behaviours or rituals – such as washing hands, keeping things in a specific order, or checking something again and again.

The primary mode of communicative coordination in the TS narratives, on the other hand, is coordination of inner worlds (Gärdenfors, 2014, p. 182). When people coordinate inner worlds, they “inform each other so as to reach a richer or better coordination” (Gärdenfors, 2014, p. 94) and they “add to the common ground” (Gärdenfors, 2014, p. 96). The following sections elaborate on a number of linguistic means through which this type of coordination is achieved in the narratives.

4.1 *Like God’s own sneeze*: Comparative construal

An assumption in the dynamics model is that “central to people’s concept of causation” are the dynamics of events (Wolff, 2007, p. 86). Whereas “[k]inematics concern the visible properties of an event: the shapes, sizes, positions, points of contact, velocities, and accelerations of the various entities,” dynamics “concern the invisible properties of an event, namely, the underlying energies and forces that give rise to the motions” (Wolff, 2007, p. 86). Gärdenfors (2014, p. 148) likewise hypothesizes that “[a]n action is represented by the pattern of forces that generates it.” He speculates that the capacity to extract the forces in biological motion “extends to other forms of motion” (Gärdenfors, 2014, p. 151). By considering portrayals of TS involving comparative construal we can begin to disentangle the force patterns that are construed as fundamental to TS actions.

Similes cue comparative construal, often through *like* or *as* and offer means of coordinating communicatively, for instance, by construing something unfamiliar in terms of something more familiar. In the TS narratives, simile is used to construe two actions comparatively, often ticcing and another action.

- (5) Trying not to tic is **like** trying not to blink; it's very uncomfortable and ultimately pointless as it comes out more explosively.

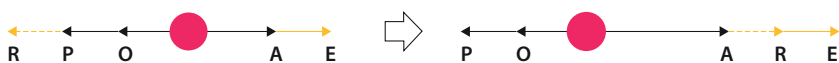
Force constitutes the basis for the comparison between ticcing and blinking; the force behind both blinking and ticcing can be resisted for a little while, but will eventually overcome any resistance with added (explosive) velocity. In other words, the basis for the simile in (5) is construed similarities in the force patterns for blinking and ticcing. The force construal in (5) evokes the basic physics behind confined and unconfined explosion – namely that confined velocities are greater than unconfined velocities. Now consider (6), which evokes comparative construal through the use of *compare*:

- (6) Suppressing tics **has been compared to** sneezing. You can hold in a sneeze, but it eventually comes out. I like to **compare it to** vomiting. You try to keep it down, but you feel it rising in your throat. You're anxious about the inevitable. And the longer you prolong it, the more the nausea and anxiety builds. You feel relieved when it comes out, but it's not socially acceptable to do this in front of others.

The construal of force in (6) is similar to that in (5). Suppression (i.e. patient force) is foregrounded in both examples and the urge to tic/blink/sneeze/vomit (i.e. affector force) is construed as mounting with suppression. Both examples profile the inevitability of force manifestation (i.e. the tic unavoidably *comes out*). To facilitate coordination of inner worlds, the construals in (5) and (6) juxtapose TS actions and bodily functions: blinking, sneezing, and vomiting. In addition to affector force (i.e. the urge to tic), patient force (i.e. suppression/resistance), and resultant force (i.e. manifested through ticcing), example (6) introduces social force through *it's not socially acceptable to do this in front of others*. Social force can be construed as driving patient suppression and takes the form of social pressure to resist ticcing. In (5) both the affector and the patient of the force interaction are implicit, but afforded by the discursive setting. In (6) *you* is construed as patient while the affector is implicitly construed as Tourette Syndrome.

The construal of force cued by (5) and (6) can be represented as in Figure 1, which includes linguistically relevant force patterns for suppression and release of tics (based on figures in e.g. Wolff, 2007, 2012). In the figures in this article, length of a vector represents magnitude, concordance is indicated by shared direction of vectors, and tendency toward an endstate is indicated by shared direction between

a vector and E. R and E vectors are yellow for representational clarity; E is a position vector (not a force vector) and R constitutes resultant force (i.e. through vector addition/subtraction of A, P, and O).



P = Patient force, A = Affector force, R = Resultant force, O = Other force, E = Endstate position vector

Figure 1. Force patterns for suppression and release of tic according to *WITHSTAND* and *CAUSE*

Initially, patient force (P), in combination with social force (O), is greater than affector force (A). The patient does not have a tendency toward the endstate, there is no affector–patient concordance, and the endstate is not approached. In other words, the initial event is construed according to *WITHSTAND* (cf. Table 1). As affector force becomes greater in magnitude (i.e. through build-up of tension), resultant force (R) manifests in the form of ticcing and the endstate (E) is approached. The force pattern is that for *CAUSE* (cf. Table 1); there is no affector–patient concordance, the patient does not have a tendency for the endstate, but the endstate is approached.

4.2 *A Touretting volcano*: Force as a basis for metaphorization

Through comparative construal, TS is also metaphorically construed as the source of a mental force that moves outward from the self (e.g. Kövecses, 2000). This radiating force is a locus of control; it can potentially be contained (e.g. *held in*), but it can also be released with control (e.g. *let out*) or without control (e.g. *burst out*, *escape*). Construal of TS as a radiating force often realizes an *INSIDE–OUTSIDE* configuration (i.e. according to a *CONTAINER* schema, e.g. Johnson, 1987, p. 126; Lakoff, 1987, p. 267); the inside is hidden and out of view whereas the outside is public and open to scrutiny.

- (7) It's just that Tourette's makes you unable to **contain** those urges: the chaotic confusion, the love of language, the urge to **lash out** at the world even if you're only beating at the air with your fists. It **starts at the center of your body and radiates out until it reaches public view**, announcing to the world what you'd hoped to keep hidden.

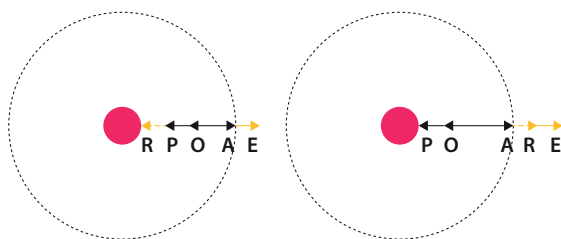
Example (7) portrays TS as a force that *starts at the center of your body and radiates out until it reaches public view* and illustrates the construal of a private inner sphere and an outer public sphere. Example (8) portrays the struggle to *contain* TS and

through metaphorization construes a TS individual in terms of a volcano, amply illustrating an INSIDE–OUTSIDE construal.

- (8) One day in Mrs. Williams’s computer class, I desperately tried to **contain** my verbal **outbursts** in the back of the room. I was a **dormant Touretting volcano**, **ready to erupt** – and erupt I did.

Much like examples (5) and (6), (8) evokes explosive velocity through the use of *contain* and *erupt*.

The construal of TS as a radiating force can be represented as in Figure 2, which illustrates constraining patient force (P) along with social force (O) both working against the endstate (i.e. ticing) and against the urge to tic (A). Initially there is balance between the two, or P + O are stronger (i.e. WITHSTAND, cf. Table 1), but as the urge to tic overcomes the individual, a result manifests (R) in the form of ticing, approaching the endstate (E) (i.e. CAUSE, cf. Table 1). The resultant ticing crosses a construed boundary between an inner sphere and an outer one.



P = Patient force, A = Affecter force, R = Resultant force, O = Other force, E = Endstate vector

Figure 2. Force patterns for TS as a radiating force and an INSIDE–OUTSIDE configuration

The same kind of construal of TS is reflected in the use of the prepositions *in* and *out*, as in (9).

- (9) You can try and **hold it in** by not twitching your eye, but sooner or later, you’re going to have to **let the tic out** and twitch your eye.

Example (9) portrays a force-dynamic shift from WITHSTAND to ENABLE (cf. Table 1). The first event evokes resistance and the second event evokes release of force with control through the use of *let* (cf. Section 4.5).

The force patterns associated with TS are portrayed as changing according to event participants and situations and along with exertion that either exacerbates or subdues the urge to tic or strengthens or weakens the power to suppress tics. Whereas singing or dancing can diminish the volatility of the TS affecter force, stress can increase it:

- (10) He has said that the stress of a big game **causes his tics to flare**, but when an opposing striker approaches the goal, all of sudden he is in control of them.

In (10), the use of *flare* evokes an uncontrollable outward/upward motion, in this case fueled by *stress*. Outward force is at times realized as upward force; in (11) upward force is cued by *build up* whereas *burst forth* and *outward* cue outward force construal.

- (11) Once or twice each minute, premonitory urges **build up** like a crackling background noise in my brain until they **burst forth** and manifest themselves as **outward** tics.

Unlike most of the previous examples, (11) does not explicitly evoke suppression (i.e. there is no profiled patient force). However, the use of *burst forth* suggests explosive force that would follow pent up or contained force, implying suppression. Upward force can also be cued by expressions like *that awful sensation welling up* and *waiting for my Tourette's to bubble up*, which evoke fluid force patterns, whereas downward force can be evoked by verbs like *suppress*, *repress* and *subdue*. The prepositions *up* and *down* can also cue forward/backward velocity, as in *slow the tics down*. The use of prepositions in these construals evokes force (cf. Zwarts, 2010) and is best described in terms of vectors as opposed to scalars like speed or distance.

4.3 *Police always make my tics worse*: CAUSE

A great many expressions in the TS narratives evoke CAUSE (cf. Table 1). Psychological force construal according to CAUSE portrays a sentient being as a locus of force negotiation (in the narratives, typically an individual with TS). As noted in Section 3.3, such construal can be realized in terms of a “divided self” (Talmy, 2000, pp. 431–432) through which parts of the self are associated with opposing force vectors. This type of construal is evoked by (12) through the use of the periphrastic causative verb *make*.

- (12) The phrases I come out with are so wonderfully surreal – for example: “The hippies of outrageous fortune weigh heavy on the minds of dogs” – that I **make myself laugh**.

In (12) the individual is the source of both affector force (i.e. causing laughter) and patient force (i.e. resisting laughter). Through vocalizations (i.e. surreal phrases), the individual in (12) causes him-/herself to laugh. The use of *come out with* reinforces the construed lack of intentionality vis-à-vis the vocal tic and also emphasizes its outward-moving and public nature.

In addition to a divided-self construal, as in (12), a person with TS can be construed as a locus of competing forces by assigning affector status to different parts of the body, as in (13), where the *brain* is construed as affector.

- (13) Imagine being faced with an otherwise well-balanced patient **whose brain compels him to do things that he does not want to do** – sometimes even the opposite of what he desires ...

Loci of affector and patient forces are construed as internal to an individual, but their sources can nonetheless be construed as individuated (i.e. as separable entities) to some degree and can also be construed as personified, i.e., associated with “human motivations, characteristics, and activities” (Lakoff & Johnson, 1980, p. 33). Similar to (13), (14) attributes affector force to the *mind*:

- (14) Pick up that rock, **my mind commanded**. You’d better pick up that rock.

Example (14) includes an imperative, which is inherently forceful; *Pick up that rock* evokes affector force (made explicit through *my mind*) and a desired endstate (i.e. the rock having been picked up). The patient is implicitly the addressee, made explicit in the second sentence through *you*.

TS and tics can also be construed as individuated and as sources of either affector or patient force (typically affector force). In (15) *the tic* is the locus of patient force, while *I* stands as affector forcing *the tic down my right arm*.

- (15) Over the years I’ve learnt to redirect the movement. For instance, if I have hot coffee in my left hand I’ll **be able to force the tic** down my right arm to avoid disaster.

In a passive construction like *feel compelled or forced to make* in (16), there is no explicit source of affector force; (16) is, however, initiated by *With Tourette’s*, which attributes affector force to the disorder according to CAUSE.

- (16) With Tourette’s, what slows you down is that there are so many movements that **you feel compelled or forced to make** before you’re able to make the movement you want to make.

Some uses of *make* in the narratives rely on a discursively established CAUSE for their construal of force; consider (17):

- (17) I **make sounds, repeat words, and form movements** involuntarily. These are called tics and they’re meaningless.

In (17) *I* is construed as the affector of the *sounds, words, and movements*. In addition, however, the discursive setting (i.e. a TS narrative) has established CAUSE as a

force dynamic between TS as affector and the TS individual as patient. Construals of actions like those in (17) draw upon this discursively established CAUSE. The affector of (17) is therefore also construed as the patient of the discursively established CAUSE. The use of *involuntarily* furthers the prompting of the discursive CAUSE by implying a separate driving force for the actions.

Gärdenfors (2014) suggests that “[w]hat makes coercion verbs special is that the result of the force vector is not a result vector but a new event” (Gärdenfors, 2014, p. 187; cf. Verhagen and Kemmer’s (1997, p. 62) distinction between *causal predicate* and *effected predicate*). He writes that “[t]he coercion verb is a manner verb in an event generated by an Agent X acting on a patient Y that combines with another verb describing another event where Y is Agent” (Gärdenfors, 2014, p. 187). In other words, coercion verbs combine with a second verb (e.g. *make* in (18) or *laugh* in (12), *do* in (13), *pick up* in (14)) to construe two linked events where the result of the first event is the source of affector force in the second event. This view of coercion as a linking of events facilitates representation of expressions like those in (18) and (19).

- (18) TS makes your brain tell your body that your eye must twitch. Therefore, you twitch your eye.
- (19) Tourette’s syndrome causes me to have quick jerky movements called tics that make me do things like shaking my head or my hands, or even smelling my hands a lot. I can’t help it and it makes me embarrassed when people ask why I do these things.

In linked force-dynamic construals as in (18) and (19), one force interaction leads to another, which leads to another. In (18) TS represents the initial source of affector force causing a chain of dynamic interactions ultimately leading to animation of the patient (i.e. *Therefore, you twitch your eye*). The use of forceful *therefore* makes an explicit causal connection between the two representations of the eye twitch in (18). Linking of dynamic events allows shifts in participants while maintaining the construal of a single (multi-event) force-dynamic scenario. In (19) the result of the initial force-dynamic event (i.e. *have ... tics*) stands as the source of affector force in the subsequent force dynamic (i.e. *tics that make me do things like ...*). A partial representation of (19) could look as in Figure 3. The line connecting the result of the first event and the affector force of the second event indicates that having tics is the source of *make* in the second event. Note that the results of both events are themselves events (i.e. *have quick jerky movements ...* and *do things like...*).



P = Patient force, A = Affector force, R = Resultant force, E = Endstate position vector

Figure 3. Linking of force events

The initial event of (19) includes an explicit patient (*me*) in *Tourette's syndrome causes me to have quick jerky movements called tics*. A similar event is portrayed in (20), but in (20) there is no explicit patient.

(20) It's a neurological disorder that **causes** sudden involuntary body movements.

Verhagen and Kemmer (1997, p. 63) note that the sentence *He has had a wheelchair built* (they discuss the Dutch equivalent of this sentence) leaves out the causee and evokes only a “highly schematic” interpretation for this participant. In the same manner, (20) includes no explicit patient, but does include a result (i.e. *sudden involuntary body movements*). Example (20) profiles affector and result, but not patient. Causative chains like those in (18) and (19) are construed with a higher degree of granularity than (20), which foregrounds only the beginning and end of a similar chain of force events.

This section has focused on affector force originating with the TS individual in the form of urges to tic. The narratives also portray interpersonal affector force (i.e. social force) as influencing patients' behavior and mental states. In (21) *make fun* portrays an endstate (*fun*) as achieved by the affector (*people*) at the expense of the patient (*me*). According to CAUSE, the expression *make fun* profiles lack of affector–patient concordance. Social force is construed as the source of changes in emotions and beliefs for the patient (i.e. *made me feel, makes me think*).

(21) It is also hard for me since people would have the tendency to stare at me while my Tics were acting up or sometimes even **make fun** of me and mock me. Those things would greatly affect my self-esteem because it **made** me feel unaccepted and it **makes** me think that there's something wrong with me.

Likewise, in (22), social force (i.e. *being bullied*) is construed as the cause of a change in the patient (i.e. the worsening of tics). Social force is tied to psychological force and is construed as exacerbating TS affector force.

(22) Looking back I realize that my tics got worse at this time **because** I was being bullied. The extra stress and greater attention to the tics only **made** them worse.

Social force is also cued by *push*, which cues either social or physical force in the narratives. Example (23) cues CAUSE; affector force is evoked by *people* and patient force by *you*.

- (23) Many people like to just **push and push**, wanting you to tic and be funny when you just want to get on with your day.

The endstate in (23) is clearly one toward which the patient has no tendency (i.e. *tic and be funny*). Example (24) also cues CAUSE; the endstate is presumably desirable for the patient (i.e. *be better*), but despite desirability, the patient does not have a strong enough tendency toward the endstate.

- (24) Sometimes I think of you as my own personal trainer. You **push** me to be better. You inspire me to be open-minded to eccentricity and peculiarity.

In (24) TS is the affector (i.e. *you*) and is construed as personified. In the narrative from which (24) is taken, personification construals of TS are also evoked by expressions like *You were like that annoying relative you're forced to see every year at Thanksgiving and you kept showing up to parties I never invited you to*.

4.3.1 I had to obey the pattern: CAUSE through modals

In the narratives, CAUSE is also cued through the use of modals (e.g. *have to*, *must*). Modals are inherently force dynamic (Sweetser, 1990; Winter & Gärdenfors, 1995; Talmy, 2000; Langacker, 2008). Both root/deontic modals and epistemic modals have been analyzed as evoking force negotiation (see Chilton, 2010, 2014 for vector-based accounts of deontic modals). Langacker (2008, p. 305) suggests that “the modal force” for root/deontic modals is mainly “manifested in the realm of social interaction” and concerns “notions like obligation, permission, intention, and ability.” In the TS narratives, deontic uses of modals typically involve construal of psychological force driving specific actions, as in (25).

- (25) The pattern might vary, but there was always a specific rhythm, and it **had to be** followed. Exactly. If it wasn't – if I tried to resist – I **had to start** all over again, until I got it right.

Deontic modals are used in the narratives to profile the urge to act. In (25) this urge is cued by *had to* and properties of this force are explicit (i.e. *a specific rhythm, a pattern*). The source of the force is implicit (TS), but afforded by the discourse. Resultant force is construed as iterative (e.g. Talmy, 2000, p. 63) relative to the properties of the force pattern (requiring no resistance, i.e. affector–patient concordance, and a perfect match between force pattern and result).

In the narratives, modals draw upon a discursively established CAUSE construal (cf. Example (17)) between TS as affector and a TS individual as patient, and evoke force dynamics where force-interactive elements can be left implicit.

- (26) Years ago I was in a book store with an old friend. We were walking through the store and every time I picked up a book, I opened it, shoved my face into it and smelled the pages. **I have to do it. I had to do it to every book I touched.**

Through the use of *have to/had to*, (26) cues CAUSE. The source of affector force is implicit. The result is cued through a series of actions (i.e. *every time I picked up a book, I opened it, shoved my face into it and smelled the pages*). These actions are introduced prior to the modals so that the behavior is described first and forceful properties of the actions are introduced through the modals. Modals are used in this manner in the narratives to evoke CAUSE according to which actions like smelling books in (26) are construed as forceful.

Different kinds of CAUSE can be effected through the use of modals; two construals involving *must* are illustrated by (27) and (28), one that evokes an increasing momentum of force and another that evokes goal-oriented force.

- (27) But throughout the lecture my premonitory sensations build up steadily, urgently, like God's own sneeze. So I **must follow this period of submergence** by climbing the stairs to the privacy of my office, a dolphin coming up to breathe, there to tic, tic, tic ad libitum until the need subsides.

The use of *must* in (27) construes force in terms a build-up that inevitably leads to the unfolding of a course of events. Affector force in (27) is represented in terms of *premonitory sensations*. Similar to the comparative construals discussed in Sections 4.1 and 4.2, these sensations are construed as building to the point of release (i.e. ticcing). In (27) the build-up is metaphorically construed in terms of submergence along with an increasing pressure to breathe. In (27) focus is on the relevance of past and present events to future ones. A different construal is seen in the use of *must* in (28).

- (28) The anxiety that almost constantly floats through my mind **must** be pushed to the side if I'm going to focus all my attention on dancing.

In (28) psychological force is construed in terms of goal-oriented action. Gärdenfors writes that "the intention domain is a product space of the goal domain and the action domain. An intention is thus a combination of a goal and an imagined action conceived of as leading toward that goal" (2014, p. 64). In (28) force is construed as intention; focus is on the relevance of future events to future goals. Pushing aside anxiety is an action "conceived of as leading toward" a specific goal (i.e. *to focus all*

my attention on dancing). The force-conditional construal is set up by *if* and *must*. Anxiety is construed as an obstacle to a ‘flow’ of attention, an obstacle that *must be pushed to the side*.

4.4 *I managed to suppress that tic*: WITHSTAND

WITHSTAND has already been addressed in Sections 4.1–4.3. For WITHSTAND a construed endstate is not approached. The patient has no tendency toward the endstate, and because patient force is greater than affector force, the patient manages to avoid the endstate (Table 1). In the narratives, WITHSTAND is cued in conjunction with CAUSE for the portrayal of resistance to urges through words like *subdue*, *suppress*, *resist*, and *contain*, as in (8), repeated here as (29).

- (29) One day in Mrs. Williams’s computer class, I desperately tried to **contain** my verbal **outbursts** in the back of the room. I was a **dormant Touretting volcano, ready to erupt** – and erupt I did.

Example (29) profiles resistance (i.e. patient force). Affector force is construed as the urge to tic. WITHSTAND is also evoked in conjunction with ENABLE as in (9), repeated here as (30):

- (30) You can try and **hold it in** by not twitching your eye, but sooner or later, you’re going to have to **let the tic out** and twitch your eye.

Example (30) evokes WITHSTAND through *hold it in* and ENABLE through *let the tic out*; (31) likewise cues WITHSTAND and ENABLE:

- (31) First, imagine the biggest sneeze you can. Now, **hold it; don’t let it out**. Even if the pressure builds. That feeling. Right there. Imagine that feeling in your body constantly. That is the closest feeling I can relate to how Tourette Syndrome feels.

Example (31) portrays suppression through two expressions, the first according to WITHSTAND (*hold it*), and the other through a negated ENABLE construal (*don’t let it out*) which supports ENABLE as well as WITHSTAND. Verhagen (2005, Chapter 2) suggests that sentential negation evokes two separate *mental spaces*, one that affirms the event in question and another that negates it. In line with Verhagen’s proposal, we can note that the expression *don’t let it out* in (31) supports WITHSTAND (i.e. *don’t let it out*) as well as ENABLE (i.e. ‘let it out’); it can be followed by *that would be terrible* (in which *that* presupposes ENABLE, i.e. letting it out would be terrible), or *on the contrary hold it in* (*contrary to hold it in* is ‘letting it out,’ i.e. it presupposes ENABLE).

4.5 *Let the tic out*: ENABLE

ENABLE can be evoked by the verbs *help*, *allow*, and *let*. In the TS narratives, *help* cues ENABLE as in Figure 4a, but does so in different ways. While all uses of *help* in the narratives involve affector–patient concordance, the endstate is less predictably portrayed. Roughly half of the instances of *help* cue an endstate only implicitly or establish it less locally. In *I also have three grandparents that help me a ton*, for example, the endstate of *help* is not explicit. In expressions that include no explicit endstate, it can nonetheless be alluded to as in *has helped with my tics* (the endstate is some change vis-à-vis *my tics*) or *tries to help with kind words* (an instrument is introduced as directing affector force).

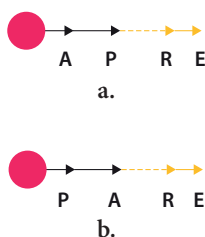
Roughly half of the instances of *help* in the narratives include an explicit endstate. All but one of these construe an endstate in terms of a change of STATE for the patient (or in a few cases maintenance of a STATE as in *help me stay emotionally strong*), and resultant force takes the form of an event, in (32) *form my senses*.

- (32) The fact is, TS helped form my senses to look for humor in many things that others sometimes don't.

Verbs like *understand*, *realize*, *figure out*, and *discover* profile a change in the patient's comprehension of, or attitude toward, something. A change into a state of control is evoked by verbs like *cope*, *control*, and *manage*, while verbs like *grow* and *develop* portray progress vis-à-vis some process.

Wolff (2007, p. 103) points out that the ENABLE verbs differ somewhat "in what they imply about what might occur in the absence of the affector." He writes that "*help* (and sometimes *enable*) leaves open the possibility that the result could occur in the absence of the affector" (Wolff, 2007, p. 103) while this is not the case for verbs like *allow*, *let* and *permit* (and sometimes *enable*). In line with Wolff's observation, in the narratives, affector force is often construed as non-essential to realization of the endstate in uses of *help*. The construals effected by *help* relative to ENABLE are, in this way, different from many construals realized by *let* and *allow*. ENABLE for *help* is represented in 4a where patient force (P) is represented as greater than affector force (A) to illustrate the less essential nature of affector force to the endstate. ENABLE for *let* and *allow* is represented in Figure 4b. While *help* construes affector force as less essential to approaching the endstate than patient force, *let* and *allow* primarily construe affector force as essential in this respect.

In all instances of *allow* in the narratives, an endstate is explicit in proximity to *allow*. Most uses of *allow* construe the 'letting' in terms of making an endstate possible, with the exception of uses that involve 'permission' or, in the case of negation, 'lack of permission' (e.g. *we shouldn't allow our flaws or handicaps to stifle our potential for success*). Example (33) profiles a shift in affector–patient concordance



P = Patient force, A = Affector force, R = Resultant force, E = Endstate position

Figure 4. ENABLE force configuration

from lack of concordance $\rightarrow\leftarrow$ to concordance $\rightarrow\rightarrow$ through contrast between PREVENT (implicit: I prevent the tic from happening) and ENABLE (*I ... allow the tic to happen*). Contrast is evoked by *instead*.

- (33) So next time I tried my tic “re-direction” from, say, my arm to my grunts or from my face to my legs, I would **instead allow** the tic to happen, but I would only attempt to slow it down.

As noted, in most uses of *allow*, affector force is construed as essential to reaching the endstate (cf. Figure 4b). In (33), however, it is quite possible that the endstate (i.e. ticcing) could be approached without concordance. Sources of affector and patient force vary in uses of *allow*; medication or therapies are at times construed as sources of affector force (e.g. medication can allow a better life), as are abilities and states of the patient (e.g. having the ability to recognize tics before they happen can allow control).

Wolff and Song (2003, p. 294) point out that while some of the periphrastic causative verbs in their study (cf. Section 3.2) can be used in sentences with a single clause, as in *the rain caused a flood*, *let* “requires a clausal complement.” Like *cause*, *allow* permits profiling of the result of an implicit second event, as in (34). This implicit second event can be made explicit through *allowed me to make an accurate assessment*.

- (34) It smoothed out what could have been some very bad years and also **allowed me an accurate assessment** of the full range of phenomena that for me comprise Tourette.

In line with Wolff & Song’s observation, portrayal of a result of an implicit event is not possible in the use of *let*, which in the narratives only (with the exception of *let go* and *let loose*) cues linked explicit events, as in (35).

- (35) I had the good fortune to be a ticcing young boy who had some compassionate onlookers – a loving family and friends who simply **let me tic...**

As for *allow*, uses of *let* also include a number of negated expressions. *Let* is also used to portray psychological force inherent to a single individual according to a divided-self construal (Talmy, 2000):

- (36) I wasn't stupid. I knew there was no way she was fully blocking me from the onlookers' stares. But for a moment I **let myself** believe her.

In the narratives, *let* portrays different kinds of affector–patient concordance (see Soares da Silva, 2007, for an analysis of verbs of letting according to Talmy's force dynamics); some involve an affector not standing in the way of the patient's inherent force tendency. This is exemplified by (36), which cues ENABLE according to Figure 4a (i.e. affector force is not essential to the endstate). Other uses express permission (often negated), release of force (e.g. *let loose* and *let out*), or letting in of force (e.g. *let in* or *let into*). These evoke ENABLE as in Figure 4b, for which affector force is essential to the endstate.

4.6 *I can't stop myself*: PREVENT and DESPITE

The causative verbs *stop* and *prevent* are used in the narratives to portray force negotiation internal to an individual, as in *I've been able to stop myself saying anything more*, often negated as in *I can't stop myself*. These verbs are also used to portray force negotiation between an individual and external circumstances, in particular vis-à-vis goals and pursuits. *Stop* is used in the narratives to cue PREVENT or PREVENT and DESPITE, as in (37).

- (37) But even if those happen to me, it doesn't **stop me** from doing things I love.

For DESPITE, like WITHSTAND, but unlike CAUSE, ENABLE, and PREVENT, the patient is the subject (e.g. *I have succeeded in life despite having Tourettes*). Wolff and Song (2003, p. 320) note that the stronger participant of a force dynamic, whether affector or patient, stands as the subject. In negated uses of *stop*, as in (37), the affector (*it*) is the subject despite being weaker. In line with Verhagen's (2005) proposal, (37) supports two construals – one in which the affector is stronger and the endstate is not approached (i.e. PREVENT), and another where the affector is weaker and the endstate is approached (i.e. DESPITE). The fact that (37) can be followed by either *that would be terrible* (in which *that* requires PREVENT, i.e. it stopping me from doing things I love would be terrible), or *and that is fortunate* (in which *that* requires DESPITE, i.e. it *not* stopping me from doing things I love is fortunate) suggests that both construals are supported by (37).

DESPITE is cued in the narratives through negated uses of verbs like *stop* and *prevent*, and by *despite*, or *even though*, as in (38), but also by verbs like *overcome*

and *conquer* as in *I have overcome many obstacles in my life and I would conquer Tourette's Syndrome on my own* to portray perseverance and strength in the face of adversity.

(38) So **even though** I have coprolalia, I don't curse a lot.

DESPITE is also cued by verbs like *keep*, as in (39). The atelic use of *keep pushing* involves affector force steadily opposing the patient's tendency for a particular direction (cued by *ahead*); continuous effort (i.e. patient force) is required.

(39) And for those with TS like me, **keep pushing** ahead.

In other words, affector force for DESPITE can be explicit, as in (38) (having *coprolalia*), or implicit as in (39) and (40).

(40) Imagine being faced with an otherwise well-balanced patient **whose brain compels him to do things** that he does not want to do – sometimes even the opposite of what he desires: to twitch in front of an audience, avert his eyes from a beautiful painting, shout out in a quiet church service. Observe a gentle soul who pokes and punches himself, a beautiful girl who contorts her face into a scowl, a cautious child who **must** nonetheless hop into the street.

In (40), an intitial force dynamic (CAUSE) involving psychological force is introduced through *compels*; a divided-self construal is effected whereby a TS individual is construed as both affector (i.e. his brain) and patient (i.e. his wishes and desires). A number of actions are construed as in opposition to the individual's desires; he twitches *in front of an audience*, averts *his eyes from a beautiful painting* and shouts *out in a quiet church service* despite his desires (i.e. DESPITE). The last sentence introduces three force-dynamic events; each of these involves construed discord or opposition. The first event involves a participant (*a gentle soul*) and actions carried out by this participant (*who pokes and punches himself*); opposition is construed as holding between properties of the participant (GENTLE) and implicit properties of the actions (VIOLENT or SELF-HARMING). The second event is likewise construed as involving opposition between intrinsic properties of the girl (BEAUTIFUL) and transient properties of the girl as a result of the action (UGLY). The third event involves similar opposition between CAUTIOUS (cued by *cautious*) and RECKLESS (cued by *hop into the street*). The forceful properties (i.e. DESPITE) of the events in (40) stem in part from such construed discord of meaning and in part from the use of *things he does not want to do* and *sometimes even the opposite of what he desires*, and *must nonetheless*.

5. Implications for understanding TS experiences

To summarize, TS is characterized in the narratives largely in terms of actions and events construed as forceful transactions between a patient and forces acting upon it. Force patterns underlying TS actions form the basis for comparative construals that draw upon similarities and differences between TS actions and bodily functions like sneezing or blinking, and underpins metaphorization construals of TS through which the disorder is prominently construed as an outward-moving force. The TS force is a locus of control for the individual; it can be contained or let out with control, but can also escape through lack of control in the form of vocal and motor tics. Psychological force construal prominently evokes CAUSE in portrayals of urges and forced action and WITHSTAND in depictions of suppression. ENABLE allows portrayals of control (e.g. *If I'm alone, I let the tic out*); a construed endstate is approached in accordance with both affector and patient force. DESPITE portrays perseverance in the face of obstacles and difficulties, and PREVENT is often cued in negated constructions along with DESPITE in descriptions of endurance and resolve. Throughout the assessment of the explanatory model in Section 4, potential insights into experiences of TS have been offered, albeit not evaluated as such. Among other things, the discussion has illustrated that TS individuals are saliently portrayed as subject to a disorder force that causes animation in the form of tics by overriding the TS individuals' natural force tendencies.

Harvey and Koteyko (2013, p. 142) argue that by investigating the role metaphors play in discourses on illness and disorder, including their "heuristic utility as explanatory shortcuts," "we can achieve a better understanding of the ways health and illness discourses circulating in society are formulated and (re-)constructed." Although metaphor certainly has potential for providing valuable insight vis-à-vis discourses on illness and disorder, this explanatory potential is not limited to metaphor, but is inherent to various forms of construal. Force construal, as discussed in Section 4, results from *conceptual integration* (Fauconnier & Turner, 2002), or *analogy*, broadly conceived (e.g. Hofstadter, 2001; Hofstadter & Sander, 2013). LOC incorporates such integration at various levels of conceptual organization; force construal can, for instance, be effected by mapping force configurations onto contentful pre-meaning structures (cf. *simplex network* integration or *Frame-to-value* mapping; Fauconnier & Turner, 2002, pp. 120–122), or by prompting force-dynamic correspondences between domains (cf. *single-scope network* integration; Fauconnier & Turner, 2002, pp. 126–131). The resulting construals are at times clearly metaphorical (e.g. *a Touretting volcano*) and, in other cases, less so (e.g. *ticcing is like sneezing*).

Force clearly provides pervasive conceptual scaffolding for a range of experiences portrayed in the narratives, and by considering the role of such construal (not limited to metaphorical language use), we can potentially increase our understanding of experiences of this disorder. Consider (41).

- (41) This is backward, I know, in the sense that what conventionally **allows** a neuro-typical person to feel good/relaxed, **makes** me hyper, more tense, and sometimes more frustrated. Figuring this out has really **helped**. I believe that understanding my body, my tics, and myself is the key to coping with my TS.

Example (41) establishes contrast between two force-dynamic events involving the same circumstances as affector force, but different patients and results. The first event is construed according to *ENABLE* (i.e. *what conventionally allows a neuro-typical person to feel good/relaxed*). The patient of this force dynamic is *a neuro-typical person* and the result is *feel good/relaxed*. The second event is construed according to *CAUSE* (i.e. *what conventionally allows ... makes me ...*). The patient is *me* and the result is being *hyper, more tense, and sometimes more frustrated*. Through force construal (i.e. by contrasting *ENABLE* and *CAUSE*), (41) highlights a crucial difference in functioning between a neuro-typical person and a TS individual. Whereas a neuro-typical person is construed as in concordance with affector force, the TS individual is construed as in opposition to this force and this opposition implies struggle.

A force-dynamic framework as proposed in this article has potential utility for investigations of *control*. Control is often discussed in research on experiences of illness and disorder and is central to experiences of TS (e.g. Buckser, 2006, 2008; O'Connor et al., 2009). Buckser (2006) argues that TS falls somewhere in between the dichotomy between control and lack of control. He writes that “[t]he symptoms of Tourette are neither controlled nor uncontrolled. They are betwixt and between, a bit of both and not quite either” (Buckser, 2006, p. 263). Control is inherently force dynamic; it involves the construal of at least two entities, one of which has the power to make the other function in a given way, but control is potentially conceptualized in a variety of ways. As noted previously, *ENABLE* can portray control, as in *I let the tic out*, and *CAUSE* can be cued to describe either lack of control for the TS individual, as in *My body makes me play Tourette’s, no matter how much I protest*, or, less commonly, control, as in *I’ll be able to force the tic down my right arm*. These two instances of *CAUSE* differ their construed loci of patient and affector force, and consequently in their portrayal of agency. Investigating the force dynamics of control potentially allows more nuanced and precise description and can highlight significant aspects of meaning construction with regard to this notion.

6. Conclusion

Chilton (2014, p. 12) writes that in addition to evaluating the “extent of its efficiency for descriptively capturing the linguistic data,” a descriptive apparatus proposed within cognitive linguistics should ideally “go some way towards interfacing with the descriptive approaches of neighbouring sciences, such as cognitive science and neuroscience.” This article has aimed to do both of these things by showing the explanatory potential of a vector approach situated within a lexical model of ontologies and construals. Despite clear advantages of a LOC/dynamics model description and explanation of force construal, there are force patterns in the narratives that are less easily accommodated by the configurations as they are presented here, force patterns that require elaboration of the relative directions of the forces vis-à-vis the affector and patient. Consider (42):

- (42) But then one day I had the idea of “**redirecting**” my tics. So, if my head was bobbing up and down, I tried to **will** my arm to twitch instead. I went **with them** rather than **against them**. I only **steered them** “my way”.

The configurations, as drawn from the dynamics model, cannot sufficiently account for the force dynamics of (42). ‘Redirection,’ for instance, requires consideration of the direction of force in relation to either a goal or a path tied to the intentions of both the patient and the affector. The configurations can be supplemented by elaborations of the position vector to allow representations of force construals for which the relative directions of vectors vis-à-vis the force participants are crucial (cf. Zwarts, 2005, 2010; Wolff, 2012; Chilton, 2014; Gärdenfors, 2014).

This article has focused primarily on psychological force, but as noted there are additional types of force. A LOC/dynamics model approach also has potential for accommodating intersubjectively-directed force construal as in *let me tell you* and *despite what you may think*. For such discursive force construal, the endstate can be conceptualized as a meeting of minds (Gärdenfors, 2014) between co-conceptualizers, and affector and patient forces can be considered to be inherent to the ground (i.e. the communicative situation and its participants, e.g. Langacker, 2008, p. 78). An expression like *let me tell you* cues ENABLE (i.e. affector–patient concordance) and foregrounds a common communicative goal, whereas an expression like *despite what you may think* cues DESPITE and portrays preconceptions on the part of the reader as obstacles to be traversed.

As noted, force is used as a basis for comparative construal (e.g. metaphor and simile). This article has not elaborated on the extent to which the extraction of relevant force patterns for comparative construal is discursively motivated and constrained. In this respect there is potential for further integrating findings from

analogy research with a framework of construal. In particular, *goal relevance* as a constraint on inference projection in analogy is of interest in this regard (e.g. Gentner & Smith, 2013).

These limitations and potential gaps aside, combining LOC and the dynamics model allows representation of various modes of force construal in language use in a manner that clearly separates construal from the event structures presupposed in use. Linguistic meaning cannot be reduced to configurational structure alone and incorporating vectors as the configurational basis of force construal allows us to capture nuances of causative meaning in use through attention to contentful meaning (e.g. the domains according to which force is manifested) and construal (e.g. profiling and comparison) in addition to configurational meaning. Couching the causal concepts of the dynamics model within a semantic framework like LOC makes it possible to account for causative construal in actual language use as modes of realizing CAUSE, ENABLE, PREVENT, DESPITE and WITHSTAND.

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