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“Nixon stonewalled the investigation”: Potential contributions of grammatical metaphor to conceptual metaphor theory and analysis.

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Abstract.

Halliday’s (1985; 1998) theory of grammatical metaphor (GM) has been quite influential among scholars who study structural approaches to language but has received little attention among researchers in cognitive linguistics. In this paper we summarize the aspects of Halliday’s approach that are most relevant to cognitive linguists, and show how key aspects of grammatical metaphor are related to the analysis of lexical and conceptual metaphors. Using an example of scientific writing analyzed by Halliday (1998) as well as examples from discourse previously subjected to conceptual metaphor analysis, we show how the two approaches might usefully be combined to yield new insights in the analysis of naturally-occurring discourse.

Key words: metaphor, conceptual metaphor, grammatical metaphor, syntactic transformation, discourse analysis.

“Nixon *stonewalled* the investigation”’: Potential contributions of grammatical metaphor to conceptual metaphor theory and analysis.

Traditional approaches to metaphor, dating back to Aristotle, treat metaphor as a strictly lexical phenomenon, in which one word is substituted for another. The traditional approach to metaphor as a purely linguistic phenomenon identifies metaphors simply as a word used in place of another word from a different domain, such that meanings associated with the vehicle are transferred to or associated with the topic. Most traditional discussions of metaphor focus on nominal metaphors such as ‘Achilles is *a lion*,’¹ in which the vehicle (*‘lion’*) is substituted for some associated quality (e.g., *brave*). However, a traditional substitution approach can readily be extended to other parts of speech such as adverbs, as in ‘she sang *sweetly*,’ where *‘sweetly’* is substituted for *pleasantly* or *in a pleasant voice*. A traditional substitution approach can also be extended to multi-word phrases, as in ‘the industrious student *flew through* his homework’, where *‘flew through’* is substituted for *completed rapidly*.

Several recent theories of metaphor have departed from the traditional approach. Perhaps the most radical departure from the traditional view is Conceptual Metaphor Theory (CMT), which holds that metaphor is located in thought rather than in language. Lakoff and Johnson (1980) argue that metaphorical expressions observed in language, such as *‘flew through his homework,’* express underlying *conceptual metaphors* in which a more abstract concept, e.g. *doing homework*, is experienced as or in terms of a less

¹ We follow the custom of indicating metaphors by italics within quotation marks – single marks for invented examples, double for attested examples.

abstract, more tangible concept, e.g. *movement through physical space*. These underlying conceptual metaphors are usually denoted by small capital letters, e.g. “A TASK IS A PHYSICAL SPACE” and “COMPLETING A TASK IS MOVEMENT THROUGH SPACE,” to emphasize that, at the most fundamental level, they are constituted by relationships among concepts, not by relationships between semantic units. Lakoff and Johnson deliberately focus on commonplace expressions such as ‘*rising prices*’ and ‘*warm relationship*’ (classified by many advocates of traditional lexical approaches as *lexicalized* or ‘*dead*’ metaphors). They argue that analysis of these widely-used expressions can provide insights into the underlying conceptual structure of cognition. Thus, ‘*rising prices*’ reflects an underlying mapping of *quantity* onto *height* (“UP IS MORE”) and *price* onto *object* (“IDEA IS OBJECT”). Similarly, ‘*warm relationship*’ reflects an underlying mapping of *affection* onto *temperature* (“AFFECTION IS WARMTH,” also evident in expressions like ‘a *warm* greeting’ and, conversely, ‘a *cold* personality’).

A second departure from the traditional view, based on Perceptual Simulation Theory (Barsalou, 2008; Gibbs & Matlock, 2008), argues that language units (words, phrases, and grammatical structures) partially activate neural pathways that would be associated with referenced objects, states, and actions, i.e., partial simulations of the metaphor vehicle (Bergen, 2012). The relevant partial simulations activated by a vehicle become associated with the topic. Although Perceptual Simulation Theory is capable of standing on its own as a theory of metaphor, it is readily combined with CMT, since it helps to explain Lakoff and Johnson’s claim that the metaphor topic is not merely expressed by but actually *experienced as* the vehicle. Thus, according to a synthesis of Perceptual Simulation with CMT, when we hear ‘*rising prices*’ we actually experience

the abstract concept *price* as a simulation of an object moving upward, and when we hear ‘*a warm greeting*’ we actually experience the abstract concept *friendliness* as a partial simulation of physical warmth.

A third departure from the traditional approach, Grammatical Metaphor (Halliday, 1985; 1998) focuses on “transcategorization,” in which a phenomenon of one sort is treated as a phenomenon of another sort (see also Mao, 2010). The most obvious example of transcategorization is what Lakoff & Johnson call *objectification* or *objective metaphor*, in which an abstract concept, a quality, or a process is expressed as a noun and treated as a thing. Mao provides an example, ‘These ideas have been subject to widespread criticism,’ in which the action *to criticize* (expressed as a verb) is transformed into an abstract entity criticism (expressed as a noun). However, transcategorization can extend well beyond objectification; for example objects can be treated as actions or qualities, and even as abstract concepts. Thus, “unnoticed surface² cracks,” from a text we will discuss later, presents a verb → adjective transcategorization, representing *process* (notice) as *quality* (unnoticed) coupled with a noun → adjective transcategorization, representing *part of entity* (surface) as *location* ([on the] surface).

Grammatical metaphor (GM) has been extensively discussed in connection with structural approaches to language, but has received little attention within cognitive linguistics. The transcategorization in GM reflects a shift or transformation from one syntactic category to another *within* one domain. Metaphor, as it is commonly understood, is a shift or transformation from one domain to an entirely different domain, and can take place within a syntactic category, as in ‘Achilles is a *lion*.’ It can also take

² To help distinguish them from conceptual and lexical metaphors, we will follow Halliday’s convention of marking grammatical metaphors by underlining them.

place between syntactic categories, as in “Mitt Romney is a *vulture* capitalist,” where the noun *vulture* is transcategorized and substituted (through assonance) for the noun *venture* – both of which are transcategorized to the form of an adjective modifying capitalist. The transcategorization from entity (noun) to descriptive modifier (adjective) in this example can also be used as an illustration of GM. This possibility, which we will take up later in this paper, has been neglected in previous discussions of lexical metaphor.

Are these phenomena sufficiently similar in terms of cognitive processing, cognitive effects, or both, that transcategorization from one grammatical form to another may usefully be considered a type of metaphor? Alternatively, can GM analysis contribute to discourse analysis in a way that merits including it as a branch of metaphor analysis? In this paper we give a brief overview of some of the tenets of GM that are most relevant to cognitive approaches to metaphor, noting areas of convergence as well as divergence between the two approaches. We will then consider to what extent GM might usefully be included within the concept of *metaphor* as it is used in cognitive theories. Finally, using examples from actual discourse we show some ways that GM might extend and enrich cognitive approaches to metaphor theory and analysis.

Grammatical Metaphor.

Halliday proposed the concept of grammatical metaphor within an overarching theory about the “lexico-grammatical” structure of language. His theory of language structure itself appears within an even broader social theory based on three assumptions: “that the grammar of every (natural) language is a theory of human experience... (and) also an enactment of interpersonal relationships” as well as “creating discourse” (Halliday, 1998, p. 186). Although Halliday’s broader theoretical enterprise is well

beyond the scope of this paper, we believe much of his analysis of grammatical metaphors can stand on its own, independent of his social theory.

Halliday argued that “lexical variation is only one aspect of lexicogrammatical selection of wording” and proposed the category of grammatical metaphors (GM), “where the variation is essentially in the grammatical forms although often entailing some lexical variation as well” (Halliday, 1985:320). Grammatical metaphor in particular is defined as any expression that uses one kind of grammatical structure to replace another kind of grammatical structure, based on the assumption that the new grammatical structure represents or expresses an underlying concept that is from a totally different domain from the concept expressed by the initial grammatical structure. Thus when the noun *venture* is used (transcategorized³) as “venture” (an adjective modifying *capitalist*) the underlying concept is changed from *a risky undertaking* (an abstract entity denoting a kind of activity) to *the quality of profiting from risky undertakings* (an abstract quality). We note in passing that this transcategorization, and the compound it produces when joined with *capitalist*, would require a considerably more complex analysis in GM, a point to which we will return later in this paper.

Based on his analysis of the metafunctions of language as ideational, interpersonal and textual, Halliday proposed two categories of grammatical metaphor, ideational and interpersonal; other scholars have proposed a third category, textual grammatical metaphors (e.g., Martin, 1992; Thompson, 1996). In this article we focus mainly on ideational metaphors, which are the most relevant to the concept of metaphor as it is generally understood in cognitive linguistics. Later in the article, we briefly discuss

³ The root *transform* is more familiar than *transcategorize*, but *transform* implies merely a surface change (a change in form) whereas *transcategorize* implies a more basic change, from one *category* to another.

interpersonal metaphors, which have the potential to extend metaphor analysis to otherwise anomalous discourse samples.

Grammatical metaphors serve to reshape and reconstrue our experiences by re-presenting one type of phenomenon as another. One example is a simple process to an entity, *earn* to *earnings*. Another is a complex process to an entity, multiple activities and relationships → science. A third example is a series of transformations, e.g. an entity (noun) to a simple process (verb) back to an abstract entity (noun), as in color → to color → coloring. The word transcategorization itself represents one such series: category (noun) → categorize (verb) → transcategorize (verb) → transcategorization (noun).

Other more complex examples include using an interrogative sentence to express imperative meaning ('have you started your homework?') or a declarative sentence to express an imperative ('it's time to start your homework'), and so on (Mao, 2010). By focusing on the conceptual meanings implied by grammatical form and structure GM is able to bring to the surface the cognitive / linguistic processes through which grammatical play and transformation might potentially create new meaning. It is here that we think GM departs most from cognitive linguistics, and can be viewed as more than merely a different, more abstruse, and more complicated terminology.

Halliday argues that grammatical metaphor tends to develop from *process* toward *entity*, leading to nominalization, a primary focus of ideational metaphor. Halliday (1998, p. 191) gives the example, 'the brakes failed,' which can be transformed into 'the failure of the brakes.' Here, the underlying lexical item *to fail* and its primary conceptual meaning *not performing as expected* do not change, but the (lack of) action denoted by the verb is re-presented as an entity associated with the brakes, which can then enter into

causal relationships. ‘The driver was going too fast. The brakes failed. Then the vehicle careened off the road’ can be transformed into ‘The vehicle’s speed led to the failure of the brakes, causing the vehicle to careen off the road.’ The grammatical metaphors in the transformed version removes the driver entirely as a causal agent and replaces the driver as agent with a sequence of two metaphorical entities, speed and brake failure.

A process (verb) can also be reconstrued as a quality, as in increase → increasing. Conversely, a quality can be reconstrued as a process (dark → darken) or as an entity (darkening, darkness or just dark as in “the dark of night”). In his discussion of scientific discourse, Halliday (1998) also shows how an entire clause can be metaphorically represented as a noun. Thus, “electrons cannot be distinguished from one another” is nominalized as “the absolute indistinguishability of the electrons...” which is then available for use in further theoretical arguments. It might be noted that “the failure of the brakes,” in the previous example, also implicitly represents an extended bit of discourse, in this case a story about what caused the brakes not to function.

Halliday claims that “not all possible metaphoric moves actually occur” (1998, p. 209) and provides an ordering of metaphoric moves that do occur: “relator → circumstance → process → quality → entity” (p. 211), so that, for examples, processes (verbs) can be metaphorically construed as entities (nouns). However, Halliday claims that the reverse ordering does not occur: “entities cannot be construed as if they were processes... This drift towards the concrete is, of course, exactly what one finds to be a feature of metaphor in its traditional, lexicalized sense” (p. 211). It is difficult to know what to make of this, since it is easy to find counter-examples. For example, from the noun, *stone*, we have the verb to stone, the adjectives stony as well as stone, which

combines with *wall* to produce stone wall and revert back to stonewall, used metaphorically as a verb ('Nixon stonewalled the investigation') or as a modifier as in the nickname of Confederate General "Stonewall" Jackson. *Carpet* is used as a verb (carpet the floors) and, metaphorically, as an adverb in 'carpet-bombing' (or adjective, if bombing is taken as a transcategorization from verb to noun). Halliday himself provides counter-examples, including "presidential decree" (1998, p. 213), but he does not explain how these counter-examples are consistent with the claim that metaphoric moves occur in only one direction.

Lakoff and Johnson (1980, p. 5) define metaphor as "*understanding and experiencing one kind of thing in terms of another*" (emphasis in original). The fail → failure example seems to fit this definition, inasmuch as the transformation encourages us to experience a process as an object. From this perspective both "failure" and "indistinguishability" are examples of what Lakoff and Johnson call *objectification* metaphors: they represent abstract processes as objects, things that can be observed and measured and that can play an active role in further processes.

In a brief discussion of grammatical metaphor, Steen (2007) emphasizes that a lexical metaphor *must* be disambiguated. The literal and metaphorical meanings must be distinguished, and the relationship between them understood, before the meaning in context can be understood. In contrast, Steen argues that a nominal form of a verb, such as "failure," does not require disambiguation, since the word re-presents a process as an entity. From Steen's argument it follows that the concept of *grammatical* or *syntactic* metaphor must involve broadening the definition of *metaphor* beyond the way it is understood both by traditional theories and by cognitive theories.

Although we are sympathetic with the implication that including GM within the concept of metaphor must entail altering and expanding the definition of metaphor, Steen's argument overlooks key aspects of Halliday's approach. In Halliday's view, "failure" implies a process and not an entity precisely *because of* the metaphorical mapping. Using an example, "On Macquarie's *arrival* in England..." (i.e. "*when Macquarie arrived...*"), Steen claims that *arrival* has a clear meaning based on the verb *to arrive*, and requires no disambiguation, but the context slightly obscures the potential for GM. A different context for the same word may facilitate the discussion: 'The President's unexpected arrival caused great confusion.' Following Halliday's analysis, in this second example the transcategorical transformation from the verb (process or action) *arrive* creates a noun, arrival that can then be entered into a causal relation with confusion, which is itself a transcategorical transformation from the verb *confuse* to the noun, confusion. From Halliday's point of view the key feature of all of these examples is that the GM converts or re-presents an action or process (*to arrive*) as a potentially causal entity. Similarly, unexpected transforms the cognitive action verb, *to expect* into an adjective that qualifies and describes the noun created by transforming *arrive* into arrival. Finally, confusion transforms the action verb *to confuse* into a noun that represents a state of cognitive uncertainty and physical disorder as an entity. The modification of expect → unexpected, arrive → arrival, and confuse → confusion thus transforms a series of three actions into a quality and two entities, which can then be arranged in a causal statement.

Syntax can be viewed as merely instructions for how to assemble word meanings into coherent and contextually-relevant thoughts, which might imply that syntax has no

meaning in itself. Alternatively, syntax can be viewed as adding meaning independent of the words. “Tom hit the ball” means something quite different from “The ball hit Tom.” “He is too nice” means something different from “He is nice, too.” The concept of grammatical metaphor depends on this second understanding, that syntax adds meaning independent of the words themselves. According to perceptual simulation theory, syntax interacts with lexical meanings to shape simulations, e.g. a simulation of the tactile and muscular activation associated with swinging a bat for “Tom hit the ball” vs. a simulation of the pain of being struck by a ball for “The ball hit Tom” (Bergen, 2012).

GM inherently assumes that syntactic structures, word order and word form, carry meaning independently of the words. Verbs signify processes or actions; nouns construe participants capable of acting or being acted upon. Nominal groups “are the more stable elements on the experiential scene which tend to persist through time, whereas the processes themselves are evanescent. When leaves have fallen, the leaves are still around; but the falling is no longer in sight” (Halliday, 1998, p. 197). Glass *breaks* in a brief moment; the glass remains broken indefinitely. Adjectives classify and describe the modified entity, ascribing qualities that affect its participation in processes or actions. Adverbs qualify and potentially limit (or amplify) the modified process or action, ascribing qualities that influence how it is accomplished and how it affects participants. A GM transforms the lexically designated concept in a way that fundamentally alters the way in which it participates in and contributes to constituted experience (e.g., stories). Thus, ‘the leaves fall’ would be expected to activate a simulation of objects descending through space, which would also be activated by ‘the falling leaves.’ ‘Glass breaks’ would activate a simulation of an instantaneous change from a solid pane (or a solid

container for liquid) to exploding fragments. By contrast ‘the fallen leaves’ would be expected to activate a simulation of objects lying, still, upon the ground, and ‘the broken glass’ would be expected to activate a simulation of fragments of glass scattered across some surface (but not in motion).

Lexically both *arrive* and *arrival* refer to a situation in which Macquarie, or the President, was not present at one moment and was present at a subsequent moment. *Break* and *broken* refer to a situation in which the glass was a continuous sheet (or object) at one moment, hundreds of separate shards at a subsequent moment. But the verb form expresses the additional and independent idea of an *action* or *process*. In the case of *arrive*, the verb expresses motion from one place to another, in the case of *break*, it refers to a change in the state of molecular bonds. In each case the noun form expresses a very different idea of a *state of being*. Whether a state of being is necessarily understood as an *entity* is debatable, but Halliday claims that, in order for it to enter into a causal relation, it must be at least implicitly understood as an entity. This claim seems reasonable. Where GM seems to intersect with cognitive theories of metaphor is the idea that the independent meaning of lexical word form (and word order) is presented – and experienced – as a fundamentally different meaning, associated with a totally different lexical form / structure and thereby able to enter into totally different understandings and propositions.

To summarize the discussion thus far, at a surface level a grammatical metaphor can be thought about as a phrase in which one aspect of the way we perceive and act in the world is understood and experienced as an entirely different aspect. This transformation is represented linguistically by the reformulation of one part of speech,

representing one aspect of experience, into a different part of speech to represent a different aspect of experience. Common forms are action → entity, as in failure, quality → action, as in darken, quality → entity, as in darkness, and entity → action *or* quality, as in stone. In the following sections we will present and discuss examples of discourse analysis in which grammatical metaphor analysis and conceptual metaphor analysis are compared and combined, beginning with an example of scientific discourse discussed by Halliday (1998).

Method.

For the conceptual metaphor analysis, we followed procedures outlined by Cameron (2006; 2007) with modifications suggested by Dorst and Kaal (2012). Initially, we checked candidates for metaphor status with the Merriam-Webster on-line dictionary, <http://www.merriam-webster.com/dictionary>. We generally relied on the first definition, supported by consulting the derivation. Dubious cases, as when a context-relevant literal definition is given as a secondary, derived definition, were resolved according to the criterion of topical incongruity (Dorst & Kaal, 2012): is the apparent meaning in context incongruous with the topic? Because our primary interest is in the metaphors themselves in relation to the discourse sample, and not in their relation to the overarching structure of language, we used a simplified procedure, in which we began by identifying parts of speech at the surface level of the text, then consulting the Merriam-Webster on-line dictionary to determine the form of the base lexeme to determine the presence of metaphorical transformation.

Although he does not describe his methods in any detail, it appears that Halliday begins by rewording the original text into a form that is entirely congruent, which he calls

the “natural” form. He considers the overall meaning of the passage in making decisions about how the grammatical functions of particular words and phrases are to be classified. Although he does not explicitly mention it, in this initial step it appears that Halliday also considers the most basic and customary form of a word in his analysis – e.g., the verb form *to fail* is more basic than the noun form *failure*. He then compares the reworded version to the original text to identify the metaphorical transformations, which have often “undergone through more than one cycle of metaphoric transformation” (1998, p. 207), and identifies the congruent and metaphorical semantic types for each transformation. Halliday argues that “Since the metaphoric process is taking place in the grammar, any transformation is likely to reverberate throughout the clause... So grammatical metaphors tend to occur in *syndromes*: clusters of interrelated transformations that reconfigure the grammatical structure as a whole” (1998, p. 214). Identifying these clusters is an important step in interpretation.

Halliday does not provide the “natural form” of his sample texts. When attempting to duplicate his analysis, we found it relatively simple to recover the apparent “natural form” of many of the short passages, but other passages were quite difficult to recover, and the text as a whole was extremely difficult. Moreover, in many passages there were more than one feasible candidate for the “natural” form. Halliday’s concept of a “congruent” form has been criticized by several researchers (e.g., Fu, 2009; Hu, 2000; Mao, 2010), but the concept of a “natural” or “congruent” form does not seem essential to the underlying idea of grammatical metaphor. A viable alternative is to analyze a text in relatively small units (words or phrases). However, this more granular approach precludes identifying some of the more complex forms of GM discussed by Halliday.

Example 1: Metaphor in scientific writing.

Halliday (1998, p. 215) reproduces a paragraph from an article by two scientists in *Scientific American* (Michalske, & Bunker, 1987), with detailed coding for grammatical metaphors. We coded the conceptual metaphors in the same text. In this section we present the two parallel analyses, line by line. We then summarize and critique Halliday's interpretation of the GM analysis, and finally discuss how the two approaches differ and how they might complement each other. Halliday's GM analysis is indicated by underlining, followed by the GM interpretation. Where the rationale for Halliday's coding is unclear, or where it apparently involves intermediate steps that are not readily apparent, we follow it with a question mark within parentheses⁴. Our conceptual metaphor (CM) analysis is indicated by italics, followed by a proposed conceptual metaphor in small capital letters. Where the same phrase is coded for both GM and CM, we present the GM analysis first, followed by the CM. Sequential numbers have been added to the sentences to facilitate discussion. Our comments on the coding are indicated within curly brackets, {comment}.

1. Even though the fracture of glass can be a *dramatic event*, many failures are *preceded* by the slow extension of preexisting cracks.

fracture of: verb → noun; noun → various {?}

dramatic: LIFE IS A STAGE

event: 0 → noun {?}

⁴ Most of these instances probably reflect Halliday's conclusion that the observed phrase represents a series of intermediate metaphorical "displacements." Although this might make sense from the perspective of language structure, from a cognitive perspective it is difficult to see how such a series of "displacements" could be processed within the time constraints of actual language production and comprehension. The idea of a series of intermediate metaphorical displacements is consistent with Halliday's idea of "natural forms" and, conversely, the process of recovering the "natural" form of a passage is necessary for this more complex level of analysis. Our solution was to analyze only the apparent direct displacements.

failures: verb → noun

preceded by: conjunction → verb {?}; TIME IS SPACE; PROCESS IS MOTION

slow: adverb → adjective {however, as near as we can tell, the adjective form is at least as basic as the adverb form, thus this does not appear to be an actual GM.}

extension of preexisting: verb → noun, noun → various {?}; conjunction → verb or verb → adjective

2. A good example of a slowly spreading crack is often found in the windshield of an automobile.

spreading: verb → adjective; found 0 → verb {?}; TO PERCEIVE IS TO DISCOVER

3. The extension of a small crack, which may have *started from* the impact of a stone, can be *followed* day by day as the crack gradually *propagates* across the entire windshield.

extension: verb → noun

started from: TIME IS SPACE, PROCESS IS MOTION

impact of: verb → noun, noun → various {?}

can be *followed*: TIME IS SPACE, PROCESS IS MOTION

propagates: personification: A CRACK IS A PERSON; BREEDS FROM PARENT STOCK

4. In other cases small, unnoticed surface cracks can *grow* during an incubation period and cause a catastrophic failure when they *reach* a critical size.

unnoticed surface cracks: verb → adjective; prepositional phrase (on the surface) → noun premodifier

grow: A DISCONTINUITY IS AN ORGANISM; TO EXTEND IN SPACE IS TO GROW

incubation period: verb → noun, noun → modifier; A PROCESS IS AN ORGANISM,
TO DEVELOP IS TO HATCH OR BE BORN

cause a catastrophic failure: conjunction → verb {? - perhaps *cause it to fail and
cause a catastrophe*}; prepositional phrase → adjective {?}; verb → noun

reach: be/go + preposition → verb {?}; A STATE (SIZE) IS A LOCATION IN SPACE
a critical size: adjective → noun {?}

5. Cracks in glass can *grow* at speeds of *less* than one trillionth of an inch per hour, and
under these conditions the incubation period can *span* several years *before* the
catastrophic failure is observed.

grow: A QUALITY (SPEED) IS AN ORGANISM

at speeds: adjective → noun {?}

less than: A QUALITY (SPEED) IS AN OBJECT OR SUBSTANCE

under: A CONDITION IS A LOCATION OR OBJECT LOCATED IN SPACE

these conditions: conjunction → noun {?}

incubation period: verb → noun; DISCONTINUITY IS AN ORGANISM, TO DEVELOP IS
TO HATCH

span several years: TIME IS SPACE; be/go + preposition → verb {?}

before: TIME IS SPACE

catastrophic failure is observed. Prepositional phrase → adjective {?}; verb →
noun; noun → adjective {?}; either EVENT IS OBJECT or metonymic reference to
result of process.

6. *On* an atomic⁵ scale the slow growth of cracks corresponds to the sequential rupturing of interatomic bonds at rates as *low* as one bond rupture per hour.

On: SCALE (SIZE) IS AN OBJECT LOCATED IN SPACE – [this could also be coded as a GM, concrete object → abstract object].

slow growth of adverb → adjective {?}; verb → noun; noun → (?)

corresponds to: conjunction → verb {?}

sequential: prepositional phrase → adjective {?}

rupturing of: verb → noun, noun → (?)

interatomic bonds: prep phrase → noun premodifier {?}; ENERGY IS A PHYSICAL TIE

rates as low: adjective → noun {?}; RATE IS OBJECT, LESS IS DOWN

bond rupture: noun → adjective; verb → noun; ENERGY IS A PHYSICAL TIE, OVERCOME IS BREAK

7. The *wide range* of rates *over* which glass can fracture – varying by 12 orders of magnitude (factors of 10) *from* the fastest shatter *to* the slowest creep – *makes* the investigation of crack growth a particularly engaging enterprise.

wide range: RATES OF CHANGE ARE OBJECTS IN SPACE; preposition → noun {?}

of rates: adjective → noun {?}

over which: A RATE OF CHANGE IS A LOCATION OR OBJECT LOCATED IN SPACE

orders of magnitude: adjective → noun; RATE OF CHANGE IS AN OBJECT

from ... to: RATE OF CHANGE IS AN OBJECT IN SPACE

fastest shatter adverb → adjective {?}; verb → noun

slowest: adverb → adjective {?}

⁵ It is not clear why Halliday did not identify the *atom* → atomic GM.

creep: verb → noun; CORRELATED CHANGE IN STATE IS ORGANISM MOVING IN SPACE.

makes: conjunction → verb (?); QUALITY OF A PROCESS (INVESTIGATION) IS AN OBJECT;

investigation of crack growth: verb → noun; noun → ?; verb → noun; A CRACK IS AN ORGANISM.

engaging: verb → adjective; TO BE INTERESTED IS TO BE PLEDGED OR CONSTRAINED

enterprise: ? → noun {?}

From Michalske, T. A. & Bunker, B. C. (1987), quoted and analyzed in Halliday (1998, p. 215)

The first thing that becomes apparent from this exercise is that a few words and phrases are identified as both grammatical metaphors (GM) and conceptual (or thematic) metaphors (CM/TM) – but the interpretation of even these differs radically between the two approaches. In the following section we will summarize Halliday’s interpretation of the GMs; then we will provide an interpretation of the CM/TMs and compare the two approaches.

Grammatical Metaphor interpretation. It is apparent that Halliday’s analysis of the glass fracturing text is focused almost entirely on the way a “congruent” structure of language seems to be transformed into an “incongruent” structure. In contrast to cognitively-based analyses, Halliday gives little or no attention to the actual *comprehension* of language. To the contrary, from his discussion it is apparent that he is

more interested in historical transformations of language, and in the role of these transformations in constructing a scientific “ideology.”

Nevertheless, following his detailed analysis of the grammatical (re-)structuring of scientific language, Halliday does discuss the apparent motivation behind the use of GM in the creation of scientific texts. He identifies two objectives or “metafunctional environments”⁶ (1998, p. 221) for GM in scientific writing. One is textual, to manage the information flow in order to create reasoned arguments, for example, by condensing an entire process into a metaphorical noun that can then be entered into causal sentences. E.g., the metaphors “*propagation*” and “*incubation*” combine conventional (conceptual or thematic) metaphors with grammatical metaphors, each of which represents a very complex process in a single word. Given the actual nature of a crack in glass (a crack is not an entity at all; it is a sequence of broken molecular bonds) several complex paragraphs would be required to express these ideas in literal language.

The second objective for GM is ideational, “creating ordered taxonomies of abstract technical constructs.” By nominalizing a series of complex processes, the scientist can classify these processes into categories and subcategories and combine them into causal relationships. Both “*propagation*” and “*incubation*” imply a hierarchy of causal relations that, again, would be difficult to specify in more direct, literal language. Halliday provides another example from a biological text: following “all electrons... are indistinguishable,” “the indistinguishability of the electrons” is entered (as a causal entity) into a further process, the movement of solvents across a membrane (p. 221).

⁶ It is difficult to be certain about the nuances of meaning Halliday intended here; we will use the simpler term “objective.”

Inspecting the clear-cut cases of GM in the text (and disregarding the instances that require a multi-layered sequence of “metaphorical displacements”), we notice that the majority of GMs in the glass fracture example are nominalization, and these seem crucial to the organization of the text as a coherent argument. The text also includes several transformations to a verb or an adjective. “Unnoticed surface cracks” includes both a verb → adjective and a noun → adjective transformations. The verb → adjective transformation represents a past failure of perception as a quality of the cracks and the noun → adjective transformation represents an abstract location with respect to an entity as a quality of the cracks. Although interesting in their own right, these transformations do not play the key role in the argument that the verb → noun and especially the process → noun transformations play. These transformations may not be as crucial as the nominalization transformations for the theoretical structure of the argument. However, they do play a crucial role in qualifying and elaborating that argument – and in rendering it accessible to a non-technical reader.

Halliday shows how the nominalization of process leads through repeated use to lexicalization and creation of a technical, specialist language. This specialist language both separates the discourse of science from ordinary discourse and facilitates the development and expansion of scientific argument. In fact, this kind of grammatical transformation is probably a necessary step in the orderly progression of science. Halliday further claims that this process of nominalization and separation of the discourse of science from ordinary discourse leads to the creation of ideology. If the term “ideology” is defined in a very broad way, as something like “a coherent system of ideas expressed in a coherent set of linguistic constructions,” then the claim is trivially true. If

“ideology” is construed in a more traditional way as implying that the coherent system of ideas is self-generating and impenetrable from outside, and that it results in class domination, then we find Halliday’s argument unconvincing. However, these broader claims are beyond the scope of this paper.

Conceptual Metaphor interpretation. A relatively small number of conceptual metaphors are used throughout the glass fracture passage, most of them to represent abstract concepts: SPACE, MOTION THROUGH SPACE, OBJECT, and ORGANISM appear several times. PERSON, DISCOVERY, and CONSTRAINT (“*bond*”) appear once each. Since the process being described is dynamic, the use of ORGANISM and MOTION THROUGH SPACE is not surprising. TIME IS SPACE is very conventional, but the use of SPACE as a metaphor vehicle seems a little more interesting since the subject of the passage is the extension of a crack across the space of a windshield. The appearance of a PROCREATION metaphor in two different versions, “*propagate*” and “*incubation*,” represents the crack as an organism in two important senses: It unifies the series of broken molecular bonds as a single entity, converting the crack from a feature of an entity (the windshield) into a discrete entity, distinct from the windshield. It also invests the crack with a “life force,” almost a sentient will, again independent of the molecular bonds that lend the windshield its solid integrity and, when broken, appear as a crack⁷. As with the grammatical metaphors identified by Halliday’s analysis, conceptual metaphors facilitate the coherent organization of the passage. In contrast to grammatical metaphors, which distil meaning

⁷ A more accurate metaphor might be a defensive line of infantry, in which the death or retreat of one soldier makes it more difficult for the soldiers on either side to hold the line, and thereby increases the possibility that they will also “fail.” A less dramatic metaphor might be a clothing zipper. As long as all teeth are engaged, the zipper cannot be pried apart except with great force, because the teeth reinforce each other and help to hold each other in place. Once one tooth disengages or breaks, the tooth next to it will be supported on only one side, and so will be more easily disengaged as well.

in a way that facilitates theoretical discussion, conceptual metaphors re-present meaning in more familiar concepts that increases its accessibility to a non-technical audience.

Combining GM with CM analysis. Lexical metaphors are often used as a way to avoid complex phrasing. A good example is the CONDUIT or CONTAINER metaphor system used for discussing language and communication generally (Reddy, 1993; also Lakoff & Johnson, 1980). To discuss the difficulty of selecting exactly the right wording ('I can't seem to *put* my ideas *into* words') without metaphors would require a long series of sentences involving the creation or enactment of symbols that would be more or less incomprehensible. The CONTAINER metaphor, misleading as it may be in a fundamental sense, at least allows us to proceed with a discussion of word choice with a minimum of fuss. Similarly, to discuss the consequences of "the indistinguishability of the electrons" without a grammatical transformation of some sort – a GM – would also require a forbiddingly complex series of sentences. The same might reasonably be said about the metaphors in the Michalske and Bunker example. "Incubation period" may seem misleading in that it seems to imply that a crack in a sheet of glass is a living entity, but it is difficult to think of any other, reasonably compact, phrase that would be any better. It seems reasonable to argue that what Halliday identifies as GM serves a rhetorical purpose complementary to that served by Conceptual Metaphors.

What Halliday (using a metaphor of his own that combines GM with CM) discusses as "the distillation of technical meaning" (1998, p. 221) can probably be applied to non-technical meaning (ordinary conversation) just as readily. In ordinary discourse, as in science discourse, GM and CM are often combined. For example, to *love* (verb) is to have '*fallen in*' love (noun) and to '*be in*' love (noun), and may be associated

with 'having' (noun) a loving (adjective) personality. We could speak and write about these experiences without either GM or CM – but it would be much more cumbersome and awkward, so much more that it is doubtful that we could, after all, express the underlying experiences without metaphor of both types.

We believe that GM can usefully be combined with conventional metaphor analysis in many instances. For example, during the 2012 U.S. Presidential primary, Texas Governor Rick Perry called Mitt Romney a “*vulture* capitalist.” “Vulture capitalist” combines a conventional (lexical / conceptual) metaphor with a complex combination of grammatical metaphors. “*Vulture*” is on the surface a product of playful transformation of *venture*, achieved by substituting one sound for another, very similar, sound. As a grammatical metaphor, vulture transforms a noun denoting a species of bird that eats dead animals (an entity) into an adjective denoting something like “behaving like a vulture” or “having qualities associated with a vulture.” However, vulture as an adjective is rarely if ever used literally, thus, the GM transformation requires and implies a prior metaphorical interpretation.

“*Vulture* capitalist” as a lexical or conceptual metaphor implies experiencing the behavior of a capitalist as vulture-like (Ritchie, 2014). In effect, it requires activation of a story about the behavior (or culturally imputed behavior) of vultures (they circle around looking for dead or dying animals to eat, and sometimes start feeding before the animal is totally dead). This story is then metaphorically projected onto the behavior (or culturally imputed behavior) of capitalists, or more specifically venture capitalists (they look for and acquire failing companies, sell off their assets and lay off workers, and either sell the much smaller company or close it down altogether).

The analysis must also consider the unspoken but implied topic phrase, venture capitalist. Capitalist is a transformation of *capital*, a noun denoting the abstract concept of assets that have value and contribute to economic activities in various ways. Both forms, *capitalist* and *capital*, are nouns, but each represents a distinct and complex process, and so both may be considered GMs. Capital represents an entire system of producing, distributing, and selling goods and services, in a way that allows the entire system to be treated as an entity and entered, as a unit, into complex discussions of economics. Capitalist represents the role of persons who are legally entitled to claim “ownership” of capital, and thereby blends a complex system of property law with a complex system of economic roles and activities – and also facilitates complex discussions of economics. The phrase, venture capitalist, would not be considered a conceptual metaphor, but analyzing it as grammatical metaphor can contribute significantly to understanding how an economic argument works.

Venture is primarily a verb meaning to undertake an activity that may be dangerous; it is commonly transcategorized into venture, a noun denoting a risky undertaking of some sort. In venture capitalist it is further transcategorized into a modifier (adjective) denoting something like *person who engages in and profits from risky undertakings*. The simplest GM analysis would treat this as a verb → modifier GM, but the phrase “venture capitalist” creates a parallel between venture, a noun → adjective GM that implies (at least weakly) venture as a parallel noun → adjective GM.

From this analysis it appears that a thorough analysis of a complex metaphor like “venture capitalist” implicitly requires something like GM analysis combined with more conventional lexical or conceptual metaphor analysis. We note in passing that the phrase,

“grammatical metaphor,” is itself a GM. Like the other process → entity GMs analyzed by Halliday, grammatical metaphor allows a complex process to be nominalized and entered into subsequent arguments, as we are doing here.

Extending the concept of GM to speech acts.

Halliday focuses on the syntactic form of lexical units (primarily words), but the basic idea of lexical transformation as a form of metaphor is easily extended to word order and other aspects of syntax as well. Mao (2010) points out that the basic process of transcategorization can also be applied at the broader scale of speech acts as well as to the micro-scale of word forms, for example in a rhetorical question, when an interrogative sentence (‘Don’t you think it’s time to leave?’) is used to express an imperative meaning (‘leave now’).

At an even broader scale, extended segments may be presented as one class of interaction, when the underlying intention is an interaction of an entirely different sort. One example, which would probably be classified as an *interpersonal metaphor* in the terminology of grammatical metaphor, comes from a conversation about police-community relations among four politically radical young people, analyzed in Ritchie (2010):

TYLER: Are you a cop? Are you a cop?

CELESTE: No.

TYLER: Are you a cop?

CELESTE: No.

TYLER: That’s *three times*, okay. *We’re cool*.

Each of Tyler's utterances is presented as a *bona fide* request for information. The entire sequence of three repetitions of this questions takes the overt form of a hostile interrogation based on an underlying belief, common among political radicals (and users of illegal drugs) in the U.S., that evidence from an undercover police officer will be excluded from a criminal trial if the officer has denied being a police officer three times. By implication the sequence is a hostile test of Celeste's identity. Since Tyler and Celeste are friends, it is almost certain that he knew that she was not a police officer. Moreover, since the conversation in which this exchange occurred was quite innocuous, it would have been of little consequence if Celeste *were* a police officer. Thus, the question was not *actually* a question, and the sequence not actually a test of identity. It is better regarded as teasing, and as part of an enactment of a fantasy in which the conversation was actually something much more dangerous and the group was actually doing something exciting and politically important. This is consistent with an expanded concept of grammatical metaphor as the transcategorization across types of speech act.

Consistent with Lakoff and Johnson's definition of metaphor, construed rather broadly, the *form* of the exchange between Tyler and Celeste can be regarded as a kind of *conversationally enacted* metaphor. It presents, and encourages the participants to experience, one type of interaction (a conversation about police-community relations, undertaken to fulfill a school assignment for one of the participants) as a totally different type of interaction (a potentially dangerous conspiracy). This also approximately fits the concept of *direct metaphor* as described by Dorst and Kaal (2012), inasmuch as the entire exchange is quite incongruous. If we construe the concept of *grammar* rather broadly, as referring to the structure of communicative interactions generally, and not merely to the

structure of phrases and sentences, then the exchange between Tyler and Celeste can be understood as an extended grammatical metaphor, specifically an *interpersonal grammatical metaphor*. At the level of individual utterances, the metaphor vehicle is an *ideational* use of language, an apparent request from Tyler for information, an apparent response from Celeste. But at the level of the entire exchange it is an *interpersonal* use of language, in which their separate identities and the relationship between their identities are represented by the sequence of questions and responses. Since this representation is contextually incongruent, it would also be classified as metaphorical according to the criteria described by Dorst and Kaal.

Factual assertion as language play. Another example is an extended exchange reported by Norrick & Spitz (2010, pp. 97-100), as an “example of using natural conflict talk patterns for nonserious argument.” The participants are a middle-aged woman, FR, her son, DV, in his early 20s, and another male, MK, about the same age as FR (mid 40s). The three have been discussing meal-planning for an event when FR suggested they might make a quiche. Her son DV objected that he does not like quiche, explaining “real men don’t eat it,” an apparent reference to the pop-culture book, *Real men don’t eat quiche* (Feirstein, 1982) DV followed up with a riddle:

DV: How many *real men* does it take to change a light bulb?”

FR: “tell me.”

DV: “None, *real men* aren’t afraid of the dark.”

MK challenged the premise of DV’s riddle, asking “what’s the light bulb got to do with the dark?” DV initially responded, “well if you have a light bulb on, it’s NOT.” When MK challenged this explanation, DV launched into a fanciful account of how lightbulbs work: “they suck in darkness, they’re darkness suckers. They suck the

darkness out of the air.” There followed a long sequence (nearly 30 speaking turns) in which MK fed straight lines to DV, while DV elaborated his account of how lightbulbs suck darkness out of the room, even claiming to have learned it in physics.

In addition to the simple metaphors (as marked), this exchange provides three distinct examples of interaction / interpersonal metaphors. DV’s initial objection to serving quiche takes the grammatical form of a *bona fide* statement of personal taste, but it is readily recognized as a satirical remark about a pop-culture book and the attitudes represented by the book (metaphorically expressed in the ironic use of the phrase “*real men*”). The riddle is presented as a *bona fide* request for information (or test of knowledge) followed by a *bona fide* answer, but the question is actually a set-up for a joke and the answer is, again, a satirical remark about the same book. Finally, “they suck in darkness, they’re darkness suckers. They suck the darkness out of the air” presents a deliberate bit of nonsense as a *bona fide* factual explanation. Each of the underscored words constitutes a GM, and each takes a form consistent with Halliday’s explanation of the use of GM in scientific language. This potentially reinforces the mock-science tone of DV’s explanation of how lightbulbs work and the mock-argumentative tone of the entire exchange. Thus, a series of ideational GMs (transcategorized words and short phrases) are embedded within an extended *interpersonal* GM (a conversation transcategorized from one interpersonal form to quite a different form). This analysis is consistent with Norrick & Spitz’s analysis, but we believe that it expands on Norrick & Spitz in a potentially quite useful way.

We note in passing that our analyses of both the “Are you a cop?” sequence and the “darkness suckers” sequence as interpersonal GMs are consistent with Relevance

Theory (Sperber & Wilson, 1996; Wilson & Sperber, 2004) . When the apparently serious question “Are you a cop?” is seen to be irrelevant to the current conversational context, a search for a context in which it *is* relevant in effect forces a transcategorization of the context itself from *casual conversation* to conspiracy, followed by a further transcategorization to *teasing* and *pretense*. When the apparently serious explanation that lightbulbs “suck darkness out of the air” is seen to be relevant to no known facts about physics, a search for a context in which it is relevant similarly forces a transcategorization of the context itself from scientific explanation to *stringing a line*.

Are grammatical metaphors activated during language processing? Many researchers and theorists have questioned whether conceptual metaphors play a part in language comprehension. As we previously mentioned, extensive experimental research has shown that the perceptual simulations that underlie conceptual metaphors are at least weakly activated during language processing (Bergen, 2012; Gibbs & Matlock, 2008). Although much of this research is based on active verbs (“*grasp* the concept”) or physical sensations (“*cold* greeting”), the general activation of perceptual simulations is supported by research on animals such as eagles and objects such as road signs and cooking eggs (for a comprehensive review see Bergen, 2012). This accumulated research supports the claim that “*vulture* capitalist” activates, at least weakly, perceptual simulations associated with the vehicle, “*vultures*,” and culturally commonplace stories about their activities.

What would it mean for a GM to become activated during processing? Our analysis of “vulture” in “vulture capitalist” suggests a partial answer. The syntactic transformation from noun to adjective motivates the activation of both traits associated with the bird and stories associated with the bird. Capitalist would presumably activate at

least some of the complex system of financial economic and legal relationships involved in property ownership would become activated as partial simulations. The implicit parallel syntactic transformation of ‘venture’ from noun to adjective activates traits and stories associated with that particular profession / activity. Combining these partial simulations (potentially) maps the *vulture* traits and stories onto the *venture* traits and stories. In the case of ‘the failure of glass’ simulations of both the action of breakage and an abstract entity would be at least weakly activated. In the case of arrival, both the movement of a person into a space and the person’s sustained presence would be activated. In the case of “Are you a cop?” a story about unmasking an undercover agent would be weakly activated. In the case of the darkness suckers exchange, the discourse form of a physics lecture or a scientific argument would be weakly activated.

Although there has been no direct research testing the potential of GMs to activate perceptual simulations, or exploring other possible effects of GMs on cognitive processing, some of the experimental evidence reviewed by Bergen (2012) does support the role of syntax in shaping perceptual simulations. For example, in one series of experiments, Bergen had subjects listen to a series of sentences describing motion either away or toward the subject (“you”) or a third person (“the pitcher”). Subjects were then shown two pictures in quick succession and asked to indicate whether the second object was the same as the first object. When the sentence described motion *toward* the subject, they responded faster to a second picture that was slightly *larger* than the first as compared to a second picture that was slightly *smaller* (consistent with motion *toward* vs. *away*). When the sentence described motion toward a third person, subjects responded

faster to a second picture that was displaced slightly to the right (suggesting motion perpendicular to the line of sight) than to a non-displaced picture.

These results, along with the results of several other experiments reviewed by Bergen, are consistent with the idea that syntax has an effect on perceptual simulation and comprehension independent of word meaning. They are also consistent with the idea that syntactic elements interact with lexical elements in shaping perceptual simulations. Testing the more extensive idea that original syntactic form is experienced while processing a transcategorized form (e.g., that the process of failing or breaking is at least weakly experienced while processing a sentence about the 'failure of something' or 'something broken') will require more elaborate experimental designs. GMs that map complex processes onto a noun or adjective, such as capital or capitalist pose even more complicated issues.

Discussion.

Most language theorists and researchers would probably agree that syntactic and lexical aspects of language make somewhat independent contributions to meaning and understanding, and even that syntax and semantics represent separate but interacting systems of meaning. Based on this distinction, Halliday (1985; 1998) has extended the idea of (lexical) metaphor as a relation between two distinct lexical units (e.g. words from distinct domains of meaning) and proposed a concept of grammatical metaphor as a relation between two distinct syntactic units (e.g. the verb and noun forms of a common lexeme).

Lakoff & Johnson define metaphor as a relationship between two concepts in which the topic concept is experienced as the vehicle concept. Halliday claims that

grammatical structure often represents a grammatical transformation or “transcategorization” in which an original (grammatically-expressed) concept (the topic) is experienced as a quite different grammatically-expressed concept (a vehicle). This kind of grammatical transcategorization seems compatible with the overarching concept of conceptual metaphor. The two approaches to the relationship between language and thought are not by any means co-extensive: Conceptual metaphors include many conceptual mappings that are not expressed in grammatical structure, and what Halliday identifies as grammatical metaphors include many examples that, from a cognitive linguistics perspective, appear to be merely a grammatical transformation, a transformation of a relatively unchanged underlying concept, and not a mapping of one underlying concept onto something totally different.

There is also a small class of transcategorizations in which the altered form can *only* be construed lexically as a metaphor. The following come readily to mind, and most other examples we could think of also have to do with taste – but examples from other domains can probably be found:

Sweet → sweetly (‘she sang *sweetly*.’)

Bitter → bitterly (‘he complained *bitterly* about the bitter taste of the tea.’)

One simply cannot say ‘the candy tastes sweetly’ or ‘the tea tastes bitterly’ – to do so would require personifying candy and tea respectively. Many transcategorizations support a metaphorical interpretation – but as we noted in our parallel analysis of the “glass cracks” sample text, the lexical metaphors are often independent of the grammatical metaphors (e.g. “*preceded by*” and “*found in*”).

Based in part on his analysis of GM in scientific discourse, Halliday makes some broader historical and philosophical claims about the role of grammatical metaphor in constituting ideologies that may be of use to researchers in critical discourse analysis. We have not explored these dimensions of Halliday's work in this paper, but rather focused primarily on the implications and potential contributions of grammatical metaphor to a more cognitively oriented approach to discourse analysis.

Independent of any claims about intellectual history or ideology, the GM and CM analyses of the "glass cracks" example yield different but complementary insights about the passage and about the topic. The extension to speech acts, suggested by Mao (2010), also has some promise for analyzing otherwise anomalous texts, as shown by our example of the "Are you a cop?" and "lightbulb" sequences, and provide a potentially useful complement to Relevance Theory. Thus, it appears that including grammatical metaphor as a sub-category within a cognitive concept of metaphor would not require an excessive enlargement of the definition of metaphor provided by Lakoff and Johnson, as claimed by Steen – although GM does require a different set of procedures for coding and analysis. It also appears that GM can add a potentially useful tool for discourse analysis. For example, in a previous analysis of "venture capitalist," Ritchie (2014) applied conceptual metaphor and story metaphor analysis; the addition of GM in our analysis of the same metaphor adds considerably to the richness of the explanation. In future work we plan to explore this possibility in greater depth by analyzing one or more texts using both GM and CM. Conversely, we have also shown that conceptual metaphor analysis usefully supplements and enriches Halliday's (1998) account of the Michalski and Bunker (1987) article on glass fractures.

A further question that has not been addressed by Halliday (as far as we can determine) is cognitive processing and comprehension. Some recent experimental evidence (Bergen, 2012) indirectly supports the idea that GM may interact with conceptual metaphors in a way that shapes perceptual simulations and affects cognitive processing. Whether GMs might affect cognitive processing on its own has not been directly tested. Conversely, if grammatical metaphors are not routinely activated (e.g., if a person who hears or reads “failure” as a noun does not experience at least a weak activation of fail as a verb), does that leave any meaningful role for GM in either discourse analysis or cognitive metaphor theory?

Summary.

The concept of grammatical metaphor, introduced by Halliday (1985; 1998; Halliday & Matthiessen, 1999) provides a potentially useful extension of cognitive metaphor theory and analysis. Some grammatical metaphors appear to fall within the class of *objectification metaphors* discussed by Lakoff & Johnson (1980), but many of the categories of grammatical metaphor discussed by Halliday require a quite different conceptual and analytic approach. We have shown that grammatical metaphors can be readily combined with cognitive metaphors in analysis of naturally-occurring discourse, and in many instances analysis combining the two approaches leads to deeper insights. The question of whether and how grammatical metaphors might actually affect cognitive processing language remains largely untested and unexplored, although recent experimental evidence lends some support to the more general claim that syntax contributes to language processing in ways that are independent of, but interact with, lexical processing. In conclusion we believe that further research on grammatical

metaphor has the potential to enrich and expand our understanding of language, cognition, and the interaction of language with cognition.

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