Anatol Stefanowitsch
Metonymies don't bomb people, people bomb people

Abstract: In the cognitive linguistic literature, sentences like *Nixon bombed Hanoi* have long been explained in terms of metonymy, either 'referential' (i.e. the NP Nixon metonymically refers to the bomber pilots controlled by President Nixon), or 'predicative' (i.e. the verb bomb metonymically refer to the ordering of the bombing). More recently, it has been suggested that such sentences may be better analyzed as slightly untypical literal instances of the transitive construction. In this paper, a corpus-based analysis of the verb *bomb* is presented, which shows that the usage of this verb is very different and much more heterogeneous than the constructed examples cited in the literature suggest. It is argued that this heterogeneity cannot be coherently analyzed in terms of referential or predicative metonymy. Instead, a non-metonymic account is sketched out based on a general characterization of causative transitives and verb frames from which logical subjects are selected based on salience. This account provides a unified analysis of the phenomenon that even allows us to recognize additionally the existence of referential metonymies in certain cases. The paper contributes to a growing body of research literature that takes the idea of a 'usage-based' cognitive linguistics seriously by attempting to test and develop analyses empirically on the basis of authentic usage data.

Keywords: metonymy, referential metonymy, predicative metonymy, transitives, frame semantics

1 Introduction

Corpus data are increasingly used in cognitive linguistic research to help the researcher test hypotheses or decide between different preexisting answers to a research question. However, such data may also change the question itself in ways that lead the researcher to explore alternative explanations. This paper

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aims to demonstrate this by using corpus data to determine the most plausible analysis of the sentence *Nixon bombed Hanoi* (Lakoff and Johnson 1980). Obviously, US President Richard Nixon did not personally drop bombs on the city of Hanoi, raising the question what this sentence means and how it does so.

This sentence, and others like it, have traditionally been analyzed either in terms of a 'referential' metonymy allowing the NP *Nixon* to refer to the pilots carrying out the bombing, or in terms of a 'predicative' metonymy allowing the verb *bomb* to refer to the ordering of the bombing. In Section 2, I lay out these approaches in more detail and discuss issues with both analyses raised in previous research. I will also introduce a third approach suggested in the literature but not laid out in detail that treats such sentences as slightly untypical but nevertheless literal instances of the transitive construction.

In Section 3, I present a corpus-based analysis of the verb *bomb* as it occurs in actual usage. The analysis shows that the usage of the verb is very different and much more heterogeneous than the constructed examples used in the literature would lead us to expect. Approaching this heterogeneity in terms of referential or predicative metonymy does not lead to a unified, internally coherent analysis.

In Section 4, I sketch out in more detail the non-metonymic account, using a general characterization of causative transitives and verb frames from which logical subjects (i.e. syntactic subjects in active clauses or prepositional objects of agentive by-phrase in passive clauses) are selected based on salience. This account provides a unified analysis of the phenomenon that even allows us to recognize the existence of referential metonymies in some examples.

2 Two types of metonymy

Metonymy is generally defined as a figure of speech where a word (the *metonym*) is used to refer not to its literal referent but to a related entity. In cognitive linguistics, it is assumed that the relevant relationship is established by conceptual mappings between entities in the same experiential domain that serve to focus on contextually relevant aspects of that domain (cf. Lakoff and Johnson 1980: 35).

In (1a–e), I list some typical conceptual metonymies (cf. Lakoff and Johnson 1980: 38–39) together with authentic examples from the British National Corpus (the mappings and metonyms are shown in small caps, three-character sequences in square brackets indicate the corpus file here and throughout the paper):

(1) a. place for institution
         The WHITE HOUSE *admitted it had known of the plot for days...*
         (A2T)
     b. place for event
         It will take a second PEARL HARBOR *for the Americans to realise how ineffi-cient the NSA really is...*
         (AN0)
     c. part for whole[1]
         [S]he was treated as a PRETTY FACE *in a working environment which is heavily masculine...*
         (A5Y)
     d. restaurant table for customer[2]
         TABLE TEN *is waiting for the check.*
         (N. Neuhaus, *Snow White Must Die*)[3]

(2)   controller for controlled
         It was Christmas, 1972, when PRESIDENT NIXON *bombed Hanoi.*
         *(*J. Irving, *Owen Meany*)

Obviously, some of these mappings are highly general and productive (e.g. [1a, b]), while others are lexically conventionalized (e.g. [1c]) and/or specific to par-ticular discourse domains (e.g. [1d]). However, they all fit, at least at first glance, the definition given above. Replacing the metonyms in (1) and (2) with nouns referring directly to their intended referent (which I will refer to as the *target*) gives us literal, but otherwise synonymous equivalents:

(1') a. 'A representative of the executive branch of *the government of the USA, located in the White House*, admitted...'
      b. 'It will take a second unforeseen *attack like that of Pearl Harbor* by the Japanese on 7th December 1941 for the Americans to realise...'

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1 Note that PART FOR WHOLE (and WHOLE FOR PART) are sometimes treated as a separate phenom-enon traditionally referred to as *synecdoche* (cf. e.g. Seto 1999), but I will follow Lakoff and Johnson (1980) in treating it as s subtype of metonymy.
2 Lakoff and Johnson's widely-quoted and analyzed example for this mapping is *The ham sandwich is waiting for the check*; however, I have been unable to find even a single authentic example where customers are referred to by the food they ordered. This does not mean that it is never done, but there is little we can say about this usage on an empirical basis.
3 Citations from books were found through the Google Books archive. Author and title are given in square brackets here and throughout the paper.

    c. 'She was treated as *a person whose only relevant feature was a pretty face*...'

    d. '*The customer(s) at table ten* is/are waiting for the check.'

(2')   '...when bomber crews controlled by President Nixon bombed Hanoi.'

This approach is largely uncontroversial for examples (1a–d), where the apparent metonym is indeed interpreted as referring to an entity related to its literal referent: (1a) is not a statement about the White House but about the institution headquartered at the White House, (1d) is not a statement about a table, but about someone sitting at that table, etc.

    With (2), the approach runs into problems: in analogy to the examples in (1), we could argue (following Lakoff and Johnson 1980 and others) that since Richard Nixon did not personally drop bombs on Hanoi, the phrase *President Nixon* refers metonymically to the bomber crews carrying out the bombing. A closer look reveals, however, that (2) is actually understood to be a statement about Richard Nixon rather than the bomber crews. This fact has a range of structural reflexes, two of which I will briefly discuss here.

    First, intra-clausal anaphoric pronouns can usually agree in number and person either with the metonym (cf. [3a]) or with the target (cf. [3b]).[4] In the case of anaphoric reference across clauses, agreement with the target seems to be obligatory, as in (3c), where the pronoun *they* could not be felicitously replaced with *it*:

(3) a. *If you've just delivered burgers to a table that asked you for ketchup and you know another* TABLE *is waiting for* ITS *check, deliver the ketchup first*...
        (yourbusiness.azcentral.com)
    b. TABLE 12 *is waiting for* THEIR *check.*
        (baltimoresun.com)
    c. *I noticed* A TABLE *behind us waiting for the check and* THEY *did not look like a group of happy diners*...
        (urbanspoon.com)

As Stallard (1993) points out, this is not the case in sentences like (2), where anaphoric pronouns obligatorily agree in person and number with the apparent

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4 In fact, agreement with the intended referent seems to be more typical than agreement with the literal referent (although I am not aware of any quantitative corpus-based studies of this phenomenon).

metonym *President Nixon* rather than the apparent target "bomber crews controlled by President Nixon" (Stallard 1993: 87) (his acceptability judgments):[5]

(4) a. NIXON *bombed Hanoi.* HE *wanted to force the Communists to negotiate.*
    b. NIXON *bombed Hanoi.* *THEY *sang all the way back to Saigon.*

Similarly, if the verb of a sentence with a metonymic (logical) subject is modified by an adverb or adverbial, these are interpreted as relating to the target rather than the metonym. It is not the table that is angry in (5a) or not being served in (5b), but the people sitting at the table:

(5) a. *You still eat meals like there might be a* TABLE *(angrily) waiting for their check at any moment.*
        (yoiu.org)
    b. *Also, the* TABLE *next to us left without ever being served*
        (plus.google.com)

Adverbs and adverbials relating to the metonym *table* cannot felicitously occur in analogous clauses:

(6) a. ?? TABLE *12 is spotlessly waiting for its check.*
    b. ?? *The* TABLE *next to us left without ever being cleaned.*

In contrast, adverbs in sentences like (2) relate to the apparent metonym – *Nixon* in (7a) and *the U.S. government* in (7b) –, rather than the apparent target *crews controlled by Nixon/the government*:

(7) a. NIXON *secretly bombed Cambodia.*
        (V. Sanders, *Access to History*)

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5 Again, I am not aware of any empirical study of this phenomenon, but Stallard's judgments are confirmed by an informal search of the Google Books archive: There are eleven authentic occurrences of the string {Nixon bombed Hanoi} (excluding cases where it is used as a linguistic example). In two cases, the anaphoric pronoun *he* occurs in the same or the next sentence, in two additional cases there are dependent infinitival clauses whose logical subject is clearly President Nixon (e.g. *President Nixon bombed Hanoi not to rid North Vietnam of communism but to keep it from imposing communism on South Vietnam* [*The Atlantic*, Vol. 256 (1985): 22]). In contrast, there is not a single case with an anaphoric pronoun referring to the pilots.

b.   *THE UNITED STATES GOVERNMENT bombed Cambodia without informing U.S. citizens about it.*
(L. Fox, *Gateway*)

Examples (7a, b) refer to the bombing of Cambodia on May 18, 1969, which Nixon ordered personally without informing the US Congress or the public; even the pilots were kept ignorant of their targets. Thus, the person acting secretly is the literal referent of the apparent metonym *Nixon*, not the apparent metonymic target "bomber crews". In fact, as (8a, b) show, adverbs and adverbials relating to the bomber crews cannot be included felicitously:

(8) a.   ?? *Due to low visibility, NIXON mistakenly bombed the wrong village.*
     b.   ?? *The GOVERNMENT bombed Cambodia without informing their families at home about it* (where *their families* refers to the families of the bomber crews).

In order to account for such differences in interpretation and anaphoric reference, Stallard (1993) proposes a reanalysis of examples like (2). He posits two different types of metonymy, *referential* and *predicative* (cf. also Nunberg 1995). Referential metonymies are 'classic' cases like those in (1a–d), where a noun phrase is used to refer to an entity metonymically related to its literal referent. In contrast, predicative metonymies are cases like those in (2), where Stallard argues that it is not the noun phrase that is used metonymically, but the predicate.

   Put simply, under this analysis a literal paraphrase of (2) would not be (9a), as suggested by Lakoff and Johnson's analysis, but something like (9b):

(9) a.   CONTROLLER FOR CONTROLLED
          'Bomber crews controlled by President Nixon bombed Hanoi.' (= 2e)
     b.   EVENT FOR CAUSE OF EVENT
          'President Nixon caused bomber crews to bomb Hanoi.'

The analysis in terms of a predicative metonymy solves the problems relating to adverbs and anaphoric pronouns, since the subject NP *President Nixon* literally refers to President Nixon under this analysis.

   However, the analysis is not without problems of its own. Crucially, note that (2) is factive: it entails not only that Richard Nixon ordered the bombing, but also that the bombing actually took place (cf. Kabakciev 2000: 106). Thus, the statement is understood to be about the dropping of bombs, rather than the

order to do so, just like it is understood to be about Richard Nixon rather than the bomber crews.

Warren (2006) suggests in passing that sentences like (2) might be analyzed as as referential metonymies based on PART FOR WHOLE rather than CONTROLLER FOR CONTROLLED: as Commander-in-Chief, Richard Nixon is part of the US armed forces whose bomber crews carry out the actual bombing. The literal counterpart of (2) would be something like (10) under this analysis, explaining at least to some extent why the sentence is understood to be about Nixon as a prominent part of the entity actually referred to:

(10)   *The U.S. air force bombed Hanoi.*

However, the analysis does not account for the fact that anaphors, adverbs and adverbials are interpreted relative to Nixon rather than the air force.

In addition to the two metonymic accounts of sentences like (2), there is an account that treats it as a non-metonymic variant of the simple transitive construction. Talmy (2000: 274–275) and Pinker (2008: 86) discuss the analogous examples in (11a) and (11b, c) respectively:

(11) a.   *The pharaoh built a pyramid for himself.*
     b.   *Henry Ford made cars.*
     c.   *Bush invaded Iraq.*

Talmy (2000: 274) discusses (11a) as an example of what he calls "gapping", noting that after an Agent has initiated an event, a causal chain ensues that can include intermediate agents "whose agency is essential in the sequence leading to the final reported result", but whose "act[s] of intention and volition" are outside the focus of attention. Thus, (1a) would be a kind of abbreviated variant of a sentence like *Nixon caused the air force to cause bomber crews to bomb Hanoi.*

Similarly, Pinker (2008: 86) argues that which part of a causal chain is put in the (logical) subject position of lexically causative verbs depends on the "grain size of the mind's view of the world". Historical events are typically conceptualized relative to the "acts of influential leaders", allowing (or even encouraging) speakers to ignore the intervening links in the causal chain from those acts to the final outcome (see also Warren [2004] and Hasegawa [2010] for suggestions that cases like (2) and (11a–c) are specific cases of a transitive causative construction).

To sum up, we have (at least) three different analyses of sentences like *President Nixon bombed Hanoi*:

1. as an instance of a classic (referential) metonymy, with *President Nixon* standing
   a) for "bomber crews" (via the CONTROLLER-FOR-CONTROLLED mapping) or
   b) for "the armed forces" of which the bomber crews are also members (via the PART-FOR-WHOLE mapping);
2. as an instance of a predicative metonymy, with the predicate *bomb Hanoi* standing for the event "cause to bomb Hanoi";
3. as a somewhat untypical instance of the lexical causative, where the instigator of an action is not identical to the agent who performs this action, and where the instigator rather than the ultimate agent is chosen as subject.

All three analyses rest on artificially constructed examples describing situations where a person with substantial authority causes his subordinates to perform an action. None of the authors investigates how the verbs in question are actually used and thus there is no way of telling how natural, let alone how widespread examples like (2) are and, even more importantly, how they relate to other uses of the verbs in question.

In the next section, I will give a corpus-based description of the verb *bomb* (and some related verbs), and then return to the question to what extent either of the two metonymic approaches adequately captures uses like (2) in light of the actual usage of *bomb*.

3 A corpus-based study of logical subjects of the verb *bomb*

In the first subsection, I will explicate a semantic frame for the verb *bomb* in the sense relevant here, which will serve as the basis for categorizing the corpus data presented in the second subsection.

3.1 The BOMB Frame

Dictionaries generally distinguish two different meanings of the verb *bomb,* as exemplified by the following entry from the Cambridge Advanced Learners Dictionary:

(12) a. [1] to drop bombs on something: *Planes bombed the city every night*.
[2] to destroy something by exploding a bomb inside it: *This hotel was bombed a few years ago*.
(CALD, s.v. *bomb* [verb])

In the context of the present discussion, only the first of these senses (for which the synonym *bombard* is sometimes given) is relevant; the second sense will not be considered any further. In (12b–e), some additional dictionary entries and examples for this first sense are listed:

(12) b. to attack somebody/something by [...] dropping bombs from a plane
The city was heavily bombed in the war.
(OALD)
   c. to attack (a place or people) with a bomb or many bombs
The planes flew 200 miles to bomb their target.
(MW)
   d. to attack with or as if with a bomb or bombs; drop bombs (on)
Imagine, though, thinking every plane that flies overhead is going to bomb you or something
(Collins, example from Scarlett Thomas, *Going Out*)
   e. throw bombs at or attack with bombs
The Americans bombed Dresden
(WordNet)

Based on these definitions and examples we can assume the following frame elements: an (unnamed) AGENT, who flies an AIRCRAFT to a LOCATION where the agent drops BOMBS on that location (and the people there). Interestingly, none of the definitions make reference to the fact that bombings take place during a MILITARY CONFLICT; only the example accompanying (12b) mentions this explicitly and the word *attack* in definitions (12b, c) implies it. Once we take this into account, we can say more about the agent: A military conflict involves two CONFLICT PARTIES (each of which typically consists of a POPULATION of a COUNTRY) with ARMED FORCES; within the armed forces, there is a chain of command from the COMMANDER-IN-CHIEF (typically the <u>head of state</u> or head of government) via a hierarchy of additional COMMANDING OFFICERS down to the SOLDIER carrying out an individual act of war (for example, the bombing of a target).

On this basis, we can postulate the following frame:

(13)　　*bomb*: a SOLDIER$_I$ who is a member of the MILITARY$_{II}$ of a PARTY$_{III}$ (typically the POPULATION$_{III.a}$ of a COUNTRY$_{III.b}$) in a MILITARY CONFLICT$_{IV}$ flies an AIR-CRAFT$_V$ to a target LOCATION$_{VI}$ and drops one or more BOMBS$_{VII}$ on that location and/or the PEOPLE$_{VIII}$ there, after having been ordered to do so by a COMMANDING OFFICER$_{IX}$ who is part of a chain of command leading up to the COMMANDER-IN-CHIEF$_X$.

In the next subsection, I will investigate which of these frame elements actually occur in the logical subject position of the verb *bomb*. I will assume that all frame elements may occur in the logical subject position, except LOCATION (element VI in the frame) and PEOPLE AT LOCATION (element VIII). Thus, I will make use of the following annotation scheme:

(14) a.　SOLDIER (element I in the frame in [13] above), for references either to individual members of a bomber crew or the crew collectively;

　　 b.　AIRCRAFT (element V), as in examples (12a, c, d.), these may be referred to by a *GENERAL* term like *plane* or *aircraft*, a specific *MAKE* or *TYPE*, or even a *PROPER NAME*);

　　 c.　BOMB (element VII), for sentences like *Japanese bombs bombed the U.S. to start the WWI* [Diane Marshall, *Presidential Puzzlers*];

　　 d.　COMMAND, with the subcategories *COMMANDER-IN-CHIEF* (element X), as in *Nixon bombed Hanoi* and *(OTHER) SUPERIOR* (element IX), referring to any other commanding officer;

　　 e.　MILITARY (element II), with the subcategory *ARMED FORCES* for references to the military as a whole or any of its major branches, and *UNIT* for references to smaller units, such as battalions, squadrons etc;

　　 f.　PARTY (element III), with the subcategories *POPULATION* (III.a) for cases like the example accompanying (17e), *COUNTRY* (III.b) for cases where the country itself is mentioned (*The U.S. bombed Dresden*), and *OTHER* for cases like *the enemy, the Allies*, etc.;

　　 g.　CONFLICT (element IV), for sentences like *[A]n atomic war has bombed them back to the Middle Ages* (John L. Flynn, *Visions in Light and Shadow*).

3.2 The data

First, I extracted all cases of the verb *bomb* from the British National Corpus manually (i.e., without making use of the POS tagging, which proved highly unreliable with respect to identifying nominal and verbal uses of the forms

bomb, *bombs* and *bombing* and adjectival vs. verbal uses of *bombing* and *bombed*). Next, I manually discarded all intransitive uses (in the senses 'fail', as in *the movie/product bombed* and 'move', as in *they bombed down the motorway)*, and all transitive uses with the sense 'destroy something by exploding a bomb inside it' (cf. [12a] above).

This left 332 cases referring to situations where bombs were dropped from planes. For 141 of these cases (mostly passive and infinitival clauses), no specific logical subject could be recovered. These were cases like (15a, b):

(15) a. *But my mother always speaks of sleeping in the shelter. When London was bombed.*
         (G1S)
     b. *Bombers were still going over Germany and [John] argued that it was indefensible to bomb cities where women and children could be killed.*
         (G16)

Although it is clear which party is doing the bombing in these examples (the German Luftwaffe in [15a], the Allied Forces in [15b]), no specific surface form is present that could be categorized according to the annotation scheme in (13) above. Of course, where such surface forms were present for infinitival and passive clauses, as in (16a, b), these were categorized in the same way as in active declarative clauses (which accounted for the majority of the data points in the sample):

(16) a. *Stepanakert was bombed by AZERBAIJANI AIRCRAFT on July 20*
         (HLM)
     b. *"It's so PLANES don't see where to bomb," continued Tom…*
         (CAB)

In the remaining sample of 191 cases that did have an explicit logical subject, all of the categories from the annotation scheme were found except for the category CONFLICT (as in [14g] above):

(17) a. *[M]Y SECOND PILOT just remarked that he was glad we did not bomb Mannheim…*
         (J56)
     b. *Allied planes, including RAF TORNADOS, have bombed Iraq again…*
         (K1C)

    c.   *[T]he best radars can detect [the F 15], which is why only STEALTH FIGHTERS bombed well-guarded Baghdad.*
        (ABJ)

    d.   *MARY ALICE flew in the low box and bombed an airfield in France...*
        (CLV)

    e.   *You should surrender / Our BOMBS bomb people who don't*
        (F9M)

    f.   *To lend some credibility to his policy, NIXON continued to bomb North Vietnam openly.*
        (EWG)

    g.   [About General Michael Dugan, the Air Force Chief of Staff] *All HE wanted to do was bomb "downtown Baghdad"*
        (ACP)

    h.   *Meeting minimum resistance, THE ALLIED AIR FORCES continued to bomb targets in Iraq...*
        (HL4)

    i.   *There was another iron dictatorship in Germany, WHOSE CONDOR LEGION bombed the working classes in Guernica on 26 April 1937.*
        (AC6)

    j.   *[T]HE GERMANS were bombing shipping in the North Sea and threatening to invade England on 18 July.*
        (G16)

    k.   *ALLIES bomb Iraqi missile defences*
        (K1C)

    l.   *The fact that WE have bombed Iraq, a rather small Third World country, back into the 19th century or even earlier...*
        (G2J)

    m.   *Both Lavan and Sirri were bombed BY IRAQ in 1986*
        (HRE)

There were cases with SOLDIERS as the logical subject (cf. [17a]), with AIRCRAFT, referred to either directly by a word like *plane* or *aircraft*, by a word for a specific MAKE of aircraft (cf. [17b] for both), a specific TYPE of aircraft (cf. [17c]) or the PROPER NAME of an aircraft (cf. [17d]). The word *bomb* also occurred (in a poem, cf. [17e]). There were cases with members of the COMMAND in the logical subject position, both with COMMANDER-IN-CHIEF (cf. [17f]) and with other SUPERIORS (cf. [17g]). The category MILITARY also occurred, both in the form of ARMED FORCES (cf. [17h]) and of specific UNITS (cf. [17i]). Finally, the PARTIES of the military conflict occurred in the logical subject position, referred to as COUNTRIES (cf. [17m]) or

their POPULATIONS (cf. [17j]), some OTHER label like *allies* (cf. [17k]) or a GENERIC PRONOUN (cf. [17l]). The latter was not part of the annotation scheme originally, but its inclusion is necessary to differentiate cases like (17a), where a pronoun refers to one or more of the actual crew members of a bomber aircraft, and (17l), where it refers to one or more members of the conflict party who do not participate in any direct way in the bombing.

If we assume that a unified semantic analysis of sentences with the verb *bomb* is possible, then this impressive diversity of logical subject types for the verb *bomb* casts doubts on both types of metonymic interpretation suggested above. Let us briefly discuss these, beginning with the analysis in terms of a referential metonymy.

If the logical subject of *bomb* necessarily refers to the bomber crew or one of its members, then all examples in (17) with the exception of (17a) are metonymical, instantiating a range of different metonymies. Examples with planes (17b, c, d) or bombs (17e) would be explained by a mapping like INSTRUMENT FOR USER, (17f and g) by CONTROLLER FOR CONTROLLED, (17h–l) by WHOLE FOR PART (or GROUP FOR MEMBER) mappings at different levels of specificity (e.g. AIR FORCE FOR BOMBER CREW or POPULATION FOR INDIVIDUAL), and (17m) by PLACE FOR PERSON LIVING IN THAT PLACE (or perhaps a chain of two metonymies like PLACE FOR INSTITUTION (Iraq for Iraqi air force) and GROUP FOR MEMBER (air force for bomber crew).

Even disregarding for a moment the serious problems with pronouns and adverbs outlined in Section 1 above, the range of logical subjects in (17a–m) raises at least two problems for an account in terms of referential metonymy, one theoretical and one empirical. The theoretical problem is that the set of metonymies is very heterogeneous and nothing motivates this heterogeneity: there is nothing that would lead us to expect that we would find these particular metonymies and not others. In other words, the analysis remains purely descriptive. The empirical problem is that an analysis in terms of referential metonymy predicts that 'literal' cases like (17a) should make up the majority of the data (or at least the largest single group). Before we turn to the question whether this prediction is borne out by the data, let us turn to the problems of an account in terms of 'predicative' metonymy.

Under this analysis, too, (17a) would be the only literal use of the verb *bomb*. Examples (17f, g) would be clear instances of the EVENT FOR CAUSE OF EVENT metonymy discussed in Section 2 above. The only other examples than can perhaps accounted for by this metonymy are (17h, i), with the military (or military units) in the logical subject position. Although the military is more likely to be conceptualized as carrying out a military action than to be causing it, it does occasionally occur in sentences that clearly refer to the causing event; compare

the parallel examples in (18a), with *Nixon* in the logical subject position, and (18b), with the *army* in the logical subject position:

(18) a.   *On December 17, NIXON ordered renewed saturation bombing of North Vietnam*
      (S. Tucker, *U.S. Leadership in Wartime*)
   b.   *They uncovered so many targets that 6TH ARMY simply ordered saturation bombing on the entire area.*
      (L. Alexander, *Shadows in the Jungle*)

However, since an army as a whole cannot literally *order* something, (18b) is actually better analyzed as a GROUP-FOR-MEMBER referential metonymy where *6th Army* stands for the commanding officer giving the actual order. In other words, examples (17h, i) may be analyzed as predicative EVENT FOR CAUSE OF EVENT metonymies only if we additionally assume a referential GROUP-FOR-MEMBER metonymy. I will return to this problem presently, but first, note that none of the other examples can be very plausibly accounted for by this metonymy.

    First, while the conflict parties in the form of countries (17m) or their population (19j, k) are in some sense part of a causal chain leading from the commander(-in-chief) to the bomber crew, they cannot be literally said to 'cause the crew to bomb' the target in question. It is very difficult to say what exactly the predicative metonymy would be in these examples, as the link between them and the act of dropping bombs is very indirect – the population, for example, may have elected the person who either serves as, or in turn appoints the commander-in-chief, but we would probably not want to posit that *bomb* in *The Germans were bombing shipping in the North Sea* stands for 'elected the person who appointed the commander-in-chief who ordered bomber crews to bomb'. Instead, it seems again that we are truly dealing with a GROUP-FOR-MEMBER referential metonymy here, where *the Germans* stands for the group of Germans more specifically responsible for the bombing. And of course in the case of (17m), a referential metonymy is unavoidable, since a country cannot act at all – *Iraq* clearly stands for the people responsible via a PLACE-FOR-PEOPLE mapping.

    Finally, it is obvious that neither the examples with aircraft (in [17b–d]) nor those with bombs (cf. [17e]) in the logical subject position can be accounted for by the EVENT FOR CAUSE OF EVENT metonymy. They superficially resemble clauses with instrumental logical subjects, but they are not restricted semantically in the same way.

    The empirical problems for both analyses become clear when we look at the actual frequency with which the different categories occur in the logical subject

position. The referential analysis predicts that since all sentences with *bomb* literally predicate the dropping of bombs by bomber crews, SOLDIER should be the most frequently instantiated category in the logical subject position. The predicative analysis could also be argued to predict this, since it is also based on the assumption that *bomb* in its literal meaning predicates the dropping of bombs. Instead, or perhaps in addition, it could be argued to predict that COMMAND should be the most frequently instantiated category (or at least one frequently instantiated category), since this is the category naturally picked out by the mapping.

Table 1 shows the frequency of the different categories (and their subcategories) in the logical subject position, both as the head noun of the logical subject NP (in the first column), and in material modifying head nouns from different categories, such as adjectives (in the second column).

Tab. 1: Logical subjects of *bomb* in the BNC

Head	Modifier(s)	
AIRCRAFT (70)	PARTY (30)	MILITARY (2)
by *aircraft* or a synonym (40)	country (20)	force (2)
by make (20)	other (7)	
by name (6)	function (3)	
by type (4)	CREW (3)	
	COMMAND (2)	
	superior (2)	
	MILITARY (1)	
	unit (1)	
PARTY (63)		
population (23)		
generic (17)		
country (13)		
other (7)		
function (3)		

MILITARY (31) force (22) unit (9)	PARTY (16) country (13) other (2) population (1)
	CREW (1)
	COMMAND (1) <u>head of state</u> (1)
CREW (17)	MILITARY (1) force (1)
	COMMAND (1) head of state (1)
COMMAND (8) head of state (5) superior (3)	
BOMB (2)	

As Table 1 shows, the predictions of neither the referential nor the predicative analysis are borne out by usage data. CREW and COMMAND are actually among the *least* frequently instantiated categories (the only one even less frequent is BOMB). Sentences like *Nixon bombed Hanoi* are very infrequent, accounting for only 2.4% (8/332) of the total sample. Their supposed literal counterparts, i.e. sentences corresponding to *Bomber crews bombed Hanoi,* are more than twice as frequent, but they still only account for 5.1% of the sample (17/332). Even sentences like *The U.S. air force bombed Hanoi* (i.e. example 10 above), which would be the literal counterpart of (2) if we assume the latter to be based on a PART-FOR-WHOLE metonymy, are still relatively infrequent, accounting for 9.3% of the sample (31/332).

Thus, in addition to the fact that analyses based on metonymy fail to provide a unified (or at least coherent) account of the data in (17a–m), they also fail to predict typical uses of the verb *bomb*, where the logical subject position is occupied either by a noun referring to the AIRCRAFT (most typically modified by an adjective or noun referring to the CONFLICT PARTY), or by a noun referring to the CONFLICT PARTY directly. In other words, the most typical uses of *bomb* are sentences like (19a, b), with (19c) following at some distance:

(19) a. *U.S. aircraft bombed Hanoi.*
　　b. *The United States bombed Hanoi.*
　　c. *The U.S. air force bombed Hanoi.*

Counting both head nouns and modifiers, CONFLICT PARTY is by far the most frequently instantiated category in the logical subject position of *bomb*, accounting for a third of all cases (109/332 = 32.8%). Although this may be surprising from the perspective of the discussion of (2) in the literature, it makes perfect sense from the perspective of the kinds of contexts in which the verb *bomb* is used: Military conflicts are typically conflicts between two nation states (or alliances of nation states), and thus it is unsurprising that these (alliances of) nation states should be mentioned most frequently in the logical subject position of verbs referring to specific military actions.

　　As unsurprising as the preference for the category CONFLICT PARTY in the logical subject position of *bomb* (and verbs like it) is from this perspective, two questions remain. First, does this mean that such uses are literal, while the other uses listed in (17) are derived (metonymically or otherwise)? And second, could those uses be derived in any way that avoids the problems of the referential and predicative metonymic accounts outlined in Section 2 above?

　　Let us begin with the second question, which can be answered negatively straight away. Under a referential-metonymy analysis, we could find metonymies that relate all logical subject categories to the category CONFLICT PARTY (most of them could be treated as instances of PART-FOR-WHOLE, as a country's population, head of state and military, including its commanding officers and soldiers, are all constituent parts of that country). The only exceptions would be the categories AIRCRAFT (which is instantiated most frequently as head noun) and BOMB (which is instantiated least frequently as head noun), both of which could be treated as INSTRUMENT-FOR-USER metonymies. However, this analysis would fail to account for the fact that pronouns and adverbs relate to the literal referents of the logical subject NP, not to the supposed target of the metonymic mapping. This also answers the first question: (19a–c) are no more or less plausibly 'literal' uses than any of the other examples in (17)

　　Under a predicative-metonymy analysis, we would have to define the literal sense of the verb *bomb* in a way that would make CONFLICT PARTY its literal logical subject. However, since *bomb* uncontroversially means 'drop bombs on', and neither countries nor their populations are literally the agents of a bomb-dropping event, this would not result in a plausible analysis.

　　What the corpus data in their full complexity show, then, is that a unified analysis of *bomb* sentences in terms of metonymy is not possible. Instead, a

grammatical analysis in terms of (literal) extensions of a regular causative transitive construction strongly suggests itself (cf. Talmy 2000: 274–276; Pinker 2008: 65–73; Hasegawa 2010).

4 Analysis and consequences

An analysis of the sentences in (17) (including cases like [2]) as instances of a literal causative transitive construction has to capture, first, the fact that both the verb and the logical subject NP occur in their literal meaning (e.g., *Nixon* refers to Richard Nixon and *bomb* means 'drop bombs on') and second, that the relationship of the logical subject NP to the action described by the verb is not necessarily that of a typical Agent (someone who instigates and carries out an action volitionally). For example, the bomber crew referred to by *we* in (17a) are Agents (but not Instigators), while the *stealth fighters* in (17b) are Instruments; the commander-in-chief in (17f) is an Instigator who does not carry out the action personally, while the country in (17m) is the entity on whose behalf the action is carried out.

Researchers in very different frameworks seem to agree that the causative transitive construction encodes an Agent acting on a Patient (Pinker 1989: 73; Goldberg 1995: 117). There is also general agreement that especially the notion Agent has to be defined very broadly, since English lexical causatives are notoriously generous with respect to the semantic roles that their logical subject may encode (Hawkins 1986: ch. 4; cf. also Taylor 1989: ch. 11). Probably the most coherent schematic characterization is that in Langacker (1991: 330), which assumes that the subject encodes the "primary clausal figure".

If we assume, uncontroversially, that the meaning of verbs is defined relative to frames (Fillmore 1982), then the verb *bomb* activates all the (categories of) referents found in the logical subject positions in (17a–m); and it follows from Langacker's characterization of transitives that speakers can choose any frame element for the logical subject position that is upstream from the referent of the object – in other words, all elements that are part of the causal chain that includes the Instigator/Agent. This captures the entire range of logical subjects in (17a–m), including the marginal category BOMB. Speakers' choices would be guided (as Talmy and Pinker suggest) by which of the elements are particularly salient in a particular context.

We could, in principle, refer to the different choices as instances of a "frame metonymy" (cf. Koch [2001], who does not cover the specific case discussed here but who plausibly argues that metonymies can generally be defined with

respect to referential shifts within frames). However, nothing would be gained by this: whichever element is chosen as the logical subject of *bomb* stands for itself, not some other frame element or the frame as a whole (or, at least, it usually does so, a point I will return to below). In other words, neither the frame itself nor other elements in it are usually the metonymic target of the logical subject NP; instead, the frame simply mediates the identification of the relationship between the logical subject NP and the action expressed by the verb.

The account proposed here makes a number of predictions that the accounts in terms of referential or predicative metonymies do not necessarily make. I will discuss three of these in conclusion.

The first prediction concerns referential metonymies. As just pointed out, the referents in the logical subject position of verbs like *bomb* usually stand for themselves under the analysis adopted here. However, like any NP they may of course participate in referential metonymies on occasion. In other words, the grammatical account predicts that there should be both metonymical and non-metonymical uses of at least some of the frame elements.

This prediction is confirmed by usage data. Let me demonstrate this for one of the categories that obviously cannot be the Agent of the verb *bomb* in any objective sense: AIRCRAFT (it could be shown analogously for the other categories). First, consider (20a, b), which show that aircraft in the logical subject position may indeed stand for themselves rather than their crew (*Sugar* is the proper name of a specific bomber plane):

(20) a. *[O]n 21 October A FLORIDA-BASED PLANE piloted by Díaz Lanz bombed Havana...* (G1R)
   b. *Later the same day, SUGAR was off again, this time to bomb the railway junction at Revigny. This was to be Sugar's last operation for almost five months. Towards the end of July Sugar was dismantled...* (CGJ)

In (20a), the NP *a Florida-based plane* clearly refers to the aircraft itself, not to its pilot, as the latter is explicitly mentioned in addition. In (20b), *Sugar* also clearly refers to the aircraft rather than its crew, as seen by the topic continuity (i.e., the fact that the aircraft is the topic of the following sentences, and indeed, of the entire text in which this example occurs).

However, there are also examples where logical subject NPs literally referring to aircraft are more likely intended to stand for a different frame element, for example, (21a, b):

(21) a. *On Sunday, IRANIAN F-4 PHANTOM JETS bombed a Mujahideen base in Iraq in apparent retaliation for a rebel raid...* (AJ6)

   b. *"It's so PLANES don't see where to bomb," continued Tom...* (CAB)

In (21a), the adverbial *in retaliation for* relates to the Instigator or Agent of the bombing than to the plane, since planes do not make strategic decisions about responses to military actions by the enemy. Likewise, in (21b) *planes* is actually the logical subject of a matrix clause with the verb *see*, whose frame does not include aircraft as an element. In both examples, the NPs referring to aircraft seem to function as metonyms for the people sending or piloting the aircraft (via an INSTRUMENT FOR USER metonymy).

The second prediction concerns the likelihood that a particular frame element is chosen in a particular context. The prediction is that this would always be the most salient/relevant frame element.

This prediction, too, is borne out by the usage data: The general frequencies of the different categories correspond well with what we would assume are salient frame elements in typical contexts. The high frequency of the category CONFLICT PARTY was argued above to be a consequence of the fact that this category is the most salient when talking about military conflicts in general. The high frequency of the category AIRCRAFT also follows from this prediction: aircraft are the most immediately salient frame element when the focus in on an actual bombing event rather than the conflict as such. The Instigators are typically absent from the site of the bombing, and the Agents remain anonymous and invisible inside their aircraft, so it is only natural to choose the aircraft themselves as logical subjects (cf. [22a], where the large number of planes is a crucial part of the scene described). Additionally, while Agents and even Instigators are fairly interchangeable, the aircraft often have specific properties that allow the hearer to identify who sent them (as is the case with specific models of aircraft; cf. [22b], where the model name *Blenheim* identifies the aircraft as British), or they have properties that allow the bombing to be carried out in the first place (as is the case with specific types of aircraft; cf. [22c]):

(22) a. *For the next half-hour we watched HUNDREDS OF ALLIED PLANES bombing the town of Caen a few miles away from our positions.*
      (A61)

   b. *The German defences north of South Vaagsö had been bombed by THREE BLENHEIMS an hour or so earlier...*
      (CCS)

    c.   *[P]erhaps the best radars can detect [the F-15], which is why only* STEALTH
        FIGHTERS *bombed well-guarded Baghdad.*
        (ABJ)

Note that the prediction that speakers select the contextually most salient element from the frame as the logical subject also accounts for the rather exceptional cases which were the departure point of this inquiry, namely cases where the Instigator is chosen.

Lakoff and Johnson (whether intentionally or not) selected a very typical exception when they constructed the sentence *Nixon bombed Hanoi*. This sentence sounds natural, and occurs in authentic data, precisely because the Vietnam War was so strongly associated with Richard Nixon personally (both because he frequently did act without involving the expected institutions, and because he became a symbol of a war that the population of his country was increasingly dissatisfied with).

More generally Instigators occur as logical subjects of the verb *bomb* if they are seen as individually responsible for the military conflict that the bombing is part of. For example, in the Google Books archive there are more than a hundred unique hits each for the strings *Nixon bombed*, *Clinton bombed* (mainly in the context of the bombing of Belgrade), and *Hitler bombed*, but only a handful for the strings *Roosevelt bombed* and *Churchill bombed*. Even Royal Air Force Marshal Arthur Harris, who is so closely personally associated with the bombing raids that helped end the Second World War that he was given the nickname *Bomber Harris*, only occurs in the logical subject position of *bomb* six times in the Google Books archive.

The third prediction concerns the grammatical position in which the apparent CONTROLLER-FOR-CONTROLLED metonymy is found. If the above account is correct, it should occur exclusively in the logical subject position of lexical causative verbs, so that (23a) should be unremarkable while (23b) should be odd, while true referential metonymies can occur in any position in the clause, so that both (24a) and (24b) should be unremarkable:

(23) a.   *NIXON bombed Hanoi* (≈ 2)
     b.   ?? *The Vietcong shot down NIXON*
        (where *Nixon* refers to one or more bomber crews)

(24) a.　*The WHITE HOUSE admitted it had known of the plot for days.* (= 1a)
　　 b.　*Cleland [...] accused the WHITE HOUSE of withholding classified information...*
　　　　(M. M. Chantiloupe, *Iraq: The War That Shouldn't Be*)

Again, this prediction is borne out by the data: the apparent metonymy CONTROLLER FOR CONTROLLED strongly favors logical subject positions. This is not to say that this (apparent) metonymy never occurs in the logical object position; a careful search of the Google Books archive yields examples like (25):

(25)　*SADDAM HUSSEIN had invaded Kuwait, and we had invaded SADDAM.*
　　　(P. Lynch, *Beating the Street*)

However, such examples are extremely rare: the entire archive yields only two hits for the string [*invaded Saddam*], as opposed to almost 12,000 hits for [*invaded Iraq*]; the metonymic version (which really is a referential metonymy here) accounts for less than a fiftieth of a percent). In contrast, the same apparent metonymy in the logical subject position (where it is actually just the selection of a salient frame element) is very frequent: there are 786 hits for the strings [*(Saddam|Hussein) (has|had)? invaded*], as opposed to 761 hits for [*Iraq (has|had)? invaded*]; the metonymic version accounts for roughly fifty percent.

5 Conclusion

In this paper, I have tried to show that taking into account even relatively superficially the type of data that corpora offer with respect to a phenomenon whose analysis is contested in cognitive linguistics may lead to the insight that none of the favored analyses are actually sustainable and that a completely different approach must be taken if the aim is a unified and internally consistent account.

　　Specifically, I showed that sentences with Instigators of an action in the logical subject position of transitive sentences cannot be satisfactorily analyzed as either referential or predicative metonymies, but that they must be analyzed as resulting from the interaction of the general causative transitive construction and the causal chain present in the frames of lexical causative verbs. This analysis is not entirely novel, building strongly on suggestions by Talmy (2000) which could, to some extent, be considered a cognitive linguistic analysis, and Pinker (2008), which probably would not.

The case study shows the need to include authentic usage data systematically and exhaustively not just in cases where the aim is to test one or more fully formulated hypotheses, but also in cases where all available hypotheses are known to have problems and where the aim includes the exploration of alternative hypotheses.

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